



# HARTNER

Precision Cutting Tools

麻花钻







**HARTNER**

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Precision Cutting Tools



# 描述

类型	类型	螺旋角	顶尖角	磨削方式		
N	适合加工标准的普通材料 (e.g., steel, GS, GG)	20°-30°	118°	后锥形式标准钻尖设计	高速钢钻头	
H	适合加工硬材料且短屑的材料 (e.g., MS, bronze, Elektron)	12°-16°	118°	后锥形式标准钻尖设计		
W	适合加工软的长屑材料 (z.B. Al-Legierungen, Kupfer)	35°-40°	130°	后锥形式标准钻尖设计		
FN	适合加工标准的普通材料,深孔加工时使用	35°	130°	后锥形式标准钻尖设计		
FN 500	适合加工长屑且韧性好的材料 (如合金钢,热处理钢,硬化钢)	20°-30°	130°	后锥形式标准钻尖设计		
FU 500 FU 500 DZ	适合于通用加工 (如合金钢,非合金钢,最大到 800 N/mm <sup>2</sup> ) DZ=圆柱柄	35°	118°	双面磨削,特殊设计		
FW	适合加工软且长屑的材料, 在深孔加工时使用	35°-40°	130°	后锥形式标准钻尖设计		
S	适合加工难加工材料 (如 不锈钢,热处理钢)	35°	130°	后锥形式标准钻尖设计		
IS	适合加工韧性好的不锈钢,热处理钢	40°	130°	后锥形式标准钻尖设计		
HX500	用于耐磨材料,如Hardox	22°	135°	双后刀面修磨		
V	适合加工硬且难加工的材料 (如弹簧钢)	20°-30°	130°	后锥形式标准钻尖设计		
TS 3 G	当对位置精度,尺寸精度要求比较高时使用	28°	150°	非标刀尖		硬质合金钻头
TS 80 U	适合于通用型加工 (如 GG,GGG,钢 最大到1000 N/mm <sup>2</sup> )	20°-30°	140°	圆弧后刀面 特殊芯厚 type U		
TS 100 U	适合于加工钢 最大到1000 N/mm <sup>2</sup>	25°-35°	140°	双后刀面		
TS 100 HPC	用于结构钢和拉伸强度不超过 1400N /mm <sup>2</sup> 的硬化钢,不锈钢, 钛合金和特殊合金的高性能加工	25°-30°	140°	优化的后刀面几何参数		
TS 150 GG	适合于加工短屑的铸件 铝和高硅铝合金	0° (直槽)	120°	双后刀面 特殊芯厚 type GG		
TS 100 R	适合于加工新型逐渐 GGV 和ADI 铸铁,球墨铸铁,锻造铸铁	30°	-	圆型磨削		
TS 100 T	适合于钢和铸铁的深孔加工	30°	135°	圆弧后刀面		
TS 100 INOX	适合于不锈钢加工用	30°	140°	双后刀面		
TS 100 H	适合加工高强度钢,硬化钢,特殊合金材料。	30°	140°	圆弧后刀面		
TS 100 EG	叉形去毛刺刀				去毛刺刀	
TS 100 VR	前/后去毛刺 90°					
TLB E80	焊刃式单刃型枪钻				枪钻	
TLB E100	整体硬质合金单刃型枪钻					
TLB E800	可换刀片式单刃型枪钻					
TLB Z80	焊刃式双刃型枪钻					

# ISO 材料代码

<b>P</b>	钢和高合金钢
<b>M</b>	不锈钢
<b>K</b>	灰铸铁,可锻铸铁和球墨铸铁
<b>N</b>	铝合金及其它有色金属
<b>S</b>	特殊合金,镍基合金以及钛合金
<b>H</b>	硬化钢及硬化铸铁

## 图标说明

刀具材料

<b>HSS</b>	<b>HSS-E</b>	<b>M42</b>	<b>HSS-E-PM</b>	<b>VHM</b>	<b>HM</b>
高速钢				整体硬质合金	镶嵌硬质合金

表面处理

光亮处理	蒸汽回火处理	刃带氮化处理	Bronze-Oxid	TiAlN	AlTiN nano	AlTiN	TiCN	火焰涂层
TiN	MolyGlide	TiAlSiN	镀镍	发蓝处理				

类型

<b>N</b>	<b>H</b>	<b>W</b>	<b>FN</b>	<b>FN500</b>	<b>FU500</b>	<b>FU500 DZ</b>	<b>FW</b>	<b>S</b>	<b>IS</b>	
具体类型解释, 请看折页	<b>HX500</b>	<b>V</b>	<b>TS3 G</b>	<b>TS80 U</b>	<b>TS100 U</b>	<b>TS100 HPC</b>	<b>TS150 GG</b>	<b>TS100 R</b>	<b>TS100 T</b>	<b>TS100 INOX</b>
	<b>TS100 H</b>	<b>TS100 EG</b>	<b>TS100 VR</b>	<b>TLB E 80</b>	<b>TLB E 100</b>	<b>TLB E 800</b>	<b>TLB Z 80</b>			

型式

<b>R</b>	<b>A</b>	<b>B</b>	<b>C</b>
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钻深

<b>3xD</b>	<b>5xD</b>	....	<b>~3xD</b>	<b>~5xD</b>	....	<b>SPL 45,00</b>	<b>SPL 80,00</b>	....
						mm	mm	

标准

<b>DIN 333</b>	<b>DIN 338</b>	<b>DIN 339</b>	<b>DIN 340</b>	<b>DIN 343</b>	<b>DIN 344</b>	<b>DIN 345</b>	<b>DIN 1869</b>	<b>DIN 1897</b>	....
<b>DIN 8374</b>	<b>DIN 8375</b>	<b>DIN 8376</b>	<b>DIN 8377</b>	<b>DIN 8378</b>	<b>DIN 8379</b>	<b>DIN 6537K</b>	<b>DIN 6537L</b>	<b>DIN 6527K</b>	DIN 标准
	Hartner 标准								

顶尖角

90°	118°	120°	130°	135°	140°	142°	150°

Ø-公差

<b>m7</b>	<b>h5</b>	<b>h6</b>	<b>h7</b>	<b>h8</b>	<b>0/-0,004</b>
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切削方向

顺时针	逆时针

柄部形式

DIN 6536 标准			直柄	莫式柄	SK柄

横刃修磨

带横刃修磨

内冷

带内冷	不带内冷



## 订购方式

当订货时, 请注明订货号和直径

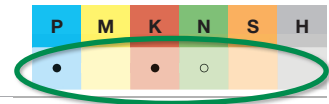
如订购81010, 直径0.200mm

= 81010 0.200

产品型号

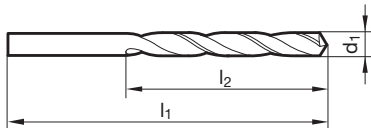
工具钻

产品型号: 81010



芯厚 ≥ Ø 1,000 • 圆弧后刀面

适于加工: 合金/非合金钢和铸钢 • 灰铸铁, 可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,200		19,000	2,500	0,640		26,000	8,000
0,220		19,000	2,500	0,650		26,000	8,000
0,230		19,000	2,500	0,660		26,000	8,000
0,240		19,000	2,500	0,670		26,000	8,000
0,250		19,000	3,000	0,680		28,000	9,000
0,260		19,000	3,000	0,690		28,000	9,000
0,270		19,000	3,000	0,700		28,000	9,000

直径 Ø

刀具的适用性, 折扣组  
价格查询

- 最佳选择
- 可以用



## 重要提示

### 销售情况

交货受制于询价的订单情况。

当订购非标刀具时,按照原来的订单数量的10%上下偏差,分两项。  
付款按实际交货数量。

### 小批量的销售情况

对于小批量的订单,可能还需付额外的费用。

刀具组别	标准	每盒包装情况
直柄HSS 麻花钻	DIN 338 DIN 1897 及类似厂标	≤Ø 7.50mm一盒10支包装 >Ø 7.50...Ø10.60mm一盒5支包装 >Ø 10.60mm1一盒1支包装
	DIN 339 DIN 340 及类似厂标	≤Ø 6.70mm一盒10支包装 >Ø 6.70...Ø10.60mm一盒5支包装 >Ø 10.60mm1一盒1支包装
	DIN 1869	≤Ø 7.50mm一盒10支包装 >Ø 7.50...Ø10.60mm一盒5支包装 >Ø 10.60mm1一盒1支包装
锥柄HSS 麻花钻	所有DIN标准 及厂标	所有尺寸的都是独立包装
硬质合金和镶硬质合金 麻花钻	所有DIN标准 及厂标	所有尺寸的都是独立包装
微钻	DIN 1899	所有尺寸都是10支包装
中心钻	DIN 333 A型,R型	≤Ø 4.00mm一盒10支包装 >Ø 4.00mm一盒一支包装
	DIN 333 B型	≤Ø 2.50mm一盒10支包装 >Ø 2.50mm一盒1支包装

### 银行信息详情

Deutsche Bank AG  
IBAN DE74 6537 0075 0014 6415 00  
BIC DEUTDESS653

BW Bank  
IBAN DE45 6005 0101 0002 5924 44  
BIC SOLADEST600







HARTNER

## 目录

### 直柄麻花钻

HSS, HSS-E, HSS-E-PM, 硬质合金材质  
抛光处理和涂层

### 锥柄麻花钻

HSS, HSS-E, 硬质合金材质  
抛光处理和涂层

### TS钻头

硬质合金高性能刀具  
抛光处理和涂层

### 单刃及双刃枪钻

硬质合金材质, 带硬质合金头部或可换式刀片  
抛光处理及涂层

### 微钻

非标钻头  
抛光处理及涂层

### 阶梯钻 / 中心钻

HSS及HSS-E材质  
抛光处理和涂层

### 铰刀 / 去毛刺刀

HSS及HSS-E材质  
抛光处理和涂层

### 复合钻系统

麻花钻系统 带可换式刀片和内冷却  
HSS-E, HSS-E-PM及硬质合金涂层可换式刀片

### 技术参数

尺寸、定义和推荐



产品代号	页	钴深	标准	表面处理	描述	刀具材料	型号
80495	388		公司标准	AlTiN nano	前/后去毛刺 90°	整硬	TS 100 VR
81000	104	3xD	公司标准	TiAlZrN	HX 500	M42	HX 500
81010	53	~5xD	DIN 338	蒸汽回火处理	工具钻	HSS	N
81011	83	~5xD	DIN 338	蒸汽回火处理	工具钻	HSS-E	N
81012	77	~5xD	DIN 338	光亮处理	工具钻	M42	N
81013	85	~5xD	DIN 338	光亮处理	工具钻	HSS-E	IS
81015	57	~5xD	DIN 338	蒸汽回火处理	工具钻	HSS	N
81017	59	~5xD	DIN 338	蒸汽回火处理	工具钻	HSS	N
81018	79	~5xD	DIN 338	Bronze-Oxid	工具钻	M42	N
81019	81	~5xD	DIN 338	nanoFIRE	工具钻	M42	N
81020	60	~5xD	DIN 338	光亮处理	工具钻	HSS	H
81025	62	~5xD	DIN 338	光亮处理	工具钻	HSS	H
81030	64	~5xD	DIN 338	光亮处理	工具钻	HSS	W
81035	66	~5xD	DIN 338	光亮处理	工具钻	HSS	W
81040	67	~5xD	DIN 338	刃带氮化处理	工具钻	HSS	FN
81041	87	~5xD	DIN 338	刃带氮化处理	工具钻	HSS-E	FN
81045	69	~5xD	DIN 338	刃带氮化处理	工具钻	HSS	FN
81061	89	~5xD	DIN 338	光亮处理	工具钻	HSS-E	S
81078	97	~5xD	DIN 338	AlTiZrN	工具钻	HSS-E	IS
81110	24	~3xD	DIN 1897	蒸汽回火处理	短钻	HSS	N
81112	35	~3xD	DIN 1897	光亮处理	短钻	M42	N
81115	26	~3xD	DIN 1897	光亮处理	短钻	HSS	N
81120	28	~3xD	DIN 1897	光亮处理	短钻	HSS	H
81130	29	~3xD	DIN 1897	光亮处理	短钻	HSS	W
81140	30	~3xD	DIN 1897	刃带氮化处理	短钻	HSS	FN
81145	31	~3xD	DIN 1897	刃带氮化处理	短钻	HSS	FN
81171	37	~3xD	DIN 1897	蒸汽回火处理	短钻	HSS-E	V
81173	39	~3xD	DIN 1897	光亮处理	短钻	HSS-E	IS
81178	44	~3xD	DIN 1897	AlTiZrN	短钻	HSS-E	IS
81190	119		公司标准	蒸汽回火处理	直柄双头钻	HSS	N
81191	115		公司标准	光亮处理	NC 点钻	HSS	N
81192	116		公司标准	光亮处理	NC 点钻	HSS	N
81210	122	~10xD	DIN 339	蒸汽回火处理	采用钻套的麻花钻	HSS	N
81310	124	~10xD	DIN 340	蒸汽回火处理	长系列麻花钻	HSS	N
81311	138	~10xD	DIN 340	蒸汽回火处理	长系列麻花钻	HSS-E	N
81315	126	~10xD	DIN 340	蒸汽回火处理	长系列麻花钻	HSS	N
81317	127	~10xD	DIN 340	蒸汽回火处理	长系列麻花钻	HSS	N
81320	128	~10xD	DIN 340	光亮处理	长系列麻花钻	HSS	H
81330	129	~10xD	DIN 340	光亮处理	长系列麻花钻	HSS	W
81340	131	~10xD	DIN 340	刃带氮化处理	长系列麻花钻	HSS	FN
81341	139	~10xD	DIN 340	刃带氮化处理	长系列麻花钻	HSS-E	FN
81350	133	~10xD	DIN 340	光亮处理	长系列麻花钻	HSS	FW
81361	141	~10xD	DIN 340	光亮处理	长系列麻花钻	HSS-E	S
81362	141	~10xD	DIN 340	TiN	长系列麻花钻	HSS-E	S
81410	147	~15xD	DIN 1869	蒸汽回火处理	超长麻花钻,系列1	HSS	N
81440	148	~15xD	DIN 1869	刃带氮化处理	超长麻花钻,系列1	HSS	FN
81441	151	~15xD	DIN 1869	刃带氮化处理	超长麻花钻,系列1	HSS-E	FN
81450	149	~15xD	DIN 1869	光亮处理	超长麻花钻,系列1	HSS	FW
81510	152	~20xD	DIN 1869	蒸汽回火处理	超长麻花钻,系列2	HSS	N
81540	153	~20xD	DIN 1869	刃带氮化处理	超长麻花钻,系列2	HSS	FN
81541	155	~20xD	DIN 1869	刃带氮化处理	超长麻花钻,系列2	HSS-E	FN
81610	156	~25xD	DIN 1869	蒸汽回火处理	超长麻花钻,系列3	HSS	N
81640	157	~25xD	DIN 1869	刃带氮化处理	超长麻花钻,系列3	HSS	FN
81641	158	~25xD	DIN 1869	刃带氮化处理	超长麻花钻,系列3	HSS-E	FN
81740	159	>25xD	公司标准	刃带氮化处理	超长麻花钻	HSS	FN
81750	160	>25xD	公司标准	光亮处理	超长麻花钻	HSS	FN
81760	161	>25xD	公司标准	光亮处理	超长麻花钻	HSS	FN
81810	162		DIN 1898	蒸汽回火处理	锥孔钻	HSS	N
82010	173	~5xD	DIN 345	蒸汽回火处理	麻花钻	HSS	N
82011	177	~5xD	DIN 345	蒸汽回火处理	麻花钻	HSS-E	N
82012	178	~5xD	DIN 345	光亮处理	莫氏锥柄麻花钻	HSS-E	IS
82030	175	~5xD	DIN 345	光亮处理	麻花钻	HSS	W
82191	183		公司标准	蒸汽回火处理	NC 点钻	HSS	N
82192	183		公司标准	蒸汽回火处理	NC 点钻	HSS	N
82210	184	~10xD	DIN 341	蒸汽回火处理	长系列麻花钻	HSS	N
82211	185	~10xD	DIN 341	蒸汽回火处理	长系列麻花钻	HSS-E	N

产品代号	页	钴深	标准	表面处理	描述	刀具材料	型号
82310	186	~15xD	DIN 1870	蒸汽回火处理	超长麻花钻,系列1	HSS	N
82340	187	~15xD	DIN 1870	刃带氮化处理	超长麻花钻,系列1	HSS	FN
82341	188	~15xD	DIN 1870	刃带氮化处理	超长麻花钻,系列1	HSS-E	FN
82410	189	~20xD	DIN 1870	蒸汽回火处理	超长麻花钻,系列2	HSS	N
82440	190	~20xD	DIN 1870	刃带氮化处理	超长麻花钻,系列2	HSS	FN
82466	191	>20xD	公司标准	刃带氮化处理	超长麻花钻	HSS	FN
82467	192	20xD	公司标准	刃带氮化处理	超长麻花钻	HSS	FN
82468	193	>20xD	公司标准	光亮处理	超长麻花钻	HSS	FN
82469	194	>20xD	公司标准	光亮处理	超长麻花钻	HSS	FN
82515	198	~15xD	公司标准	蒸汽回火处理	超长油孔钻	HSS-E	FN
82521	195	~10xD	公司标准	蒸汽回火处理	长系列油孔钻	HSS	N
82525	197	~10xD	公司标准	蒸汽回火处理	长系列油孔钻	HSS-E	FN
82535	196	~10xD	公司标准	蒸汽回火处理	长系列油孔钻	HSS	FN
82571	423		公司标准	蒸汽回火处理	冷却剂供给管道		
82578	424		公司标准		快速释放冷却管单元		
82710	121	~10xD	公司标准	光亮处理	内冷钻	HSS	FN
82761	120	~5xD	公司标准	光亮处理	内冷钻	HSS-E	FN
82810	202		DIN 1898	蒸汽回火处理	锥孔钻	HSS	N
82971	181	~3xD	公司标准	蒸汽回火处理	工具钻	HSS-E	V
82972	182	~3xD	公司标准	光亮处理	莫氏锥柄麻花钻	HSS-E	IS
83000	368		DIN 333	光亮处理	不带侧平面中心钻	HSS	N
83005	371		DIN 333	光亮处理	不带侧平面中心钻	HSS	N
83100	366		DIN 333	光亮处理	不带侧平面中心钻	HSS	N
83101	373		DIN 333	光亮处理	不带侧平面中心钻	HSS-E	N
83102	374		DIN 333	nanoFIRE	不带侧平面中心钻	HSS-E	N
83105	367		DIN 333	光亮处理	不带侧平面中心钻	HSS	N
83110	372		公司标准	光亮处理	不带侧平面中心钻	HSS	N
83200	370		DIN 333	光亮处理	不带侧平面中心钻	HSS	N
83300	369		DIN 333	光亮处理	不带侧平面中心钻	HSS	N
83370	375		公司标准	光亮处理	不带侧平面中心钻	整硬	N
83500	376		DIN 333	光亮处理	带侧平面中心钻	HSS	N
83600	376		DIN 333	光亮处理	带侧平面中心钻	HSS	N
83700	377		DIN 333	光亮处理	带侧平面中心钻	HSS	N
84100	386		公司标准	光亮处理	叉形去毛刺刀	整硬	TS 100 EG
84101	387		公司标准	光亮处理	叉形去毛刺刀	整硬	TS 100 EG
84400	33	~3xD	DIN 1897	TiN	短钻	HSS	N
84405	71	~5xD	DIN 338	TiN	工具钻	HSS	N
84406	73	~5xD	DIN 338	TiN头部	工具钻	HSS	N
84415	75	~5xD	DIN 338	TiN	工具钻	HSS	FN
84418	135	~10xD	DIN 340	TiN	长系列麻花钻	HSS	N
84423	136	~10xD	DIN 340	TiN	长系列麻花钻	HSS	FN
84425	150	~15xD	DIN 1869	TiN	超长麻花钻,系列1	HSS	FN
84426	154	~20xD	DIN 1869	TiN	超长麻花钻,系列2	HSS	FN
84434	115		公司标准	TiN	NC 点钻	HSS	N
84435	116		公司标准	TiN	NC 点钻	HSS	N
84445	348		公司标准	TiN	直柄短款阶梯钻	HSS	N
84448	368		DIN 333	TiN	不带侧平面中心钻	HSS	N
84450	366		DIN 333	TiN	不带侧平面中心钻	HSS	N
84460	176	~5xD	DIN 345	TiN	麻花钻	HSS	N
84461	120	~5xD	公司标准	TiN	内冷钻	HSS-E	FN
84501	33	~3xD	DIN 1897	nanoFIRE	短钻	HSS	N
84502	75	~5xD	DIN 338	nanoFIRE	工具钻	HSS	FN
84503	40	~3xD	DIN 1897	nanoFIRE	短钻	HSS-E	V
84504	91	~5xD	DIN 338	nanoFIRE	工具钻	HSS-E	FN
84505	95	~5xD	DIN 338	nanoFIRE	工具钻	HSS-E	S
84506	136	~10xD	DIN 340	nanoFIRE	长系列麻花钻	HSS	FN
84507	109	~5xD	公司标准	nanoFIRE	增强柄麻花钻	HSS-E-PM	FN 500
84508	145	~10xD	DIN 340	nanoFIRE	长系列麻花钻	HSS-E	FN
84511	46	~3xD	DIN 1897	nanoFIRE	短钻	HSS-E-PM	FN 500
84660	179	~5xD	DIN 345	TiAlN	麻花钻	HSS-E	FN
84800	91	~5xD	DIN 338	TiN	工具钻	HSS-E	FN
84801	107	~5xD	公司标准	nanoFIRE	增强柄麻花钻	HSS-E-PM	FU 500
84802	93	~5xD	DIN 338	TiN	工具钻	HSS-E	FU 500 DZ
84803	40	~3xD	DIN 1897	TiN	短钻	HSS-E	V
84804	93	~5xD	DIN 338	光亮处理	工具钻	HSS-E	FU 500 DZ
84805	105	~3xD	公司标准	nanoFIRE	增强柄麻花钻	HSS-E-PM	FU 500

产品代号	页	钻深	标准	表面处理	描述	刀具材料	型号
84806	42	~3xD	DIN 1897	TiN	短钻	HSS-E	FU 500 DZ
84807	95	~5xD	DIN 338	TiN	工具钻	HSS-E	S
84808	42	~3xD	DIN 1897	光亮处理	短钻	HSS-E	FU 500 DZ
84810	332	~5xD	DIN 1899	TiN	无内冷微钻	HSS-E-PM	N
84811	99	~5xD	DIN 338	TiN	工具钻	HSS-E-PM	FN 500 DZ
84812	143	~10xD	DIN 340	TiN	长系列麻花钻	HSS-E	FU 500 DZ
84814	143	~10xD	DIN 340	光亮处理	长系列麻花钻	HSS-E	FU 500 DZ
84859	180	~5xD	DIN 345	TiN	麻花钻	HSS-E	N
85010	354		DIN 8374	蒸汽回火处理	直柄阶梯钻	HSS	N
85110	358		公司标准	蒸汽回火处理	直柄阶梯钻	HSS	N
85210	356		DIN 8376	蒸汽回火处理	直柄阶梯钻	HSS	N
85216	359		公司标准	蒸汽回火处理	直柄阶梯钻	HSS	N
85218	355		DIN 8374	蒸汽回火处理	直柄阶梯钻	HSS	N
85310	357		DIN 8378	蒸汽回火处理	直柄阶梯钻	HSS	N
85510	364		公司标准	蒸汽回火处理	锥柄阶梯钻	HSS	N
85610	362		DIN 8377	蒸汽回火处理	锥柄阶梯钻	HSS	N
85616	365		公司标准	蒸汽回火处理	锥柄阶梯钻	HSS	N
85619	361		DIN 8375	蒸汽回火处理	锥柄阶梯钻	HSS	N
85710	363		DIN 8379	蒸汽回火处理	锥柄阶梯钻	HSS	N
85910	345		公司标准	蒸汽回火处理	依照DIN332标准的中心阶梯钻	HSS	N
85911	345		公司标准	蒸汽回火处理	依照DIN332标准的中心阶梯钻	HSS	N
85912	346		公司标准	蒸汽回火处理	依照DIN332标准的中心阶梯钻	HSS	N
85914	347		公司标准	蒸汽回火处理	依照DIN332标准的中心阶梯钻	HSS	N
85916	349		公司标准	光亮处理	直柄短款阶梯钻	HSS	N
85917	350		公司标准	光亮处理	直柄短款阶梯钻	HSS	N
85918	351		公司标准	光亮处理	直柄短款阶梯钻	HSS	N
85920	352		公司标准	光亮处理	直柄短款阶梯钻	HSS	N
86010	165		DIN 344	蒸汽回火处理	直柄扩孔钻	HSS	N
86110	200		DIN 343	蒸汽回火处理	锥柄扩孔钻	HSS	N
86111	201		DIN 343	蒸汽回火处理	锥柄扩孔钻	HSS-E	N
86400	334	4xD	公司标准	AlTiN	无内冷微钻	整硬	N
86401	336	7xD	公司标准	AlTiN	无内冷微钻	整硬	N
86402	333		公司标准	TiAlN	无内冷微钻	整硬	N
86405	337	5xD	公司标准	TiAlN	带内冷微钻	整硬	N
86408	338	8xD	公司标准	TiAlN	带内冷微钻	整硬	N
86412	339	15xD	公司标准	TiAlN头部	带内冷微钻	整硬	N
86509	257	15xD	公司标准	TiAlN	带内冷TS钻头	整硬	TS 100 T
86511	258	20xD	公司标准	TiAlN头部	带内冷TS钻头	整硬	TS 100 T
86512	259	25xD	公司标准	TiAlN头部	带内冷TS钻头	整硬	TS 100 T
86513	260	30xD	公司标准	TiAlN头部	带内冷TS钻头	整硬	TS 100 T
86514	261	40xD	公司标准	TiAlN头部	带内冷TS钻头	整硬	TS 100 T
86602	411		公司标准	TiN	可换刀片	HSS-E-PM	
86605	412		公司标准	TiN	可换刀片	HSS-E	
86608	413		公司标准	FIRE	可换刀片	HSS-E-PM	
86609	414		公司标准	AlTiN	可换刀片	HSS-E-PM	
86611	415		公司标准	AlTiN	可换刀片	HSS-E-PM	
86612	399	3xD	公司标准	镀镍	带直柄复合钻刀杆		
86622	400	5xD	公司标准	镀镍	带直柄复合钻刀杆		
86624	401	7xD	公司标准	镀镍	带直柄复合钻刀杆		
86628	402		公司标准	镀镍	带直柄复合钻刀杆		
86630	404		公司标准	镀镍	带莫氏锥柄复合钻刀杆		
86650	405		公司标准	镀镍	带莫氏锥柄复合钻刀杆		
86670	406		公司标准	发蓝处理	带莫氏锥柄复合钻刀杆		
86678	408		公司标准	镀镍	带莫氏锥柄复合钻刀杆		
86680	407		公司标准	发蓝处理	带莫氏锥柄复合钻刀杆		
86681	432	1xD	公司标准	镀镍	复合 HPC 刀柄		
86682	433	1.5xD	公司标准	镀镍	复合 HPC 刀柄		HPC
86683	435	3xD	公司标准	镀镍	复合 HPC 刀柄		HPC
86684	437	5xD	公司标准	镀镍	复合 HPC 刀柄		HPC
86685	439	7xD	公司标准	镀镍	复合 HPC 刀柄		HPC
86686	441	10xD	公司标准	镀镍	复合 HPC 刀柄		HPC
86690	422		公司标准		内冷接口		
86691	426		公司标准	发蓝处理	多用型带内冷刀柄		
86692	427		公司标准	发蓝处理	多用型带内冷刀柄		
86693	428		公司标准	发蓝处理	多用型带内冷刀柄		
86694	429		公司标准	发蓝处理	多用型带内冷刀柄		

产品代号	页	钻深	标准	表面处理	描述	刀具材料	型号
86699	430		公司标准	发蓝处理	用于刀柄出水的夹持直柄的变径套		
86701	417		公司标准	FIRE	可换刀片	整硬	
86702	418		公司标准	FIRE	可换刀片	整硬	
86708	419		公司标准	TiN	可换刀片	整硬	
86709	420		公司标准	TiN	可换刀片	整硬	
86711	421		公司标准	光亮处理	可换刀片	整硬	
86721	443		公司标准	AlTiN nano	复合HPC可换刀片	整硬	HPC
86722	446		公司标准	nanoFIRE	复合HPC可换刀片	整硬	HPC
86723	449		公司标准	TiAlSiN	复合HPC可换刀片	整硬	HPC
86724	452		公司标准	光亮处理	复合HPC可换刀片	整硬	HPC
86725	455		公司标准	AlTiN nano	复合HPC可换刀片	整硬	HPC
86726	459		公司标准	TiAlN	复合HPC镗刀刀片	整硬	
86727	459		公司标准	光亮处理	复合HPC镗刀刀片	整硬	
86728	460		公司标准	TiN	复合HPC镗刀刀片	整硬	
86729	458		公司标准	nanoFIRE	复合HPC可换刀片	整硬	
86842	425		公司标准		梅花螺丝起子		
86843	461		公司标准		复合HPC刀柄压紧螺钉 1.5-10xD		
86844	462		公司标准		扭力扳手		
86845	463		公司标准		Torx扳手头		
86846	464		公司标准		复合HPC镗刀刀柄压紧螺钉		
87011	329	~5xD	DIN 1899	光亮处理	无内冷微钻	HSS-E-PM	N
87016	331	~5xD	DIN 1899	光亮处理	无内冷微钻	HSS-E-PM	N
88013	112	~5xD	DIN 338	蒸汽回火处理	成套工具钻	HSS	N
88014	113	~5xD	DIN 338	光亮处理	成套工具钻	HSS-E	S
88015	112	~3xD	DIN 1897	MolyGlide	成套工具钻	HSS-E	P2000
88016	113	~5xD	DIN 338	TiN头部	成套工具钻	HSS	N
88018	114	~5xD	DIN 338	Bronze-Oxid	成套工具钻	M42	N
88021	384		DIN 335	光亮处理	90°镗钻	HSS	
88022	385		DIN 335	TiAlN	90°螺旋槽镗刀套装	HSS-E	
88026	114	~5xD	DIN 338	蒸汽回火处理	成套工具钻	HSS-E	N
88200	382		DIN 335	光亮处理	90°镗钻	HSS	
88201	383		DIN 335	TiAlN	90°螺旋槽镗刀	HSS-E	
88303	111		公司标准		成套工具钻		
89235	48	~3xD	DIN 6539	光亮处理	短钻	整硬	N
89237	216	3xD	DIN 6539	TiN	不带内冷TS钻头	整硬	TS 100 U
89239	263	5xD	DIN 6539	光亮处理	3刃TS钻	整硬	TS 3 G
89242	117		公司标准	光亮处理	NC 点钻	整硬	N
89243	118		公司标准	光亮处理	NC 点钻	整硬	N
89244	100	~5xD	公司标准	光亮处理	工具钻	整硬	N
89246	52	~3xD	公司标准	光亮处理	短钻	整硬	N
89247	262	5xD	DIN 6537L	光亮处理	3刃TS钻	整硬	TS 3 G
89249	117		公司标准	光亮处理	NC 点钻	整硬	N
89252	360			光亮处理	直柄阶梯钻	整硬	N
89253	50	~3xD	公司标准	nanoFIRE	短钻	整硬	N
89254	353		公司标准	光亮处理	直柄短款阶梯钻	整硬	N
89261	102	~5xD	公司标准	nanoFIRE	工具钻	整硬	N
89264	210	3xD	DIN 6537K	TiN	不带内冷TS钻头	整硬	TS 100 U
89266	222	3xD	DIN 6537K	TiN	带内冷TS钻头	整硬	TS 100 U
89272	231	5xD	DIN 6537L	TiN	带内冷TS钻头	整硬	TS 100 U
89275	220	5xD	公司标准	TiN	不带内冷TS钻头	整硬	TS 100 U
89281	335	~5xD	公司标准	光亮处理	无内冷微钻	整硬	N
89286	146	~10xD	公司标准	光亮处理	长系列麻花钻	整硬	N
89292	229	4xD	公司标准	光亮处理	带内冷TS钻头	整硬	TS 150 GG
89293	253	10xD	公司标准	光亮处理	带内冷TS钻头	整硬	TS 150 GG
89294	245	7xD	公司标准	光亮处理	带内冷TS钻头	整硬	TS 150 GG
89295	253	10xD	公司标准	光亮处理	带内冷TS钻头	整硬	TS 150 GG
89301	163		DIN 8037	光亮处理	硬质合金刀片螺旋槽钻	硬质合金	N
89302	199		DIN 8041	光亮处理	硬质合金刀片螺旋槽钻	硬质合金	N
89303	164		DIN 8038	光亮处理	硬质合金刀片螺旋槽钻	硬质合金	N
89306	221	3xD	DIN 6538K	TiN	带内冷TS钻头	硬质合金	TS 80 U
89307	230	5xD	DIN 6538M	TiN	带内冷TS钻头	硬质合金	TS 80 U
89308	244	7xD	DIN 6538L	TiN	带内冷TS钻头	硬质合金	TS 80 U
89401	216	3xD	DIN 6539	nanoFIRE	不带内冷TS钻头	整硬	TS 100 U
89402	212	3xD	DIN 6537K	nanoFIRE	不带内冷TS钻头	整硬	TS 100 U
89408	232	5xD	DIN 6537L	nanoFIRE	带内冷TS钻头	整硬	TS 100 U
89410	223	3xD	DIN 6537K	nanoFIRE	带内冷TS钻头	整硬	TS 100 U

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89411	232	5xD	DIN 6537L	nanoFIRE	带内冷TS钻头	整硬	TS 100 U
89412	246	7xD	公司标准	nanoFIRE	带内冷TS钻头	整硬	TS 100 U
89413	212	3xD	DIN 6537K	nanoFIRE	不带内冷TS钻头	整硬	TS 100 U
89414	218	5xD	DIN 6537L	nanoFIRE	不带内冷TS钻头	整硬	TS 100 U
89415	223	3xD	DIN 6537K	nanoFIRE	带内冷TS钻头	整硬	TS 100 U
89416	246	7xD	公司标准	nanoFIRE	带内冷TS钻头	整硬	TS 100 U
89417	218	5xD	DIN 6537L	nanoFIRE	不带内冷TS钻头	整硬	TS 100 U
89418	255	12xD	公司标准	nanoFIRE涂层	带内冷TS钻头	整硬	TS 100 U
89420	234	5xD	DIN 6537L	FIRE	带内冷TS钻头	整硬	TS 100 R
89421	248	7xD	公司标准	FIRE	带内冷TS钻头	整硬	TS 100 R
89422	214	3xD	DIN 6537K	TiAlSiN	不带内冷TS钻头	整硬	TS 100 H
89423	225	3xD	DIN 6537K	TiAlSiN	带内冷TS钻头	整硬	TS 100 H
89424	225	3xD	DIN 6537K	TiAlSiN	带内冷TS钻头	整硬	TS 100 H
89425	236	5xD	DIN 6537L	TiAlSiN	带内冷TS钻头	整硬	TS 100 H
89426	236	5xD	DIN 6537L	TiAlSiN	带内冷TS钻头	整硬	TS 100 H
89427	250	7xD	公司标准	TiAlSiN	带内冷TS钻头	整硬	TS 100 H
89450	227	3xD	DIN 6537K	AlTiN nano	带内冷TS钻头	整硬	TS 100 INOX
89451	238	5xD	DIN 6537L	AlTiN nano	带内冷TS钻头	整硬	TS 100 INOX
89460	242	5xD	DIN 6537L	nanoFIRE	TS 100 HPC	整硬	TS 100 HPC
89461	251	7xD	公司标准	nanoFIRE	TS 100 HPC	整硬	TS 100 HPC
89501	277	80.000	公司标准	光亮处理	E 100单刃枪钻	整硬	TLB E 100
89502	279	160.000	公司标准	光亮处理	E 100单刃枪钻	整硬	TLB E 100
89503	276	45.000	公司标准	光亮处理	E 100单刃枪钻	整硬	TLB E 100
89504	278	120.000	公司标准	光亮处理	E 100单刃枪钻	整硬	TLB E 100
89505	280	20xD	公司标准	TiN	E 80单刃枪钻	硬质合金	TLB E 80
89506	282	40xD	公司标准	TiN	E 80单刃枪钻	硬质合金	TLB E 80
89507	283	80xD	公司标准	TiN	E 80单刃枪钻	硬质合金	TLB E 80
89508	295	30xD	公司标准	光亮处理	Z 80双刃枪钻	硬质合金	TLB Z 80
89509	281	30xD	公司标准	TiN	E 80单刃枪钻	硬质合金	TLB E 80
89510	276	45.000	公司标准	AlTiN	E 100单刃枪钻	整硬	TLB E 100
89511	277	80.000	公司标准	AlTiN	E 100单刃枪钻	整硬	TLB E 100
89512	278	120.000	公司标准	AlTiN	E 100单刃枪钻	整硬	TLB E 100
89513	279	160.000	公司标准	AlTiN	E 100单刃枪钻	整硬	TLB E 100
89514	280	20xD	公司标准	TiCN	E 80单刃枪钻	硬质合金	TLB E 80
89515	281	30xD	公司标准	TiCN	E 80单刃枪钻	硬质合金	TLB E 80
89516	282	40xD	公司标准	TiCN	E 80单刃枪钻	硬质合金	TLB E 80
89517	283	80xD	公司标准	TiCN	E 80单刃枪钻	硬质合金	TLB E 80
89518	295	30xD	公司标准	光亮处理	Z 80双刃枪钻	硬质合金	TLB Z 80
89520	271	25xD	公司标准	AlTiN nano	E 100单刃枪钻	整硬	TLB E 100
89521	273	50xD	公司标准	AlTiN nano	E 100单刃枪钻	整硬	TLB E 100
89522	275	75xD	公司标准	AlTiN nano	E 100单刃枪钻	整硬	TLB E 100
89523	271	25xD	公司标准	光亮处理	E 100单刃枪钻	整硬	TLB E 100
89524	273	50xD	公司标准	光亮处理	E 100单刃枪钻	整硬	TLB E 100
89525	275	75xD	公司标准	光亮处理	E 100单刃枪钻	整硬	TLB E 100
89530	292	30xD	公司标准	TiN	带可换刀片的E 800单刃枪钻	硬质合金	TLB E 800
89535	293		公司标准	TiN	单刃枪钻E800的刀片	整硬	
89536	294		公司标准	TiN	单刃枪钻E800的支撑条	整硬	
89539	284	GL 600	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89540	285	GL 800	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89541	287	GL1200	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89542	289	GL1600	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89543	291	GL2000	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89544	286	GL1000	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89545	288	GL1400	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89546	290	GL1800	公司标准	TiN	E 80 XXL单刃枪钻	硬质合金	TLB E 80
89550	227	3xD	DIN 6537K	AlTiN nano	带内冷TS钻头	整硬	TS 100 INOX
89551	238	5xD	DIN 6537L	AlTiN nano	带内冷TS钻头	整硬	TS 100 INOX
89560	240	5xD	DIN 6537L	光亮处理	带内冷TS钻头	整硬	TS 100 ALU

# HARTNER 刀具派发系统

自动装置和刀具柜

TM 326



TM 426





TM 826

TM 626

NEW

TM 526



## 刀具存储和管理的个性化高效解决方案.

TM 326、TM 426、TM 526 和 TM 626 四种刀具派发系统为定制刀具存放提供了灵活的选择。根据需求和企业规模，您可以选择不同的自动化管理等级。可选择的个性化派发方式，例如抽屉或螺旋系统。

我们根据您的需求和业务需要定制 Hartner 刀具派发系统。籍此您可以做出最佳选择，这一点也得到了众多满意客户的证实。

# HARTNER 刀具管理软件

## 智能化

所有 Hartner 刀具派发系统均由交互界面友好的 TM 软件控制。通过高度集成的触摸屏,实现简单、快速、直观的系统操作。

该软件为客户提供了涉及所有生产领域的相关应用以及个性化设置。

通过模块化的设计,模拟整个生产流程。刀具循环的所有环节,从供货、存储到报废处理,可全透明显示。

软件记录着所有库存变化的相关数据,自动触发订单提醒,根据不同的标准生成客户所需的分析报告。

丰富而详尽的报告内容为您企业的刀具循环流程提供大量的优化潜力。

可对接不同的物料管理系统,同时也可通过自动订单系统,与您的供应实现在线连接。



# HARTNER 刀具管理软件

## 服务与客户优势。

- ▼ 简单直观的用户界面及菜单导航
- ▼ 个性化的操作界面
- ▼ 生成多种刀具清单
- ▼ 直接调用 CAD 系统和图形程序, 处理和展示刀具图纸
- ▼ 多重的存储管理功能, 可管控刀具派发系统
- ▼ 为客户提供清晰的刀具领用成本明细
- ▼ 按照不同的条件, 生成精确的消耗分析报告, 例如: 每个工件, 每台机床, 每个生产区域的刀具消耗量
- ▼ 可按照客户需求进行编程, 生成个性化解决方案
- ▼ 通过相应接口可与所有常用的 ERP/PPS 系统、刀具管理系统和立体库系统对接
- ▼ 生成个性化用户表格







# HARTNER

Precision Cutting Tools

直柄麻花钻















## 直柄麻花钻

HSS, HSS-E, HSS-E-PM, 硬质合金  
抛光处理和涂层









P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 短钻

		DIN 1897	N	HSS		右手	圆柱形	~3xD	0,500 - 39,500	81110	24
		DIN 1897	N	HSS		左手	圆柱形	~3xD	0,500 - 36,500	81115	26
		DIN 1897	H	HSS		右手	圆柱形	~3xD	1,200 - 16,000	81120	28
		DIN 1897	W	HSS		右手	圆柱形	~3xD	1,500 - 16,000	81130	29
		DIN 1897	FN	HSS		右手	圆柱形	~3xD	1,500 - 15,500	81140	30
		DIN 1897	FN	HSS		左手	圆柱形	~3xD	1,000 - 12,500	81145	31
		DIN 1897	N	HSS		右手	圆柱形	~3xD	1,000 - 25,000	84400	33
		DIN 1897	N	HSS		右手	圆柱形	~3xD	1,000 - 25,000	84501	33
		DIN 1897	N	M42		右手	圆柱形	~3xD	1,000 - 15,000	81112	35
		DIN 1897	V	HSS-E		右手	圆柱形	~3xD	0,400 - 25,000	81171	37
		DIN 1897	IS	HSS-E		右手	圆柱形	~3xD	1,000 - 12,000	81173	39
		DIN 1897	V	HSS-E		右手	圆柱形	~3xD	0,500 - 15,000	84503	40
		DIN 1897	V	HSS-E		右手	圆柱形	~3xD	0,500 - 15,000	84803	40
		DIN 1897	FU 500 DZ	HSS-E		右手	圆柱形	~3xD	1,000 - 14,000	84806	42

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 短钻















	•	•	•	•		DIN 1897	FU 500 DZ	HSS-E	○	右手	圆柱形	~3xD	1,000 - 14,000	84808	42
	○	•	○	○	•	DIN 1897	IS	HSS-E	Ⓢ	右手	圆柱形	~3xD	1,000 - 13,000	81178	44
	•	○	•	○	○	DIN 1897	FN 500	HSS-E-PM	Ⓢ	右手	圆柱形	~3xD	1,000 - 13,500	84511	46
	○	○	○	•	○	DIN 6539	N	整硬	○	右手	圆柱形	~3xD	0,800 - 16,000	89235	48
	○	○	○	•	○	哈特纳标准	N	整硬	Ⓢ	右手	圆柱形	~3xD	1,000 - 16,000	89253	50
	○	○	○	○	○	哈特纳标准	N	整硬	○	右手	圆柱形	~3xD	0,500 - 6,100	89246	52

## 工具钻

	•	•	○	○		DIN 338	N	HSS	⊙ <sub>Z,36</sub> <sup>+0</sup>	右手	圆柱形	~5xD	0,200 - 20,000	81010	53
	•	•	○	○		DIN 338	N	HSS	⊙ <sub>6,00</sub> <sup>+0</sup>	左手	圆柱形	~5xD	0,250 - 17,000	81015	57
	•	•	○	○		DIN 338	N	HSS	●	右手	圆柱形	~5xD	3,000 - 13,000	81017	59
	•	•	○	○		DIN 338	H	HSS	○	右手	圆柱形	~5xD	0,300 - 20,000	81020	60
	•	•	○	○		DIN 338	H	HSS	○	左手	圆柱形	~5xD	0,500 - 16,000	81025	62
	•	•	○	○		DIN 338	W	HSS	○	右手	圆柱形	~5xD	0,250 - 16,500	81030	64
	•	•	○	○		DIN 338	W	HSS	○	左手	圆柱形	~5xD	0,500 - 15,000	81035	66

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 工具钻

		DIN 338	FN	HSS		右手	圆柱形	~5xD	0,800 - 16,000	81040	67
		DIN 338	FN	HSS		左手	圆柱形	~5xD	1,400 - 16,000	81045	69
		DIN 338	N	HSS		右手	圆柱形	~5xD	0,400 - 19,500	84405	71
		DIN 338	N	HSS		右手	圆柱形	~5xD	1,000 - 16,000	84406	73
		DIN 338	FN	HSS		右手	圆柱形	~5xD	1,000 - 16,000	84415	75
		DIN 338	FN	HSS		右手	圆柱形	~5xD	1,000 - 16,000	84502	75
		DIN 338	N	M42		右手	圆柱形	~5xD	1,000 - 14,000	81012	77
		DIN 338	N	M42		右手	圆柱形	~5xD	1,000 - 13,000	81018	79
		DIN 338	N	M42		右手	圆柱形	~5xD	1,000 - 16,000	81019	81
		DIN 338	N	HSS-E		右手	圆柱形	~5xD	0,200 - 20,000	81011	83
		DIN 338	IS	HSS-E		右手	圆柱形	~5xD	1,000 - 13,000	81013	85
		DIN 338	FN	HSS-E		右手	圆柱形	~5xD	1,000 - 13,000	81041	87
		DIN 338	S	HSS-E		右手	圆柱形	~5xD	0,200 - 17,500	81061	89
		DIN 338	FN	HSS-E		右手	圆柱形	~5xD	1,000 - 13,000	84800	91




P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 工具钻

	•	○	•	•	○	DIN 338	FN	HSS-E	Ⓡ	右手	圆柱形	~5xD	1,000 - 13,000	84504	91
	•	•	•	•	○	DIN 338	FU 500 DZ	HSS-E	○	右手	圆柱形	~5xD	1,000 - 14,000	84804	93
	•	•	•	•	○	DIN 338	FU 500 DZ	HSS-E	Ⓡ	右手	圆柱形	~5xD	1,000 - 14,000	84802	93
	○	•	•	•	○	DIN 338	S	HSS-E	Ⓡ	右手	圆柱形	~5xD	0,500 - 13,000	84807	95
	○	•	•	•	○	DIN 338	S	HSS-E	Ⓡ	右手	圆柱形	~5xD	0,500 - 13,000	84505	95
	○	•	○	○	○	DIN 338	IS	HSS-E	Ⓡ	右手	圆柱形	~5xD	1,000 - 13,000	81078	97
	•	○	•	○	○	DIN 338	FN 500 DZ	HSS-E-PM	Ⓡ	右手	圆柱形	~5xD	1,000 - 14,000	84811	99
	○	○	○	•	○	哈特纳标准	N	整硬	○	右手	圆柱形	~5xD	1,000 - 12,000	89244	100
	○	○	○	•	○	哈特纳标准	N	整硬	Ⓡ	右手	圆柱形	~5xD	1,000 - 12,000	89261	102

## HX 500

	•	○	•	○	○	哈特纳标准	HX 500	M42	Ⓡ	右手	圆柱形	3xD	1,000 - 13,000	81000	104
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## 增强柄麻花钻

	•	•	•	•	○	哈特纳标准	FU 500	HSS-E-PM	Ⓡ	右手	HA	~3xD	1,000 - 20,000	84805	105
	•	•	•	•	○	哈特纳标准	FU 500	HSS-E-PM	Ⓡ	右手	HA	~5xD	2,000 - 20,000	84801	107

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 增强柄麻花钻



●	○	●	○	○	○	哈特纳标准	FN 500	HSS-E-PM	Ⓡ	右手	HA	~5xD	2,000 - 13,000	84507	109
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## 成套工具钻



●	○	●	○	○	○	哈特纳标准								88303	111
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●	○	●	○	○	○	DIN 1897	P2000	HSS-E	Ⓜ	右手	圆柱形	~3xD		88015	112
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●	○	●	○	○	○	DIN 338	N	HSS	Ⓢ	右手	圆柱形	~5xD		88013	112
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●	○	●	○	○	○	DIN 338	N	HSS	Ⓣ	右手	圆柱形	~5xD		88016	113
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 成套工具钻



○	●			●		DIN 338	S	HSS-E	○	右手	圆柱形	~5xD		88014	113
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●		●	○			DIN 338	N	HSS-E	●	右手	圆柱形	~5xD		88026	114
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●	●	●	●	●	○	DIN 338	N	M42	●	右手	圆柱形	~5xD		88018	114
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## NC 点钻



●	○	●	●	○		哈特纳标准	N	HSS	○	右手	圆柱形	3,000 - 25,000		81191	115
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●	○	●	●	○		哈特纳标准	N	HSS	Ⓜ	右手	圆柱形	3,000 - 25,000		84434	115
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●	○	●	●	●		哈特纳标准	N	HSS	○	右手	圆柱形	3,000 - 25,000		81192	116
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●	○	●	●	○		哈特纳标准	N	HSS	Ⓜ	右手	圆柱形	3,000 - 25,000		84435	116
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○	○	○	○	○	○	哈特纳标准	N	整硬	○	右手	圆柱形	4,000 - 20,000		89242	117
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## NC 点钻



○	○	○	○	○	○	哈特纳标准	N	整硬	○	右手	HB	4,000 - 20,000		89249	117
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○	○	○	○	○	○	哈特纳标准	N	整硬	○	右手	HA	4,000 - 20,000		89243	118
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## 直柄双头钻



●	○	●	●	●	●	哈特纳标准	N	HSS	$\text{○}_{2,36}^{+0}$	右手	圆柱形	2,000 - 10,000		81190	119
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## 内冷钻



●	●	●	●	●	●	哈特纳标准	FN	HSS-E	○	右手	HE	~5xD	5,000 - 20,000	82761	120
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●	●	●	●	●	○	哈特纳标准	FN	HSS-E	Ⓜ	右手	HE	~5xD	5,000 - 20,000	84461	120
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●	○	●	●	○	○	哈特纳标准	FN	HSS	○	右手	圆柱形	~10xD	3,000 - 13,000	82710	121
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## 采用钻套的麻花钻



●	●	○	○	○	○	DIN 339	N	HSS	$\text{○}_{2,36}^{+0}$	右手	圆柱形	~10xD	0,800 - 19,000	81210	122
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## 长系列麻花钻



●	●	○	○	○	○	DIN 340	N	HSS	$\text{○}_{2,36}^{+0}$	右手	圆柱形	~10xD	0,400 - 22,000	81310	124
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●	●	○	○	○	○	DIN 340	N	HSS	$\text{○}_{6,00}^{+0}$	左手	圆柱形	~10xD	0,900 - 12,000	81315	126
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●	●	○	○	○	○	DIN 340	N	HSS	●	右手	圆柱形	~10xD	3,100 - 12,200	81317	127
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 长系列麻花钻

	DIN 340	H	HSS	○	右手	圆柱形	~10xD	0,500 - 14,500	<b>81320</b>	128
	DIN 340	W	HSS	○	右手	圆柱形	~10xD	0,500 - 17,000	<b>81330</b>	129
	DIN 340	FN	HSS		右手	圆柱形	~10xD	0,900 - 14,000	<b>81340</b>	131
	DIN 340	FW	HSS	○	右手	圆柱形	~10xD	1,000 - 14,000	<b>81350</b>	133
	DIN 340	N	HSS		右手	圆柱形	~10xD	0,500 - 16,000	<b>84418</b>	135
	DIN 340	FN	HSS		右手	圆柱形	~10xD	1,000 - 14,000	<b>84423</b>	136
	DIN 340	FN	HSS		右手	圆柱形	~10xD	1,000 - 14,000	<b>84506</b>	136
	DIN 340	N	HSS-E		右手	圆柱形	~10xD	0,500 - 12,500	<b>81311</b>	138
	DIN 340	FN	HSS-E		右手	圆柱形	~10xD	1,000 - 16,000	<b>81341</b>	139
	DIN 340	S	HSS-E	○	右手	圆柱形	~10xD	1,000 - 13,000	<b>81361</b>	141
	DIN 340	S	HSS-E		右手	圆柱形	~10xD	1,000 - 13,000	<b>81362</b>	141
	DIN 340	FU 500 DZ	HSS-E	○	右手	圆柱形	~10xD	1,000 - 14,000	<b>84814</b>	143
	DIN 340	FU 500 DZ	HSS-E		右手	圆柱形	~10xD	1,000 - 14,000	<b>84812</b>	143
	DIN 340	FN	HSS-E		右手	圆柱形	~10xD	1,000 - 12,000	<b>84508</b>	145

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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
## 长系列麻花钻




○		○				哈特纳标准	N	整硬	○	右手	圆柱形	~10xD	0,500 - 1,500	89286	146
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## 超长麻花钻,系列1



●		●	○			DIN 1869	N	HSS		右手	圆柱形	~15xD	1,600 - 13,000	81410	147
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●		●	●			DIN 1869	FN	HSS		右手	圆柱形	~15xD	2,000 - 13,000	81440	148
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○			●			DIN 1869	FW	HSS	○	右手	圆柱形	~15xD	2,000 - 9,500	81450	149
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●		●	●			DIN 1869	FN	HSS		右手	圆柱形	~15xD	2,000 - 12,000	84425	150
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●	●	●	●	○		DIN 1869	FN	HSS-E		右手	圆柱形	~15xD	3,000 - 10,000	81441	151
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## 超长麻花钻,系列2



●		●	○			DIN 1869	N	HSS	●	右手	圆柱形	~20xD	3,000 - 12,000	81510	152
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●		●	●			DIN 1869	FN	HSS		右手	圆柱形	~20xD	2,000 - 13,000	81540	153
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●		●	●	○		DIN 1869	FN	HSS		右手	圆柱形	~20xD	3,000 - 8,500	84426	154
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●	●	●	●	○		DIN 1869	FN	HSS-E		右手	圆柱形	~20xD	3,000 - 10,000	81541	155
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## 超长麻花钻,系列3



●		●	○			DIN 1869	N	HSS	●	右手	圆柱形	~25xD	3,500 - 12,000	81610	156
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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### 超长麻花钻,系列3



•	•	•	•	•		DIN 1869	FN	HSS	☉	右手	圆柱形	~25xD	2,500 - 13,000	81640	157
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•	•	•	•	•		DIN 1869	FN	HSS-E	☉	右手	圆柱形	~25xD	2,500 - 13,000	81641	158
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### 超长麻花钻



•	•	•	•	•		哈特纳标准	FN	HSS	☉	右手	圆柱形	>25xD	6,000 - 12,000	81740	159
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•	•	•	•	•		哈特纳标准	FN	HSS	○	右手	圆柱形	>25xD	8,000 - 12,000	81750	160
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•	•	•	•	•		哈特纳标准	FN	HSS	○	右手	圆柱形	>25xD	10,000 - 12,000	81760	161
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### 锥孔钻



•	○	•	○	•		DIN 1898	N	HSS	☉ <sub>2,36</sub>	右手	圆柱形		2,000 - 12,000	81810	162
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### 硬质合金刀片螺旋槽钻



○	•	○	•	○		DIN 8037	N	硬质合金	○	右手	圆柱形		2,600 - 20,000	89301	163
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○	•	○	•	○		DIN 8038	N	硬质合金	○	右手	圆柱形		3,100 - 19,000	89303	164
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### 直柄扩孔钻



•	○	•	○	•		DIN 344	N	HSS	☉	右手	圆柱形		3,800 - 15,000	86010	165
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## 短钻

产品代号 81110

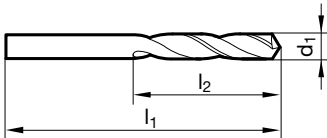


P	M	K	N	S	H
•		•	○		



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 适用于自动/专用车床 • 适用于手动机床

薄壁材料 • 适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		20,000	3,000	3,250		49,000	18,000
0,600		21,000	3,500	3,300		49,000	18,000
0,700		23,000	4,500	3,350		49,000	18,000
0,800		24,000	5,000	3,400		52,000	20,000
0,850		24,000	5,000	3,500		52,000	20,000
0,900		25,000	5,500	3,600		52,000	20,000
1,000		26,000	6,000	3,650		52,000	20,000
1,050		26,000	6,000	3,700		52,000	20,000
1,100		28,000	7,000	3,750		52,000	20,000
1,200		30,000	8,000	3,800		55,000	22,000
1,250		30,000	8,000	3,850		55,000	22,000
1,300		30,000	8,000	3,900		55,000	22,000
1,350		32,000	9,000	4,000		55,000	22,000
1,400		32,000	9,000	4,100		55,000	22,000
1,500		32,000	9,000	4,200		55,000	22,000
1,550		34,000	10,000	4,250		55,000	22,000
1,600		34,000	10,000	4,300		58,000	24,000
1,650		34,000	10,000	4,450		58,000	24,000
1,700		34,000	10,000	4,500		58,000	24,000
1,750		36,000	11,000	4,600		58,000	24,000
1,800		36,000	11,000	4,650		58,000	24,000
1,900		36,000	11,000	4,700		58,000	24,000
1,950		38,000	12,000	4,750		58,000	24,000
2,000		38,000	12,000	4,800		62,000	26,000
2,050		38,000	12,000	4,850		62,000	26,000
2,100		38,000	12,000	4,900		62,000	26,000
2,200		40,000	13,000	4,950		62,000	26,000
2,250		40,000	13,000	5,000		62,000	26,000
2,300		40,000	13,000	5,050		62,000	26,000
2,400		43,000	14,000	5,100		62,000	26,000
2,500		43,000	14,000	5,200		62,000	26,000
2,550		43,000	14,000	5,250		62,000	26,000
2,600		43,000	14,000	5,300		62,000	26,000
2,700		46,000	16,000	5,400		66,000	28,000
2,750		46,000	16,000	5,500		66,000	28,000
2,800		46,000	16,000	5,600		66,000	28,000
2,900		46,000	16,000	5,700		66,000	28,000
2,950		46,000	16,000	5,750		66,000	28,000
3,000		46,000	16,000	5,800		66,000	28,000
3,050		49,000	18,000	5,850		66,000	28,000
3,100		49,000	18,000	5,900		66,000	28,000
3,200		49,000	18,000	6,000		66,000	28,000





## 短钻

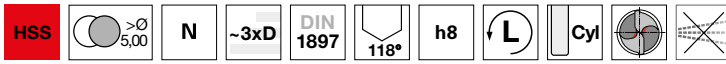
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
6,100		70,000	31,000	12,000		102,000	51,000
6,150		70,000	31,000	12,050		102,000	51,000
6,200		70,000	31,000	12,200		102,000	51,000
6,250		70,000	31,000	12,300	31/64	102,000	51,000
6,300		70,000	31,000	12,500		102,000	51,000
6,350	1/4	70,000	31,000	12,600		102,000	51,000
6,500		70,000	31,000	12,700	1/2	102,000	51,000
6,600		70,000	31,000	12,750		102,000	51,000
6,700		70,000	31,000	12,900		102,000	51,000
6,750	17/64	74,000	34,000	13,000		102,000	51,000
6,800		74,000	34,000	13,100	33/64	102,000	51,000
6,900		74,000	34,000	13,200		102,000	51,000
7,000		74,000	34,000	13,500		107,000	54,000
7,100		74,000	34,000	13,600		107,000	54,000
7,400		74,000	34,000	13,750		107,000	54,000
7,500		74,000	34,000	14,000		107,000	54,000
7,600		79,000	37,000	14,200		111,000	56,000
7,700		79,000	37,000	14,250		111,000	56,000
7,750		79,000	37,000	14,300		111,000	56,000
7,800		79,000	37,000	14,500		111,000	56,000
7,900		79,000	37,000	14,750		111,000	56,000
8,000		79,000	37,000	15,000		111,000	56,000
8,100		79,000	37,000	15,100		115,000	58,000
8,200		79,000	37,000	15,250		115,000	58,000
8,250		79,000	37,000	15,500		115,000	58,000
8,300		79,000	37,000	15,750		115,000	58,000
8,350		79,000	37,000	16,000		115,000	58,000
8,400		79,000	37,000	16,250		119,000	60,000
8,500		79,000	37,000	16,270	41/64	119,000	60,000
8,600		84,000	40,000	16,500		119,000	60,000
8,700		84,000	40,000	17,000		119,000	60,000
8,750		84,000	40,000	17,500		123,000	62,000
8,800		84,000	40,000	18,000		123,000	62,000
8,900		84,000	40,000	18,200		127,000	64,000
9,000		84,000	40,000	18,500		127,000	64,000
9,100		84,000	40,000	18,750		127,000	64,000
9,200		84,000	40,000	19,000		127,000	64,000
9,250		84,000	40,000	19,100		131,000	66,000
9,300		84,000	40,000	19,500		131,000	66,000
9,500		84,000	40,000	20,000		131,000	66,000
9,600		89,000	43,000	20,500		136,000	68,000
9,700		89,000	43,000	21,000		136,000	68,000
9,750		89,000	43,000	21,500		141,000	70,000
9,800		89,000	43,000	22,000		141,000	70,000
9,900		89,000	43,000	22,500		146,000	72,000
10,000		89,000	43,000	23,000		146,000	72,000
10,050		89,000	43,000	23,500		146,000	72,000
10,100		89,000	43,000	24,000		151,000	75,000
10,200		89,000	43,000	24,500		151,000	75,000
10,250		89,000	43,000	25,000	63/64	151,000	75,000
10,300		89,000	43,000	26,000		156,000	78,000
10,400		89,000	43,000	26,500		156,000	78,000
10,500		89,000	43,000	27,000		162,000	81,000
10,600		89,000	43,000	27,500		162,000	81,000
10,700		95,000	47,000	28,000		162,000	81,000
10,750		95,000	47,000	28,750		168,000	84,000
10,800		95,000	47,000	29,000		168,000	84,000
10,900		95,000	47,000	30,000		168,000	84,000
11,000		95,000	47,000	31,000		174,000	87,000
11,100		95,000	47,000	32,000		180,000	90,000
11,200		95,000	47,000	39,500		200,000	100,000
11,400		95,000	47,000				
11,500		95,000	47,000				
11,700		95,000	47,000				
11,750		95,000	47,000				
11,800		95,000	47,000				

## 短钻

产品代号 81115

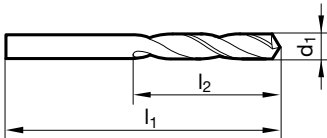


P	M	K	N	S	H
•		•	○		



芯厚  $\geq \varnothing 14,200$  • 圆弧后刀面 • 适用于自动/专用车床

薄壁材料 • 适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		20,000	3,000	3,500		52,000	20,000
0,550		21,000	3,500	3,700		52,000	20,000
0,700		23,000	4,500	3,750		52,000	20,000
0,750		23,000	4,500	3,800		55,000	22,000
0,800		24,000	5,000	3,900		55,000	22,000
0,850		24,000	5,000	4,000		55,000	22,000
0,950		25,000	5,500	4,100		55,000	22,000
1,000		26,000	6,000	4,250		55,000	22,000
1,150		28,000	7,000	4,300		58,000	24,000
1,250		30,000	8,000	4,400		58,000	24,000
1,330		32,000	9,000	4,500		58,000	24,000
1,350		32,000	9,000	4,600		58,000	24,000
1,500		32,000	9,000	4,700		58,000	24,000
1,550		34,000	10,000	4,750		58,000	24,000
1,600		34,000	10,000	4,800		62,000	26,000
1,710		36,000	11,000	4,900		62,000	26,000
1,800		36,000	11,000	5,000		62,000	26,000
1,830		36,000	11,000	5,100		62,000	26,000
1,900		36,000	11,000	5,200		62,000	26,000
1,980	5/64	38,000	12,000	5,300		62,000	26,000
2,000		38,000	12,000	5,400		66,000	28,000
2,100		38,000	12,000	5,500		66,000	28,000
2,200		40,000	13,000	5,600		66,000	28,000
2,400		43,000	14,000	5,700		66,000	28,000
2,420		43,000	14,000	5,750		66,000	28,000
2,500		43,000	14,000	5,800		66,000	28,000
2,550		43,000	14,000	5,900		66,000	28,000
2,600		43,000	14,000	6,000		66,000	28,000
2,720		46,000	16,000	6,100		70,000	31,000
2,750		46,000	16,000	6,150		70,000	31,000
2,820		46,000	16,000	6,200		70,000	31,000
2,850		46,000	16,000	6,400		70,000	31,000
2,900		46,000	16,000	6,600		70,000	31,000
2,950		46,000	16,000	6,700		70,000	31,000
3,000		46,000	16,000	6,750	17/64	74,000	34,000
3,010		49,000	18,000	6,800		74,000	34,000
3,050		49,000	18,000	6,900		74,000	34,000
3,100		49,000	18,000	7,000		74,000	34,000
3,200		49,000	18,000	7,100		74,000	34,000
3,350		49,000	18,000	7,200		74,000	34,000
3,400		52,000	20,000	7,300		74,000	34,000
3,450		52,000	20,000	7,400		74,000	34,000

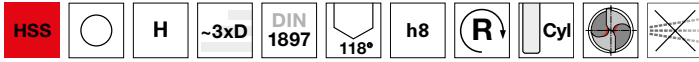
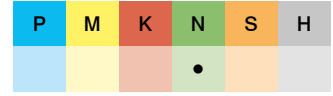


## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,600		79,000	37,000	11,800		95,000	47,000
7,700		79,000	37,000	11,900		102,000	51,000
7,750		79,000	37,000	12,000		102,000	51,000
7,900		79,000	37,000	12,100		102,000	51,000
8,000		79,000	37,000	12,250		102,000	51,000
8,100		79,000	37,000	12,400		102,000	51,000
8,200		79,000	37,000	12,500		102,000	51,000
8,250		79,000	37,000	12,600		102,000	51,000
8,300		79,000	37,000	12,750		102,000	51,000
8,400		79,000	37,000	12,800		102,000	51,000
8,500		79,000	37,000	12,900		102,000	51,000
8,600		84,000	40,000	13,000		102,000	51,000
8,700		84,000	40,000	13,200		102,000	51,000
8,750		84,000	40,000	13,250		107,000	54,000
8,800		84,000	40,000	13,400		107,000	54,000
8,900		84,000	40,000	13,500		107,000	54,000
9,000		84,000	40,000	13,600		107,000	54,000
9,100		84,000	40,000	13,750		107,000	54,000
9,200		84,000	40,000	13,800		107,000	54,000
9,250		84,000	40,000	14,000		107,000	54,000
9,400		84,000	40,000	14,200		111,000	56,000
9,500		84,000	40,000	14,300		111,000	56,000
9,600		89,000	43,000	14,400		111,000	56,000
9,700		89,000	43,000	14,500		111,000	56,000
9,750		89,000	43,000	14,700		111,000	56,000
10,000		89,000	43,000	14,750		111,000	56,000
10,100		89,000	43,000	15,000		111,000	56,000
10,200		89,000	43,000	15,500		115,000	58,000
10,300		89,000	43,000	16,000		115,000	58,000
10,500		89,000	43,000	16,500		119,000	60,000
10,600		89,000	43,000	17,000		119,000	60,000
10,700		95,000	47,000	18,000		123,000	62,000
10,750		95,000	47,000	19,000		127,000	64,000
10,800		95,000	47,000	20,000		131,000	66,000
11,000		95,000	47,000	21,000		136,000	68,000
11,100		95,000	47,000	22,000		141,000	70,000
11,200		95,000	47,000	29,750		168,000	84,000
11,250		95,000	47,000	30,000		168,000	84,000
11,300		95,000	47,000	31,500		174,000	87,000
11,400		95,000	47,000	36,000		193,000	96,000
11,500		95,000	47,000	36,500		193,000	96,000
11,750		95,000	47,000				

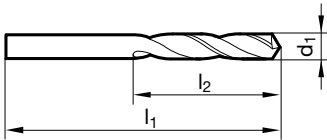
## 短钻

产品代号 81120



芯厚  $\geq \varnothing 15,000$  • 圆弧后刀面

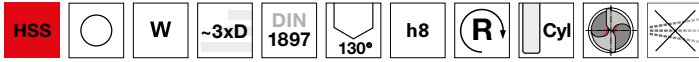
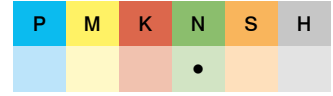
脆硬的材料 • 黄铜, 镁合金 • 青铜, 磷青铜 • 石板, 电木, 酚醛树脂



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,200		30,000	8,000	5,000		62,000	26,000
1,400		32,000	9,000	5,100		62,000	26,000
1,500		32,000	9,000	5,200		62,000	26,000
1,600		34,000	10,000	5,300		62,000	26,000
1,700		34,000	10,000	5,400		66,000	28,000
1,900		36,000	11,000	5,500		66,000	28,000
2,000		38,000	12,000	5,600		66,000	28,000
2,350		40,000	13,000	5,700		66,000	28,000
2,380	3/32	43,000	14,000	5,800		66,000	28,000
2,400		43,000	14,000	6,000		66,000	28,000
2,500		43,000	14,000	6,100		70,000	31,000
2,600		43,000	14,000	6,200		70,000	31,000
2,700		46,000	16,000	6,500		70,000	31,000
2,800		46,000	16,000	7,000		74,000	34,000
2,900		46,000	16,000	7,500		74,000	34,000
2,950		46,000	16,000	8,000		79,000	37,000
3,000		46,000	16,000	8,500		79,000	37,000
3,100		49,000	18,000	8,600		84,000	40,000
3,200		49,000	18,000	8,700		84,000	40,000
3,250		49,000	18,000	9,000		84,000	40,000
3,300		49,000	18,000	10,000		89,000	43,000
3,400		52,000	20,000	10,200		89,000	43,000
3,500		52,000	20,000	10,500		89,000	43,000
3,600		52,000	20,000	12,000		102,000	51,000
3,800		55,000	22,000	13,000		102,000	51,000
3,900		55,000	22,000	14,000		107,000	54,000
4,000		55,000	22,000	15,000		111,000	56,000
4,100		55,000	22,000	16,000		115,000	58,000
4,200		55,000	22,000				
4,300		58,000	24,000				
4,400		58,000	24,000				
4,500		58,000	24,000				
4,600		58,000	24,000				
4,700		58,000	24,000				
4,800		62,000	26,000				
4,900		62,000	26,000				

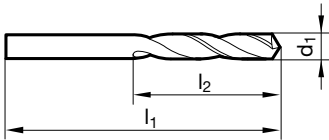
## 短钻

产品代号 81130



芯厚  $\geq \varnothing 2,500$  • 圆弧后刀面

适于加工: 软/长屑材料 • 铝及铝合金 • 锌, 精炼铜, 硅, 电子材料 • 软复合材料、木头



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,500	32,000	9,000	5,200	62,000	26,000
2,000	38,000	12,000	5,300	62,000	26,000
2,200	40,000	13,000	5,400	66,000	28,000
2,300	40,000	13,000	5,700	66,000	28,000
2,500	43,000	14,000	5,800	66,000	28,000
2,600	43,000	14,000	6,000	66,000	28,000
2,800	46,000	16,000	6,400	70,000	31,000
2,900	46,000	16,000	6,500	70,000	31,000
3,000	46,000	16,000	6,800	74,000	34,000
3,200	49,000	18,000	7,000	74,000	34,000
3,300	49,000	18,000	7,500	74,000	34,000
3,400	52,000	20,000	7,800	79,000	37,000
3,500	52,000	20,000	8,000	79,000	37,000
3,600	52,000	20,000	8,500	79,000	37,000
3,800	55,000	22,000	9,000	84,000	40,000
3,900	55,000	22,000	10,000	89,000	43,000
4,000	55,000	22,000	10,500	89,000	43,000
4,100	55,000	22,000	11,000	95,000	47,000
4,200	55,000	22,000	12,000	102,000	51,000
4,300	58,000	24,000	13,000	102,000	51,000
4,500	58,000	24,000	15,000	111,000	56,000
4,900	62,000	26,000	16,000	115,000	58,000
5,000	62,000	26,000			
5,100	62,000	26,000			

## 短钻

产品代号 81140

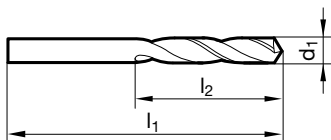


P	M	K	N	S	H
●	○	○	●		



芯厚  $\geq \phi 1,500$  • 圆弧后刀面 • 适合加工高强度钢

易切削钢 • 不锈钢/耐酸钢 •  $\leq 800 \text{ N/mm}^2$  的热处理钢和淬硬钢 • 非长屑铝/铜合金



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		32,000	9,000	6,600		70,000	31,000
1,600		34,000	10,000	6,700		70,000	31,000
1,800		36,000	11,000	6,800		74,000	34,000
2,000		38,000	12,000	7,000		74,000	34,000
2,100		38,000	12,000	7,100		74,000	34,000
2,200		40,000	13,000	7,300		74,000	34,000
2,350		40,000	13,000	7,400		74,000	34,000
2,400		43,000	14,000	7,800		79,000	37,000
2,500		43,000	14,000	8,000		79,000	37,000
2,600		43,000	14,000	8,100		79,000	37,000
2,700		46,000	16,000	8,300		79,000	37,000
2,800		46,000	16,000	8,400		79,000	37,000
2,900		46,000	16,000	8,500		79,000	37,000
3,000		46,000	16,000	8,600		84,000	40,000
3,100		49,000	18,000	8,800		84,000	40,000
3,150		49,000	18,000	9,000		84,000	40,000
3,300		49,000	18,000	9,100		84,000	40,000
3,500		52,000	20,000	9,200		84,000	40,000
3,700		52,000	20,000	9,300		84,000	40,000
4,000		55,000	22,000	9,400		84,000	40,000
4,100		55,000	22,000	9,500		84,000	40,000
4,200		55,000	22,000	9,600		89,000	43,000
4,300		58,000	24,000	9,700		89,000	43,000
4,600		58,000	24,000	9,800		89,000	43,000
4,700		58,000	24,000	10,000		89,000	43,000
4,800		62,000	26,000	10,500		89,000	43,000
4,900		62,000	26,000	11,000		95,000	47,000
5,000		62,000	26,000	11,500		95,000	47,000
5,100		62,000	26,000	12,000		102,000	51,000
5,200		62,000	26,000	12,300	31/64	102,000	51,000
5,300		62,000	26,000	12,500		102,000	51,000
5,400		66,000	28,000	13,000		102,000	51,000
5,500		66,000	28,000	15,000		111,000	56,000
5,600		66,000	28,000	15,500		115,000	58,000
5,700		66,000	28,000				
5,800		66,000	28,000				
5,900		66,000	28,000				
6,000		66,000	28,000				
6,200		70,000	31,000				
6,300		70,000	31,000				
6,400		70,000	31,000				
6,500		70,000	31,000				

## 短钻

产品代号 81145

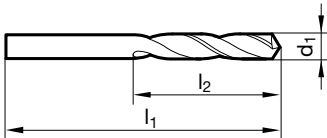


P	M	K	N	S	H
●	○	○	●		



芯厚  $\geq \phi 1,000$  • 圆弧后刀面 • 适合加工高强度钢

易切削钢 • 不锈钢/耐酸钢 •  $\leq 800 \text{ N/mm}^2$  的热处理钢和淬硬钢 • 非长屑铝/铜合金



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	4,300		58,000	24,000
1,100		28,000	7,000	4,400		58,000	24,000
1,250		30,000	8,000	4,500		58,000	24,000
1,300		30,000	8,000	4,600		58,000	24,000
1,400		32,000	9,000	4,650		58,000	24,000
1,500		32,000	9,000	4,700		58,000	24,000
1,600		34,000	10,000	4,800		62,000	26,000
1,650		34,000	10,000	4,900		62,000	26,000
1,700		34,000	10,000	5,000		62,000	26,000
1,800		36,000	11,000	5,100		62,000	26,000
1,850		36,000	11,000	5,200		62,000	26,000
1,900		36,000	11,000	5,300		62,000	26,000
2,100		38,000	12,000	5,500		66,000	28,000
2,200		40,000	13,000	5,600		66,000	28,000
2,250		40,000	13,000	5,700		66,000	28,000
2,300		40,000	13,000	5,800		66,000	28,000
2,350		40,000	13,000	5,900		66,000	28,000
2,400		43,000	14,000	6,000		66,000	28,000
2,500		43,000	14,000	6,200		70,000	31,000
2,550		43,000	14,000	6,300		70,000	31,000
2,600		43,000	14,000	6,500		70,000	31,000
2,650		43,000	14,000	6,600		70,000	31,000
2,700		46,000	16,000	6,700		70,000	31,000
2,780	7/64	46,000	16,000	6,800		74,000	34,000
2,800		46,000	16,000	6,900		74,000	34,000
2,850		46,000	16,000	7,000		74,000	34,000
2,900		46,000	16,000	7,500		74,000	34,000
2,950		46,000	16,000	7,800		79,000	37,000
3,000		46,000	16,000	7,900		79,000	37,000
3,150		49,000	18,000	8,000		79,000	37,000
3,170	1/8	49,000	18,000	8,100		79,000	37,000
3,250		49,000	18,000	8,200		79,000	37,000
3,300		49,000	18,000	8,300		79,000	37,000
3,500		52,000	20,000	8,400		79,000	37,000
3,650		52,000	20,000	8,500		79,000	37,000
3,680		52,000	20,000	8,600		84,000	40,000
3,700		52,000	20,000	8,700		84,000	40,000
3,800		55,000	22,000	8,800		84,000	40,000
3,900		55,000	22,000	9,000		84,000	40,000
4,000		55,000	22,000	9,200		84,000	40,000
4,100		55,000	22,000	9,500		84,000	40,000
4,200		55,000	22,000	9,700		89,000	43,000



## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
10,000		89,000	43,000				
10,500		89,000	43,000				
11,000		95,000	47,000				
11,500		95,000	47,000				
12,500		102,000	51,000				

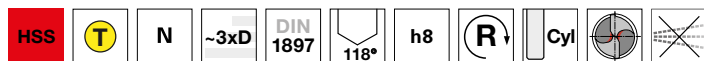


## 短钻

产品代号 84400



P	M	K	N	S	H
•		•	○		

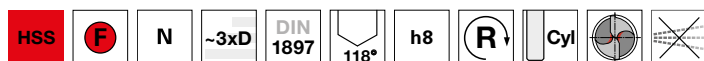


芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 适用于自动/专用车床 • 适用于手动机床  
薄壁材料 • 适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨

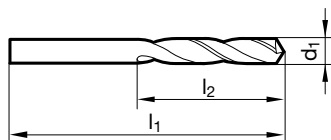
产品代号 84501



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 适用于自动/专用车床 • 适用于手动机床  
薄壁材料 • 适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
1,000		26,000	6,000	3,700		52,000	20,000
1,100		28,000	7,000	3,800		55,000	22,000
1,200		30,000	8,000	3,900		55,000	22,000
1,300		30,000	8,000	4,000		55,000	22,000
1,350		32,000	9,000	4,100		55,000	22,000
1,400		32,000	9,000	4,200		55,000	22,000
1,450		32,000	9,000	4,300		58,000	24,000
1,500		32,000	9,000	4,400		58,000	24,000
1,600		34,000	10,000	4,500		58,000	24,000
1,700		34,000	10,000	4,600		58,000	24,000
1,800		36,000	11,000	4,700		58,000	24,000
1,900		36,000	11,000	4,800		62,000	26,000
2,000		38,000	12,000	4,900		62,000	26,000
2,100		38,000	12,000	5,000		62,000	26,000
2,200		40,000	13,000	5,100		62,000	26,000
2,300		40,000	13,000	5,200		62,000	26,000
2,400		43,000	14,000	5,300		62,000	26,000
2,500		43,000	14,000	5,400		66,000	28,000
2,600		43,000	14,000	5,500		66,000	28,000
2,700		46,000	16,000	5,600		66,000	28,000
2,800		46,000	16,000	5,700		66,000	28,000
2,900		46,000	16,000	5,800		66,000	28,000
3,000		46,000	16,000	5,900		66,000	28,000
3,100		49,000	18,000	6,000		66,000	28,000
3,200		49,000	18,000	6,100		70,000	31,000
3,300		49,000	18,000	6,200		70,000	31,000
3,400		52,000	20,000	6,300		70,000	31,000
3,450		52,000	20,000	6,400		70,000	31,000
3,500		52,000	20,000	6,500		70,000	31,000
3,600		52,000	20,000	6,600		70,000	31,000



## 短钻

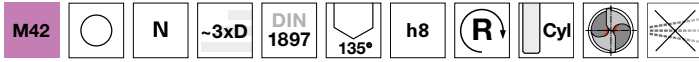
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
6,700		70,000	31,000	11,000		95,000	47,000
6,800		74,000	34,000	11,200		95,000	47,000
6,900		74,000	34,000	11,300		95,000	47,000
7,000		74,000	34,000	11,400		95,000	47,000
7,100		74,000	34,000	11,500		95,000	47,000
7,200		74,000	34,000	11,700		95,000	47,000
7,300		74,000	34,000	11,800		95,000	47,000
7,400		74,000	34,000	11,900		102,000	51,000
7,500		74,000	34,000	12,000		102,000	51,000
7,600		79,000	37,000	12,100		102,000	51,000
7,700		79,000	37,000	12,200		102,000	51,000
7,800		79,000	37,000	12,300	31/64	102,000	51,000
7,900		79,000	37,000	12,500		102,000	51,000
8,000		79,000	37,000	12,700	1/2	102,000	51,000
8,100		79,000	37,000	12,800		102,000	51,000
8,200		79,000	37,000	13,000		102,000	51,000
8,300		79,000	37,000	13,200		102,000	51,000
8,400		79,000	37,000	13,500		107,000	54,000
8,500		79,000	37,000	13,800		107,000	54,000
8,600		84,000	40,000	14,000		107,000	54,000
8,700		84,000	40,000	14,200		111,000	56,000
8,800		84,000	40,000	14,800		111,000	56,000
8,900		84,000	40,000	15,000		111,000	56,000
9,000		84,000	40,000	15,300		115,000	58,000
9,100		84,000	40,000	15,500		115,000	58,000
9,200		84,000	40,000	16,000		115,000	58,000
9,300		84,000	40,000	17,000		119,000	60,000
9,400		84,000	40,000	17,500		123,000	62,000
9,500		84,000	40,000	18,000		123,000	62,000
9,600		89,000	43,000	18,500		127,000	64,000
9,700		89,000	43,000	19,500		131,000	66,000
9,800		89,000	43,000	20,000		131,000	66,000
9,900		89,000	43,000	25,000	63/64	151,000	75,000
10,000		89,000	43,000				
10,100		89,000	43,000				
10,200		89,000	43,000				
10,300		89,000	43,000				
10,400		89,000	43,000				
10,500		89,000	43,000				
10,600		89,000	43,000				
10,720	27/64	95,000	47,000				
10,800		95,000	47,000				

## 短钻

产品代号 81112

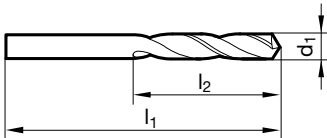


P	M	K	N	S	H
●	○	○	●	●	○



圆弧后刀面 • 钴铝合金钢 • 出色的耐磨性

中/高拉伸强度铬镍基合金 • 哈氏合金, 镍合金, 锰合金 • 不锈钢/耐酸/耐热钢 • 耐磨板材 • 钢和青铜的刚度达到1400 N/mm<sup>2</sup>



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	4,800		62,000	26,000
1,100		28,000	7,000	4,900		62,000	26,000
1,200		30,000	8,000	5,000		62,000	26,000
1,300		30,000	8,000	5,100		62,000	26,000
1,400		32,000	9,000	5,200		62,000	26,000
1,500		32,000	9,000	5,300		62,000	26,000
1,600		34,000	10,000	5,400		66,000	28,000
1,700		34,000	10,000	5,500		66,000	28,000
1,800		36,000	11,000	5,560	7/32	66,000	28,000
1,900		36,000	11,000	5,600		66,000	28,000
2,000		38,000	12,000	5,800		66,000	28,000
2,100		38,000	12,000	6,000		66,000	28,000
2,200		40,000	13,000	6,100		70,000	31,000
2,300		40,000	13,000	6,200		70,000	31,000
2,380	3/32	43,000	14,000	6,300		70,000	31,000
2,400		43,000	14,000	6,350	1/4	70,000	31,000
2,500		43,000	14,000	6,400		70,000	31,000
2,600		43,000	14,000	6,500		70,000	31,000
2,700		46,000	16,000	6,600		70,000	31,000
2,780	7/64	46,000	16,000	6,800		74,000	34,000
2,800		46,000	16,000	6,900		74,000	34,000
2,900		46,000	16,000	7,000		74,000	34,000
3,000		46,000	16,000	7,100		74,000	34,000
3,100		49,000	18,000	7,200		74,000	34,000
3,170	1/8	49,000	18,000	7,300		74,000	34,000
3,200		49,000	18,000	7,400		74,000	34,000
3,300		49,000	18,000	7,500		74,000	34,000
3,400		52,000	20,000	7,540	19/64	79,000	37,000
3,500		52,000	20,000	7,600		79,000	37,000
3,600		52,000	20,000	7,700		79,000	37,000
3,700		52,000	20,000	7,800		79,000	37,000
3,800		55,000	22,000	7,900		79,000	37,000
3,900		55,000	22,000	8,000		79,000	37,000
3,970	5/32	55,000	22,000	8,100		79,000	37,000
4,000		55,000	22,000	8,200		79,000	37,000
4,100		55,000	22,000	8,300		79,000	37,000
4,200		55,000	22,000	8,500		79,000	37,000
4,300		58,000	24,000	8,600		84,000	40,000
4,400		58,000	24,000	8,700		84,000	40,000
4,500		58,000	24,000	9,000		84,000	40,000
4,600		58,000	24,000	9,200		84,000	40,000
4,700		58,000	24,000	9,300		84,000	40,000



## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,500		84,000	40,000	13,500		107,000	54,000
9,700		89,000	43,000	14,000		107,000	54,000
9,800		89,000	43,000	14,500		111,000	56,000
9,900		89,000	43,000	15,000		111,000	56,000
10,000		89,000	43,000				
10,500		89,000	43,000				
11,000		95,000	47,000				
11,500		95,000	47,000				
12,000		102,000	51,000				
12,500		102,000	51,000				
12,700	1/2	102,000	51,000				
13,000		102,000	51,000				

## 短钻

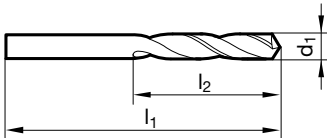
产品代号 81171



P	M	K	N	S	H
•	•	•	○	•	○



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 不锈钢/耐酸钢 • 弹簧钢 • 奥氏体不锈钢 • 哈氏合金, 镍合金, 锰合金



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400		19,000	2,500	2,500		43,000	14,000
0,500		20,000	3,000	2,550		43,000	14,000
0,600		21,000	3,500	2,600		43,000	14,000
0,650		22,000	4,000	2,650		43,000	14,000
0,750		23,000	4,500	2,700		46,000	16,000
0,800		24,000	5,000	2,800		46,000	16,000
0,860		25,000	5,500	2,900		46,000	16,000
0,870		25,000	5,500	3,000		46,000	16,000
0,900		25,000	5,500	3,050		49,000	18,000
0,950		25,000	5,500	3,100		49,000	18,000
1,000		26,000	6,000	3,200		49,000	18,000
1,030		26,000	6,000	3,250		49,000	18,000
1,100		28,000	7,000	3,300		49,000	18,000
1,150		28,000	7,000	3,400		52,000	20,000
1,200		30,000	8,000	3,500		52,000	20,000
1,250		30,000	8,000	3,550		52,000	20,000
1,300		30,000	8,000	3,600		52,000	20,000
1,350		32,000	9,000	3,700		52,000	20,000
1,400		32,000	9,000	3,750		52,000	20,000
1,450		32,000	9,000	3,800		55,000	22,000
1,500		32,000	9,000	3,900		55,000	22,000
1,550		34,000	10,000	4,000		55,000	22,000
1,600		34,000	10,000	4,100		55,000	22,000
1,650		34,000	10,000	4,200		55,000	22,000
1,700		34,000	10,000	4,250		55,000	22,000
1,750		36,000	11,000	4,300		58,000	24,000
1,800		36,000	11,000	4,500		58,000	24,000
1,850		36,000	11,000	4,600		58,000	24,000
1,900		36,000	11,000	4,650		58,000	24,000
1,950		38,000	12,000	4,800		62,000	26,000
1,970		38,000	12,000	4,900		62,000	26,000
1,980	5/64	38,000	12,000	5,000		62,000	26,000
2,000		38,000	12,000	5,050		62,000	26,000
2,030		38,000	12,000	5,100		62,000	26,000
2,050		38,000	12,000	5,200		62,000	26,000
2,100		38,000	12,000	5,300		62,000	26,000
2,200		40,000	13,000	5,400		66,000	28,000
2,250		40,000	13,000	5,500		66,000	28,000
2,300		40,000	13,000	5,550		66,000	28,000
2,400		43,000	14,000	5,600		66,000	28,000
2,450		43,000	14,000	5,700		66,000	28,000
2,470		43,000	14,000	5,800		66,000	28,000



## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,900		66,000	28,000	10,600		89,000	43,000
5,950	15/64	66,000	28,000	10,800		95,000	47,000
6,000		66,000	28,000	10,900		95,000	47,000
6,100		70,000	31,000	11,000		95,000	47,000
6,200		70,000	31,000	11,100		95,000	47,000
6,250		70,000	31,000	11,200		95,000	47,000
6,300		70,000	31,000	11,500		95,000	47,000
6,400		70,000	31,000	11,750		95,000	47,000
6,500		70,000	31,000	11,800		95,000	47,000
6,600		70,000	31,000	12,000		102,000	51,000
6,700		70,000	31,000	12,200		102,000	51,000
6,750	17/64	74,000	34,000	12,250		102,000	51,000
6,800		74,000	34,000	12,300	31/64	102,000	51,000
6,900		74,000	34,000	12,400		102,000	51,000
7,000		74,000	34,000	12,500		102,000	51,000
7,100		74,000	34,000	12,600		102,000	51,000
7,200		74,000	34,000	12,800		102,000	51,000
7,300		74,000	34,000	12,900		102,000	51,000
7,400		74,000	34,000	13,000		102,000	51,000
7,500		74,000	34,000	13,300		107,000	54,000
7,600		79,000	37,000	13,500		107,000	54,000
7,700		79,000	37,000	13,750		107,000	54,000
7,800		79,000	37,000	13,800		107,000	54,000
7,900		79,000	37,000	14,000		107,000	54,000
8,000		79,000	37,000	14,500		111,000	56,000
8,100		79,000	37,000	15,000		111,000	56,000
8,200		79,000	37,000	15,500		115,000	58,000
8,250		79,000	37,000	15,750		115,000	58,000
8,300		79,000	37,000	16,000		115,000	58,000
8,400		79,000	37,000	16,500		119,000	60,000
8,500		79,000	37,000	17,000		119,000	60,000
8,800		84,000	40,000	17,500		123,000	62,000
8,900		84,000	40,000	18,500		127,000	64,000
9,000		84,000	40,000	19,000		127,000	64,000
9,100		84,000	40,000	19,500		131,000	66,000
9,200		84,000	40,000	20,000		131,000	66,000
9,400		84,000	40,000	20,500		136,000	68,000
9,500		84,000	40,000	21,000		136,000	68,000
9,600		89,000	43,000	22,000		141,000	70,000
9,750		89,000	43,000	22,200		141,000	70,000
9,800		89,000	43,000	23,000		146,000	72,000
9,900		89,000	43,000	25,000	63/64	151,000	75,000
10,000		89,000	43,000				
10,050		89,000	43,000				
10,100		89,000	43,000				
10,200		89,000	43,000				
10,400		89,000	43,000				
10,500		89,000	43,000				

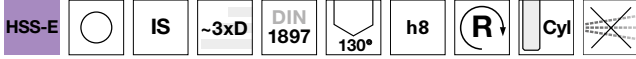


## 短钻

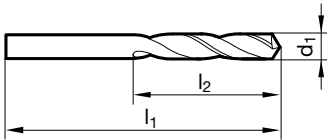
产品代号 81173



P	M	K	N	S	H
○	●		○	○	



INOX-钻头 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 适于加工: 不锈钢/耐酸-/耐热奥氏体钢



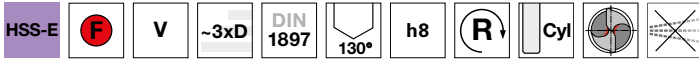
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	26,000	6,000	5,000	62,000	26,000
1,100	28,000	7,000	5,100	62,000	26,000
1,300	30,000	8,000	5,200	62,000	26,000
1,400	32,000	9,000	5,300	62,000	26,000
1,500	32,000	9,000	5,500	66,000	28,000
1,600	34,000	10,000	5,600	66,000	28,000
1,700	34,000	10,000	5,800	66,000	28,000
1,800	36,000	11,000	5,900	66,000	28,000
2,000	38,000	12,000	6,000	66,000	28,000
2,100	38,000	12,000	6,300	70,000	31,000
2,200	40,000	13,000	6,500	70,000	31,000
2,300	40,000	13,000	6,700	70,000	31,000
2,400	43,000	14,000	6,800	74,000	34,000
2,500	43,000	14,000	6,900	74,000	34,000
2,600	43,000	14,000	7,000	74,000	34,000
2,700	46,000	16,000	7,100	74,000	34,000
2,800	46,000	16,000	7,400	74,000	34,000
2,900	46,000	16,000	7,500	74,000	34,000
3,000	46,000	16,000	7,600	79,000	37,000
3,100	49,000	18,000	7,800	79,000	37,000
3,200	49,000	18,000	7,900	79,000	37,000
3,300	49,000	18,000	8,000	79,000	37,000
3,400	52,000	20,000	8,100	79,000	37,000
3,500	52,000	20,000	8,200	79,000	37,000
3,600	52,000	20,000	8,500	79,000	37,000
3,800	55,000	22,000	8,700	84,000	40,000
3,900	55,000	22,000	9,000	84,000	40,000
4,000	55,000	22,000	9,200	84,000	40,000
4,100	55,000	22,000	9,500	84,000	40,000
4,200	55,000	22,000	10,000	89,000	43,000
4,300	58,000	24,000	10,200	89,000	43,000
4,500	58,000	24,000	10,500	89,000	43,000
4,600	58,000	24,000	11,000	95,000	47,000
4,700	58,000	24,000	11,500	95,000	47,000
4,800	62,000	26,000	11,700	95,000	47,000
4,900	62,000	26,000	12,000	102,000	51,000

## 短钻

产品代号 84503



P	M	K	N	S	H
•	•	•	○	•	○

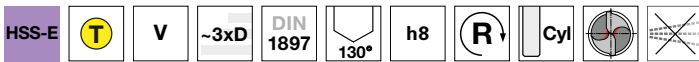


芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 不锈钢/耐酸钢 • 弹簧钢 • 奥氏体不锈钢 • 哈氏合金, 镍合金, 锰合金

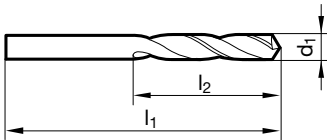
产品代号 84803



P	M	K	N	S	H
•	•	•	○	•	○



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 不锈钢/耐酸钢 • 弹簧钢 • 奥氏体不锈钢 • 哈氏合金, 镍合金, 锰合金



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,500		20,000	3,000	3,050		49,000	18,000
0,700		23,000	4,500	3,100		49,000	18,000
0,900		25,000	5,500	3,200		49,000	18,000
1,000		26,000	6,000	3,250		49,000	18,000
1,100		28,000	7,000	3,300		49,000	18,000
1,200		30,000	8,000	3,350		49,000	18,000
1,300		30,000	8,000	3,400		52,000	20,000
1,400		32,000	9,000	3,450		52,000	20,000
1,500		32,000	9,000	3,500		52,000	20,000
1,600		34,000	10,000	3,600		52,000	20,000
1,700		34,000	10,000	3,700		52,000	20,000
1,800		36,000	11,000	3,800		55,000	22,000
1,850		36,000	11,000	3,900		55,000	22,000
1,900		36,000	11,000	4,000		55,000	22,000
2,000		38,000	12,000	4,100		55,000	22,000
2,050		38,000	12,000	4,200		55,000	22,000
2,100		38,000	12,000	4,300		58,000	24,000
2,200		40,000	13,000	4,400		58,000	24,000
2,300		40,000	13,000	4,500		58,000	24,000
2,350		40,000	13,000	4,600		58,000	24,000
2,400		43,000	14,000	4,700		58,000	24,000
2,450		43,000	14,000	4,800		62,000	26,000
2,500		43,000	14,000	4,900		62,000	26,000
2,550		43,000	14,000	5,000		62,000	26,000
2,600		43,000	14,000	5,100		62,000	26,000
2,700		46,000	16,000	5,200		62,000	26,000
2,800		46,000	16,000	5,300		62,000	26,000
2,900		46,000	16,000	5,400		66,000	28,000
2,950		46,000	16,000	5,500		66,000	28,000
3,000		46,000	16,000	5,600		66,000	28,000





## 短钻

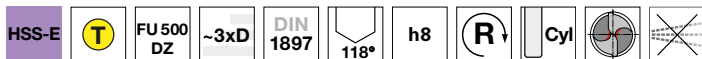
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,700		66,000	28,000	8,600		84,000	40,000
5,800		66,000	28,000	8,700		84,000	40,000
5,900		66,000	28,000	8,800		84,000	40,000
6,000		66,000	28,000	9,000		84,000	40,000
6,050		70,000	31,000	9,100		84,000	40,000
6,100		70,000	31,000	9,200		84,000	40,000
6,200		70,000	31,000	9,300		84,000	40,000
6,300		70,000	31,000	9,500		84,000	40,000
6,350	1/4	70,000	31,000	9,600		89,000	43,000
6,400		70,000	31,000	9,700		89,000	43,000
6,500		70,000	31,000	9,800		89,000	43,000
6,600		70,000	31,000	9,900		89,000	43,000
6,700		70,000	31,000	10,000		89,000	43,000
6,800		74,000	34,000	10,200		89,000	43,000
6,900		74,000	34,000	10,500		89,000	43,000
7,000		74,000	34,000	11,000		95,000	47,000
7,100		74,000	34,000	11,500		95,000	47,000
7,200		74,000	34,000	12,000		102,000	51,000
7,300		74,000	34,000	12,500		102,000	51,000
7,400		74,000	34,000	13,000		102,000	51,000
7,500		74,000	34,000	14,000		107,000	54,000
7,700		79,000	37,000	14,500		111,000	56,000
7,800		79,000	37,000	15,000		111,000	56,000
7,900		79,000	37,000				
8,000		79,000	37,000				
8,100		79,000	37,000				
8,200		79,000	37,000				
8,300		79,000	37,000				
8,400		79,000	37,000				
8,500		79,000	37,000				

## 短钻

产品代号 84806



P	M	K	N	S	H
•	•	•	•		

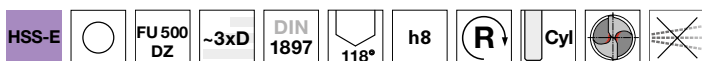


芯厚  $\geq \varnothing 1,000$  • 双后刀面 • 高耐磨强度 • 要求适合低进给率 • 要求低扭矩 • 普遍适用  
强度小于800N/mm<sup>2</sup>的合金/非合金钢 • 热/冷锻钢 • 耐磨轴承钢 • 有色金属 • 铸件材料 • 不锈钢 • 塑料

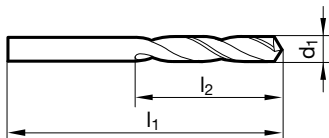
产品代号 84808



P	M	K	N	S	H
•	•	•	•		



芯厚  $\geq \varnothing 1,000$  • 双后刀面 • 高耐磨强度 • 要求适合低进给率 • 要求低扭矩 • 普遍适用  
强度小于800N/mm<sup>2</sup>的合金/非合金钢 • 热/冷锻钢 • 耐磨轴承钢 • 有色金属 • 铸件材料 • 不锈钢 • 塑料



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	3,600		52,000	20,000
1,100		28,000	7,000	3,700		52,000	20,000
1,200		30,000	8,000	3,800		55,000	22,000
1,300		30,000	8,000	3,900		55,000	22,000
1,400		32,000	9,000	3,970	5/32	55,000	22,000
1,500		32,000	9,000	4,000		55,000	22,000
1,600		34,000	10,000	4,100		55,000	22,000
1,700		34,000	10,000	4,200		55,000	22,000
1,800		36,000	11,000	4,300		58,000	24,000
1,900		36,000	11,000	4,370	11/64	58,000	24,000
2,000		38,000	12,000	4,400		58,000	24,000
2,100		38,000	12,000	4,500		58,000	24,000
2,200		40,000	13,000	4,600		58,000	24,000
2,300		40,000	13,000	4,700		58,000	24,000
2,380	3/32	43,000	14,000	4,760	3/16	62,000	26,000
2,400		43,000	14,000	4,800		62,000	26,000
2,500		43,000	14,000	4,900		62,000	26,000
2,600		43,000	14,000	5,000		62,000	26,000
2,700		46,000	16,000	5,100		62,000	26,000
2,780	7/64	46,000	16,000	5,160	13/64	62,000	26,000
2,800		46,000	16,000	5,200		62,000	26,000
2,900		46,000	16,000	5,300		62,000	26,000
3,000		46,000	16,000	5,400		66,000	28,000
3,100		49,000	18,000	5,500		66,000	28,000
3,170	1/8	49,000	18,000	5,560	7/32	66,000	28,000
3,200		49,000	18,000	5,600		66,000	28,000
3,300		49,000	18,000	5,700		66,000	28,000
3,400		52,000	20,000	5,800		66,000	28,000
3,500		52,000	20,000	5,900		66,000	28,000
3,570	9/64	52,000	20,000	5,950	15/64	66,000	28,000



## 短钻

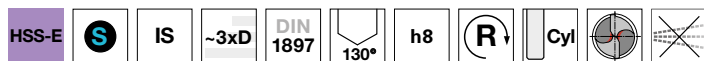
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
6,000		66,000	28,000	8,700		84,000	40,000
6,100		70,000	31,000	8,730	11/32	84,000	40,000
6,200		70,000	31,000	8,800		84,000	40,000
6,300		70,000	31,000	8,900		84,000	40,000
6,350	1/4	70,000	31,000	9,000		84,000	40,000
6,400		70,000	31,000	9,100		84,000	40,000
6,500		70,000	31,000	9,200		84,000	40,000
6,600		70,000	31,000	9,300		84,000	40,000
6,700		70,000	31,000	9,400		84,000	40,000
6,800		74,000	34,000	9,500		84,000	40,000
6,900		74,000	34,000	9,600		89,000	43,000
7,000		74,000	34,000	9,700		89,000	43,000
7,100		74,000	34,000	9,800		89,000	43,000
7,140	9/32	74,000	34,000	9,900		89,000	43,000
7,200		74,000	34,000	10,000		89,000	43,000
7,300		74,000	34,000	10,100		89,000	43,000
7,400		74,000	34,000	10,200		89,000	43,000
7,500		74,000	34,000	10,300		89,000	43,000
7,600		79,000	37,000	10,400		89,000	43,000
7,700		79,000	37,000	10,500		89,000	43,000
7,800		79,000	37,000	11,000		95,000	47,000
7,900		79,000	37,000	11,110	7/16	95,000	47,000
7,940	5/16	79,000	37,000	11,500		95,000	47,000
8,000		79,000	37,000	12,000		102,000	51,000
8,100		79,000	37,000	12,500		102,000	51,000
8,200		79,000	37,000	13,000		102,000	51,000
8,300		79,000	37,000	13,500		107,000	54,000
8,400		79,000	37,000	14,000		107,000	54,000
8,500		79,000	37,000				
8,600		84,000	40,000				

## 短钻

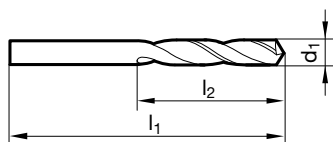
产品代号 81178



P	M	K	N	S	H
○	●	○	○	●	



优化定心的圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 适于加工: 不锈钢/耐酸-/耐热奥氏体钢 • 特殊合金



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
1,000		26,000	6,000	5,100		62,000	26,000
1,100		28,000	7,000	5,200		62,000	26,000
1,200		30,000	8,000	5,300		62,000	26,000
1,300		30,000	8,000	5,400		66,000	28,000
1,400		32,000	9,000	5,500		66,000	28,000
1,500		32,000	9,000	5,550		66,000	28,000
1,600		34,000	10,000	5,600		66,000	28,000
1,700		34,000	10,000	5,700		66,000	28,000
1,800		36,000	11,000	5,800		66,000	28,000
1,900		36,000	11,000	5,900		66,000	28,000
2,000		38,000	12,000	6,000		66,000	28,000
2,100		38,000	12,000	6,100		70,000	31,000
2,200		40,000	13,000	6,200		70,000	31,000
2,300		40,000	13,000	6,300		70,000	31,000
2,400		43,000	14,000	6,400		70,000	31,000
2,500		43,000	14,000	6,500		70,000	31,000
2,600		43,000	14,000	6,600		70,000	31,000
2,700		46,000	16,000	6,700		70,000	31,000
2,800		46,000	16,000	6,800		74,000	34,000
2,900		46,000	16,000	6,900		74,000	34,000
3,000		46,000	16,000	7,000		74,000	34,000
3,100		49,000	18,000	7,100		74,000	34,000
3,200		49,000	18,000	7,200		74,000	34,000
3,300		49,000	18,000	7,300		74,000	34,000
3,400		52,000	20,000	7,400		74,000	34,000
3,500		52,000	20,000	7,450		74,000	34,000
3,600		52,000	20,000	7,500		74,000	34,000
3,700		52,000	20,000	7,600		79,000	37,000
3,800		55,000	22,000	7,700		79,000	37,000
3,900		55,000	22,000	7,800		79,000	37,000
4,000		55,000	22,000	7,900		79,000	37,000
4,100		55,000	22,000	8,000		79,000	37,000
4,200		55,000	22,000	8,100		79,000	37,000
4,300		58,000	24,000	8,200		79,000	37,000
4,400		58,000	24,000	8,300		79,000	37,000
4,500		58,000	24,000	8,400		79,000	37,000
4,600		58,000	24,000	8,500		79,000	37,000
4,650		58,000	24,000	8,600		84,000	40,000
4,700		58,000	24,000	8,700		84,000	40,000
4,800		62,000	26,000	8,800		84,000	40,000
4,900		62,000	26,000	8,900		84,000	40,000
5,000		62,000	26,000	9,000		84,000	40,000



## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,100		84,000	40,000	10,500		89,000	43,000
9,200		84,000	40,000	11,000		95,000	47,000
9,250		84,000	40,000	11,200		95,000	47,000
9,300		84,000	40,000	11,500		95,000	47,000
9,400		84,000	40,000	11,800		95,000	47,000
9,500		84,000	40,000	12,000		102,000	51,000
9,600		89,000	43,000	12,500		102,000	51,000
9,700		89,000	43,000	13,000		102,000	51,000
9,800		89,000	43,000				
9,900		89,000	43,000				
10,000		89,000	43,000				
10,200		89,000	43,000				



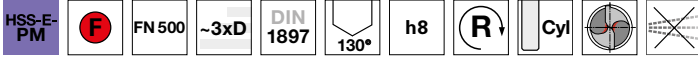
# HARTNER

## 短钻

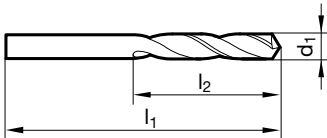
产品代号 84511



P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • PM-粉末冶金钴合金高速钢 • 刚性好 • 出色的耐磨性  
 高强度材料、高合金钢 • 热处理钢和淬硬钢 • 铸铁,黄铜,青铜



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	5,560	7/32	66,000	28,000
1,200		30,000	8,000	5,700		66,000	28,000
1,500		32,000	9,000	5,800		66,000	28,000
2,000		38,000	12,000	5,900		66,000	28,000
2,200		40,000	13,000	6,000		66,000	28,000
2,300		40,000	13,000	6,200		70,000	31,000
2,400		43,000	14,000	6,300		70,000	31,000
2,500		43,000	14,000	6,350	1/4	70,000	31,000
2,600		43,000	14,000	6,400		70,000	31,000
2,700		46,000	16,000	6,500		70,000	31,000
2,780	7/64	46,000	16,000	6,600		70,000	31,000
3,000		46,000	16,000	6,700		70,000	31,000
3,100		49,000	18,000	6,750	17/64	74,000	34,000
3,170	1/8	49,000	18,000	6,800		74,000	34,000
3,200		49,000	18,000	6,900		74,000	34,000
3,260		49,000	18,000	7,100		74,000	34,000
3,300		49,000	18,000	7,140	9/32	74,000	34,000
3,500		52,000	20,000	7,200		74,000	34,000
3,570	9/64	52,000	20,000	7,300		74,000	34,000
3,600		52,000	20,000	7,370		74,000	34,000
3,700		52,000	20,000	7,400		74,000	34,000
3,800		55,000	22,000	7,500		74,000	34,000
3,900		55,000	22,000	7,540	19/64	79,000	37,000
4,000		55,000	22,000	7,600		79,000	37,000
4,090		55,000	22,000	7,700		79,000	37,000
4,100		55,000	22,000	7,900		79,000	37,000
4,200		55,000	22,000	7,940	5/16	79,000	37,000
4,370	11/64	58,000	24,000	8,000		79,000	37,000
4,400		58,000	24,000	8,100		79,000	37,000
4,500		58,000	24,000	8,200		79,000	37,000
4,650		58,000	24,000	8,300		79,000	37,000
4,700		58,000	24,000	8,500		79,000	37,000
4,760	3/16	62,000	26,000	8,600		84,000	40,000
4,800		62,000	26,000	8,700		84,000	40,000
4,980		62,000	26,000	8,730	11/32	84,000	40,000
5,000		62,000	26,000	8,800		84,000	40,000
5,100		62,000	26,000	9,100		84,000	40,000
5,160	13/64	62,000	26,000	9,130	23/64	84,000	40,000
5,300		62,000	26,000	9,200		84,000	40,000
5,400		66,000	28,000	9,300		84,000	40,000
5,410		66,000	28,000	9,350		84,000	40,000
5,500		66,000	28,000	9,500		84,000	40,000



## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,520	3/8	89,000	43,000	11,510	29/64	95,000	47,000
9,600		89,000	43,000	11,910	15/32	102,000	51,000
9,800		89,000	43,000	12,000		102,000	51,000
9,900		89,000	43,000	12,500		102,000	51,000
9,920	25/64	89,000	43,000	12,700	1/2	102,000	51,000
10,000		89,000	43,000	13,000		102,000	51,000
10,200		89,000	43,000	13,500		107,000	54,000
10,320	13/32	89,000	43,000				
10,500		89,000	43,000				
10,720	27/64	95,000	47,000				
11,000		95,000	47,000				
11,110	7/16	95,000	47,000				



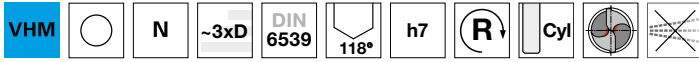
# HARTNER

## 短钻

产品代号 89235

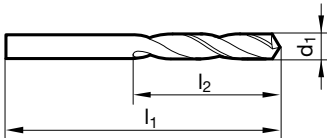


P	M	K	N	S	H
○	○	○	●	○	



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 适合加工: 灰铸铁 • 青铜、黄铜 • 铝和铝合金 • 镁和镁合金 • 塑料及纤维增强塑料



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,800		24,000	5,000	4,200		55,000	22,000
0,900		25,000	5,500	4,300		58,000	24,000
1,000		26,000	6,000	4,370	11/64	58,000	24,000
1,100		28,000	7,000	4,400		58,000	24,000
1,200		30,000	8,000	4,500		58,000	24,000
1,300		30,000	8,000	4,600		58,000	24,000
1,400		32,000	9,000	4,700		58,000	24,000
1,500		32,000	9,000	4,760	3/16	62,000	26,000
1,600		34,000	10,000	4,800		62,000	26,000
1,700		34,000	10,000	4,850		62,000	26,000
1,800		36,000	11,000	4,900		62,000	26,000
1,900		36,000	11,000	5,000		62,000	26,000
1,980	5/64	38,000	12,000	5,100		62,000	26,000
2,000		38,000	12,000	5,200		62,000	26,000
2,100		38,000	12,000	5,300		62,000	26,000
2,200		40,000	13,000	5,400		66,000	28,000
2,300		40,000	13,000	5,500		66,000	28,000
2,380	3/32	43,000	14,000	5,560	7/32	66,000	28,000
2,400		43,000	14,000	5,600		66,000	28,000
2,500		43,000	14,000	5,700		66,000	28,000
2,600		43,000	14,000	5,800		66,000	28,000
2,700		46,000	16,000	5,900		66,000	28,000
2,780	7/64	46,000	16,000	6,000		66,000	28,000
2,800		46,000	16,000	6,100		70,000	31,000
2,900		46,000	16,000	6,200		70,000	31,000
3,000		46,000	16,000	6,300		70,000	31,000
3,050		49,000	18,000	6,350	1/4	70,000	31,000
3,100		49,000	18,000	6,400		70,000	31,000
3,170	1/8	49,000	18,000	6,500		70,000	31,000
3,200		49,000	18,000	6,600		70,000	31,000
3,300		49,000	18,000	6,700		70,000	31,000
3,400		52,000	20,000	6,800		74,000	34,000
3,500		52,000	20,000	6,900		74,000	34,000
3,570	9/64	52,000	20,000	7,000		74,000	34,000
3,600		52,000	20,000	7,100		74,000	34,000
3,700		52,000	20,000	7,140	9/32	74,000	34,000
3,800		55,000	22,000	7,200		74,000	34,000
3,900		55,000	22,000	7,300		74,000	34,000
3,970	5/32	55,000	22,000	7,400		74,000	34,000
4,000		55,000	22,000	7,500		74,000	34,000
4,040		55,000	22,000	7,600		79,000	37,000
4,100		55,000	22,000	7,700		79,000	37,000





## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,800		79,000	37,000	10,200		89,000	43,000
7,900		79,000	37,000	10,300		89,000	43,000
7,940	5/16	79,000	37,000	10,500		89,000	43,000
8,000		79,000	37,000	10,800		95,000	47,000
8,100		79,000	37,000	11,000		95,000	47,000
8,200		79,000	37,000	11,110	7/16	95,000	47,000
8,300		79,000	37,000	11,400		95,000	47,000
8,400		79,000	37,000	11,500		95,000	47,000
8,500		79,000	37,000	12,000		102,000	51,000
8,600		84,000	40,000	12,300	31/64	102,000	51,000
8,700		84,000	40,000	12,400		102,000	51,000
8,730	11/32	84,000	40,000	13,000		102,000	51,000
8,800		84,000	40,000	13,200		102,000	51,000
8,900		84,000	40,000	14,000		107,000	54,000
9,000		84,000	40,000	15,000		111,000	56,000
9,100		84,000	40,000	16,000		115,000	58,000
9,300		84,000	40,000				
9,400		84,000	40,000				
9,500		84,000	40,000				
9,600		89,000	43,000				
9,700		89,000	43,000				
9,800		89,000	43,000				
9,900		89,000	43,000				
10,000		89,000	43,000				

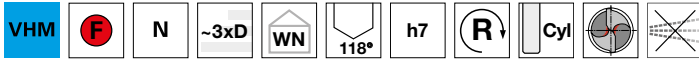


## 短钻

产品代号 89253

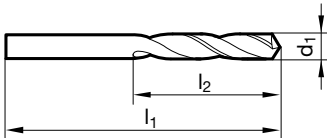


P	M	K	N	S	H
○	○	○	●	○	



双后刀面 • 精密磨削过的主切削刃

铝材料含硅量高 • 易切削钢和热处理钢 • 适合加工: 结构钢和淬硬钢 • 铸件材料 • 塑料及纤维增强塑料 • 镁和镁合金 • 黄铜



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	3,800		55,000	22,000
1,100		28,000	7,000	3,900		55,000	22,000
1,190	3/64	30,000	8,000	3,970	5/32	55,000	22,000
1,200		30,000	8,000	4,000		55,000	22,000
1,300		30,000	8,000	4,040		55,000	22,000
1,400		32,000	9,000	4,100		55,000	22,000
1,500		32,000	9,000	4,200		55,000	22,000
1,590	1/16	34,000	10,000	4,300		58,000	24,000
1,600		34,000	10,000	4,370	11/64	58,000	24,000
1,700		34,000	10,000	4,400		58,000	24,000
1,800		36,000	11,000	4,500		58,000	24,000
1,850		36,000	11,000	4,570		58,000	24,000
1,900		36,000	11,000	4,600		58,000	24,000
1,980	5/64	38,000	12,000	4,700		58,000	24,000
2,000		38,000	12,000	4,760	3/16	62,000	26,000
2,060		38,000	12,000	4,800		62,000	26,000
2,100		38,000	12,000	4,900		62,000	26,000
2,200		40,000	13,000	4,980		62,000	26,000
2,250		40,000	13,000	5,000		62,000	26,000
2,300		40,000	13,000	5,060		62,000	26,000
2,380	3/32	43,000	14,000	5,100		62,000	26,000
2,400		43,000	14,000	5,160	13/64	62,000	26,000
2,500		43,000	14,000	5,200		62,000	26,000
2,530		43,000	14,000	5,300		62,000	26,000
2,600		43,000	14,000	5,400		66,000	28,000
2,700		46,000	16,000	5,500		66,000	28,000
2,780	7/64	46,000	16,000	5,560	7/32	66,000	28,000
2,800		46,000	16,000	5,600		66,000	28,000
2,900		46,000	16,000	5,700		66,000	28,000
2,950		46,000	16,000	5,800		66,000	28,000
3,000		46,000	16,000	5,900		66,000	28,000
3,050		49,000	18,000	5,950	15/64	66,000	28,000
3,100		49,000	18,000	6,000		66,000	28,000
3,170	1/8	49,000	18,000	6,040		70,000	31,000
3,200		49,000	18,000	6,100		70,000	31,000
3,300		49,000	18,000	6,150		70,000	31,000
3,400		52,000	20,000	6,200		70,000	31,000
3,450		52,000	20,000	6,250		70,000	31,000
3,500		52,000	20,000	6,300		70,000	31,000
3,570	9/64	52,000	20,000	6,350	1/4	70,000	31,000
3,600		52,000	20,000	6,400		70,000	31,000
3,700		52,000	20,000	6,500		70,000	31,000



## 短钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
6,600		70,000	31,000	9,000		84,000	40,000
6,700		70,000	31,000	9,130	23/64	84,000	40,000
6,800		74,000	34,000	9,300		84,000	40,000
6,900		74,000	34,000	9,500		84,000	40,000
7,000		74,000	34,000	9,520	3/8	89,000	43,000
7,030		74,000	34,000	9,600		89,000	43,000
7,100		74,000	34,000	9,700		89,000	43,000
7,140	9/32	74,000	34,000	9,800		89,000	43,000
7,200		74,000	34,000	9,920	25/64	89,000	43,000
7,300		74,000	34,000	10,000		89,000	43,000
7,400		74,000	34,000	10,080		89,000	43,000
7,500		74,000	34,000	10,200		89,000	43,000
7,540	19/64	79,000	37,000	10,320	13/32	89,000	43,000
7,600		79,000	37,000	10,500		89,000	43,000
7,800		79,000	37,000	10,720	27/64	95,000	47,000
7,900		79,000	37,000	11,000		95,000	47,000
7,940	5/16	79,000	37,000	11,110	7/16	95,000	47,000
8,000		79,000	37,000	11,500		95,000	47,000
8,030		79,000	37,000	11,510	29/64	95,000	47,000
8,100		79,000	37,000	11,910	15/32	102,000	51,000
8,200		79,000	37,000	12,000		102,000	51,000
8,300		79,000	37,000	12,300	31/64	102,000	51,000
8,330	21/64	79,000	37,000	12,700	1/2	102,000	51,000
8,400		79,000	37,000	13,000		102,000	51,000
8,500		79,000	37,000	13,500		107,000	54,000
8,600		84,000	40,000	14,000		107,000	54,000
8,700		84,000	40,000	14,290	9/16	111,000	56,000
8,730	11/32	84,000	40,000	14,500		111,000	56,000
8,800		84,000	40,000	15,000		111,000	56,000
8,900		84,000	40,000	16,000		115,000	58,000

## 短钻

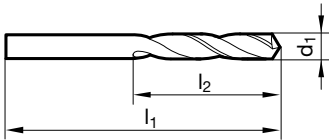
产品代号 89246



P	M	K	N	S	H
○	○	○	○	○	○



双后刀面 • 精密磨削过的主切削刃  
 玻璃纤维增强塑料 • 加工热固性塑料在切削刃和刃带上易磨损



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
0,500	30,000	6,500	4,000	50,000	22,000
0,900	30,000	9,500	4,100	50,000	25,000
1,000	30,000	11,000	4,200	50,000	25,000
1,200	30,000	13,000	4,600	50,000	25,000
1,400	30,000	13,000	4,700	50,000	25,000
2,000	40,000	17,500	5,000	50,000	25,000
2,500	40,000	17,500	5,200	50,000	25,000
3,000	45,000	20,000	5,300	50,000	25,000
3,100	50,000	22,000	5,600	50,000	25,000
3,200	50,000	22,000	5,800	50,000	25,000
3,400	50,000	22,000	5,900	50,000	25,000
3,600	50,000	22,000	6,100	65,000	30,000

## 工具钻

产品代号 81010

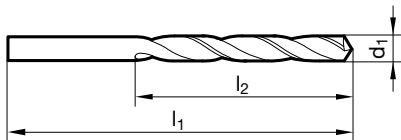


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 1,000 • 圆弧后刀面

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,200		19,000	2,500	0,650		26,000	8,000
0,220		19,000	2,500	0,670		26,000	8,000
0,230		19,000	2,500	0,690		28,000	9,000
0,240		19,000	2,500	0,700		28,000	9,000
0,250		19,000	3,000	0,710		28,000	9,000
0,260		19,000	3,000	0,720		28,000	9,000
0,270		19,000	3,000	0,730		28,000	9,000
0,280		19,000	3,000	0,740		28,000	9,000
0,290		19,000	3,000	0,750		28,000	9,000
0,300		19,000	3,000	0,760		30,000	10,000
0,310		19,000	4,000	0,770		30,000	10,000
0,320		19,000	4,000	0,780		30,000	10,000
0,330		19,000	4,000	0,790	1/32	30,000	10,000
0,350		19,000	4,000	0,800		30,000	10,000
0,370		19,000	4,000	0,810		30,000	10,000
0,380		19,000	4,000	0,820		30,000	10,000
0,390		20,000	5,000	0,830		30,000	10,000
0,400		20,000	5,000	0,850		30,000	10,000
0,410		20,000	5,000	0,860		32,000	11,000
0,420		20,000	5,000	0,870		32,000	11,000
0,430		20,000	5,000	0,880		32,000	11,000
0,440		20,000	5,000	0,890		32,000	11,000
0,450		20,000	5,000	0,900		32,000	11,000
0,460		20,000	5,000	0,910		32,000	11,000
0,470		20,000	5,000	0,940		32,000	11,000
0,480		20,000	5,000	0,950		32,000	11,000
0,490		22,000	6,000	0,960		34,000	12,000
0,500		22,000	6,000	0,970		34,000	12,000
0,510		22,000	6,000	0,980		34,000	12,000
0,520		22,000	6,000	0,990		34,000	12,000
0,530		22,000	6,000	1,000		34,000	12,000
0,540		24,000	7,000	1,010		34,000	12,000
0,550		24,000	7,000	1,020		34,000	12,000
0,560		24,000	7,000	1,030		34,000	12,000
0,570		24,000	7,000	1,040		34,000	12,000
0,580		24,000	7,000	1,050		34,000	12,000
0,590		24,000	7,000	1,070		36,000	14,000
0,600		24,000	7,000	1,100		36,000	14,000
0,610		26,000	8,000	1,110		36,000	14,000
0,620		26,000	8,000	1,120		36,000	14,000
0,630		26,000	8,000	1,130		36,000	14,000
0,640		26,000	8,000	1,150		36,000	14,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,160		36,000	14,000	2,440		57,000	30,000
1,180		36,000	14,000	2,450		57,000	30,000
1,190	3/64	38,000	16,000	2,460		57,000	30,000
1,200		38,000	16,000	2,500		57,000	30,000
1,210		38,000	16,000	2,510		57,000	30,000
1,220		38,000	16,000	2,520		57,000	30,000
1,250		38,000	16,000	2,530		57,000	30,000
1,260		38,000	16,000	2,550		57,000	30,000
1,270		38,000	16,000	2,570		57,000	30,000
1,300		38,000	16,000	2,600		57,000	30,000
1,310		38,000	16,000	2,640		57,000	30,000
1,350		40,000	18,000	2,650		57,000	30,000
1,360		40,000	18,000	2,700		61,000	33,000
1,400		40,000	18,000	2,750		61,000	33,000
1,410		40,000	18,000	2,780	7/64	61,000	33,000
1,420		40,000	18,000	2,800		61,000	33,000
1,430		40,000	18,000	2,850		61,000	33,000
1,440		40,000	18,000	2,880		61,000	33,000
1,450		40,000	18,000	2,900		61,000	33,000
1,460		40,000	18,000	2,940		61,000	33,000
1,480		40,000	18,000	2,950		61,000	33,000
1,490		40,000	18,000	2,970		61,000	33,000
1,500		40,000	18,000	3,000		61,000	33,000
1,520		43,000	20,000	3,010		65,000	36,000
1,550		43,000	20,000	3,020		65,000	36,000
1,560		43,000	20,000	3,050		65,000	36,000
1,580		43,000	20,000	3,070		65,000	36,000
1,590	1/16	43,000	20,000	3,100		65,000	36,000
1,600		43,000	20,000	3,150		65,000	36,000
1,620		43,000	20,000	3,160		65,000	36,000
1,650		43,000	20,000	3,170	1/8	65,000	36,000
1,700		43,000	20,000	3,200		65,000	36,000
1,720		46,000	22,000	3,250		65,000	36,000
1,730		46,000	22,000	3,260		65,000	36,000
1,740		46,000	22,000	3,300		65,000	36,000
1,750		46,000	22,000	3,350		65,000	36,000
1,760		46,000	22,000	3,400		70,000	39,000
1,800		46,000	22,000	3,450		70,000	39,000
1,820		46,000	22,000	3,500		70,000	39,000
1,830		46,000	22,000	3,550		70,000	39,000
1,840		46,000	22,000	3,600		70,000	39,000
1,850		46,000	22,000	3,650		70,000	39,000
1,890		46,000	22,000	3,670		70,000	39,000
1,900		46,000	22,000	3,680		70,000	39,000
1,910		49,000	24,000	3,700		70,000	39,000
1,920		49,000	24,000	3,750		70,000	39,000
1,930		49,000	24,000	3,800		75,000	43,000
1,950		49,000	24,000	3,850		75,000	43,000
1,980	5/64	49,000	24,000	3,900		75,000	43,000
1,990		49,000	24,000	3,930		75,000	43,000
2,000		49,000	24,000	3,950		75,000	43,000
2,010		49,000	24,000	3,970	5/32	75,000	43,000
2,020		49,000	24,000	3,990		75,000	43,000
2,030		49,000	24,000	4,000		75,000	43,000
2,040		49,000	24,000	4,030		75,000	43,000
2,050		49,000	24,000	4,040		75,000	43,000
2,100		49,000	24,000	4,050		75,000	43,000
2,110		49,000	24,000	4,060		75,000	43,000
2,120		49,000	24,000	4,100		75,000	43,000
2,150		53,000	27,000	4,150		75,000	43,000
2,170		53,000	27,000	4,200		75,000	43,000
2,200		53,000	27,000	4,220		75,000	43,000
2,220		53,000	27,000	4,250		75,000	43,000
2,250		53,000	27,000	4,300		80,000	47,000
2,270		53,000	27,000	4,320		80,000	47,000
2,300		53,000	27,000	4,350		80,000	47,000
2,330		53,000	27,000	4,370	11/64	80,000	47,000
2,350		53,000	27,000	4,390		80,000	47,000
2,360		53,000	27,000	4,400		80,000	47,000
2,370		57,000	30,000	4,450		80,000	47,000
2,380	3/32	57,000	30,000	4,500		80,000	47,000
2,400		57,000	30,000	4,530		80,000	47,000

## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
4,550		80,000	47,000	7,250		109,000	69,000
4,570		80,000	47,000	7,300		109,000	69,000
4,600		80,000	47,000	7,350		109,000	69,000
4,650		80,000	47,000	7,400		109,000	69,000
4,700		80,000	47,000	7,450		109,000	69,000
4,750		80,000	47,000	7,500		109,000	69,000
4,760	3/16	86,000	52,000	7,540	19/64	117,000	75,000
4,780		86,000	52,000	7,600		117,000	75,000
4,800		86,000	52,000	7,700		117,000	75,000
4,830		86,000	52,000	7,750		117,000	75,000
4,850		86,000	52,000	7,800		117,000	75,000
4,900		86,000	52,000	7,850		117,000	75,000
4,920		86,000	52,000	7,900		117,000	75,000
4,950		86,000	52,000	7,940	5/16	117,000	75,000
5,000		86,000	52,000	7,950		117,000	75,000
5,050		86,000	52,000	8,000		117,000	75,000
5,060		86,000	52,000	8,050		117,000	75,000
5,100		86,000	52,000	8,100		117,000	75,000
5,110		86,000	52,000	8,200		117,000	75,000
5,150		86,000	52,000	8,250		117,000	75,000
5,160	13/64	86,000	52,000	8,300		117,000	75,000
5,200		86,000	52,000	8,330	21/64	117,000	75,000
5,250		86,000	52,000	8,400		117,000	75,000
5,300		86,000	52,000	8,450		117,000	75,000
5,310		93,000	57,000	8,500		117,000	75,000
5,350		93,000	57,000	8,550		125,000	81,000
5,400		93,000	57,000	8,600		125,000	81,000
5,410		93,000	57,000	8,700		125,000	81,000
5,450		93,000	57,000	8,730	11/32	125,000	81,000
5,500		93,000	57,000	8,750		125,000	81,000
5,530		93,000	57,000	8,800		125,000	81,000
5,550		93,000	57,000	8,850		125,000	81,000
5,560	7/32	93,000	57,000	8,900		125,000	81,000
5,600		93,000	57,000	9,000		125,000	81,000
5,610		93,000	57,000	9,100		125,000	81,000
5,620		93,000	57,000	9,130	23/64	125,000	81,000
5,650		93,000	57,000	9,150		125,000	81,000
5,700		93,000	57,000	9,200		125,000	81,000
5,750		93,000	57,000	9,250		125,000	81,000
5,790		93,000	57,000	9,300		125,000	81,000
5,800		93,000	57,000	9,350		125,000	81,000
5,850		93,000	57,000	9,400		125,000	81,000
5,900		93,000	57,000	9,500		125,000	81,000
5,950	15/64	93,000	57,000	9,520	3/8	133,000	87,000
5,970		93,000	57,000	9,550		133,000	87,000
6,000		93,000	57,000	9,600		133,000	87,000
6,030		101,000	63,000	9,650		133,000	87,000
6,040		101,000	63,000	9,700		133,000	87,000
6,050		101,000	63,000	9,750		133,000	87,000
6,100		101,000	63,000	9,800		133,000	87,000
6,150		101,000	63,000	9,900		133,000	87,000
6,200		101,000	63,000	9,920	25/64	133,000	87,000
6,250		101,000	63,000	9,950		133,000	87,000
6,300		101,000	63,000	10,000		133,000	87,000
6,350	1/4	101,000	63,000	10,050		133,000	87,000
6,400		101,000	63,000	10,080		133,000	87,000
6,450		101,000	63,000	10,100		133,000	87,000
6,500		101,000	63,000	10,200		133,000	87,000
6,550		101,000	63,000	10,250		133,000	87,000
6,600		101,000	63,000	10,300		133,000	87,000
6,650		101,000	63,000	10,320	13/32	133,000	87,000
6,700		101,000	63,000	10,400		133,000	87,000
6,750	17/64	109,000	69,000	10,500		133,000	87,000
6,800		109,000	69,000	10,600		133,000	87,000
6,850		109,000	69,000	10,700		142,000	94,000
6,900		109,000	69,000	10,720	27/64	142,000	94,000
6,950		109,000	69,000	10,750		142,000	94,000
7,000		109,000	69,000	10,800		142,000	94,000
7,050		109,000	69,000	10,900		142,000	94,000
7,100		109,000	69,000	11,000		142,000	94,000
7,140	9/32	109,000	69,000	11,100		142,000	94,000
7,200		109,000	69,000	11,110	7/16	142,000	94,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
11,200		142,000	94,000	14,250		169,000	114,000
11,250		142,000	94,000	14,300		169,000	114,000
11,300		142,000	94,000	14,400		169,000	114,000
11,400		142,000	94,000	14,500		169,000	114,000
11,500		142,000	94,000	14,600		169,000	114,000
11,510	29/64	142,000	94,000	14,700		169,000	114,000
11,600		142,000	94,000	14,750		169,000	114,000
11,700		142,000	94,000	14,800		169,000	114,000
11,750		142,000	94,000	14,900		169,000	114,000
11,800		142,000	94,000	15,000		169,000	114,000
11,900		151,000	101,000	15,080	19/32	178,000	120,000
11,910	15/32	151,000	101,000	15,100		178,000	120,000
12,000		151,000	101,000	15,250		178,000	120,000
12,050		151,000	101,000	15,400		178,000	120,000
12,100		151,000	101,000	15,500		178,000	120,000
12,200		151,000	101,000	15,700		178,000	120,000
12,250		151,000	101,000	15,750		178,000	120,000
12,300	31/64	151,000	101,000	15,800		178,000	120,000
12,400		151,000	101,000	15,870	5/8	178,000	120,000
12,500		151,000	101,000	16,000		178,000	120,000
12,600		151,000	101,000	16,100		184,000	125,000
12,700	1/2	151,000	101,000	16,200		184,000	125,000
12,750		151,000	101,000	16,250		184,000	125,000
12,800		151,000	101,000	16,270	41/64	184,000	125,000
12,850		151,000	101,000	16,500		184,000	125,000
12,900		151,000	101,000	16,600		184,000	125,000
13,000		151,000	101,000	16,700		184,000	125,000
13,100	33/64	151,000	101,000	17,000		184,000	125,000
13,200		151,000	101,000	17,250		191,000	130,000
13,250		160,000	108,000	17,500		191,000	130,000
13,300		160,000	108,000	17,750		191,000	130,000
13,400		160,000	108,000	17,800		191,000	130,000
13,490	17/32	160,000	108,000	18,000		191,000	130,000
13,500		160,000	108,000	18,500		198,000	135,000
13,600		160,000	108,000	18,750		198,000	135,000
13,700		160,000	108,000	19,000		198,000	135,000
13,750		160,000	108,000	19,250		205,000	140,000
13,800		160,000	108,000	19,500		205,000	140,000
13,900		160,000	108,000	20,000		205,000	140,000
14,000		160,000	108,000				
14,100		169,000	114,000				
14,200		169,000	114,000				

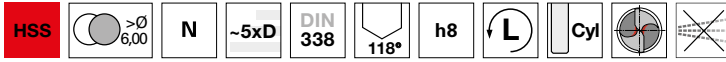


## 工具钻

产品代号 81015

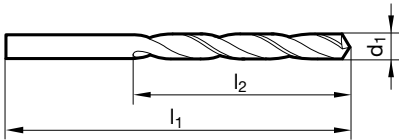


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 15,000 • 圆弧后刀面

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,250		19,000	3,000	3,150		65,000	36,000
0,300		19,000	3,000	3,200		65,000	36,000
0,370		19,000	4,000	3,250		65,000	36,000
0,400		20,000	5,000	3,300		65,000	36,000
0,500		22,000	6,000	3,350		65,000	36,000
0,650		26,000	8,000	3,400		70,000	39,000
0,700		28,000	9,000	3,450		70,000	39,000
0,800		30,000	10,000	3,500		70,000	39,000
0,900		32,000	11,000	3,550		70,000	39,000
0,950		32,000	11,000	3,600		70,000	39,000
1,000		34,000	12,000	3,650		70,000	39,000
1,050		34,000	12,000	3,700		70,000	39,000
1,100		36,000	14,000	3,750		70,000	39,000
1,150		36,000	14,000	3,800		75,000	43,000
1,170		36,000	14,000	3,850		75,000	43,000
1,200		38,000	16,000	3,900		75,000	43,000
1,250		38,000	16,000	3,950		75,000	43,000
1,300		38,000	16,000	4,000		75,000	43,000
1,350		40,000	18,000	4,100		75,000	43,000
1,400		40,000	18,000	4,150		75,000	43,000
1,450		40,000	18,000	4,200		75,000	43,000
1,500		40,000	18,000	4,250		75,000	43,000
1,550		43,000	20,000	4,350		80,000	47,000
1,560		43,000	20,000	4,400		80,000	47,000
1,600		43,000	20,000	4,450		80,000	47,000
1,700		43,000	20,000	4,500		80,000	47,000
1,800		46,000	22,000	4,550		80,000	47,000
2,000		49,000	24,000	4,600		80,000	47,000
2,050		49,000	24,000	4,650		80,000	47,000
2,100		49,000	24,000	4,700		80,000	47,000
2,200		53,000	27,000	4,750		80,000	47,000
2,250		53,000	27,000	4,850		86,000	52,000
2,400		57,000	30,000	4,900		86,000	52,000
2,500		57,000	30,000	5,000		86,000	52,000
2,550		57,000	30,000	5,200		86,000	52,000
2,600		57,000	30,000	5,300		86,000	52,000
2,700		61,000	33,000	5,400		93,000	57,000
2,750		61,000	33,000	5,500		93,000	57,000
2,800		61,000	33,000	5,600		93,000	57,000
3,000		61,000	33,000	5,700		93,000	57,000
3,050		65,000	36,000	5,750		93,000	57,000
3,100		65,000	36,000	5,800		93,000	57,000



## 工具钻

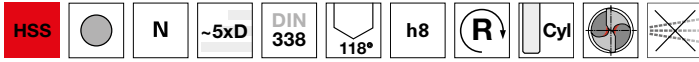
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,900		93,000	57,000	9,500		125,000	81,000
6,000		93,000	57,000	9,600		133,000	87,000
6,100		101,000	63,000	9,700		133,000	87,000
6,200		101,000	63,000	9,750		133,000	87,000
6,250		101,000	63,000	9,800		133,000	87,000
6,300		101,000	63,000	9,900		133,000	87,000
6,400		101,000	63,000	10,000		133,000	87,000
6,500		101,000	63,000	10,100		133,000	87,000
6,600		101,000	63,000	10,200		133,000	87,000
6,650		101,000	63,000	10,300		133,000	87,000
6,750	17/64	109,000	69,000	10,400		133,000	87,000
6,800		109,000	69,000	10,500		133,000	87,000
6,900		109,000	69,000	10,600		133,000	87,000
7,000		109,000	69,000	10,750		142,000	94,000
7,100		109,000	69,000	10,800		142,000	94,000
7,200		109,000	69,000	10,900		142,000	94,000
7,250		109,000	69,000	11,000		142,000	94,000
7,300		109,000	69,000	11,100		142,000	94,000
7,400		109,000	69,000	11,250		142,000	94,000
7,500		109,000	69,000	11,500		142,000	94,000
7,600		117,000	75,000	11,600		142,000	94,000
7,700		117,000	75,000	11,750		142,000	94,000
7,800		117,000	75,000	11,800		142,000	94,000
8,000		117,000	75,000	12,000		151,000	101,000
8,100		117,000	75,000	12,100		151,000	101,000
8,250		117,000	75,000	12,200		151,000	101,000
8,300		117,000	75,000	12,250		151,000	101,000
8,400		117,000	75,000	12,500		151,000	101,000
8,500		117,000	75,000	12,750		151,000	101,000
8,600		125,000	81,000	13,000		151,000	101,000
8,800		125,000	81,000	13,500		160,000	108,000
8,900		125,000	81,000	14,000		160,000	108,000
9,000		125,000	81,000	14,500		169,000	114,000
9,100		125,000	81,000	15,000		169,000	114,000
9,300		125,000	81,000	15,500		178,000	120,000
9,400		125,000	81,000	17,000		184,000	125,000

## 工具钻

产品代号 81017

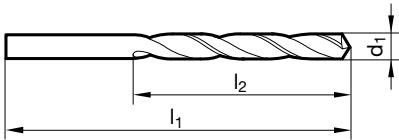


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 柄齿, DIN 1809标准

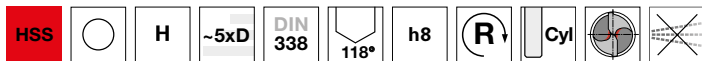
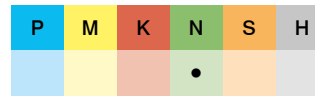
适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
3,000		61,000	33,000	7,600		117,000	75,000
3,100		65,000	36,000	7,700		117,000	75,000
3,200		65,000	36,000	7,750		117,000	75,000
3,300		65,000	36,000	7,800		117,000	75,000
3,400		70,000	39,000	7,900		117,000	75,000
3,500		70,000	39,000	8,000		117,000	75,000
3,600		70,000	39,000	8,500		117,000	75,000
3,700		70,000	39,000	8,700		125,000	81,000
3,800		75,000	43,000	8,800		125,000	81,000
4,000		75,000	43,000	8,900		125,000	81,000
4,200		75,000	43,000	9,000		125,000	81,000
4,500		80,000	47,000	9,100		125,000	81,000
4,600		80,000	47,000	9,500		125,000	81,000
5,000		86,000	52,000	9,800		133,000	87,000
5,100		86,000	52,000	10,000		133,000	87,000
5,200		86,000	52,000	10,200		133,000	87,000
5,500		93,000	57,000	10,500		133,000	87,000
5,600		93,000	57,000	11,000		142,000	94,000
5,750		93,000	57,000	11,500		142,000	94,000
5,800		93,000	57,000	12,000		151,000	101,000
6,000		93,000	57,000	13,000		151,000	101,000
6,100		101,000	63,000				
6,200		101,000	63,000				
6,300		101,000	63,000				
6,400		101,000	63,000				
6,500		101,000	63,000				
6,800		109,000	69,000				
7,000		109,000	69,000				
7,200		109,000	69,000				
7,500		109,000	69,000				

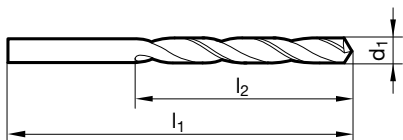
## 工具钻

产品代号 81020



芯厚 ≥ Ø 14,500 • 圆弧后刀面

脆硬的材料 • 黄铜, 镁合金 • 青铜, 磷青铜 • 石板, 电木, 酚醛树脂



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,300		19,000	3,000	2,100		49,000	24,000
0,320		19,000	4,000	2,200		53,000	27,000
0,400		20,000	5,000	2,250		53,000	27,000
0,450		20,000	5,000	2,300		53,000	27,000
0,480		20,000	5,000	2,400		57,000	30,000
0,500		22,000	6,000	2,450		57,000	30,000
0,510		22,000	6,000	2,500		57,000	30,000
0,560		24,000	7,000	2,550		57,000	30,000
0,600		24,000	7,000	2,600		57,000	30,000
0,650		26,000	8,000	2,630		57,000	30,000
0,700		28,000	9,000	2,700		61,000	33,000
0,750		28,000	9,000	2,780	7/64	61,000	33,000
0,800		30,000	10,000	2,800		61,000	33,000
0,810		30,000	10,000	2,900		61,000	33,000
0,840		30,000	10,000	2,950		61,000	33,000
0,900		32,000	11,000	3,000		61,000	33,000
0,910		32,000	11,000	3,020		65,000	36,000
0,950		32,000	11,000	3,050		65,000	36,000
1,000		34,000	12,000	3,100		65,000	36,000
1,050		34,000	12,000	3,150		65,000	36,000
1,100		36,000	14,000	3,200		65,000	36,000
1,150		36,000	14,000	3,250		65,000	36,000
1,200		38,000	16,000	3,300		65,000	36,000
1,250		38,000	16,000	3,350		65,000	36,000
1,280		38,000	16,000	3,400		70,000	39,000
1,300		38,000	16,000	3,500		70,000	39,000
1,310		38,000	16,000	3,550		70,000	39,000
1,400		40,000	18,000	3,600		70,000	39,000
1,420		40,000	18,000	3,650		70,000	39,000
1,450		40,000	18,000	3,700		70,000	39,000
1,500		40,000	18,000	3,750		70,000	39,000
1,510		43,000	20,000	3,800		75,000	43,000
1,550		43,000	20,000	3,850		75,000	43,000
1,600		43,000	20,000	3,900		75,000	43,000
1,650		43,000	20,000	4,000		75,000	43,000
1,700		43,000	20,000	4,050		75,000	43,000
1,800		46,000	22,000	4,100		75,000	43,000
1,850		46,000	22,000	4,200		75,000	43,000
1,900		46,000	22,000	4,250		75,000	43,000
1,950		49,000	24,000	4,300		80,000	47,000
2,000		49,000	24,000	4,400		80,000	47,000
2,050		49,000	24,000	4,500		80,000	47,000

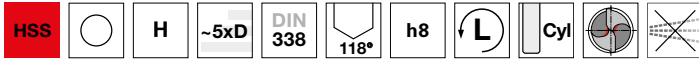
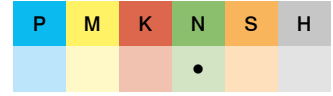


## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
4,600		80,000	47,000	8,400		117,000	75,000
4,700		80,000	47,000	8,500		117,000	75,000
4,750		80,000	47,000	8,600		125,000	81,000
4,800		86,000	52,000	8,700		125,000	81,000
4,900		86,000	52,000	8,800		125,000	81,000
5,000		86,000	52,000	8,900		125,000	81,000
5,100		86,000	52,000	9,000		125,000	81,000
5,200		86,000	52,000	9,100		125,000	81,000
5,300		86,000	52,000	9,200		125,000	81,000
5,400		93,000	57,000	9,250		125,000	81,000
5,500		93,000	57,000	9,300		125,000	81,000
5,600		93,000	57,000	9,400		125,000	81,000
5,700		93,000	57,000	9,500		125,000	81,000
5,750		93,000	57,000	9,600		133,000	87,000
5,800		93,000	57,000	9,700		133,000	87,000
5,900		93,000	57,000	9,750		133,000	87,000
6,000		93,000	57,000	9,800		133,000	87,000
6,100		101,000	63,000	9,900		133,000	87,000
6,200		101,000	63,000	10,000		133,000	87,000
6,250		101,000	63,000	10,100		133,000	87,000
6,300		101,000	63,000	10,200		133,000	87,000
6,400		101,000	63,000	10,500		133,000	87,000
6,500		101,000	63,000	10,600		133,000	87,000
6,600		101,000	63,000	10,800		142,000	94,000
6,700		101,000	63,000	11,000		142,000	94,000
6,800		109,000	69,000	11,200		142,000	94,000
6,900		109,000	69,000	11,500		142,000	94,000
7,000		109,000	69,000	12,000		151,000	101,000
7,050		109,000	69,000	12,100		151,000	101,000
7,100		109,000	69,000	12,500		151,000	101,000
7,200		109,000	69,000	12,700	1/2	151,000	101,000
7,250		109,000	69,000	13,000		151,000	101,000
7,300		109,000	69,000	13,800		160,000	108,000
7,500		109,000	69,000	14,000		160,000	108,000
7,600		117,000	75,000	14,500		169,000	114,000
7,700		117,000	75,000	15,000		169,000	114,000
7,750		117,000	75,000	15,100		178,000	120,000
7,800		117,000	75,000	15,500		178,000	120,000
7,900		117,000	75,000	16,000		178,000	120,000
8,000		117,000	75,000	18,000		191,000	130,000
8,100		117,000	75,000	19,000		198,000	135,000
8,200		117,000	75,000	20,000		205,000	140,000

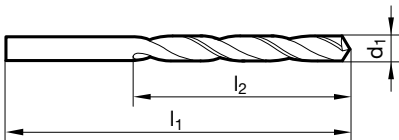
## 工具钻

产品代号 81025



芯厚  $\geq \varnothing 14,500$  • 圆弧后刀面

脆硬的材料 • 黄铜, 镁合金 • 青铜, 磷青铜 • 石板, 电木, 酚醛树脂



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		22,000	6,000	2,900		61,000	33,000
0,580		24,000	7,000	2,950		61,000	33,000
0,670		26,000	8,000	3,000		61,000	33,000
0,690		28,000	9,000	3,100		65,000	36,000
0,700		28,000	9,000	3,150		65,000	36,000
0,750		28,000	9,000	3,200		65,000	36,000
0,800		30,000	10,000	3,250		65,000	36,000
0,900		32,000	11,000	3,300		65,000	36,000
0,950		32,000	11,000	3,400		70,000	39,000
1,000		34,000	12,000	3,500		70,000	39,000
1,050		34,000	12,000	3,700		70,000	39,000
1,100		36,000	14,000	3,750		70,000	39,000
1,150		36,000	14,000	3,800		75,000	43,000
1,160		36,000	14,000	3,850		75,000	43,000
1,180		36,000	14,000	3,900		75,000	43,000
1,200		38,000	16,000	4,000		75,000	43,000
1,240		38,000	16,000	4,100		75,000	43,000
1,290		38,000	16,000	4,300		80,000	47,000
1,400		40,000	18,000	4,400		80,000	47,000
1,460		40,000	18,000	4,500		80,000	47,000
1,470		40,000	18,000	4,600		80,000	47,000
1,480		40,000	18,000	4,700		80,000	47,000
1,500		40,000	18,000	4,750		80,000	47,000
1,600		43,000	20,000	4,800		86,000	52,000
1,660		43,000	20,000	4,950		86,000	52,000
1,710		46,000	22,000	5,000		86,000	52,000
1,730		46,000	22,000	5,200		86,000	52,000
1,800		46,000	22,000	5,300		86,000	52,000
1,900		46,000	22,000	5,400		93,000	57,000
1,920		49,000	24,000	5,500		93,000	57,000
1,950		49,000	24,000	5,600		93,000	57,000
2,000		49,000	24,000	5,750		93,000	57,000
2,050		49,000	24,000	5,800		93,000	57,000
2,100		49,000	24,000	5,900		93,000	57,000
2,250		53,000	27,000	6,000		93,000	57,000
2,350		53,000	27,000	6,100		101,000	63,000
2,400		57,000	30,000	6,250		101,000	63,000
2,430		57,000	30,000	6,400		101,000	63,000
2,500		57,000	30,000	6,500		101,000	63,000
2,700		61,000	33,000	6,600		101,000	63,000
2,750		61,000	33,000	6,800		109,000	69,000
2,800		61,000	33,000	6,900		109,000	69,000

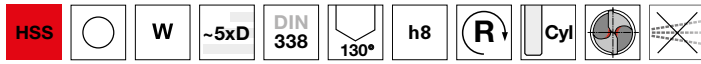
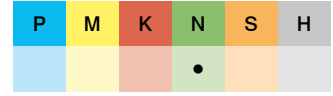


## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,000		109,000	69,000	9,800		133,000	87,000
7,100		109,000	69,000	10,000		133,000	87,000
7,200		109,000	69,000	11,000		142,000	94,000
7,300		109,000	69,000	11,500		142,000	94,000
7,500		109,000	69,000	12,000		151,000	101,000
7,700		117,000	75,000	13,000		151,000	101,000
7,750		117,000	75,000	13,500		160,000	108,000
7,800		117,000	75,000	14,000		160,000	108,000
8,000		117,000	75,000	14,500		169,000	114,000
8,100		117,000	75,000	15,500		178,000	120,000
8,500		117,000	75,000	16,000		178,000	120,000
8,600		125,000	81,000				
8,700		125,000	81,000				
8,900		125,000	81,000				
9,000		125,000	81,000				
9,200		125,000	81,000				
9,400		125,000	81,000				
9,500		125,000	81,000				

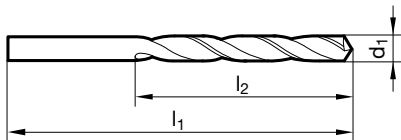
## 工具钻

产品代号 81030



芯厚  $\geq \varnothing 14,500$  • 圆弧后刀面

适于加工: 软/长屑材料 • 铝及铝合金 • 锌,精炼铜,硅,电子材料 • 软塑料 • 木材



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,250		19,000	3,000	2,450		57,000	30,000
0,300		19,000	3,000	2,500		57,000	30,000
0,400		20,000	5,000	2,550		57,000	30,000
0,500		22,000	6,000	2,600		57,000	30,000
0,550		24,000	7,000	2,700		61,000	33,000
0,600		24,000	7,000	2,750		61,000	33,000
0,700		28,000	9,000	2,800		61,000	33,000
0,800		30,000	10,000	2,850		61,000	33,000
0,850		30,000	10,000	2,900		61,000	33,000
0,900		32,000	11,000	2,950		61,000	33,000
0,950		32,000	11,000	3,000		61,000	33,000
0,970		34,000	12,000	3,050		65,000	36,000
1,000		34,000	12,000	3,100		65,000	36,000
1,050		34,000	12,000	3,150		65,000	36,000
1,070		36,000	14,000	3,200		65,000	36,000
1,100		36,000	14,000	3,250		65,000	36,000
1,150		36,000	14,000	3,300		65,000	36,000
1,200		38,000	16,000	3,400		70,000	39,000
1,240		38,000	16,000	3,450		70,000	39,000
1,250		38,000	16,000	3,500		70,000	39,000
1,280		38,000	16,000	3,600		70,000	39,000
1,300		38,000	16,000	3,650		70,000	39,000
1,400		40,000	18,000	3,700		70,000	39,000
1,450		40,000	18,000	3,750		70,000	39,000
1,500		40,000	18,000	3,800		75,000	43,000
1,530		43,000	20,000	3,850		75,000	43,000
1,550		43,000	20,000	3,900		75,000	43,000
1,600		43,000	20,000	3,950		75,000	43,000
1,650		43,000	20,000	4,000		75,000	43,000
1,700		43,000	20,000	4,040		75,000	43,000
1,750		46,000	22,000	4,100		75,000	43,000
1,800		46,000	22,000	4,150		75,000	43,000
1,900		46,000	22,000	4,200		75,000	43,000
1,950		49,000	24,000	4,250		75,000	43,000
2,000		49,000	24,000	4,300		80,000	47,000
2,050		49,000	24,000	4,400		80,000	47,000
2,100		49,000	24,000	4,500		80,000	47,000
2,150		53,000	27,000	4,600		80,000	47,000
2,200		53,000	27,000	4,700		80,000	47,000
2,250		53,000	27,000	4,750		80,000	47,000
2,300		53,000	27,000	4,800		86,000	52,000
2,400		57,000	30,000	4,850		86,000	52,000



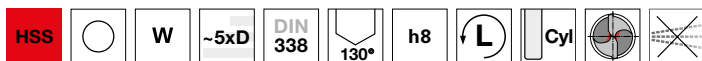
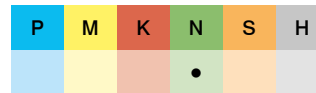


## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
4,900		86,000	52,000	9,100		125,000	81,000
4,950		86,000	52,000	9,200		125,000	81,000
5,000		86,000	52,000	9,250		125,000	81,000
5,050		86,000	52,000	9,300		125,000	81,000
5,100		86,000	52,000	9,500		125,000	81,000
5,200		86,000	52,000	9,600		133,000	87,000
5,250		86,000	52,000	9,700		133,000	87,000
5,300		86,000	52,000	9,800		133,000	87,000
5,400		93,000	57,000	9,900		133,000	87,000
5,500		93,000	57,000	10,000		133,000	87,000
5,550		93,000	57,000	10,100		133,000	87,000
5,600		93,000	57,000	10,200		133,000	87,000
5,700		93,000	57,000	10,250		133,000	87,000
5,750		93,000	57,000	10,300		133,000	87,000
5,800		93,000	57,000	10,400		133,000	87,000
5,900		93,000	57,000	10,500		133,000	87,000
5,950	15/64	93,000	57,000	10,600		133,000	87,000
6,000		93,000	57,000	10,800		142,000	94,000
6,100		101,000	63,000	10,900		142,000	94,000
6,150		101,000	63,000	10,950		142,000	94,000
6,200		101,000	63,000	11,000		142,000	94,000
6,250		101,000	63,000	11,100		142,000	94,000
6,300		101,000	63,000	11,200		142,000	94,000
6,350	1/4	101,000	63,000	11,500		142,000	94,000
6,400		101,000	63,000	11,600		142,000	94,000
6,500		101,000	63,000	11,700		142,000	94,000
6,600		101,000	63,000	11,800		142,000	94,000
6,700		101,000	63,000	12,000		151,000	101,000
6,750	17/64	109,000	69,000	12,100		151,000	101,000
6,800		109,000	69,000	12,200		151,000	101,000
6,900		109,000	69,000	12,500		151,000	101,000
7,000		109,000	69,000	12,600		151,000	101,000
7,100		109,000	69,000	12,700	1/2	151,000	101,000
7,200		109,000	69,000	13,000		151,000	101,000
7,250		109,000	69,000	13,200		151,000	101,000
7,300		109,000	69,000	13,500		160,000	108,000
7,400		109,000	69,000	14,000		160,000	108,000
7,500		109,000	69,000	14,400		169,000	114,000
7,600		117,000	75,000	14,500		169,000	114,000
7,700		117,000	75,000	15,000		169,000	114,000
7,750		117,000	75,000	15,500		178,000	120,000
7,800		117,000	75,000	16,000		178,000	120,000
7,900		117,000	75,000	16,500		184,000	125,000
8,000		117,000	75,000				
8,100		117,000	75,000				
8,300		117,000	75,000				
8,400		117,000	75,000				
8,500		117,000	75,000				
8,600		125,000	81,000				
8,700		125,000	81,000				
8,750		125,000	81,000				
8,800		125,000	81,000				
8,900		125,000	81,000				
9,000		125,000	81,000				

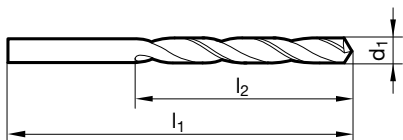
## 工具钻

产品代号 81035



芯厚  $\geq \varnothing 15,000$  • 圆弧后刀面

适于加工: 软/长屑材料 • 铝及铝合金 • 锌,精炼铜,硅,电子材料 • 软塑料 • 木材



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		22,000	6,000	4,900		86,000	52,000
0,600		24,000	7,000	5,100		86,000	52,000
0,750		28,000	9,000	5,250		86,000	52,000
1,000		34,000	12,000	5,400		93,000	57,000
1,050		34,000	12,000	5,500		93,000	57,000
1,100		36,000	14,000	5,600		93,000	57,000
1,200		38,000	16,000	5,800		93,000	57,000
1,550		43,000	20,000	6,000		93,000	57,000
1,750		46,000	22,000	6,200		101,000	63,000
1,800		46,000	22,000	6,300		101,000	63,000
1,850		46,000	22,000	6,400		101,000	63,000
1,900		46,000	22,000	6,800		109,000	69,000
2,000		49,000	24,000	6,900		109,000	69,000
2,250		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,400		109,000	69,000
2,350		53,000	27,000	7,500		109,000	69,000
2,400		57,000	30,000	7,600		117,000	75,000
2,500		57,000	30,000	7,700		117,000	75,000
2,600		57,000	30,000	7,900		117,000	75,000
2,650		57,000	30,000	9,100		125,000	81,000
2,700		61,000	33,000	9,300		125,000	81,000
2,900		61,000	33,000	9,400		125,000	81,000
3,000		61,000	33,000	9,500		125,000	81,000
3,100		65,000	36,000	10,500		133,000	87,000
3,200		65,000	36,000	11,500		142,000	94,000
3,500		70,000	39,000	12,500		151,000	101,000
3,700		70,000	39,000	13,000		151,000	101,000
3,800		75,000	43,000	13,500		160,000	108,000
3,850		75,000	43,000	14,000		160,000	108,000
3,900		75,000	43,000	15,000		169,000	114,000
3,950		75,000	43,000				
4,100		75,000	43,000				
4,200		75,000	43,000				
4,500		80,000	47,000				
4,600		80,000	47,000				
4,700		80,000	47,000				

## 工具钻

产品代号 81040

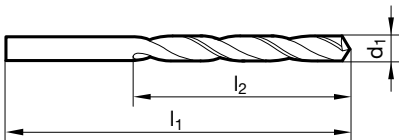


P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 宽槽 • 尤其适合孔深超过3xD

适合加工: 灰铸铁 • 强度小于1000N/mm<sup>2</sup>的钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,800		30,000	10,000	3,550		70,000	39,000
1,000		34,000	12,000	3,600		70,000	39,000
1,100		36,000	14,000	3,700		70,000	39,000
1,200		38,000	16,000	3,800		75,000	43,000
1,300		38,000	16,000	3,900		75,000	43,000
1,350		40,000	18,000	3,950		75,000	43,000
1,400		40,000	18,000	4,000		75,000	43,000
1,450		40,000	18,000	4,050		75,000	43,000
1,500		40,000	18,000	4,100		75,000	43,000
1,550		43,000	20,000	4,200		75,000	43,000
1,570		43,000	20,000	4,250		75,000	43,000
1,600		43,000	20,000	4,400		80,000	47,000
1,650		43,000	20,000	4,500		80,000	47,000
1,700		43,000	20,000	4,600		80,000	47,000
1,800		46,000	22,000	4,700		80,000	47,000
1,850		46,000	22,000	4,800		86,000	52,000
1,900		46,000	22,000	4,900		86,000	52,000
1,950		49,000	24,000	4,950		86,000	52,000
2,000		49,000	24,000	5,000		86,000	52,000
2,050		49,000	24,000	5,030		86,000	52,000
2,100		49,000	24,000	5,100		86,000	52,000
2,150		53,000	27,000	5,200		86,000	52,000
2,200		53,000	27,000	5,300		86,000	52,000
2,300		53,000	27,000	5,400		93,000	57,000
2,350		53,000	27,000	5,500		93,000	57,000
2,500		57,000	30,000	5,600		93,000	57,000
2,550		57,000	30,000	5,700		93,000	57,000
2,600		57,000	30,000	5,800		93,000	57,000
2,700		61,000	33,000	5,900		93,000	57,000
2,800		61,000	33,000	5,950	15/64	93,000	57,000
2,850		61,000	33,000	6,000		93,000	57,000
2,900		61,000	33,000	6,100		101,000	63,000
3,000		61,000	33,000	6,300		101,000	63,000
3,050		65,000	36,000	6,400		101,000	63,000
3,100		65,000	36,000	6,450		101,000	63,000
3,150		65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,250		65,000	36,000	6,800		109,000	69,000
3,300		65,000	36,000	6,900		109,000	69,000
3,350		65,000	36,000	7,000		109,000	69,000
3,400		70,000	39,000	7,100		109,000	69,000
3,500		70,000	39,000	7,300		109,000	69,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,400		109,000	69,000	10,300		133,000	87,000
7,500		109,000	69,000	10,400		133,000	87,000
7,600		117,000	75,000	10,500		133,000	87,000
7,750		117,000	75,000	10,800		142,000	94,000
7,800		117,000	75,000	10,900		142,000	94,000
7,900		117,000	75,000	11,000		142,000	94,000
8,000		117,000	75,000	11,100		142,000	94,000
8,100		117,000	75,000	11,400		142,000	94,000
8,250		117,000	75,000	11,600		142,000	94,000
8,300		117,000	75,000	12,000		151,000	101,000
8,500		117,000	75,000	12,200		151,000	101,000
8,800		125,000	81,000	12,400		151,000	101,000
8,900		125,000	81,000	12,500		151,000	101,000
9,000		125,000	81,000	13,000		151,000	101,000
9,100		125,000	81,000	14,000		160,000	108,000
9,200		125,000	81,000	14,500		169,000	114,000
9,400		125,000	81,000	15,000		169,000	114,000
9,500		125,000	81,000	15,400		178,000	120,000
9,600		133,000	87,000	15,500		178,000	120,000
9,700		133,000	87,000	16,000		178,000	120,000
9,800		133,000	87,000				
9,900		133,000	87,000				
10,000		133,000	87,000				
10,200		133,000	87,000				

## 工具钻

产品代号 81045

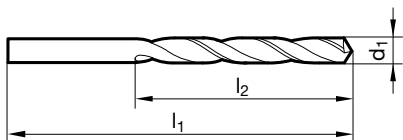


P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 1,400$  • 圆弧后刀面 • 宽槽 • 尤其适合孔深超过3xD

适合加工: 灰铸铁 • 强度小于1000N/mm<sup>2</sup>的钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
1,400		40,000	18,000	5,300		86,000	52,000
1,500		40,000	18,000	5,400		93,000	57,000
1,600		43,000	20,000	5,500		93,000	57,000
1,700		43,000	20,000	5,600		93,000	57,000
1,800		46,000	22,000	5,700		93,000	57,000
1,900		46,000	22,000	5,800		93,000	57,000
2,000		49,000	24,000	5,900		93,000	57,000
2,100		49,000	24,000	6,000		93,000	57,000
2,200		53,000	27,000	6,100		101,000	63,000
2,300		53,000	27,000	6,200		101,000	63,000
2,400		57,000	30,000	6,300		101,000	63,000
2,500		57,000	30,000	6,600		101,000	63,000
2,550		57,000	30,000	6,700		101,000	63,000
2,700		61,000	33,000	6,800		109,000	69,000
2,750		61,000	33,000	6,900		109,000	69,000
2,780	7/64	61,000	33,000	7,000		109,000	69,000
2,800		61,000	33,000	7,100		109,000	69,000
2,900		61,000	33,000	7,200		109,000	69,000
3,000		61,000	33,000	7,300		109,000	69,000
3,100		65,000	36,000	7,400		109,000	69,000
3,150		65,000	36,000	7,500		109,000	69,000
3,170	1/8	65,000	36,000	7,700		117,000	75,000
3,200		65,000	36,000	7,800		117,000	75,000
3,250		65,000	36,000	7,900		117,000	75,000
3,300		65,000	36,000	8,000		117,000	75,000
3,400		70,000	39,000	8,400		117,000	75,000
3,500		70,000	39,000	8,500		117,000	75,000
3,650		70,000	39,000	8,600		125,000	81,000
3,700		70,000	39,000	8,700		125,000	81,000
3,800		75,000	43,000	8,800		125,000	81,000
3,900		75,000	43,000	8,900		125,000	81,000
4,000		75,000	43,000	9,000		125,000	81,000
4,100		75,000	43,000	9,200		125,000	81,000
4,200		75,000	43,000	9,300		125,000	81,000
4,300		80,000	47,000	9,500		125,000	81,000
4,400		80,000	47,000	9,600		133,000	87,000
4,500		80,000	47,000	9,700		133,000	87,000
4,600		80,000	47,000	9,900		133,000	87,000
4,800		86,000	52,000	10,000		133,000	87,000
4,900		86,000	52,000	10,100		133,000	87,000
5,000		86,000	52,000	10,300		133,000	87,000
5,200		86,000	52,000	10,400		133,000	87,000



## 工具钻

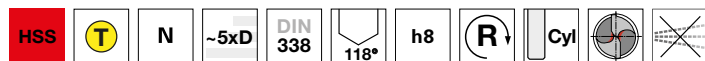
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
10,500		133,000	87,000	15,500		178,000	120,000
10,800		142,000	94,000	16,000		178,000	120,000
11,000		142,000	94,000				
11,300		142,000	94,000				
11,500		142,000	94,000				
11,700		142,000	94,000				
11,900		151,000	101,000				
13,000		151,000	101,000				
13,500		160,000	108,000				
14,000		160,000	108,000				
14,500		169,000	114,000				
15,000		169,000	114,000				

## 工具钻

产品代号 84405

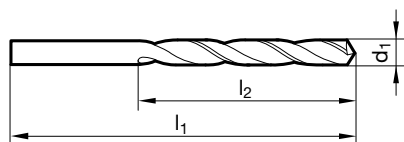


P	M	K	N	S	H
•		•	•		



芯厚 ≥ Ø 1,000 • 圆弧后刀面

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,400		20,000	5,000	2,750		61,000	33,000
0,500		22,000	6,000	2,800		61,000	33,000
0,600		24,000	7,000	2,850		61,000	33,000
0,610		26,000	8,000	2,900		61,000	33,000
0,700		28,000	9,000	2,950		61,000	33,000
0,800		30,000	10,000	3,000		61,000	33,000
0,820		30,000	10,000	3,050		65,000	36,000
0,900		32,000	11,000	3,100		65,000	36,000
1,000		34,000	12,000	3,150		65,000	36,000
1,020		34,000	12,000	3,200		65,000	36,000
1,100		36,000	14,000	3,250		65,000	36,000
1,150		36,000	14,000	3,300		65,000	36,000
1,200		38,000	16,000	3,400		70,000	39,000
1,250		38,000	16,000	3,450		70,000	39,000
1,300		38,000	16,000	3,500		70,000	39,000
1,350		40,000	18,000	3,600		70,000	39,000
1,400		40,000	18,000	3,650		70,000	39,000
1,450		40,000	18,000	3,700		70,000	39,000
1,500		40,000	18,000	3,750		70,000	39,000
1,550		43,000	20,000	3,800		75,000	43,000
1,600		43,000	20,000	3,900		75,000	43,000
1,650		43,000	20,000	3,950		75,000	43,000
1,700		43,000	20,000	4,000		75,000	43,000
1,750		46,000	22,000	4,100		75,000	43,000
1,800		46,000	22,000	4,150		75,000	43,000
1,820		46,000	22,000	4,200		75,000	43,000
1,900		46,000	22,000	4,250		75,000	43,000
2,000		49,000	24,000	4,300		80,000	47,000
2,050		49,000	24,000	4,400		80,000	47,000
2,100		49,000	24,000	4,500		80,000	47,000
2,150		53,000	27,000	4,600		80,000	47,000
2,200		53,000	27,000	4,700		80,000	47,000
2,300		53,000	27,000	4,800		86,000	52,000
2,400		57,000	30,000	4,900		86,000	52,000
2,450		57,000	30,000	5,000		86,000	52,000
2,500		57,000	30,000	5,100		86,000	52,000
2,520		57,000	30,000	5,150		86,000	52,000
2,530		57,000	30,000	5,200		86,000	52,000
2,550		57,000	30,000	5,250		86,000	52,000
2,600		57,000	30,000	5,300		86,000	52,000
2,650		57,000	30,000	5,400		93,000	57,000
2,700		61,000	33,000	5,500		93,000	57,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,600		93,000	57,000	9,900		133,000	87,000
5,700		93,000	57,000	10,000		133,000	87,000
5,800		93,000	57,000	10,100		133,000	87,000
5,900		93,000	57,000	10,200		133,000	87,000
6,000		93,000	57,000	10,250		133,000	87,000
6,040		101,000	63,000	10,300		133,000	87,000
6,100		101,000	63,000	10,500		133,000	87,000
6,200		101,000	63,000	10,600		133,000	87,000
6,300		101,000	63,000	10,700		142,000	94,000
6,350	1/4	101,000	63,000	10,750		142,000	94,000
6,400		101,000	63,000	10,800		142,000	94,000
6,500		101,000	63,000	11,000		142,000	94,000
6,550		101,000	63,000	11,200		142,000	94,000
6,600		101,000	63,000	11,250		142,000	94,000
6,700		101,000	63,000	11,300		142,000	94,000
6,750	17/64	109,000	69,000	11,500		142,000	94,000
6,800		109,000	69,000	11,600		142,000	94,000
6,900		109,000	69,000	11,700		142,000	94,000
7,000		109,000	69,000	11,750		142,000	94,000
7,100		109,000	69,000	11,800		142,000	94,000
7,200		109,000	69,000	12,000		151,000	101,000
7,300		109,000	69,000	12,200		151,000	101,000
7,400		109,000	69,000	12,500		151,000	101,000
7,500		109,000	69,000	12,700	1/2	151,000	101,000
7,600		117,000	75,000	12,800		151,000	101,000
7,700		117,000	75,000	12,900		151,000	101,000
7,750		117,000	75,000	13,000		151,000	101,000
7,800		117,000	75,000	13,100	33/64	151,000	101,000
7,900		117,000	75,000	13,250		160,000	108,000
8,000		117,000	75,000	13,500		160,000	108,000
8,100		117,000	75,000	14,000		160,000	108,000
8,200		117,000	75,000	14,200		169,000	114,000
8,300		117,000	75,000	14,250		169,000	114,000
8,400		117,000	75,000	14,500		169,000	114,000
8,500		117,000	75,000	14,750		169,000	114,000
8,600		125,000	81,000	15,000		169,000	114,000
8,700		125,000	81,000	15,250		178,000	120,000
8,750		125,000	81,000	15,500		178,000	120,000
8,900		125,000	81,000	15,800		178,000	120,000
9,000		125,000	81,000	16,000		178,000	120,000
9,100		125,000	81,000	16,500		184,000	125,000
9,200		125,000	81,000	17,000		184,000	125,000
9,300		125,000	81,000	17,500		191,000	130,000
9,400		125,000	81,000	18,000		191,000	130,000
9,500		125,000	81,000	18,500		198,000	135,000
9,600		133,000	87,000	19,000		198,000	135,000
9,700		133,000	87,000	19,500		205,000	140,000
9,800		133,000	87,000				

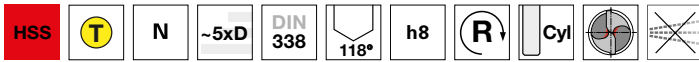


## 工具钻

产品代号 84406

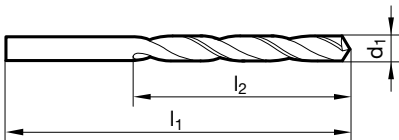


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 刀尖涂层

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	4,300		80,000	47,000
1,100		36,000	14,000	4,370	11/64	80,000	47,000
1,190	3/64	38,000	16,000	4,400		80,000	47,000
1,200		38,000	16,000	4,500		80,000	47,000
1,300		38,000	16,000	4,600		80,000	47,000
1,400		40,000	18,000	4,700		80,000	47,000
1,500		40,000	18,000	4,760	3/16	86,000	52,000
1,590	1/16	43,000	20,000	4,800		86,000	52,000
1,600		43,000	20,000	4,900		86,000	52,000
1,700		43,000	20,000	5,000		86,000	52,000
1,800		46,000	22,000	5,100		86,000	52,000
1,900		46,000	22,000	5,160	13/64	86,000	52,000
1,980	5/64	49,000	24,000	5,200		86,000	52,000
2,000		49,000	24,000	5,300		86,000	52,000
2,100		49,000	24,000	5,400		93,000	57,000
2,200		53,000	27,000	5,500		93,000	57,000
2,300		53,000	27,000	5,560	7/32	93,000	57,000
2,380	3/32	57,000	30,000	5,600		93,000	57,000
2,400		57,000	30,000	5,700		93,000	57,000
2,440		57,000	30,000	5,800		93,000	57,000
2,500		57,000	30,000	5,900		93,000	57,000
2,600		57,000	30,000	5,950	15/64	93,000	57,000
2,700		61,000	33,000	6,000		93,000	57,000
2,780	7/64	61,000	33,000	6,100		101,000	63,000
2,800		61,000	33,000	6,200		101,000	63,000
2,900		61,000	33,000	6,300		101,000	63,000
3,000		61,000	33,000	6,350	1/4	101,000	63,000
3,100		65,000	36,000	6,400		101,000	63,000
3,170	1/8	65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,300		65,000	36,000	6,700		101,000	63,000
3,400		70,000	39,000	6,750	17/64	109,000	69,000
3,500		70,000	39,000	6,800		109,000	69,000
3,570	9/64	70,000	39,000	6,900		109,000	69,000
3,600		70,000	39,000	7,000		109,000	69,000
3,700		70,000	39,000	7,100		109,000	69,000
3,800		75,000	43,000	7,140	9/32	109,000	69,000
3,900		75,000	43,000	7,200		109,000	69,000
3,970	5/32	75,000	43,000	7,300		109,000	69,000
4,000		75,000	43,000	7,400		109,000	69,000
4,100		75,000	43,000	7,500		109,000	69,000
4,200		75,000	43,000	7,540	19/64	117,000	75,000



## 工具钻

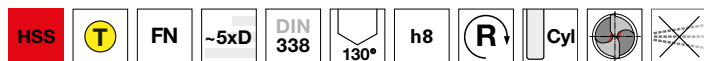
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,600		117,000	75,000	11,500		142,000	94,000
7,700		117,000	75,000	11,510	29/64	142,000	94,000
7,800		117,000	75,000	11,600		142,000	94,000
7,900		117,000	75,000	11,700		142,000	94,000
7,940	5/16	117,000	75,000	11,800		142,000	94,000
8,000		117,000	75,000	11,900		151,000	101,000
8,100		117,000	75,000	11,910	15/32	151,000	101,000
8,200		117,000	75,000	12,000		151,000	101,000
8,300		117,000	75,000	12,100		151,000	101,000
8,330	21/64	117,000	75,000	12,200		151,000	101,000
8,400		117,000	75,000	12,300	31/64	151,000	101,000
8,500		117,000	75,000	12,400		151,000	101,000
8,600		125,000	81,000	12,500		151,000	101,000
8,700		125,000	81,000	12,600		151,000	101,000
8,730	11/32	125,000	81,000	12,700	1/2	151,000	101,000
8,800		125,000	81,000	12,800		151,000	101,000
8,900		125,000	81,000	12,900		151,000	101,000
9,000		125,000	81,000	13,000		151,000	101,000
9,100		125,000	81,000	13,100	33/64	151,000	101,000
9,130	23/64	125,000	81,000	13,200		151,000	101,000
9,200		125,000	81,000	13,250		160,000	108,000
9,300		125,000	81,000	13,300		160,000	108,000
9,400		125,000	81,000	13,400		160,000	108,000
9,500		125,000	81,000	13,490	17/32	160,000	108,000
9,520	3/8	133,000	87,000	13,500		160,000	108,000
9,600		133,000	87,000	13,600		160,000	108,000
9,700		133,000	87,000	13,700		160,000	108,000
9,800		133,000	87,000	13,750		160,000	108,000
9,900		133,000	87,000	13,800		160,000	108,000
9,920	25/64	133,000	87,000	13,890	35/64	160,000	108,000
10,000		133,000	87,000	13,900		160,000	108,000
10,100		133,000	87,000	14,000		160,000	108,000
10,200		133,000	87,000	14,250		169,000	114,000
10,300		133,000	87,000	14,290	9/16	169,000	114,000
10,320	13/32	133,000	87,000	14,500		169,000	114,000
10,400		133,000	87,000	14,680	37/64	169,000	114,000
10,500		133,000	87,000	14,750		169,000	114,000
10,600		133,000	87,000	15,000		169,000	114,000
10,700		142,000	94,000	15,080	19/32	178,000	120,000
10,720	27/64	142,000	94,000	15,250		178,000	120,000
10,800		142,000	94,000	15,480	39/64	178,000	120,000
10,900		142,000	94,000	15,500		178,000	120,000
11,000		142,000	94,000	15,750		178,000	120,000
11,100		142,000	94,000	16,000		178,000	120,000
11,110	7/16	142,000	94,000				
11,200		142,000	94,000				
11,300		142,000	94,000				
11,400		142,000	94,000				

## 工具钻

### 产品代号 84415



P	M	K	N	S	H
•		•	•		



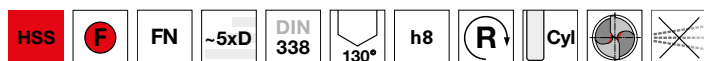
芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 宽槽 • 尤其适合孔深超过3xD

适合加工: 灰铸铁 • 强度小于1000N/mm<sup>2</sup>的钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨

### 产品代号 84502

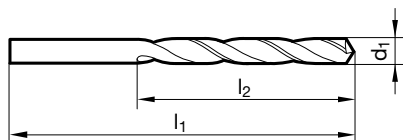


P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 宽槽 • 尤其适合孔深超过3xD

适合加工: 灰铸铁 • 强度小于1000N/mm<sup>2</sup>的钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	3,900		75,000	43,000
1,100		36,000	14,000	4,000		75,000	43,000
1,200		38,000	16,000	4,100		75,000	43,000
1,300		38,000	16,000	4,200		75,000	43,000
1,400		40,000	18,000	4,300		80,000	47,000
1,500		40,000	18,000	4,400		80,000	47,000
1,600		43,000	20,000	4,500		80,000	47,000
1,700		43,000	20,000	4,600		80,000	47,000
1,800		46,000	22,000	4,700		80,000	47,000
1,900		46,000	22,000	4,800		86,000	52,000
2,000		49,000	24,000	4,900		86,000	52,000
2,100		49,000	24,000	5,000		86,000	52,000
2,200		53,000	27,000	5,100		86,000	52,000
2,300		53,000	27,000	5,200		86,000	52,000
2,400		57,000	30,000	5,300		86,000	52,000
2,500		57,000	30,000	5,400		93,000	57,000
2,600		57,000	30,000	5,500		93,000	57,000
2,700		61,000	33,000	5,600		93,000	57,000
2,800		61,000	33,000	5,700		93,000	57,000
2,900		61,000	33,000	5,800		93,000	57,000
3,000		61,000	33,000	5,900		93,000	57,000
3,100		65,000	36,000	6,000		93,000	57,000
3,170	1/8	65,000	36,000	6,200		101,000	63,000
3,200		65,000	36,000	6,300		101,000	63,000
3,300		65,000	36,000	6,400		101,000	63,000
3,400		70,000	39,000	6,500		101,000	63,000
3,500		70,000	39,000	6,600		101,000	63,000
3,600		70,000	39,000	6,700		101,000	63,000
3,700		70,000	39,000	6,800		109,000	69,000
3,800		75,000	43,000	6,900		109,000	69,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,000		109,000	69,000	10,000		133,000	87,000
7,100		109,000	69,000	10,100		133,000	87,000
7,200		109,000	69,000	10,200		133,000	87,000
7,300		109,000	69,000	10,300		133,000	87,000
7,400		109,000	69,000	10,500		133,000	87,000
7,500		109,000	69,000	10,700		142,000	94,000
7,600		117,000	75,000	11,000		142,000	94,000
7,700		117,000	75,000	11,400		142,000	94,000
7,800		117,000	75,000	11,500		142,000	94,000
7,900		117,000	75,000	11,600		142,000	94,000
8,000		117,000	75,000	11,700		142,000	94,000
8,100		117,000	75,000	11,800		142,000	94,000
8,200		117,000	75,000	12,000		151,000	101,000
8,300		117,000	75,000	12,100		151,000	101,000
8,400		117,000	75,000	12,200		151,000	101,000
8,500		117,000	75,000	12,300	31/64	151,000	101,000
8,600		125,000	81,000	12,500		151,000	101,000
8,700		125,000	81,000	12,700	1/2	151,000	101,000
8,800		125,000	81,000	12,800		151,000	101,000
8,900		125,000	81,000	13,000		151,000	101,000
9,000		125,000	81,000	13,500		160,000	108,000
9,100		125,000	81,000	14,000		160,000	108,000
9,200		125,000	81,000	15,000		169,000	114,000
9,300		125,000	81,000	16,000		178,000	120,000
9,400		125,000	81,000				
9,500		125,000	81,000				
9,600		133,000	87,000				
9,700		133,000	87,000				
9,800		133,000	87,000				
9,900		133,000	87,000				



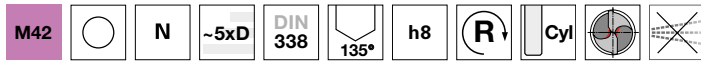
# HARTNER

## 工具钻

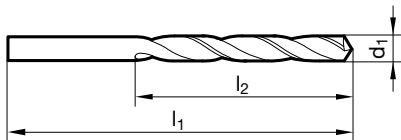
产品代号 81012



P	M	K	N	S	H
●	○	○	●	○	○



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 出色的耐磨性 • 钻铝合金钢



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	34,000	12,000	5,200	86,000	52,000
1,100	36,000	14,000	5,300	86,000	52,000
1,200	38,000	16,000	5,400	93,000	57,000
1,300	38,000	16,000	5,500	93,000	57,000
1,400	40,000	18,000	5,600	93,000	57,000
1,500	40,000	18,000	5,700	93,000	57,000
1,600	43,000	20,000	5,800	93,000	57,000
1,700	43,000	20,000	5,900	93,000	57,000
1,800	46,000	22,000	6,000	93,000	57,000
1,900	46,000	22,000	6,100	101,000	63,000
2,000	49,000	24,000	6,200	101,000	63,000
2,100	49,000	24,000	6,300	101,000	63,000
2,200	53,000	27,000	6,400	101,000	63,000
2,300	53,000	27,000	6,500	101,000	63,000
2,400	57,000	30,000	6,600	101,000	63,000
2,500	57,000	30,000	6,700	101,000	63,000
2,600	57,000	30,000	6,800	109,000	69,000
2,700	61,000	33,000	6,900	109,000	69,000
2,800	61,000	33,000	7,000	109,000	69,000
2,900	61,000	33,000	7,100	109,000	69,000
3,000	61,000	33,000	7,200	109,000	69,000
3,100	65,000	36,000	7,300	109,000	69,000
3,200	65,000	36,000	7,400	109,000	69,000
3,300	65,000	36,000	7,500	109,000	69,000
3,400	70,000	39,000	7,600	117,000	75,000
3,500	70,000	39,000	7,700	117,000	75,000
3,600	70,000	39,000	7,800	117,000	75,000
3,700	70,000	39,000	7,900	117,000	75,000
3,800	75,000	43,000	8,000	117,000	75,000
3,900	75,000	43,000	8,100	117,000	75,000
4,000	75,000	43,000	8,200	117,000	75,000
4,100	75,000	43,000	8,300	117,000	75,000
4,200	75,000	43,000	8,400	117,000	75,000
4,300	80,000	47,000	8,500	117,000	75,000
4,400	80,000	47,000	8,600	125,000	81,000
4,500	80,000	47,000	8,700	125,000	81,000
4,600	80,000	47,000	8,800	125,000	81,000
4,700	80,000	47,000	8,900	125,000	81,000
4,800	86,000	52,000	9,000	125,000	81,000
4,900	86,000	52,000	9,100	125,000	81,000
5,000	86,000	52,000	9,200	125,000	81,000
5,100	86,000	52,000	9,300	125,000	81,000



## 工具钻

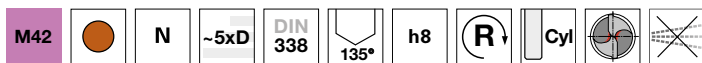
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
9,400	125,000	81,000	12,500	151,000	101,000
9,500	125,000	81,000	13,000	151,000	101,000
9,600	133,000	87,000	14,000	160,000	108,000
9,700	133,000	87,000			
9,800	133,000	87,000			
9,900	133,000	87,000			
10,000	133,000	87,000			
10,200	133,000	87,000			
10,500	133,000	87,000			
11,000	142,000	94,000			
11,500	142,000	94,000			
12,000	151,000	101,000			

## 工具钻

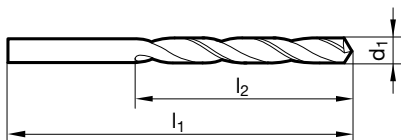
产品代号 81018



P	M	K	N	S	H
•	•	•	•	•	○



圆弧后刀面 • 钴铝合金钢 • 出色的耐磨性 • 减小芯厚



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	4,400		80,000	47,000
1,100		36,000	14,000	4,500		80,000	47,000
1,200		38,000	16,000	4,600		80,000	47,000
1,300		38,000	16,000	4,700		80,000	47,000
1,400		40,000	18,000	4,760	3/16	86,000	52,000
1,500		40,000	18,000	4,800		86,000	52,000
1,590	1/16	43,000	20,000	4,900		86,000	52,000
1,600		43,000	20,000	5,000		86,000	52,000
1,700		43,000	20,000	5,100		86,000	52,000
1,800		46,000	22,000	5,160	13/64	86,000	52,000
1,900		46,000	22,000	5,200		86,000	52,000
1,980	5/64	49,000	24,000	5,300		86,000	52,000
2,000		49,000	24,000	5,400		93,000	57,000
2,100		49,000	24,000	5,500		93,000	57,000
2,200		53,000	27,000	5,560	7/32	93,000	57,000
2,300		53,000	27,000	5,600		93,000	57,000
2,380	3/32	57,000	30,000	5,700		93,000	57,000
2,400		57,000	30,000	5,800		93,000	57,000
2,500		57,000	30,000	5,900		93,000	57,000
2,600		57,000	30,000	5,950	15/64	93,000	57,000
2,700		61,000	33,000	6,000		93,000	57,000
2,780	7/64	61,000	33,000	6,100		101,000	63,000
2,800		61,000	33,000	6,200		101,000	63,000
2,900		61,000	33,000	6,300		101,000	63,000
3,000		61,000	33,000	6,350	1/4	101,000	63,000
3,100		65,000	36,000	6,400		101,000	63,000
3,170	1/8	65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,250		65,000	36,000	6,700		101,000	63,000
3,300		65,000	36,000	6,800		109,000	69,000
3,400		70,000	39,000	6,900		109,000	69,000
3,500		70,000	39,000	7,000		109,000	69,000
3,570	9/64	70,000	39,000	7,100		109,000	69,000
3,600		70,000	39,000	7,140	9/32	109,000	69,000
3,700		70,000	39,000	7,200		109,000	69,000
3,800		75,000	43,000	7,300		109,000	69,000
3,900		75,000	43,000	7,400		109,000	69,000
3,970	5/32	75,000	43,000	7,500		109,000	69,000
4,000		75,000	43,000	7,540	19/64	117,000	75,000
4,100		75,000	43,000	7,600		117,000	75,000
4,200		75,000	43,000	7,700		117,000	75,000
4,300		80,000	47,000	7,800		117,000	75,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,900		117,000	75,000	9,900		133,000	87,000
7,940	5/16	117,000	75,000	9,920	25/64	133,000	87,000
8,000		117,000	75,000	10,000		133,000	87,000
8,100		117,000	75,000	10,100		133,000	87,000
8,200		117,000	75,000	10,200		133,000	87,000
8,300		117,000	75,000	10,300		133,000	87,000
8,330	21/64	117,000	75,000	10,320	13/32	133,000	87,000
8,400		117,000	75,000	10,500		133,000	87,000
8,500		117,000	75,000	10,720	27/64	142,000	94,000
8,600		125,000	81,000	10,800		142,000	94,000
8,700		125,000	81,000	11,000		142,000	94,000
8,730	11/32	125,000	81,000	11,110	7/16	142,000	94,000
8,800		125,000	81,000	11,500		142,000	94,000
8,900		125,000	81,000	11,510	29/64	142,000	94,000
9,000		125,000	81,000	11,910	15/32	151,000	101,000
9,100		125,000	81,000	12,000		151,000	101,000
9,130	23/64	125,000	81,000	12,200		151,000	101,000
9,200		125,000	81,000	12,300	31/64	151,000	101,000
9,300		125,000	81,000	12,500		151,000	101,000
9,500		125,000	81,000	12,700	1/2	151,000	101,000
9,520	3/8	133,000	87,000	12,800		151,000	101,000
9,600		133,000	87,000	13,000		151,000	101,000
9,700		133,000	87,000				
9,800		133,000	87,000				

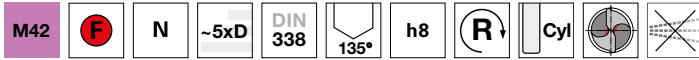


## 工具钻

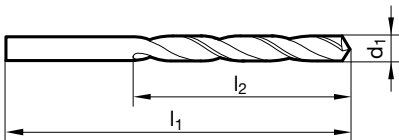
产品代号 81019



P	M	K	N	S	H
•	•	•	○	•	○



圆弧后刀面 • 钴铝合金钢 • 出色的耐磨性



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	4,760	3/16	86,000	52,000
1,100		36,000	14,000	4,800		86,000	52,000
1,200		38,000	16,000	4,900		86,000	52,000
1,300		38,000	16,000	5,000		86,000	52,000
1,400		40,000	18,000	5,100		86,000	52,000
1,500		40,000	18,000	5,160	13/64	86,000	52,000
1,590	1/16	43,000	20,000	5,200		86,000	52,000
1,600		43,000	20,000	5,300		86,000	52,000
1,700		43,000	20,000	5,400		93,000	57,000
1,800		46,000	22,000	5,500		93,000	57,000
1,900		46,000	22,000	5,600		93,000	57,000
2,000		49,000	24,000	5,700		93,000	57,000
2,100		49,000	24,000	5,800		93,000	57,000
2,200		53,000	27,000	5,900		93,000	57,000
2,300		53,000	27,000	5,950	15/64	93,000	57,000
2,380	3/32	57,000	30,000	6,000		93,000	57,000
2,400		57,000	30,000	6,100		101,000	63,000
2,500		57,000	30,000	6,200		101,000	63,000
2,600		57,000	30,000	6,300		101,000	63,000
2,700		61,000	33,000	6,350	1/4	101,000	63,000
2,800		61,000	33,000	6,400		101,000	63,000
2,900		61,000	33,000	6,500		101,000	63,000
3,000		61,000	33,000	6,600		101,000	63,000
3,100		65,000	36,000	6,700		101,000	63,000
3,170	1/8	65,000	36,000	6,750	17/64	109,000	69,000
3,200		65,000	36,000	6,800		109,000	69,000
3,300		65,000	36,000	6,900		109,000	69,000
3,400		70,000	39,000	7,000		109,000	69,000
3,500		70,000	39,000	7,100		109,000	69,000
3,600		70,000	39,000	7,200		109,000	69,000
3,700		70,000	39,000	7,300		109,000	69,000
3,800		75,000	43,000	7,400		109,000	69,000
3,900		75,000	43,000	7,500		109,000	69,000
3,970	5/32	75,000	43,000	7,600		117,000	75,000
4,000		75,000	43,000	7,700		117,000	75,000
4,100		75,000	43,000	7,800		117,000	75,000
4,200		75,000	43,000	7,900		117,000	75,000
4,300		80,000	47,000	8,000		117,000	75,000
4,400		80,000	47,000	8,100		117,000	75,000
4,500		80,000	47,000	8,200		117,000	75,000
4,600		80,000	47,000	8,300		117,000	75,000
4,700		80,000	47,000	8,400		117,000	75,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
8,500		117,000	75,000	10,100		133,000	87,000
8,600		125,000	81,000	10,200		133,000	87,000
8,700		125,000	81,000	10,500		133,000	87,000
8,730	11/32	125,000	81,000	10,800		142,000	94,000
8,800		125,000	81,000	11,000		142,000	94,000
8,900		125,000	81,000	11,200		142,000	94,000
9,000		125,000	81,000	11,500		142,000	94,000
9,100		125,000	81,000	11,800		142,000	94,000
9,200		125,000	81,000	11,910	15/32	151,000	101,000
9,300		125,000	81,000	12,000		151,000	101,000
9,400		125,000	81,000	12,200		151,000	101,000
9,500		125,000	81,000	12,500		151,000	101,000
9,600		133,000	87,000	13,000		151,000	101,000
9,700		133,000	87,000	14,000		160,000	108,000
9,800		133,000	87,000	15,000		169,000	114,000
9,900		133,000	87,000	16,000		178,000	120,000
9,920	25/64	133,000	87,000				
10,000		133,000	87,000				

## 工具钻

产品代号 81011

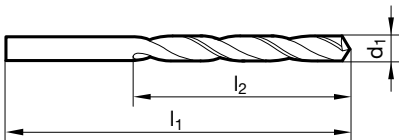


P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度

适于加工: 合金/非合金钢和铸钢 • 强度大于800 N/mm<sup>2</sup>的铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,200		19,000	2,500	1,900		46,000	22,000
0,250		19,000	3,000	1,950		49,000	24,000
0,300		19,000	3,000	2,000		49,000	24,000
0,350		19,000	4,000	2,030		49,000	24,000
0,400		20,000	5,000	2,050		49,000	24,000
0,430		20,000	5,000	2,100		49,000	24,000
0,450		20,000	5,000	2,150		53,000	27,000
0,500		22,000	6,000	2,200		53,000	27,000
0,550		24,000	7,000	2,250		53,000	27,000
0,600		24,000	7,000	2,300		53,000	27,000
0,650		26,000	8,000	2,400		57,000	30,000
0,680		28,000	9,000	2,450		57,000	30,000
0,700		28,000	9,000	2,500		57,000	30,000
0,750		28,000	9,000	2,550		57,000	30,000
0,800		30,000	10,000	2,600		57,000	30,000
0,860		32,000	11,000	2,650		57,000	30,000
0,870		32,000	11,000	2,700		61,000	33,000
0,900		32,000	11,000	2,750		61,000	33,000
0,950		32,000	11,000	2,800		61,000	33,000
0,980		34,000	12,000	2,850		61,000	33,000
1,000		34,000	12,000	2,900		61,000	33,000
1,050		34,000	12,000	2,950		61,000	33,000
1,100		36,000	14,000	3,000		61,000	33,000
1,150		36,000	14,000	3,050		65,000	36,000
1,170		36,000	14,000	3,100		65,000	36,000
1,200		38,000	16,000	3,150		65,000	36,000
1,230		38,000	16,000	3,200		65,000	36,000
1,250		38,000	16,000	3,250		65,000	36,000
1,300		38,000	16,000	3,300		65,000	36,000
1,350		40,000	18,000	3,400		70,000	39,000
1,370		40,000	18,000	3,500		70,000	39,000
1,400		40,000	18,000	3,600		70,000	39,000
1,450		40,000	18,000	3,700		70,000	39,000
1,500		40,000	18,000	3,750		70,000	39,000
1,550		43,000	20,000	3,800		75,000	43,000
1,600		43,000	20,000	3,900		75,000	43,000
1,650		43,000	20,000	4,000		75,000	43,000
1,700		43,000	20,000	4,100		75,000	43,000
1,750		46,000	22,000	4,200		75,000	43,000
1,800		46,000	22,000	4,250		75,000	43,000
1,820		46,000	22,000	4,300		80,000	47,000
1,860		46,000	22,000	4,400		80,000	47,000



## 工具钻

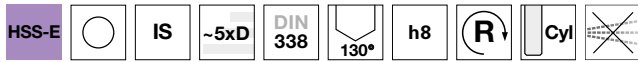
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
4,500		80,000	47,000	9,400		125,000	81,000
4,550		80,000	47,000	9,500		125,000	81,000
4,600		80,000	47,000	9,520	3/8	133,000	87,000
4,650		80,000	47,000	9,600		133,000	87,000
4,700		80,000	47,000	9,700		133,000	87,000
4,800		86,000	52,000	9,800		133,000	87,000
4,900		86,000	52,000	9,900		133,000	87,000
5,000		86,000	52,000	10,000		133,000	87,000
5,020		86,000	52,000	10,050		133,000	87,000
5,050		86,000	52,000	10,200		133,000	87,000
5,100		86,000	52,000	10,250		133,000	87,000
5,150		86,000	52,000	10,300		133,000	87,000
5,200		86,000	52,000	10,400		133,000	87,000
5,250		86,000	52,000	10,500		133,000	87,000
5,300		86,000	52,000	10,600		133,000	87,000
5,400		93,000	57,000	10,720	27/64	142,000	94,000
5,500		93,000	57,000	10,800		142,000	94,000
5,600		93,000	57,000	10,900		142,000	94,000
5,700		93,000	57,000	11,000		142,000	94,000
5,750		93,000	57,000	11,100		142,000	94,000
5,800		93,000	57,000	11,200		142,000	94,000
5,900		93,000	57,000	11,300		142,000	94,000
6,000		93,000	57,000	11,500		142,000	94,000
6,050		101,000	63,000	11,700		142,000	94,000
6,100		101,000	63,000	11,750		142,000	94,000
6,150		101,000	63,000	11,800		142,000	94,000
6,200		101,000	63,000	12,000		151,000	101,000
6,300		101,000	63,000	12,200		151,000	101,000
6,350	1/4	101,000	63,000	12,250		151,000	101,000
6,400		101,000	63,000	12,400		151,000	101,000
6,500		101,000	63,000	12,500		151,000	101,000
6,600		101,000	63,000	12,600		151,000	101,000
6,750	17/64	109,000	69,000	12,700	1/2	151,000	101,000
6,800		109,000	69,000	12,800		151,000	101,000
7,000		109,000	69,000	12,900		151,000	101,000
7,100		109,000	69,000	13,000		151,000	101,000
7,140	9/32	109,000	69,000	13,200		151,000	101,000
7,200		109,000	69,000	13,300		160,000	108,000
7,300		109,000	69,000	13,400		160,000	108,000
7,400		109,000	69,000	13,500		160,000	108,000
7,500		109,000	69,000	13,600		160,000	108,000
7,600		117,000	75,000	13,700		160,000	108,000
7,700		117,000	75,000	13,800		160,000	108,000
7,900		117,000	75,000	14,000		160,000	108,000
8,000		117,000	75,000	14,200		169,000	114,000
8,100		117,000	75,000	14,400		169,000	114,000
8,200		117,000	75,000	14,500		169,000	114,000
8,300		117,000	75,000	15,000		169,000	114,000
8,500		117,000	75,000	15,250		178,000	120,000
8,600		125,000	81,000	15,500		178,000	120,000
8,700		125,000	81,000	15,870	5/8	178,000	120,000
8,730	11/32	125,000	81,000	16,000		178,000	120,000
8,750		125,000	81,000	16,500		184,000	125,000
8,800		125,000	81,000	17,000		184,000	125,000
8,900		125,000	81,000	17,500		191,000	130,000
9,000		125,000	81,000	19,000		198,000	135,000
9,100		125,000	81,000	20,000		205,000	140,000
9,200		125,000	81,000				
9,250		125,000	81,000				
9,300		125,000	81,000				

## 工具钻

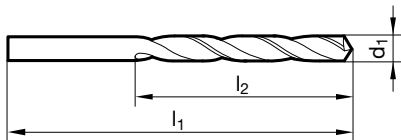
产品代号 81013



P	M	K	N	S	H
○	●	○	○	○	○



INOX-钻头 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 适于加工: 不锈钢/耐酸-/耐热奥氏体钢



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	5,100		86,000	52,000
1,100		36,000	14,000	5,200		86,000	52,000
1,200		38,000	16,000	5,300		86,000	52,000
1,300		38,000	16,000	5,400		93,000	57,000
1,400		40,000	18,000	5,500		93,000	57,000
1,500		40,000	18,000	5,600		93,000	57,000
1,600		43,000	20,000	5,700		93,000	57,000
1,700		43,000	20,000	5,800		93,000	57,000
1,800		46,000	22,000	5,900		93,000	57,000
1,900		46,000	22,000	6,000		93,000	57,000
2,000		49,000	24,000	6,100		101,000	63,000
2,100		49,000	24,000	6,200		101,000	63,000
2,200		53,000	27,000	6,300		101,000	63,000
2,300		53,000	27,000	6,400		101,000	63,000
2,400		57,000	30,000	6,500		101,000	63,000
2,500		57,000	30,000	6,600		101,000	63,000
2,600		57,000	30,000	6,700		101,000	63,000
2,700		61,000	33,000	6,800		109,000	69,000
2,800		61,000	33,000	6,900		109,000	69,000
2,900		61,000	33,000	7,000		109,000	69,000
3,000		61,000	33,000	7,100		109,000	69,000
3,100		65,000	36,000	7,200		109,000	69,000
3,200		65,000	36,000	7,300		109,000	69,000
3,300		65,000	36,000	7,400		109,000	69,000
3,400		70,000	39,000	7,500		109,000	69,000
3,500		70,000	39,000	7,600		117,000	75,000
3,570	9/64	70,000	39,000	7,700		117,000	75,000
3,600		70,000	39,000	7,800		117,000	75,000
3,700		70,000	39,000	7,900		117,000	75,000
3,800		75,000	43,000	8,000		117,000	75,000
3,900		75,000	43,000	8,100		117,000	75,000
4,000		75,000	43,000	8,200		117,000	75,000
4,100		75,000	43,000	8,300		117,000	75,000
4,200		75,000	43,000	8,400		117,000	75,000
4,300		80,000	47,000	8,500		117,000	75,000
4,400		80,000	47,000	8,600		125,000	81,000
4,500		80,000	47,000	8,700		125,000	81,000
4,600		80,000	47,000	8,800		125,000	81,000
4,700		80,000	47,000	8,900		125,000	81,000
4,800		86,000	52,000	9,000		125,000	81,000
4,900		86,000	52,000	9,100		125,000	81,000
5,000		86,000	52,000	9,200		125,000	81,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,300		125,000	81,000	11,100		142,000	94,000
9,400		125,000	81,000	11,400		142,000	94,000
9,500		125,000	81,000	11,500		142,000	94,000
9,600		133,000	87,000	11,600		142,000	94,000
9,700		133,000	87,000	11,800		142,000	94,000
9,800		133,000	87,000	12,000		151,000	101,000
9,900		133,000	87,000	12,500		151,000	101,000
10,000		133,000	87,000	13,000		151,000	101,000
10,100		133,000	87,000				
10,200		133,000	87,000				
10,300		133,000	87,000				
10,400		133,000	87,000				
10,500		133,000	87,000				
10,600		133,000	87,000				
10,700		142,000	94,000				
10,800		142,000	94,000				
10,900		142,000	94,000				
11,000		142,000	94,000				

## 工具钻

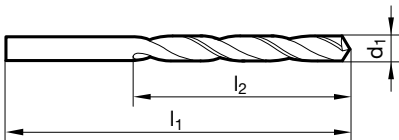
产品代号 81041



P	M	K	N	S	H
•	○	•	•		



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度 • 宽槽 • 尤其适合孔深超过3xD  
 大于800N/mm<sup>2</sup>的灰铸铁和钢 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	3,900		75,000	43,000
1,100		36,000	14,000	4,000		75,000	43,000
1,200		38,000	16,000	4,050		75,000	43,000
1,250		38,000	16,000	4,100		75,000	43,000
1,300		38,000	16,000	4,200		75,000	43,000
1,400		40,000	18,000	4,300		80,000	47,000
1,500		40,000	18,000	4,400		80,000	47,000
1,550		43,000	20,000	4,500		80,000	47,000
1,600		43,000	20,000	4,600		80,000	47,000
1,650		43,000	20,000	4,700		80,000	47,000
1,700		43,000	20,000	4,900		86,000	52,000
1,800		46,000	22,000	5,000		86,000	52,000
1,850		46,000	22,000	5,100		86,000	52,000
1,900		46,000	22,000	5,200		86,000	52,000
2,000		49,000	24,000	5,300		86,000	52,000
2,050		49,000	24,000	5,400		93,000	57,000
2,100		49,000	24,000	5,500		93,000	57,000
2,200		53,000	27,000	5,600		93,000	57,000
2,300		53,000	27,000	5,700		93,000	57,000
2,350		53,000	27,000	5,800		93,000	57,000
2,400		57,000	30,000	5,900		93,000	57,000
2,450		57,000	30,000	6,000		93,000	57,000
2,500		57,000	30,000	6,100		101,000	63,000
2,550		57,000	30,000	6,200		101,000	63,000
2,600		57,000	30,000	6,300		101,000	63,000
2,650		57,000	30,000	6,400		101,000	63,000
2,700		61,000	33,000	6,500		101,000	63,000
2,750		61,000	33,000	6,600		101,000	63,000
2,780	7/64	61,000	33,000	6,700		101,000	63,000
2,800		61,000	33,000	6,750	17/64	109,000	69,000
2,900		61,000	33,000	6,800		109,000	69,000
3,000		61,000	33,000	6,900		109,000	69,000
3,050		65,000	36,000	7,000		109,000	69,000
3,100		65,000	36,000	7,100		109,000	69,000
3,200		65,000	36,000	7,200		109,000	69,000
3,250		65,000	36,000	7,300		109,000	69,000
3,300		65,000	36,000	7,500		109,000	69,000
3,400		70,000	39,000	7,600		117,000	75,000
3,450		70,000	39,000	7,700		117,000	75,000
3,500		70,000	39,000	7,800		117,000	75,000
3,700		70,000	39,000	7,900		117,000	75,000
3,800		75,000	43,000	8,000		117,000	75,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
8,100		117,000	75,000	10,200		133,000	87,000
8,200		117,000	75,000	10,300		133,000	87,000
8,300		117,000	75,000	10,500		133,000	87,000
8,400		117,000	75,000	10,700		142,000	94,000
8,500		117,000	75,000	10,800		142,000	94,000
8,600		125,000	81,000	11,000		142,000	94,000
8,700		125,000	81,000	11,100		142,000	94,000
8,800		125,000	81,000	11,200		142,000	94,000
8,900		125,000	81,000	11,600		142,000	94,000
9,000		125,000	81,000	11,700		142,000	94,000
9,100		125,000	81,000	11,800		142,000	94,000
9,200		125,000	81,000	12,000		151,000	101,000
9,300		125,000	81,000	12,500		151,000	101,000
9,500		125,000	81,000	12,700	1/2	151,000	101,000
9,700		133,000	87,000	13,000		151,000	101,000
9,800		133,000	87,000				
9,900		133,000	87,000				
10,000		133,000	87,000				

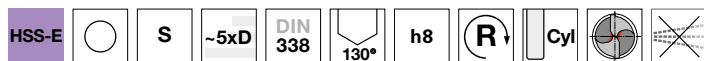


## 工具钻

产品代号 81061

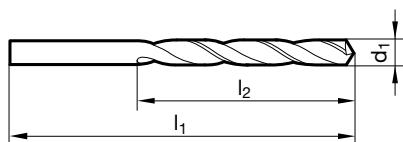


P	M	K	N	S	H
○	●			●	



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度

钛及钛合金 • 不锈钢/耐酸-/耐热奥氏体钢 • 强度超过900 N/mm<sup>2</sup>的高强度/短屑钢 • 哈氏合金, 镍合金, 锰合金



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,200		19,000	2,500	1,820		46,000	22,000
0,300		19,000	3,000	1,850		46,000	22,000
0,400		20,000	5,000	1,900		46,000	22,000
0,500		22,000	6,000	1,950		49,000	24,000
0,550		24,000	7,000	1,990		49,000	24,000
0,580		24,000	7,000	2,000		49,000	24,000
0,600		24,000	7,000	2,030		49,000	24,000
0,650		26,000	8,000	2,050		49,000	24,000
0,700		28,000	9,000	2,080		49,000	24,000
0,750		28,000	9,000	2,100		49,000	24,000
0,800		30,000	10,000	2,200		53,000	27,000
0,820		30,000	10,000	2,250		53,000	27,000
0,840		30,000	10,000	2,300		53,000	27,000
0,850		30,000	10,000	2,350		53,000	27,000
0,900		32,000	11,000	2,380	3/32	57,000	30,000
0,950		32,000	11,000	2,400		57,000	30,000
1,000		34,000	12,000	2,450		57,000	30,000
1,040		34,000	12,000	2,500		57,000	30,000
1,050		34,000	12,000	2,550		57,000	30,000
1,100		36,000	14,000	2,600		57,000	30,000
1,150		36,000	14,000	2,700		61,000	33,000
1,180		36,000	14,000	2,750		61,000	33,000
1,190	3/64	38,000	16,000	2,800		61,000	33,000
1,200		38,000	16,000	2,850		61,000	33,000
1,210		38,000	16,000	2,900		61,000	33,000
1,250		38,000	16,000	2,950		61,000	33,000
1,300		38,000	16,000	3,000		61,000	33,000
1,350		40,000	18,000	3,050		65,000	36,000
1,400		40,000	18,000	3,100		65,000	36,000
1,450		40,000	18,000	3,200		65,000	36,000
1,500		40,000	18,000	3,250		65,000	36,000
1,510		43,000	20,000	3,300		65,000	36,000
1,520		43,000	20,000	3,350		65,000	36,000
1,530		43,000	20,000	3,400		70,000	39,000
1,550		43,000	20,000	3,450		70,000	39,000
1,600		43,000	20,000	3,500		70,000	39,000
1,630		43,000	20,000	3,600		70,000	39,000
1,650		43,000	20,000	3,650		70,000	39,000
1,700		43,000	20,000	3,700		70,000	39,000
1,730		46,000	22,000	3,800		75,000	43,000
1,750		46,000	22,000	3,900		75,000	43,000
1,800		46,000	22,000	4,000		75,000	43,000



## 工具钻

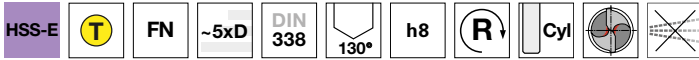
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
4,050		75,000	43,000	9,000		125,000	81,000
4,100		75,000	43,000	9,100		125,000	81,000
4,200		75,000	43,000	9,200		125,000	81,000
4,250		75,000	43,000	9,300		125,000	81,000
4,300		80,000	47,000	9,400		125,000	81,000
4,400		80,000	47,000	9,500		125,000	81,000
4,500		80,000	47,000	9,600		133,000	87,000
4,600		80,000	47,000	9,700		133,000	87,000
4,700		80,000	47,000	9,800		133,000	87,000
4,750		80,000	47,000	9,900		133,000	87,000
4,800		86,000	52,000	10,000		133,000	87,000
4,850		86,000	52,000	10,100		133,000	87,000
4,900		86,000	52,000	10,200		133,000	87,000
5,000		86,000	52,000	10,300		133,000	87,000
5,100		86,000	52,000	10,400		133,000	87,000
5,200		86,000	52,000	10,500		133,000	87,000
5,300		86,000	52,000	10,600		133,000	87,000
5,400		93,000	57,000	10,700		142,000	94,000
5,500		93,000	57,000	10,750		142,000	94,000
5,600		93,000	57,000	10,800		142,000	94,000
5,700		93,000	57,000	10,900		142,000	94,000
5,800		93,000	57,000	11,000		142,000	94,000
5,900		93,000	57,000	11,100		142,000	94,000
6,000		93,000	57,000	11,200		142,000	94,000
6,100		101,000	63,000	11,300		142,000	94,000
6,200		101,000	63,000	11,500		142,000	94,000
6,300		101,000	63,000	11,700		142,000	94,000
6,400		101,000	63,000	11,800		142,000	94,000
6,500		101,000	63,000	12,000		151,000	101,000
6,600		101,000	63,000	12,100		151,000	101,000
6,700		101,000	63,000	12,200		151,000	101,000
6,750	17/64	109,000	69,000	12,300	31/64	151,000	101,000
6,800		109,000	69,000	12,400		151,000	101,000
6,900		109,000	69,000	12,500		151,000	101,000
7,000		109,000	69,000	12,700	1/2	151,000	101,000
7,100		109,000	69,000	13,000		151,000	101,000
7,200		109,000	69,000	13,500		160,000	108,000
7,300		109,000	69,000	14,000		160,000	108,000
7,400		109,000	69,000	14,500		169,000	114,000
7,500		109,000	69,000	15,000		169,000	114,000
7,600		117,000	75,000	15,500		178,000	120,000
7,700		117,000	75,000	16,000		178,000	120,000
7,800		117,000	75,000	16,500		184,000	125,000
7,900		117,000	75,000	17,000		184,000	125,000
8,000		117,000	75,000	17,500		191,000	130,000
8,100		117,000	75,000				
8,200		117,000	75,000				
8,300		117,000	75,000				
8,400		117,000	75,000				
8,500		117,000	75,000				
8,600		125,000	81,000				
8,700		125,000	81,000				
8,800		125,000	81,000				
8,900		125,000	81,000				

## 工具钻

### 产品代号 84800



P	M	K	N	S	H
●	○	●	○		

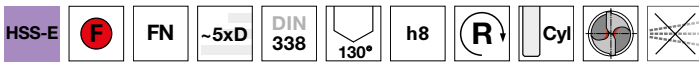


芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度 • 宽槽 • 尤其适合孔深超过3xD  
 大于800N/mm<sup>2</sup>的灰铸铁和钢 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢

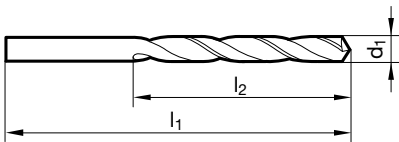
### 产品代号 84504



P	M	K	N	S	H
●	○	●	●		○



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • 高耐磨强度 • 宽槽 • 耐磨损 高强度 • 尤其适合孔深超过3xD  
 大于800N/mm<sup>2</sup>的灰铸铁和钢 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
1,000		34,000	12,000	3,400		70,000	39,000
1,100		36,000	14,000	3,500		70,000	39,000
1,200		38,000	16,000	3,600		70,000	39,000
1,300		38,000	16,000	3,700		70,000	39,000
1,400		40,000	18,000	3,800		75,000	43,000
1,450		40,000	18,000	3,900		75,000	43,000
1,500		40,000	18,000	4,000		75,000	43,000
1,600		43,000	20,000	4,100		75,000	43,000
1,700		43,000	20,000	4,200		75,000	43,000
1,800		46,000	22,000	4,300		80,000	47,000
1,900		46,000	22,000	4,400		80,000	47,000
1,930		49,000	24,000	4,500		80,000	47,000
2,000		49,000	24,000	4,600		80,000	47,000
2,100		49,000	24,000	4,700		80,000	47,000
2,200		53,000	27,000	4,800		86,000	52,000
2,250		53,000	27,000	4,900		86,000	52,000
2,300		53,000	27,000	5,000		86,000	52,000
2,400		57,000	30,000	5,100		86,000	52,000
2,450		57,000	30,000	5,200		86,000	52,000
2,500		57,000	30,000	5,300		86,000	52,000
2,550		57,000	30,000	5,400		93,000	57,000
2,600		57,000	30,000	5,500		93,000	57,000
2,700		61,000	33,000	5,560	7/32	93,000	57,000
2,800		61,000	33,000	5,600		93,000	57,000
2,900		61,000	33,000	5,700		93,000	57,000
3,000		61,000	33,000	5,800		93,000	57,000
3,100		65,000	36,000	6,000		93,000	57,000
3,200		65,000	36,000	6,100		101,000	63,000
3,250		65,000	36,000	6,200		101,000	63,000
3,300		65,000	36,000	6,300		101,000	63,000



## 工具钻

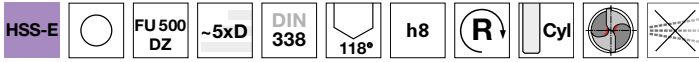
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
6,400		101,000	63,000	9,100		125,000	81,000
6,500		101,000	63,000	9,200		125,000	81,000
6,600		101,000	63,000	9,300		125,000	81,000
6,700		101,000	63,000	9,500		125,000	81,000
6,800		109,000	69,000	9,700		133,000	87,000
6,900		109,000	69,000	9,800		133,000	87,000
7,000		109,000	69,000	9,900		133,000	87,000
7,100		109,000	69,000	10,000		133,000	87,000
7,200		109,000	69,000	10,100		133,000	87,000
7,400		109,000	69,000	10,200		133,000	87,000
7,500		109,000	69,000	10,300		133,000	87,000
7,700		117,000	75,000	10,500		133,000	87,000
7,800		117,000	75,000	10,700		142,000	94,000
7,900		117,000	75,000	10,800		142,000	94,000
8,000		117,000	75,000	11,000		142,000	94,000
8,100		117,000	75,000	11,500		142,000	94,000
8,200		117,000	75,000	11,700		142,000	94,000
8,400		117,000	75,000	12,000		151,000	101,000
8,500		117,000	75,000	12,500		151,000	101,000
8,600		125,000	81,000	13,000		151,000	101,000
8,700		125,000	81,000				
8,800		125,000	81,000				
8,900		125,000	81,000				
9,000		125,000	81,000				

## 工具钻

### 产品代号 84804



P	M	K	N	S	H
•	•	•	•		

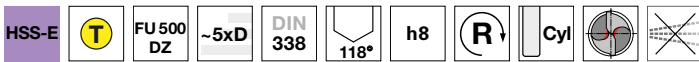


芯厚  $\geq \varnothing 1,000$  • 双后刀面 • 高耐磨强度 • 要求适合低进给率 • 要求低扭矩 • 普遍适用  
强度小于800N/mm<sup>2</sup>的合金/非合金钢 • 热/冷锻钢 • 耐磨轴承钢 • 有色金属 • 铸件材料 • 不锈钢 • 塑料

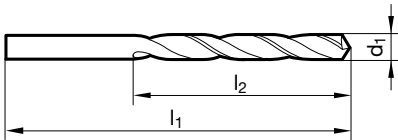
### 产品代号 84802



P	M	K	N	S	H
•	•	•	•		



芯厚  $\geq \varnothing 1,000$  • 双后刀面 • 高耐磨强度 • 要求适合低进给率 • 要求低扭矩 • 耐磨损 高强度 • 普遍适用  
强度小于800N/mm<sup>2</sup>的合金/非合金钢 • 热/冷锻钢 • 耐磨轴承钢 • 有色金属 • 铸件材料 • 不锈钢 • 塑料



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	3,600		70,000	39,000
1,100		36,000	14,000	3,700		70,000	39,000
1,200		38,000	16,000	3,800		75,000	43,000
1,300		38,000	16,000	3,900		75,000	43,000
1,400		40,000	18,000	3,970	5/32	75,000	43,000
1,500		40,000	18,000	4,000		75,000	43,000
1,600		43,000	20,000	4,100		75,000	43,000
1,700		43,000	20,000	4,200		75,000	43,000
1,800		46,000	22,000	4,300		80,000	47,000
1,900		46,000	22,000	4,370	11/64	80,000	47,000
2,000		49,000	24,000	4,400		80,000	47,000
2,100		49,000	24,000	4,500		80,000	47,000
2,200		53,000	27,000	4,600		80,000	47,000
2,300		53,000	27,000	4,650		80,000	47,000
2,380	3/32	57,000	30,000	4,700		80,000	47,000
2,400		57,000	30,000	4,760	3/16	86,000	52,000
2,500		57,000	30,000	4,800		86,000	52,000
2,600		57,000	30,000	4,900		86,000	52,000
2,700		61,000	33,000	5,000		86,000	52,000
2,780	7/64	61,000	33,000	5,100		86,000	52,000
2,800		61,000	33,000	5,160	13/64	86,000	52,000
2,900		61,000	33,000	5,200		86,000	52,000
3,000		61,000	33,000	5,300		86,000	52,000
3,100		65,000	36,000	5,400		93,000	57,000
3,170	1/8	65,000	36,000	5,500		93,000	57,000
3,200		65,000	36,000	5,550		93,000	57,000
3,300		65,000	36,000	5,560	7/32	93,000	57,000
3,400		70,000	39,000	5,600		93,000	57,000
3,500		70,000	39,000	5,700		93,000	57,000
3,570	9/64	70,000	39,000	5,800		93,000	57,000

工具钻

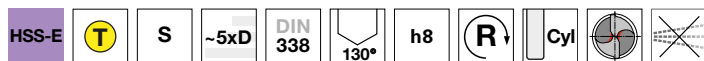
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,900		93,000	57,000	8,500		117,000	75,000
5,950	15/64	93,000	57,000	8,600		125,000	81,000
6,000		93,000	57,000	8,700		125,000	81,000
6,100		101,000	63,000	8,730	11/32	125,000	81,000
6,200		101,000	63,000	8,800		125,000	81,000
6,300		101,000	63,000	8,900		125,000	81,000
6,350	1/4	101,000	63,000	9,000		125,000	81,000
6,400		101,000	63,000	9,100		125,000	81,000
6,500		101,000	63,000	9,200		125,000	81,000
6,600		101,000	63,000	9,300		125,000	81,000
6,700		101,000	63,000	9,400		125,000	81,000
6,800		109,000	69,000	9,500		125,000	81,000
6,900		109,000	69,000	9,600		133,000	87,000
7,000		109,000	69,000	9,700		133,000	87,000
7,100		109,000	69,000	9,800		133,000	87,000
7,140	9/32	109,000	69,000	9,900		133,000	87,000
7,200		109,000	69,000	10,000		133,000	87,000
7,300		109,000	69,000	10,100		133,000	87,000
7,400		109,000	69,000	10,200		133,000	87,000
7,500		109,000	69,000	10,300		133,000	87,000
7,600		117,000	75,000	10,500		133,000	87,000
7,700		117,000	75,000	11,000		142,000	94,000
7,800		117,000	75,000	11,110	7/16	142,000	94,000
7,900		117,000	75,000	11,200		142,000	94,000
7,940	5/16	117,000	75,000	11,500		142,000	94,000
8,000		117,000	75,000	12,000		151,000	101,000
8,100		117,000	75,000	12,500		151,000	101,000
8,200		117,000	75,000	13,000		151,000	101,000
8,300		117,000	75,000	13,500		160,000	108,000
8,400		117,000	75,000	14,000		160,000	108,000

## 工具钻

产品代号 84807



P	M	K	N	S	H
○	●			●	



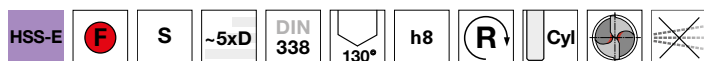
芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度

钛及钛合金 • 不锈钢/耐酸-/耐热奥氏体钢 • 强度超过900 N/mm<sup>2</sup>的高强度/短屑钢 • 哈氏合金, 镍合金, 锰合金

产品代号 84505

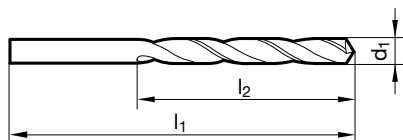


P	M	K	N	S	H
○	●			●	



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度

钛及钛合金 • 不锈钢/耐酸-/耐热奥氏体钢 • 强度超过900 N/mm<sup>2</sup>的高强度/短屑钢 • 哈氏合金, 镍合金, 锰合金



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,500		22,000	6,000	2,500		57,000	30,000
0,600		24,000	7,000	2,550		57,000	30,000
0,650		26,000	8,000	2,600		57,000	30,000
0,700		28,000	9,000	2,700		61,000	33,000
0,750		28,000	9,000	2,800		61,000	33,000
0,800		30,000	10,000	2,900		61,000	33,000
0,850		30,000	10,000	3,000		61,000	33,000
0,900		32,000	11,000	3,100		65,000	36,000
0,950		32,000	11,000	3,200		65,000	36,000
1,000		34,000	12,000	3,300		65,000	36,000
1,050		34,000	12,000	3,350		65,000	36,000
1,100		36,000	14,000	3,400		70,000	39,000
1,200		38,000	16,000	3,500		70,000	39,000
1,250		38,000	16,000	3,600		70,000	39,000
1,300		38,000	16,000	3,700		70,000	39,000
1,350		40,000	18,000	3,800		75,000	43,000
1,400		40,000	18,000	3,900		75,000	43,000
1,500		40,000	18,000	4,000		75,000	43,000
1,550		43,000	20,000	4,100		75,000	43,000
1,600		43,000	20,000	4,200		75,000	43,000
1,700		43,000	20,000	4,300		80,000	47,000
1,800		46,000	22,000	4,400		80,000	47,000
1,850		46,000	22,000	4,500		80,000	47,000
1,900		46,000	22,000	4,600		80,000	47,000
2,000		49,000	24,000	4,700		80,000	47,000
2,050		49,000	24,000	4,800		86,000	52,000
2,100		49,000	24,000	4,900		86,000	52,000
2,200		53,000	27,000	5,000		86,000	52,000
2,300		53,000	27,000	5,050		86,000	52,000
2,400		57,000	30,000	5,100		86,000	52,000



## 工具钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,200		86,000	52,000	8,800		125,000	81,000
5,300		86,000	52,000	8,900		125,000	81,000
5,400		93,000	57,000	9,000		125,000	81,000
5,500		93,000	57,000	9,100		125,000	81,000
5,600		93,000	57,000	9,200		125,000	81,000
5,700		93,000	57,000	9,300		125,000	81,000
5,800		93,000	57,000	9,400		125,000	81,000
5,900		93,000	57,000	9,500		125,000	81,000
6,000		93,000	57,000	9,600		133,000	87,000
6,100		101,000	63,000	9,700		133,000	87,000
6,200		101,000	63,000	9,800		133,000	87,000
6,300		101,000	63,000	9,900		133,000	87,000
6,400		101,000	63,000	10,000		133,000	87,000
6,500		101,000	63,000	10,100		133,000	87,000
6,600		101,000	63,000	10,200		133,000	87,000
6,700		101,000	63,000	10,300		133,000	87,000
6,800		109,000	69,000	10,500		133,000	87,000
6,900		109,000	69,000	10,800		142,000	94,000
7,000		109,000	69,000	11,000		142,000	94,000
7,100		109,000	69,000	11,500		142,000	94,000
7,200		109,000	69,000	12,000		151,000	101,000
7,300		109,000	69,000	12,300	31/64	151,000	101,000
7,400		109,000	69,000	12,500		151,000	101,000
7,500		109,000	69,000	12,700	1/2	151,000	101,000
7,600		117,000	75,000	13,000		151,000	101,000
7,700		117,000	75,000				
7,800		117,000	75,000				
7,900		117,000	75,000				
8,000		117,000	75,000				
8,100		117,000	75,000				
8,200		117,000	75,000				
8,300		117,000	75,000				
8,400		117,000	75,000				
8,500		117,000	75,000				
8,600		125,000	81,000				
8,700		125,000	81,000				

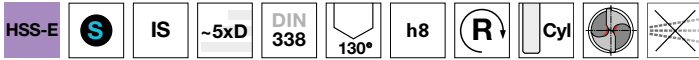


## 工具钻

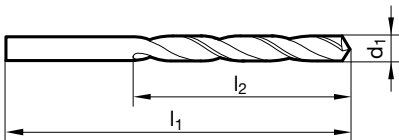
产品代号 81078



P	M	K	N	S	H
○	●	○	○	○	



优化定心的圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 适于加工： 不锈钢/耐酸-/耐热奥氏体钢 • 特殊合金



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
1,000		34,000	12,000	5,200		86,000	52,000
1,100		36,000	14,000	5,300		86,000	52,000
1,200		38,000	16,000	5,400		93,000	57,000
1,300		38,000	16,000	5,500		93,000	57,000
1,400		40,000	18,000	5,600		93,000	57,000
1,500		40,000	18,000	5,700		93,000	57,000
1,600		43,000	20,000	5,800		93,000	57,000
1,700		43,000	20,000	5,900		93,000	57,000
1,800		46,000	22,000	6,000		93,000	57,000
1,900		46,000	22,000	6,100		101,000	63,000
2,000		49,000	24,000	6,200		101,000	63,000
2,100		49,000	24,000	6,300		101,000	63,000
2,200		53,000	27,000	6,400		101,000	63,000
2,300		53,000	27,000	6,500		101,000	63,000
2,400		57,000	30,000	6,600		101,000	63,000
2,500		57,000	30,000	6,700		101,000	63,000
2,600		57,000	30,000	6,800		109,000	69,000
2,700		61,000	33,000	6,900		109,000	69,000
2,800		61,000	33,000	7,000		109,000	69,000
2,900		61,000	33,000	7,100		109,000	69,000
3,000		61,000	33,000	7,200		109,000	69,000
3,100		65,000	36,000	7,300		109,000	69,000
3,200		65,000	36,000	7,400		109,000	69,000
3,300		65,000	36,000	7,500		109,000	69,000
3,400		70,000	39,000	7,600		117,000	75,000
3,500		70,000	39,000	7,700		117,000	75,000
3,600		70,000	39,000	7,800		117,000	75,000
3,700		70,000	39,000	7,900		117,000	75,000
3,800		75,000	43,000	8,000		117,000	75,000
3,900		75,000	43,000	8,100		117,000	75,000
4,000		75,000	43,000	8,200		117,000	75,000
4,100		75,000	43,000	8,300		117,000	75,000
4,200		75,000	43,000	8,400		117,000	75,000
4,300		80,000	47,000	8,500		117,000	75,000
4,400		80,000	47,000	8,600		125,000	81,000
4,500		80,000	47,000	8,700		125,000	81,000
4,600		80,000	47,000	8,800		125,000	81,000
4,700		80,000	47,000	8,900		125,000	81,000
4,800		86,000	52,000	9,000		125,000	81,000
4,900		86,000	52,000	9,100		125,000	81,000
5,000		86,000	52,000	9,200		125,000	81,000
5,100		86,000	52,000	9,300		125,000	81,000



## 工具钻

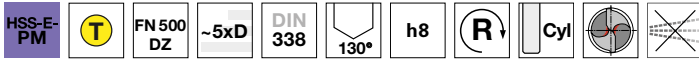
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,400		125,000	81,000	11,800		142,000	94,000
9,500		125,000	81,000	12,000		151,000	101,000
9,600		133,000	87,000	12,500		151,000	101,000
9,700		133,000	87,000	13,000		151,000	101,000
9,800		133,000	87,000				
9,900		133,000	87,000				
10,000		133,000	87,000				
10,200		133,000	87,000				
10,500		133,000	87,000				
11,000		142,000	94,000				
11,200		142,000	94,000				
11,500		142,000	94,000				

## 工具钻

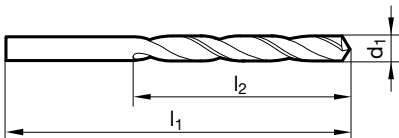
产品代号 84811



P	M	K	N	S	H
●	○	●	○	○	○



芯厚  $\geq \varnothing 1,000$  • 圆弧后刀面 • PM-粉末冶金钴合金高速钢 • 刚性好 • 出色的耐磨性  
 适于加工: 高合金钢 • 热处理钢和淬硬钢 • 铸铁, 黄铜, 青铜



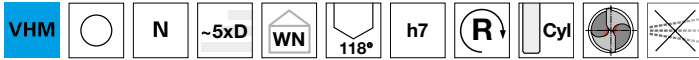
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	6,300		101,000	63,000
1,200		38,000	16,000	6,350	1/4	101,000	63,000
1,300		38,000	16,000	6,700		101,000	63,000
1,400		40,000	18,000	6,800		109,000	69,000
1,500		40,000	18,000	7,000		109,000	69,000
1,600		43,000	20,000	7,140	9/32	109,000	69,000
1,700		43,000	20,000	7,400		109,000	69,000
2,000		49,000	24,000	7,900		117,000	75,000
2,100		49,000	24,000	7,940	5/16	117,000	75,000
2,200		53,000	27,000	8,000		117,000	75,000
2,300		53,000	27,000	8,500		117,000	75,000
2,380	3/32	57,000	30,000	8,730	11/32	125,000	81,000
2,500		57,000	30,000	9,000		125,000	81,000
2,600		57,000	30,000	9,300		125,000	81,000
2,780	7/64	61,000	33,000	9,500		125,000	81,000
2,900		61,000	33,000	9,800		133,000	87,000
3,000		61,000	33,000	10,000		133,000	87,000
3,100		65,000	36,000	10,200		133,000	87,000
3,170	1/8	65,000	36,000	10,500		133,000	87,000
3,300		65,000	36,000	11,000		142,000	94,000
3,500		70,000	39,000	11,110	7/16	142,000	94,000
3,570	9/64	70,000	39,000	11,500		142,000	94,000
3,600		70,000	39,000	12,000		151,000	101,000
3,700		70,000	39,000	12,500		151,000	101,000
4,000		75,000	43,000	13,000		151,000	101,000
4,100		75,000	43,000	13,500		160,000	108,000
4,200		75,000	43,000	14,000		160,000	108,000
4,760	3/16	86,000	52,000				
4,800		86,000	52,000				
5,000		86,000	52,000				
5,160	13/64	86,000	52,000				
5,400		93,000	57,000				
5,500		93,000	57,000				
5,560	7/32	93,000	57,000				
5,950	15/64	93,000	57,000				
6,000		93,000	57,000				

## 工具钻

产品代号 89244

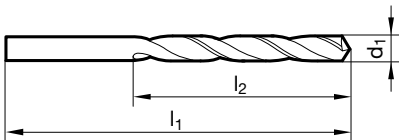


P	M	K	N	S	H
○	○	○	●	○	



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 适合加工：灰铸铁 • 青铜、黄铜 • 铝和铝合金 • 镁和镁合金 • 塑料及纤维增强塑料



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	4,600		80,000	47,000
1,100		36,000	14,000	4,700		80,000	47,000
1,200		38,000	16,000	4,760	3/16	86,000	52,000
1,300		38,000	16,000	4,800		86,000	52,000
1,400		40,000	18,000	4,900		86,000	52,000
1,500		40,000	18,000	5,000		86,000	52,000
1,600		43,000	20,000	5,100		86,000	52,000
1,700		43,000	20,000	5,160	13/64	86,000	52,000
1,800		46,000	22,000	5,200		86,000	52,000
1,900		46,000	22,000	5,300		86,000	52,000
2,000		49,000	24,000	5,400		93,000	57,000
2,100		49,000	24,000	5,500		93,000	57,000
2,200		53,000	27,000	5,560	7/32	93,000	57,000
2,300		53,000	27,000	5,600		93,000	57,000
2,380	3/32	57,000	30,000	5,700		93,000	57,000
2,400		57,000	30,000	5,800		93,000	57,000
2,500		57,000	30,000	5,900		93,000	57,000
2,600		57,000	30,000	5,950	15/64	93,000	57,000
2,700		61,000	33,000	6,000		93,000	57,000
2,780	7/64	61,000	33,000	6,100		101,000	63,000
2,800		61,000	33,000	6,200		101,000	63,000
2,900		61,000	33,000	6,300		101,000	63,000
3,000		61,000	33,000	6,350	1/4	101,000	63,000
3,100		65,000	36,000	6,400		101,000	63,000
3,170	1/8	65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,300		65,000	36,000	6,700		101,000	63,000
3,400		70,000	39,000	6,800		109,000	69,000
3,500		70,000	39,000	6,900		109,000	69,000
3,570	9/64	70,000	39,000	7,000		109,000	69,000
3,600		70,000	39,000	7,100		109,000	69,000
3,700		70,000	39,000	7,140	9/32	109,000	69,000
3,800		75,000	43,000	7,200		109,000	69,000
3,900		75,000	43,000	7,300		109,000	69,000
3,970	5/32	75,000	43,000	7,400		109,000	69,000
4,000		75,000	43,000	7,500		109,000	69,000
4,100		75,000	43,000	7,600		117,000	75,000
4,200		75,000	43,000	7,700		117,000	75,000
4,300		80,000	47,000	7,800		117,000	75,000
4,370	11/64	80,000	47,000	7,900		117,000	75,000
4,400		80,000	47,000	7,940	5/16	117,000	75,000
4,500		80,000	47,000	8,000		117,000	75,000



## 工具钻

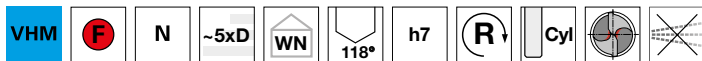
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
8,200		117,000	75,000	9,900		133,000	87,000
8,300		117,000	75,000	10,000		133,000	87,000
8,400		117,000	75,000	10,200		133,000	87,000
8,500		117,000	75,000	10,300		133,000	87,000
8,600		125,000	81,000	10,500		133,000	87,000
8,700		125,000	81,000	10,720	27/64	142,000	94,000
8,730	11/32	125,000	81,000	11,000		142,000	94,000
8,800		125,000	81,000	11,110	7/16	142,000	94,000
8,900		125,000	81,000	11,500		142,000	94,000
9,000		125,000	81,000	11,910	15/32	151,000	101,000
9,100		125,000	81,000	12,000		151,000	101,000
9,200		125,000	81,000				
9,300		125,000	81,000				
9,400		125,000	81,000				
9,500		125,000	81,000				
9,600		133,000	87,000				
9,700		133,000	87,000				
9,800		133,000	87,000				

## 工具钻

产品代号 89261

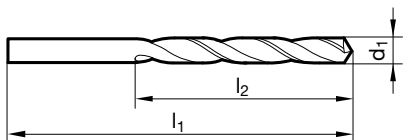


P	M	K	N	S	H
○	○	○	●	○	



双后刀面 • 精密磨削过的主切削刃

铝材料含硅量高 • 易切削钢和热处理钢 • 适合加工: 结构钢和淬硬钢 • 铸件材料 • 塑料及纤维增强塑料 • 镁和镁合金 • 黄铜



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	3,800		75,000	43,000
1,100		36,000	14,000	3,900		75,000	43,000
1,190	3/64	38,000	16,000	3,970	5/32	75,000	43,000
1,200		38,000	16,000	4,000		75,000	43,000
1,300		38,000	16,000	4,040		75,000	43,000
1,400		40,000	18,000	4,100		75,000	43,000
1,500		40,000	18,000	4,200		75,000	43,000
1,590	1/16	43,000	20,000	4,300		80,000	47,000
1,600		43,000	20,000	4,370	11/64	80,000	47,000
1,700		43,000	20,000	4,400		80,000	47,000
1,780		46,000	22,000	4,500		80,000	47,000
1,800		46,000	22,000	4,600		80,000	47,000
1,850		46,000	22,000	4,700		80,000	47,000
1,900		46,000	22,000	4,760	3/16	86,000	52,000
1,980	5/64	49,000	24,000	4,800		86,000	52,000
2,000		49,000	24,000	4,850		86,000	52,000
2,060		49,000	24,000	4,900		86,000	52,000
2,100		49,000	24,000	5,000		86,000	52,000
2,200		53,000	27,000	5,060		86,000	52,000
2,300		53,000	27,000	5,100		86,000	52,000
2,380	3/32	57,000	30,000	5,160	13/64	86,000	52,000
2,400		57,000	30,000	5,200		86,000	52,000
2,500		57,000	30,000	5,300		86,000	52,000
2,530		57,000	30,000	5,400		93,000	57,000
2,600		57,000	30,000	5,500		93,000	57,000
2,700		61,000	33,000	5,560	7/32	93,000	57,000
2,780	7/64	61,000	33,000	5,600		93,000	57,000
2,800		61,000	33,000	5,700		93,000	57,000
2,900		61,000	33,000	5,800		93,000	57,000
2,950		61,000	33,000	5,900		93,000	57,000
3,000		61,000	33,000	5,950	15/64	93,000	57,000
3,050		65,000	36,000	6,000		93,000	57,000
3,100		65,000	36,000	6,100		101,000	63,000
3,170	1/8	65,000	36,000	6,200		101,000	63,000
3,200		65,000	36,000	6,300		101,000	63,000
3,300		65,000	36,000	6,350	1/4	101,000	63,000
3,400		70,000	39,000	6,400		101,000	63,000
3,450		70,000	39,000	6,500		101,000	63,000
3,500		70,000	39,000	6,600		101,000	63,000
3,570	9/64	70,000	39,000	6,700		101,000	63,000
3,600		70,000	39,000	6,750	17/64	109,000	69,000
3,700		70,000	39,000	6,800		109,000	69,000



## 工具钻

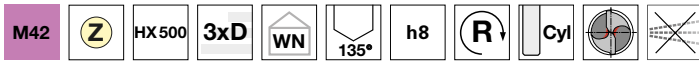
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
6,900		109,000	69,000	9,130	23/64	125,000	81,000
7,000		109,000	69,000	9,200		125,000	81,000
7,100		109,000	69,000	9,500		125,000	81,000
7,140	9/32	109,000	69,000	9,520	3/8	133,000	87,000
7,300		109,000	69,000	9,600		133,000	87,000
7,400		109,000	69,000	9,800		133,000	87,000
7,500		109,000	69,000	9,920	25/64	133,000	87,000
7,540	19/64	117,000	75,000	10,000		133,000	87,000
7,600		117,000	75,000	10,200		133,000	87,000
7,800		117,000	75,000	10,300		133,000	87,000
7,900		117,000	75,000	10,320	13/32	133,000	87,000
7,940	5/16	117,000	75,000	10,500		133,000	87,000
8,000		117,000	75,000	10,720	27/64	142,000	94,000
8,030		117,000	75,000	11,000		142,000	94,000
8,100		117,000	75,000	11,110	7/16	142,000	94,000
8,200		117,000	75,000	11,500		142,000	94,000
8,330	21/64	117,000	75,000	12,000		151,000	101,000
8,400		117,000	75,000				
8,500		117,000	75,000				
8,600		125,000	81,000				
8,700		125,000	81,000				
8,730	11/32	125,000	81,000				
9,000		125,000	81,000				
9,100		125,000	81,000				

## 短槽钻

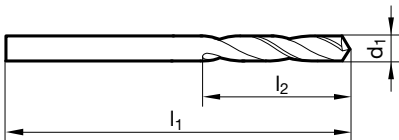
产品代号 81000



P	M	K	N	S	H
●	○	●	○	●	○



出色的耐磨性 • 优化十字钻尖形式 • 含8%钴合金高速钢  
 高性能加工结构钢, 硬化钢 • 耐磨板材 • Hardox耐磨钢板



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	34,000	6,000	8,000	117,000	37,000
1,500	40,000	9,000	8,500	117,000	37,000
2,000	49,000	12,000	9,000	125,000	40,000
2,500	57,000	14,000	9,500	125,000	40,000
3,000	61,000	16,000	10,000	133,000	43,000
3,200	65,000	18,000	10,200	133,000	43,000
3,300	65,000	18,000	10,500	133,000	43,000
3,500	70,000	20,000	11,000	142,000	47,000
4,000	75,000	22,000	11,500	142,000	47,000
4,200	75,000	22,000	12,000	151,000	51,000
4,500	80,000	24,000	12,500	151,000	51,000
5,000	86,000	26,000	13,000	151,000	51,000
5,500	93,000	28,000			
6,000	93,000	28,000			
6,500	101,000	31,000			
6,800	109,000	34,000			
7,000	109,000	34,000			
7,500	109,000	34,000			

	Hardox HiTuf	Hardox 400	Hardox 450	Hardox 500
$v_c$ (m/min)	~11	~8	~6	~4
vrc	~3	~2	~1	
$\emptyset$	f/rpm			
2.5	0.035/1400	0.025/1000	0.015/770	0.005/500
3	0.04/1200	0.03/850	0.02/640	0.01/430
4	0.05/900	0.04/650	0.03/480	0.02/320
5	0.06/700	0.05/510	0.04/400	0.03/255
6	0.07/590	0.06/430	0.05/320	0.04/220
7	0.08/500	0.07/370	0.06/280	0.05/190
8	0.09/440	0.08/320	0.07/240	0.06/160
10	0.11/350	0.10/260	0.09/200	0.08/130
13	0.14/270	0.13/200	0.12/150	0.1/100





## 增强柄麻花钻

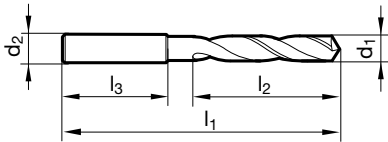
产品代号 84805



P	M	K	N	S	H
•	•	•	•		



芯厚 ≥ Ø 2,000 • 双后刀面 • 要求适合低进给率 • PM-粉末冶金钴合金高速钢 • 要求低扭矩 • 耐磨损 高强度 • 普遍适用  
 强度小于800N/mm²的合金/非合金钢 • 热/冷锻钢 • 不锈钢 • 有色金属 • 铸件材料 • 塑料 • 耐磨轴承钢



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
1,000		3,000	38,000	6,000	28,000	4,600		6,000	68,000	24,000	36,000
1,100		3,000	39,000	7,000	28,000	4,650		6,000	68,000	24,000	36,000
1,200		3,000	40,000	8,000	28,000	4,700		6,000	68,000	24,000	36,000
1,300		3,000	40,000	8,000	28,000	4,760	3/16	6,000	70,000	26,000	36,000
1,400		3,000	41,000	9,000	28,000	4,800		6,000	70,000	26,000	36,000
1,500		3,000	41,000	9,000	28,000	4,900		6,000	70,000	26,000	36,000
1,600		3,000	42,000	10,000	28,000	5,000		6,000	70,000	26,000	36,000
1,700		3,000	42,000	10,000	28,000	5,100		6,000	70,000	26,000	36,000
1,800		3,000	43,000	11,000	28,000	5,160	13/64	6,000	70,000	26,000	36,000
1,900		3,000	43,000	11,000	28,000	5,200		6,000	70,000	26,000	36,000
2,000		3,000	44,000	12,000	28,000	5,300		6,000	70,000	26,000	36,000
2,100		3,000	44,000	12,000	28,000	5,400		6,000	72,000	28,000	36,000
2,200		3,000	45,000	13,000	28,000	5,500		6,000	72,000	28,000	36,000
2,300		3,000	45,000	13,000	28,000	5,550		6,000	72,000	28,000	36,000
2,380	3/32	3,000	46,000	14,000	28,000	5,560	7/32	6,000	72,000	28,000	36,000
2,400		3,000	46,000	14,000	28,000	5,600		6,000	72,000	28,000	36,000
2,500		3,000	46,000	14,000	28,000	5,700		6,000	72,000	28,000	36,000
2,600		3,000	46,000	14,000	28,000	5,800		6,000	72,000	28,000	36,000
2,700		3,000	48,000	16,000	28,000	5,900		6,000	72,000	28,000	36,000
2,780	7/64	3,000	48,000	16,000	28,000	5,950	15/64	6,000	72,000	28,000	36,000
2,800		3,000	48,000	16,000	28,000	6,000		6,000	72,000	28,000	36,000
2,900		3,000	48,000	16,000	28,000	6,100		8,000	75,000	31,000	36,000
3,000		3,000	48,000	16,000	28,000	6,200		8,000	75,000	31,000	36,000
3,100		4,000	50,000	18,000	28,000	6,300		8,000	75,000	31,000	36,000
3,170	1/8	4,000	50,000	18,000	28,000	6,350	1/4	8,000	75,000	31,000	36,000
3,200		4,000	50,000	18,000	28,000	6,400		8,000	75,000	31,000	36,000
3,300		4,000	50,000	18,000	28,000	6,500		8,000	75,000	31,000	36,000
3,400		4,000	52,000	20,000	28,000	6,600		8,000	75,000	31,000	36,000
3,500		4,000	52,000	20,000	28,000	6,700		8,000	75,000	31,000	36,000
3,570	9/64	4,000	52,000	20,000	28,000	6,750	17/64	8,000	78,000	34,000	36,000
3,600		4,000	52,000	20,000	28,000	6,800		8,000	78,000	34,000	36,000
3,700		4,000	52,000	20,000	28,000	6,900		8,000	78,000	34,000	36,000
3,800		4,000	54,000	22,000	28,000	7,000		8,000	78,000	34,000	36,000
3,900		4,000	54,000	22,000	28,000	7,100		8,000	78,000	34,000	36,000
3,970	5/32	4,000	54,000	22,000	28,000	7,140	9/32	8,000	78,000	34,000	36,000
4,000		4,000	54,000	22,000	28,000	7,200		8,000	78,000	34,000	36,000
4,100		6,000	66,000	22,000	36,000	7,300		8,000	78,000	34,000	36,000
4,200		6,000	66,000	22,000	36,000	7,400		8,000	78,000	34,000	36,000
4,300		6,000	68,000	24,000	36,000	7,500		8,000	78,000	34,000	36,000
4,370	11/64	6,000	68,000	24,000	36,000	7,540	19/64	8,000	81,000	37,000	36,000
4,400		6,000	68,000	24,000	36,000	7,550		8,000	81,000	37,000	36,000
4,500		6,000	68,000	24,000	36,000	7,600		8,000	81,000	37,000	36,000



## 增强柄麻花钻

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
7,700		8,000	81,000	37,000	36,000	11,500		12,000	104,000	47,000	45,000
7,800		8,000	81,000	37,000	36,000	11,510	29/64	12,000	104,000	47,000	45,000
7,900		8,000	81,000	37,000	36,000	11,600		12,000	104,000	47,000	45,000
7,940	5/16	8,000	81,000	37,000	36,000	11,700		12,000	104,000	47,000	45,000
8,000		8,000	81,000	37,000	36,000	11,800		12,000	104,000	47,000	45,000
8,100		10,000	87,000	37,000	40,000	11,900		12,000	108,000	51,000	45,000
8,200		10,000	87,000	37,000	40,000	11,910	15/32	12,000	108,000	51,000	45,000
8,300		10,000	87,000	37,000	40,000	12,000		12,000	108,000	51,000	45,000
8,330	21/64	10,000	87,000	37,000	40,000	12,100		16,000	111,000	51,000	48,000
8,400		10,000	87,000	37,000	40,000	12,200		16,000	111,000	51,000	48,000
8,500		10,000	87,000	37,000	40,000	12,300	31/64	16,000	111,000	51,000	48,000
8,600		10,000	91,000	40,000	40,000	12,400		16,000	111,000	51,000	48,000
8,700		10,000	91,000	40,000	40,000	12,500		16,000	111,000	51,000	48,000
8,730	11/32	10,000	91,000	40,000	40,000	12,600		16,000	111,000	51,000	48,000
8,800		10,000	91,000	40,000	40,000	12,700	1/2	16,000	111,000	51,000	48,000
8,900		10,000	91,000	40,000	40,000	12,800		16,000	111,000	51,000	48,000
9,000		10,000	91,000	40,000	40,000	12,900		16,000	111,000	51,000	48,000
9,100		10,000	91,000	40,000	40,000	13,000		16,000	111,000	51,000	48,000
9,130	23/64	10,000	91,000	40,000	40,000	13,100	33/64	16,000	111,000	51,000	48,000
9,200		10,000	91,000	40,000	40,000	13,490	17/32	16,000	114,000	54,000	48,000
9,300		10,000	91,000	40,000	40,000	13,500		16,000	114,000	54,000	48,000
9,400		10,000	91,000	40,000	40,000	13,890	35/64	16,000	114,000	54,000	48,000
9,500		10,000	91,000	40,000	40,000	14,000		16,000	114,000	54,000	48,000
9,520	3/8	10,000	93,000	43,000	40,000	14,290	9/16	16,000	116,000	56,000	48,000
9,550		10,000	93,000	43,000	40,000	14,500		16,000	116,000	56,000	48,000
9,600		10,000	93,000	43,000	40,000	15,000		16,000	116,000	56,000	48,000
9,700		10,000	93,000	43,000	40,000	15,500		16,000	118,000	58,000	48,000
9,800		10,000	93,000	43,000	40,000	15,870	5/8	16,000	118,000	58,000	48,000
9,900		10,000	93,000	43,000	40,000	16,000		16,000	118,000	58,000	48,000
9,920	25/64	10,000	93,000	43,000	40,000	16,500		20,000	126,000	60,000	50,000
10,000		10,000	93,000	43,000	40,000	16,670	21/32	20,000	126,000	60,000	50,000
10,100		12,000	100,000	43,000	45,000	17,000		20,000	126,000	60,000	50,000
10,200		12,000	100,000	43,000	45,000	17,500		20,000	128,000	62,000	50,000
10,300		12,000	100,000	43,000	45,000	18,000		20,000	128,000	62,000	50,000
10,320	13/32	12,000	100,000	43,000	45,000	18,500		20,000	130,000	64,000	50,000
10,400		12,000	100,000	43,000	45,000	19,000		20,000	130,000	64,000	50,000
10,500		12,000	100,000	43,000	45,000	19,500		20,000	132,000	66,000	50,000
10,600		12,000	100,000	43,000	45,000	20,000		20,000	132,000	66,000	50,000
10,700		12,000	104,000	47,000	45,000						
10,720	27/64	12,000	104,000	47,000	45,000						
10,800		12,000	104,000	47,000	45,000						
10,900		12,000	104,000	47,000	45,000						
11,000		12,000	104,000	47,000	45,000						
11,100		12,000	104,000	47,000	45,000						
11,110	7/16	12,000	104,000	47,000	45,000						
11,200		12,000	104,000	47,000	45,000						
11,300		12,000	104,000	47,000	45,000						
11,400		12,000	104,000	47,000	45,000						



## 增强柄麻花钻

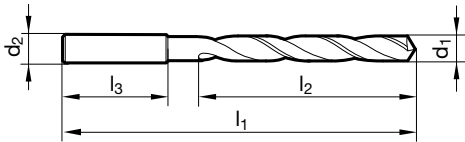
产品代号 84801



P	M	K	N	S	H
•	•	•	•		



芯厚 ≥ Ø 2,000 • 双后刀面 • 要求适合低进给率 • 要求低扭矩 • PM-粉末冶金钴合金高速钢 • 耐磨损 高强度 • 普遍适用  
 强度小于800N/mm²的合金/非合金钢 • 热/冷锻钢 • 不锈钢 • 有色金属 • 铸件材料 • 塑料



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
2,000		3,000	56,000	24,000	28,000	5,300		6,000	96,000	52,000	36,000
2,100		3,000	56,000	24,000	28,000	5,400		6,000	101,000	57,000	36,000
2,200		3,000	59,000	27,000	28,000	5,500		6,000	101,000	57,000	36,000
2,300		3,000	59,000	27,000	28,000	5,550		6,000	101,000	57,000	36,000
2,380	3/32	3,000	62,000	30,000	28,000	5,560	7/32	6,000	101,000	57,000	36,000
2,400		3,000	62,000	30,000	28,000	5,600		6,000	101,000	57,000	36,000
2,500		3,000	62,000	30,000	28,000	5,700		6,000	101,000	57,000	36,000
2,600		3,000	62,000	30,000	28,000	5,800		6,000	101,000	57,000	36,000
2,700		3,000	65,000	33,000	28,000	5,900		6,000	101,000	57,000	36,000
2,780	7/64	3,000	65,000	33,000	28,000	5,950	15/64	6,000	101,000	57,000	36,000
2,800		3,000	65,000	33,000	28,000	6,000		6,000	101,000	57,000	36,000
2,900		3,000	65,000	33,000	28,000	6,100		8,000	107,000	63,000	36,000
3,000		3,000	65,000	33,000	28,000	6,200		8,000	107,000	63,000	36,000
3,100		4,000	68,000	36,000	28,000	6,300		8,000	107,000	63,000	36,000
3,170	1/8	4,000	68,000	36,000	28,000	6,350	1/4	8,000	107,000	63,000	36,000
3,200		4,000	68,000	36,000	28,000	6,400		8,000	107,000	63,000	36,000
3,300		4,000	68,000	36,000	28,000	6,500		8,000	107,000	63,000	36,000
3,400		4,000	71,000	39,000	28,000	6,600		8,000	107,000	63,000	36,000
3,500		4,000	71,000	39,000	28,000	6,700		8,000	107,000	63,000	36,000
3,570	9/64	4,000	71,000	39,000	28,000	6,750	17/64	8,000	113,000	69,000	36,000
3,600		4,000	71,000	39,000	28,000	6,800		8,000	113,000	69,000	36,000
3,700		4,000	71,000	39,000	28,000	6,900		8,000	113,000	69,000	36,000
3,800		4,000	75,000	43,000	28,000	7,000		8,000	113,000	69,000	36,000
3,900		4,000	75,000	43,000	28,000	7,100		8,000	113,000	69,000	36,000
3,970	5/32	4,000	75,000	43,000	28,000	7,140	9/32	8,000	113,000	69,000	36,000
4,000		4,000	75,000	43,000	28,000	7,200		8,000	113,000	69,000	36,000
4,100		6,000	87,000	43,000	36,000	7,300		8,000	113,000	69,000	36,000
4,200		6,000	87,000	43,000	36,000	7,400		8,000	113,000	69,000	36,000
4,300		6,000	91,000	47,000	36,000	7,500		8,000	113,000	69,000	36,000
4,370	11/64	6,000	91,000	47,000	36,000	7,540	19/64	8,000	119,000	75,000	36,000
4,400		6,000	91,000	47,000	36,000	7,550		8,000	119,000	75,000	36,000
4,500		6,000	91,000	47,000	36,000	7,600		8,000	119,000	75,000	36,000
4,600		6,000	91,000	47,000	36,000	7,700		8,000	119,000	75,000	36,000
4,650		6,000	91,000	47,000	36,000	7,800		8,000	119,000	75,000	36,000
4,700		6,000	91,000	47,000	36,000	7,900		8,000	119,000	75,000	36,000
4,760	3/16	6,000	96,000	52,000	36,000	7,940	5/16	8,000	119,000	75,000	36,000
4,800		6,000	96,000	52,000	36,000	8,000		8,000	119,000	75,000	36,000
4,900		6,000	96,000	52,000	36,000	8,100		10,000	125,000	75,000	40,000
5,000		6,000	96,000	52,000	36,000	8,200		10,000	125,000	75,000	40,000
5,100		6,000	96,000	52,000	36,000	8,300		10,000	125,000	75,000	40,000
5,160	13/64	6,000	96,000	52,000	36,000	8,330	21/64	10,000	125,000	75,000	40,000
5,200		6,000	96,000	52,000	36,000	8,400		10,000	125,000	75,000	40,000



## 增强柄麻花钻

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
8,500		10,000	125,000	75,000	40,000	11,800		12,000	151,000	94,000	45,000
8,600		10,000	131,000	81,000	40,000	11,900		12,000	158,000	101,000	45,000
8,700		10,000	131,000	81,000	40,000	11,910	15/32	12,000	158,000	101,000	45,000
8,730	11/32	10,000	131,000	81,000	40,000	12,000		12,000	158,000	101,000	45,000
8,800		10,000	131,000	81,000	40,000	12,100		16,000	161,000	101,000	48,000
8,900		10,000	131,000	81,000	40,000	12,200		16,000	161,000	101,000	48,000
9,000		10,000	131,000	81,000	40,000	12,300	31/64	16,000	161,000	101,000	48,000
9,100		10,000	131,000	81,000	40,000	12,400		16,000	161,000	101,000	48,000
9,130	23/64	10,000	131,000	81,000	40,000	12,500		16,000	161,000	101,000	48,000
9,200		10,000	131,000	81,000	40,000	12,600		16,000	161,000	101,000	48,000
9,300		10,000	131,000	81,000	40,000	12,700	1/2	16,000	161,000	101,000	48,000
9,400		10,000	131,000	81,000	40,000	12,800		16,000	161,000	101,000	48,000
9,500		10,000	131,000	81,000	40,000	12,900		16,000	161,000	101,000	48,000
9,520	3/8	10,000	137,000	87,000	40,000	13,000		16,000	161,000	101,000	48,000
9,550		10,000	137,000	87,000	40,000	13,100	33/64	16,000	161,000	101,000	48,000
9,600		10,000	137,000	87,000	40,000	13,490	17/32	16,000	166,000	106,000	48,000
9,700		10,000	137,000	87,000	40,000	13,500		16,000	166,000	106,000	48,000
9,800		10,000	137,000	87,000	40,000	13,890	35/64	16,000	166,000	106,000	48,000
9,900		10,000	137,000	87,000	40,000	14,000		16,000	166,000	106,000	48,000
9,920	25/64	10,000	137,000	87,000	40,000	14,290	9/16	16,000	169,000	109,000	48,000
10,000		10,000	137,000	87,000	40,000	14,500		16,000	169,000	109,000	48,000
10,100		12,000	144,000	87,000	45,000	15,000		16,000	169,000	109,000	48,000
10,200		12,000	144,000	87,000	45,000	15,500		16,000	172,000	112,000	48,000
10,300		12,000	144,000	87,000	45,000	15,870	5/8	16,000	172,000	112,000	48,000
10,320	13/32	12,000	144,000	87,000	45,000	16,000		16,000	172,000	112,000	48,000
10,400		12,000	144,000	87,000	45,000	16,500		20,000	181,000	115,000	50,000
10,500		12,000	144,000	87,000	45,000	16,670	21/32	20,000	181,000	115,000	50,000
10,600		12,000	144,000	87,000	45,000	17,000		20,000	181,000	115,000	50,000
10,700		12,000	151,000	94,000	45,000	17,460	11/16	20,000	184,000	118,000	50,000
10,720	27/64	12,000	151,000	94,000	45,000	17,500		20,000	184,000	118,000	50,000
10,800		12,000	151,000	94,000	45,000	18,000		20,000	184,000	118,000	50,000
10,900		12,000	151,000	94,000	45,000	18,500		20,000	188,000	122,000	50,000
11,000		12,000	151,000	94,000	45,000	19,000		20,000	188,000	122,000	50,000
11,100		12,000	151,000	94,000	45,000	19,500		20,000	191,000	125,000	50,000
11,110	7/16	12,000	151,000	94,000	45,000	20,000		20,000	191,000	125,000	50,000
11,200		12,000	151,000	94,000	45,000						
11,300		12,000	151,000	94,000	45,000						
11,400		12,000	151,000	94,000	45,000						
11,500		12,000	151,000	94,000	45,000						
11,510	29/64	12,000	151,000	94,000	45,000						
11,600		12,000	151,000	94,000	45,000						
11,700		12,000	151,000	94,000	45,000						

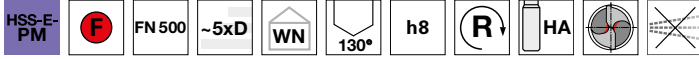


## 增强柄麻花钻

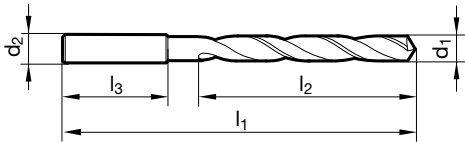
产品代号 84507



P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • PM-粉末冶金钴合金高速钢 • 出色的耐磨性 • 刚性好  
 高强度材料、高合金钢 • 热处理钢和淬硬钢 • 铸铁,黄铜,青铜



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
2,000		3,000	56,000	24,000	28,000	6,000		6,000	101,000	57,000	36,000
2,100		3,000	56,000	24,000	28,000	6,100		8,000	107,000	63,000	36,000
2,200		3,000	59,000	27,000	28,000	6,200		8,000	107,000	63,000	36,000
2,300		3,000	59,000	27,000	28,000	6,300		8,000	107,000	63,000	36,000
2,380	3/32	3,000	62,000	30,000	28,000	6,400		8,000	107,000	63,000	36,000
2,400		3,000	62,000	30,000	28,000	6,500		8,000	107,000	63,000	36,000
2,500		3,000	62,000	30,000	28,000	6,600		8,000	107,000	63,000	36,000
2,600		3,000	62,000	30,000	28,000	6,700		8,000	107,000	63,000	36,000
2,700		3,000	65,000	33,000	28,000	6,750	17/64	8,000	113,000	69,000	36,000
2,800		3,000	65,000	33,000	28,000	6,800		8,000	113,000	69,000	36,000
2,900		3,000	65,000	33,000	28,000	6,900		8,000	113,000	69,000	36,000
3,000		3,000	65,000	33,000	28,000	7,000		8,000	113,000	69,000	36,000
3,100		4,000	68,000	36,000	28,000	7,100		8,000	113,000	69,000	36,000
3,170	1/8	4,000	68,000	36,000	28,000	7,200		8,000	113,000	69,000	36,000
3,200		4,000	68,000	36,000	28,000	7,300		8,000	113,000	69,000	36,000
3,300		4,000	68,000	36,000	28,000	7,400		8,000	113,000	69,000	36,000
3,400		4,000	71,000	39,000	28,000	7,500		8,000	113,000	69,000	36,000
3,500		4,000	71,000	39,000	28,000	7,700		8,000	119,000	75,000	36,000
3,600		4,000	71,000	39,000	28,000	7,800		8,000	119,000	75,000	36,000
3,700		4,000	71,000	39,000	28,000	8,000		8,000	119,000	75,000	36,000
3,800		4,000	75,000	43,000	28,000	8,100		10,000	125,000	75,000	40,000
3,900		4,000	75,000	43,000	28,000	8,200		10,000	125,000	75,000	40,000
4,000		4,000	75,000	43,000	28,000	8,300		10,000	125,000	75,000	40,000
4,100		6,000	87,000	43,000	36,000	8,400		10,000	125,000	75,000	40,000
4,200		6,000	87,000	43,000	36,000	8,500		10,000	125,000	75,000	40,000
4,300		6,000	91,000	47,000	36,000	8,600		10,000	131,000	81,000	40,000
4,400		6,000	91,000	47,000	36,000	8,700		10,000	131,000	81,000	40,000
4,500		6,000	91,000	47,000	36,000	8,730	11/32	10,000	131,000	81,000	40,000
4,600		6,000	91,000	47,000	36,000	8,800		10,000	131,000	81,000	40,000
4,650		6,000	91,000	47,000	36,000	9,000		10,000	131,000	81,000	40,000
4,700		6,000	91,000	47,000	36,000	9,300		10,000	131,000	81,000	40,000
4,800		6,000	96,000	52,000	36,000	9,500		10,000	131,000	81,000	40,000
4,900		6,000	96,000	52,000	36,000	9,700		10,000	137,000	87,000	40,000
5,000		6,000	96,000	52,000	36,000	9,800		10,000	137,000	87,000	40,000
5,100		6,000	96,000	52,000	36,000	9,900		10,000	137,000	87,000	40,000
5,160	13/64	6,000	96,000	52,000	36,000	10,000		10,000	137,000	87,000	40,000
5,300		6,000	96,000	52,000	36,000	10,200		12,000	144,000	87,000	45,000
5,400		6,000	101,000	57,000	36,000	10,300		12,000	144,000	87,000	45,000
5,500		6,000	101,000	57,000	36,000	10,400		12,000	144,000	87,000	45,000
5,550		6,000	101,000	57,000	36,000	10,500		12,000	144,000	87,000	45,000
5,600		6,000	101,000	57,000	36,000	10,600		12,000	144,000	87,000	45,000
5,950	15/64	6,000	101,000	57,000	36,000	11,000		12,000	151,000	94,000	45,000



## 增强柄麻花钻

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
11,300		12,000	151,000	94,000	45,000	12,100		14,000	161,000	101,000	45,000
11,400		12,000	151,000	94,000	45,000	12,400		14,000	161,000	101,000	45,000
11,500		12,000	151,000	94,000	45,000	12,500		14,000	161,000	101,000	45,000
11,700		12,000	151,000	94,000	45,000	12,800		14,000	161,000	101,000	45,000
11,800		12,000	151,000	94,000	45,000	13,000		14,000	161,000	101,000	45,000
12,000		12,000	158,000	101,000	45,000						

成套工具钻

产品代号 88303



特例

d1 mm	递增 mm	每套钻头数量	代号
1.0-5.0	0.1	41	0,111
5.1-10.0	0.1	50	0,112
1.0-10.0	0.5	19	0,113
1.0-13.0	0.5	25	0,114
1.0-5.9	0.1	50	0,115
1.0-10.0	0.5	19	0,213
1.0-13.0	0.5	25	0,214
1.0-5.9	0.1	50	0,215
6.0-10.0	0.1	41	0,216
1.0-10.5	0.5	32	0,219

## 成套工具钻

产品代号 88015



P	M	K	N	S	H
•	○	○	○		



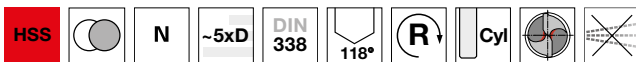
用于金属 • 圆弧后刀面

d1 mm	递增 mm	每套钻头数量	代号
1.0-5.0	0.1	41	0,011
5.1-10.0	0.1	50	0,012
1.0-13.0	0.5	25	0,014
1.0-10.5	0.5	24	0,018

产品代号 88013



P	M	K	N	S	H
•		•	○		



用于塑料 • 圆弧后刀面

适于加工：合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨

d1 mm	递增 mm	每套钻头数量	代号
1.0-10.0	0.5	19	0,013
1.0-13.0	0.5	25	0,014
1.0-5.9	0.1	50	0,015
6.0-10.0	0.1	41	0,016
1.0-10.5	0.5	32	0,019
1.0-5.0	0.1	41	0,311
1.0-13.0	0.5	25	0,314
1.0-5.9	0.1	50	0,315

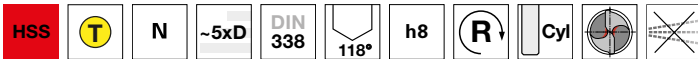


## 成套工具钻

产品代号 88016



P	M	K	N	S	H
•		•	○		



用于塑料 • 圆弧后刀面 • 刀尖涂层

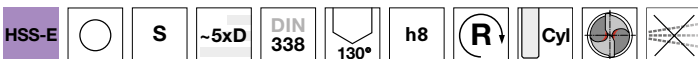
适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨

d1 mm	递增 mm	每套钻头数量	代号
1.0-13.0	0.5	25	6,014
1.0-5.9	0.1	50	6,015
6.0-10.0	0.1	41	6,016
1.0-10.5	0.5	24	6,018

产品代号 88014



P	M	K	N	S	H
○	•			•	



用于塑料 • 圆弧后刀面

钛及钛合金 • 不锈钢/耐酸-/耐热奥氏体钢 • 强度超过900 N/mm<sup>2</sup>的高强度/短屑钢 • 哈氏合金, 镍合金, 锰合金

d1 mm	递增 mm	每套钻头数量	代号
1.0-5.0	0.1	41	8,011
5.1-10.0	0.1	50	8,012
1.0-10.0	0.5	19	8,013
1.0-13.0	0.5	25	8,014
1.0-10.5	0.5	24	8,018

## 成套工具钻

产品代号 88026



P	M	K	N	S	H
•		•	○		



用于塑料 • 圆弧后刀面

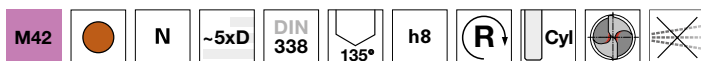
适于加工: 合金/非合金钢和铸钢 • 强度大于800 N/mm<sup>2</sup>的铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢

d1 mm	递增 mm	每套钻头数量	代号
1.0-10.0	0.5	19	3,013
1.0-13.0	0.5	25	3,014

产品代号 88018



P	M	K	N	S	H
•	•	•	•	•	○



包含高速钢M42的钻头, 标注品代号81018

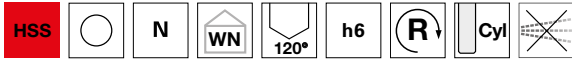
d1 mm	递增 mm	每套钻头数量	代号
1.0-10.0	0.5	19	0,013
1.0-13.0	0.5	25	0,014

## NC 点钻

产品代号 81191



P	M	K	N	S	H
●	○	●	●	○	

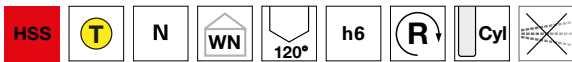


圆弧后刀面 • 仅适合打定位孔  
通用场合

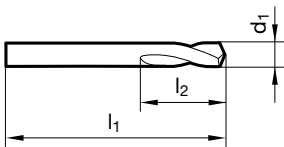
产品代号 84434



P	M	K	N	S	H
●	○	●	●	○	



圆弧后刀面 • 仅适合打定位孔  
通用场合



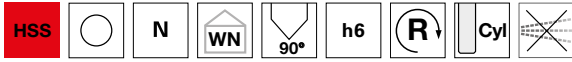
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		46,000	12,000	12,000		102,000	30,000
4,000		55,000	12,000	14,000		107,000	33,500
5,000		62,000	14,000	15,000		111,000	33,500
6,000		66,000	16,000	16,000		115,000	37,500
8,000		79,000	21,000	20,000		131,000	45,000
10,000		89,000	25,000	25,000	63/64	151,000	53,000

## NC 点钻

产品代号 81192



P	M	K	N	S	H
•	○	•	•	•	

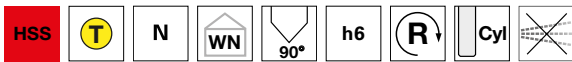


圆弧后刀面 • 仅适合打定位孔  
通用场合

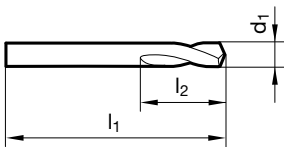
产品代号 84435



P	M	K	N	S	H
•	○	•	•	○	



圆弧后刀面 • 仅适合打定位孔  
通用场合



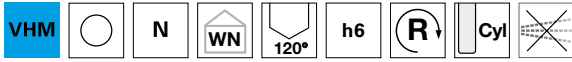
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		46,000	12,000	12,000		102,000	30,000
4,000		55,000	12,000	14,000		107,000	33,500
5,000		62,000	14,000	16,000		115,000	37,500
6,000		66,000	16,000	20,000		131,000	45,000
8,000		79,000	21,000	25,000	63/64	151,000	53,000
10,000		89,000	25,000				

## NC 点钻

### 产品代号 89242



P	M	K	N	S	H
○	○	○	○	○	○

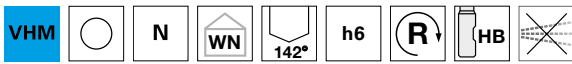


芯厚 ≥ Ø 16,000 • 双后刀面 • 仅适合打定位孔  
通用场合

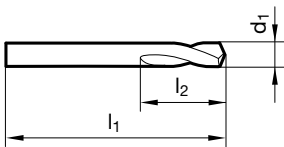
### 产品代号 89249



P	M	K	N	S	H
○	○	○	○	○	○



双后刀面 • 仅适合打定位孔  
通用场合



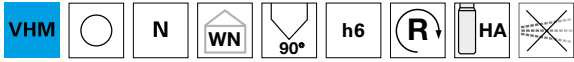
d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
4,000		55,000	12,000	12,700	1/2	102,000	30,000
5,000		62,000	14,000	16,000		115,000	37,500
6,000		66,000	16,000	20,000		131,000	45,000
8,000		79,000	21,000				
10,000		89,000	25,000				
12,000		102,000	30,000				

## NC 点钻

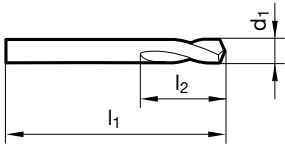
产品代号 89243



P	M	K	N	S	H
○	○	○	○	○	○



双后刀面 • 仅适合打定位孔  
通用场合



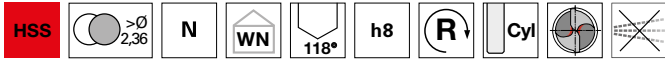
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
4,000	55,000	12,000	16,000	115,000	37,500
5,000	62,000	14,000	20,000	131,000	45,000
6,000	66,000	16,000			
8,000	79,000	21,000			
10,000	89,000	25,000			
12,000	102,000	30,000			

## 直柄双头钻

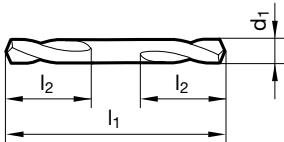
产品代号 81190



P	M	K	N	S	H
•	○	•	•	•	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 两头均可用 • 用于车身制造的手摇钻机床  
薄壁材料



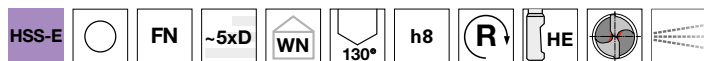
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
2,000	38,000	7,500	5,100	62,000	17,000
2,100	38,000	7,500	5,200	62,000	17,000
2,400	43,000	9,500	5,300	62,000	17,000
2,500	43,000	9,500	5,400	66,000	19,000
2,600	43,000	9,500	5,500	66,000	19,000
2,700	46,000	10,600	5,700	66,000	19,000
2,800	46,000	10,600	5,900	66,000	19,000
2,900	46,000	10,600	6,000	66,000	19,000
3,000	46,000	10,600	6,300	70,000	21,200
3,100	49,000	11,200	6,500	70,000	21,200
3,200	49,000	11,200	7,500	74,000	23,600
3,300	49,000	11,200	8,000	79,000	25,000
3,400	52,000	12,500	9,000	84,000	25,000
3,500	52,000	12,500	9,500	84,000	25,000
3,800	55,000	14,000	10,000	89,000	25,000
3,900	55,000	14,000			
4,000	55,000	14,000			
4,100	55,000	14,000			
4,200	55,000	14,000			
4,500	58,000	15,500			
4,700	58,000	15,500			
4,800	62,000	17,000			
4,900	62,000	17,000			
5,000	62,000	17,000			

## 内冷钻

### 产品代号 82761



P	M	K	N	S	H
•	•	•	•	•	

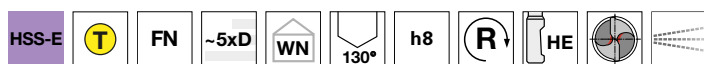


芯厚 ≥ Ø 5,000 • 圆弧后刀面 • 高耐磨强度  
 ≤1000 N/mm<sup>2</sup>的长屑材料 • 不锈钢 • 铸件材料 • 有色金属

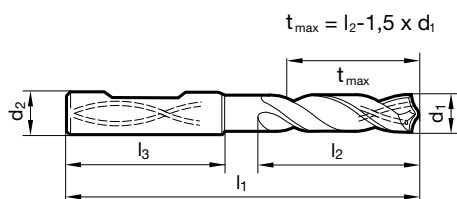
### 产品代号 84461



P	M	K	N	S	H
•	•	•	•	•	○



芯厚 ≥ Ø 5,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 ≤1000 N/mm<sup>2</sup>的长屑材料 • 不锈钢 • 铸件材料 • 有色金属



d1	d2 h6	l1	l2	l3	d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
5,000	6,000	82,000	44,000	36,000	13,000	14,000	124,000	77,000	45,000
5,500	6,000	82,000	44,000	36,000	13,500	14,000	124,000	77,000	45,000
6,000	6,000	82,000	44,000	36,000	14,000	14,000	124,000	77,000	45,000
6,500	8,000	91,000	53,000	36,000	14,500	16,000	133,000	83,000	48,000
7,000	8,000	91,000	53,000	36,000	15,000	16,000	133,000	83,000	48,000
7,500	8,000	91,000	53,000	36,000	15,500	16,000	133,000	83,000	48,000
7,800	8,000	91,000	53,000	36,000	16,000	16,000	133,000	83,000	48,000
8,000	8,000	91,000	53,000	36,000	16,500	18,000	143,000	93,000	48,000
8,500	10,000	103,000	61,000	40,000	17,000	18,000	143,000	93,000	48,000
9,000	10,000	103,000	61,000	40,000	17,500	18,000	143,000	93,000	48,000
9,500	10,000	103,000	61,000	40,000	18,000	18,000	143,000	93,000	48,000
10,000	10,000	103,000	61,000	40,000	18,500	20,000	153,000	101,000	50,000
10,200	12,000	118,000	71,000	45,000	19,000	20,000	153,000	101,000	50,000
10,500	12,000	118,000	71,000	45,000	19,500	20,000	153,000	101,000	50,000
11,000	12,000	118,000	71,000	45,000	20,000	20,000	153,000	101,000	50,000
11,500	12,000	118,000	71,000	45,000					
12,000	12,000	118,000	71,000	45,000					
12,500	14,000	124,000	77,000	45,000					

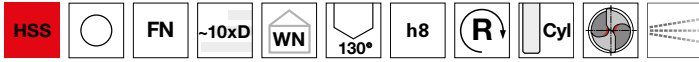


## 内冷钻

产品代号 82710

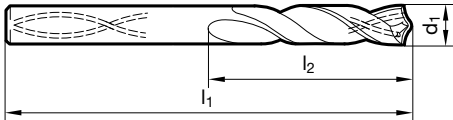


P	M	K	N	S	H
●	○	●	●	○	



芯厚  $\geq \varnothing 3,000$  • 圆弧后刀面 • 使用钻套钻削 • 尤其适合孔深超过5xD

适于加工: 叠层金属薄板件 • 钢和铸钢, 灰铸铁 •  $\leq 800\text{N/mm}^2$  的奥氏体钢



d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000	3,000	100,000	66,000	34,000	9,000	9,000	175,000	115,000	60,000
3,300	3,300	106,000	69,000	37,000	9,500	9,500	175,000	115,000	60,000
4,000	4,000	119,000	78,000	41,000	10,000	10,000	184,000	121,000	63,000
5,000	5,000	132,000	87,000	45,000	10,200	10,200	184,000	121,000	63,000
5,500	5,500	139,000	91,000	48,000	10,500	10,500	184,000	121,000	63,000
6,000	6,000	139,000	91,000	48,000	11,000	11,000	195,000	128,000	67,000
6,500	6,500	148,000	97,000	51,000	11,500	11,500	195,000	128,000	67,000
6,800	6,800	156,000	102,000	54,000	12,000	12,000	205,000	134,000	71,000
7,000	7,000	156,000	102,000	54,000	13,000	13,000	205,000	134,000	71,000
7,500	7,500	156,000	102,000	54,000					
8,000	8,000	165,000	109,000	56,000					
8,500	8,500	165,000	109,000	56,000					



# HARTNER

## 采用钻套的麻花钻

产品代号 81210

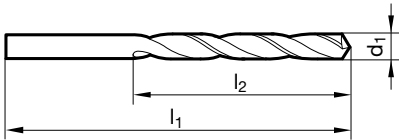


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 使用钻套钻削 • 柄齿, DIN 1809标准

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,800		42,000	22,000	4,900		108,000	74,000
0,950		45,000	24,000	5,000		108,000	74,000
1,000		48,000	26,000	5,100		108,000	74,000
1,200		52,000	30,000	5,200		108,000	74,000
1,250		52,000	30,000	5,300		108,000	74,000
1,350		55,000	33,000	5,350		116,000	80,000
1,400		55,000	33,000	5,400		116,000	80,000
1,450		55,000	33,000	5,500		116,000	80,000
1,500		55,000	33,000	5,550		116,000	80,000
1,700		58,000	35,000	5,600		116,000	80,000
1,800		62,000	38,000	5,700		116,000	80,000
1,900		62,000	38,000	5,750		116,000	80,000
2,000		66,000	41,000	5,800		116,000	80,000
2,300		70,000	44,000	5,900		116,000	80,000
2,350		70,000	44,000	5,950	15/64	116,000	80,000
2,400		74,000	47,000	6,000		116,000	80,000
2,450		74,000	47,000	6,200		124,000	86,000
2,500		74,000	47,000	6,400		124,000	86,000
2,600		74,000	47,000	6,500		124,000	86,000
2,900		79,000	51,000	6,600		124,000	86,000
3,000		79,000	51,000	6,700		124,000	86,000
3,050		84,000	55,000	6,750	17/64	133,000	93,000
3,100		84,000	55,000	6,900		133,000	93,000
3,200		84,000	55,000	7,000		133,000	93,000
3,250		84,000	55,000	7,100		133,000	93,000
3,300		84,000	55,000	7,200		133,000	93,000
3,400		91,000	60,000	7,400		133,000	93,000
3,500		91,000	60,000	7,500		133,000	93,000
3,600		91,000	60,000	7,600		142,000	100,000
3,700		91,000	60,000	7,700		142,000	100,000
3,750		91,000	60,000	7,800		142,000	100,000
3,800		96,000	64,000	8,000		142,000	100,000
3,900		96,000	64,000	8,200		142,000	100,000
4,000		96,000	64,000	8,250		142,000	100,000
4,050		96,000	64,000	8,500		142,000	100,000
4,200		96,000	64,000	8,600		151,000	107,000
4,300		102,000	69,000	8,700		151,000	107,000
4,400		102,000	69,000	8,800		151,000	107,000
4,500		102,000	69,000	9,000		151,000	107,000
4,600		102,000	69,000	9,100		151,000	107,000
4,700		102,000	69,000	9,400		151,000	107,000
4,800		108,000	74,000	9,500		151,000	107,000



## 采用钻套的麻花钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,600		162,100	116,000	12,500		184,000	134,000
9,800		162,100	116,000	13,000		184,000	134,000
10,000		162,100	116,000	13,500		194,000	142,000
10,200		162,100	116,000	14,000		194,000	142,000
10,500		162,100	116,000	14,200		202,000	147,000
10,600		162,100	116,000	14,500		202,000	147,000
10,800		173,000	125,000	15,500		211,000	153,000
11,000		173,000	125,000	16,500		218,000	159,000
11,500		173,000	125,000	18,000		226,000	165,000
11,750		173,000	125,000	19,000		234,000	171,000
12,000		184,000	134,000				
12,200		184,000	134,000				



## 长系列麻花钻

产品代号 81310

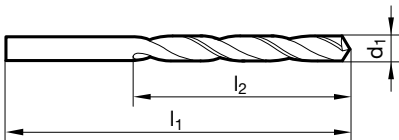


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 尤其适合加工深孔

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,400		30,000	10,000	2,900		100,000	66,000
0,500		32,000	12,000	2,950		100,000	66,000
0,600		35,000	15,000	3,000		100,000	66,000
0,700		42,000	21,000	3,050		106,000	69,000
0,750		42,000	21,000	3,100		106,000	69,000
0,800		46,000	25,000	3,150		106,000	69,000
0,850		46,000	25,000	3,200		106,000	69,000
0,900		51,000	29,000	3,250		106,000	69,000
0,910		51,000	29,000	3,300		106,000	69,000
0,950		51,000	29,000	3,350		106,000	69,000
1,000		56,000	33,000	3,400		112,000	73,000
1,050		56,000	33,000	3,450		112,000	73,000
1,100		60,000	37,000	3,500		112,000	73,000
1,200		65,000	41,000	3,550		112,000	73,000
1,250		65,000	41,000	3,600		112,000	73,000
1,300		65,000	41,000	3,650		112,000	73,000
1,350		70,000	45,000	3,700		112,000	73,000
1,400		70,000	45,000	3,750		112,000	73,000
1,500		70,000	45,000	3,800		119,000	78,000
1,550		76,000	50,000	3,900		119,000	78,000
1,600		76,000	50,000	3,950		119,000	78,000
1,700		76,000	50,000	4,000		119,000	78,000
1,750		80,000	53,000	4,040		119,000	78,000
1,800		80,000	53,000	4,050		119,000	78,000
1,850		80,000	53,000	4,100		119,000	78,000
1,900		80,000	53,000	4,150		119,000	78,000
1,950		85,000	56,000	4,200		119,000	78,000
2,000		85,000	56,000	4,250		119,000	78,000
2,050		85,000	56,000	4,300		126,000	82,000
2,100		85,000	56,000	4,400		126,000	82,000
2,150		90,000	59,000	4,450		126,000	82,000
2,200		90,000	59,000	4,500		126,000	82,000
2,250		90,000	59,000	4,550		126,000	82,000
2,400		95,000	62,000	4,600		126,000	82,000
2,450		95,000	62,000	4,650		126,000	82,000
2,500		95,000	62,000	4,700		126,000	82,000
2,550		95,000	62,000	4,750		126,000	82,000
2,600		95,000	62,000	4,760	3/16	132,000	87,000
2,700		100,000	66,000	4,800		132,000	87,000
2,750		100,000	66,000	4,850		132,000	87,000
2,800		100,000	66,000	4,900		132,000	87,000
2,850		100,000	66,000	4,950		132,000	87,000



## 长系列麻花钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,000		132,000	87,000	9,700		184,000	121,000
5,050		132,000	87,000	9,750		184,000	121,000
5,100		132,000	87,000	9,800		184,000	121,000
5,150		132,000	87,000	9,900		184,000	121,000
5,200		132,000	87,000	9,920	25/64	184,000	121,000
5,250		132,000	87,000	10,000		184,000	121,000
5,300		132,000	87,000	10,100		184,000	121,000
5,350		139,000	91,000	10,200		184,000	121,000
5,400		139,000	91,000	10,250		184,000	121,000
5,450		139,000	91,000	10,500		184,000	121,000
5,500		139,000	91,000	10,700		195,000	128,000
5,600		139,000	91,000	10,720	27/64	195,000	128,000
5,700		139,000	91,000	10,750		195,000	128,000
5,750		139,000	91,000	11,000		195,000	128,000
5,800		139,000	91,000	11,200		195,000	128,000
5,850		139,000	91,000	11,250		195,000	128,000
5,900		139,000	91,000	11,300		195,000	128,000
5,950	15/64	139,000	91,000	11,500		195,000	128,000
6,000		139,000	91,000	11,700		195,000	128,000
6,100		148,000	97,000	11,750		195,000	128,000
6,150		148,000	97,000	11,800		195,000	128,000
6,200		148,000	97,000	12,000		205,000	134,000
6,250		148,000	97,000	12,100		205,000	134,000
6,300		148,000	97,000	12,200		205,000	134,000
6,350	1/4	148,000	97,000	12,300	31/64	205,000	134,000
6,400		148,000	97,000	12,500		205,000	134,000
6,500		148,000	97,000	12,700	1/2	205,000	134,000
6,600		148,000	97,000	12,800		205,000	134,000
6,700		148,000	97,000	13,000		205,000	134,000
6,750	17/64	156,000	102,000	13,490	17/32	214,000	140,000
6,800		156,000	102,000	13,500		214,000	140,000
6,900		156,000	102,000	14,000		214,000	140,000
7,000		156,000	102,000	14,200		220,000	144,000
7,100		156,000	102,000	14,250		220,000	144,000
7,200		156,000	102,000	14,500		220,000	144,000
7,250		156,000	102,000	14,800		220,000	144,000
7,300		156,000	102,000	14,900		220,000	144,000
7,400		156,000	102,000	15,000		220,000	144,000
7,500		156,000	102,000	15,100		227,000	149,000
7,700		165,000	109,000	15,200		227,000	149,000
7,800		165,000	109,000	15,250		227,000	149,000
7,900		165,000	109,000	15,500		227,000	149,000
7,940	5/16	165,000	109,000	15,600		227,000	149,000
8,000		165,000	109,000	16,000		227,000	149,000
8,100		165,000	109,000	16,500		235,000	154,000
8,200		165,000	109,000	17,000		235,000	154,000
8,250		165,000	109,000	17,500		241,000	158,000
8,300		165,000	109,000	18,000		241,000	158,000
8,400		165,000	109,000	18,500		247,000	162,000
8,500		165,000	109,000	19,000		247,000	162,000
8,600		175,000	115,000	20,000		254,000	166,000
8,700		175,000	115,000	21,000		261,000	171,000
8,800		175,000	115,000	22,000		268,000	176,000
8,900		175,000	115,000				
9,000		175,000	115,000				
9,200		175,000	115,000				
9,300		175,000	115,000				
9,400		175,000	115,000				
9,500		175,000	115,000				
9,600		184,000	121,000				



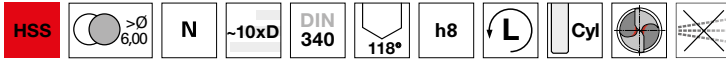
# HARTNER

## 长系列麻花钻

产品代号 81315

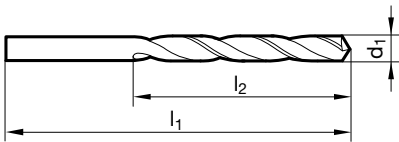


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 15,000 • 圆弧后刀面 • 尤其适合加工深孔 • 使用钻套钻削

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



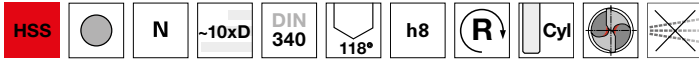
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
0,900	51,000	29,000	7,900	165,000	109,000
1,200	65,000	41,000	8,000	165,000	109,000
1,250	65,000	41,000	8,500	165,000	109,000
1,500	70,000	45,000	9,000	175,000	115,000
1,550	76,000	50,000	10,000	184,000	121,000
2,800	100,000	66,000	11,000	195,000	128,000
2,900	100,000	66,000	12,000	205,000	134,000
3,000	100,000	66,000			
3,800	119,000	78,000			
4,000	119,000	78,000			
4,200	119,000	78,000			
4,500	126,000	82,000			
5,000	132,000	87,000			
5,700	139,000	91,000			
5,800	139,000	91,000			
6,000	139,000	91,000			
6,500	148,000	97,000			
7,500	156,000	102,000			

## 长系列麻花钻

产品代号 81317

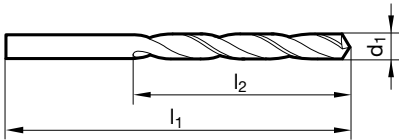


P	M	K	N	S	H
•		•	○		



芯厚  $\geq \varnothing 3,100$  • 圆弧后刀面 • 柄齿

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



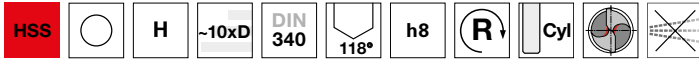
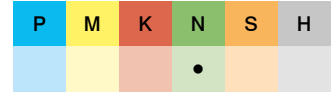
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
3,100	106,000	69,000	6,600	148,000	97,000
3,400	112,000	73,000	7,000	156,000	102,000
3,600	112,000	73,000	7,300	156,000	102,000
3,700	112,000	73,000	7,400	156,000	102,000
4,000	119,000	78,000	7,500	156,000	102,000
4,300	126,000	82,000	7,900	165,000	109,000
4,500	126,000	82,000	8,000	165,000	109,000
4,900	132,000	87,000	8,250	165,000	109,000
5,000	132,000	87,000	8,400	165,000	109,000
5,500	139,000	91,000	8,700	175,000	115,000
5,700	139,000	91,000	10,000	184,000	121,000
6,100	148,000	97,000	12,200	205,000	134,000



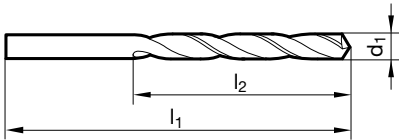
# HARTNER

## 长系列麻花钻

产品代号 81320



芯厚 ≥ Ø 14,500 • 圆弧后刀面 • 尤其适合加工深孔  
脆硬的材料 • 黄铜, 镁合金 • 青铜, 磷青铜 • 石板, 电木, 酚醛树脂



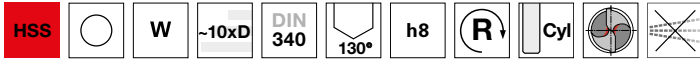
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
0,500	32,000	12,000	4,000	119,000	78,000
0,600	35,000	15,000	4,100	119,000	78,000
0,700	42,000	21,000	4,200	119,000	78,000
0,750	42,000	21,000	4,400	126,000	82,000
0,800	46,000	25,000	4,500	126,000	82,000
0,900	51,000	29,000	4,700	126,000	82,000
1,000	56,000	33,000	4,900	132,000	87,000
1,050	56,000	33,000	5,000	132,000	87,000
1,100	60,000	37,000	5,200	132,000	87,000
1,150	60,000	37,000	5,300	132,000	87,000
1,200	65,000	41,000	5,400	139,000	91,000
1,300	65,000	41,000	5,500	139,000	91,000
1,400	70,000	45,000	5,700	139,000	91,000
1,450	70,000	45,000	5,800	139,000	91,000
1,500	70,000	45,000	5,900	139,000	91,000
1,600	76,000	50,000	6,000	139,000	91,000
1,700	76,000	50,000	6,300	148,000	97,000
1,800	80,000	53,000	6,500	148,000	97,000
1,850	80,000	53,000	6,600	148,000	97,000
1,900	80,000	53,000	6,700	148,000	97,000
2,000	85,000	56,000	6,800	156,000	102,000
2,200	90,000	59,000	7,000	156,000	102,000
2,300	90,000	59,000	7,500	156,000	102,000
2,500	95,000	62,000	8,000	165,000	109,000
2,600	95,000	62,000	8,250	165,000	109,000
2,700	100,000	66,000	9,000	175,000	115,000
2,900	100,000	66,000	9,250	175,000	115,000
3,000	100,000	66,000	10,000	184,000	121,000
3,100	106,000	69,000	14,000	214,000	140,000
3,200	106,000	69,000	14,500	220,000	144,000
3,250	106,000	69,000			
3,300	106,000	69,000			
3,400	112,000	73,000			
3,500	112,000	73,000			
3,600	112,000	73,000			
3,900	119,000	78,000			





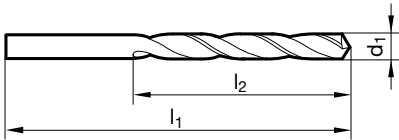
## 长系列麻花钻

产品代号 81330



芯厚 ≥ Ø 14,250 • 圆弧后刀面 • 尤其适合加工深孔

适于加工: 软/长屑材料 • 铝及铝合金 • 锌,精炼铜,硅,电子材料 • 软复合材料、木头



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
0,500		32,000	12,000	3,750		112,000	73,000
0,600		35,000	15,000	3,800		119,000	78,000
0,700		42,000	21,000	3,900		119,000	78,000
0,800		46,000	25,000	4,000		119,000	78,000
0,850		46,000	25,000	4,100		119,000	78,000
0,900		51,000	29,000	4,200		119,000	78,000
0,950		51,000	29,000	4,250		119,000	78,000
1,000		56,000	33,000	4,300		126,000	82,000
1,050		56,000	33,000	4,500		126,000	82,000
1,200		65,000	41,000	4,600		126,000	82,000
1,250		65,000	41,000	4,700		126,000	82,000
1,300		65,000	41,000	4,900		132,000	87,000
1,350		70,000	45,000	5,000		132,000	87,000
1,400		70,000	45,000	5,100		132,000	87,000
1,500		70,000	45,000	5,250		132,000	87,000
1,600		76,000	50,000	5,300		132,000	87,000
1,780		80,000	53,000	5,400		139,000	91,000
1,800		80,000	53,000	5,500		139,000	91,000
1,850		80,000	53,000	5,700		139,000	91,000
1,900		80,000	53,000	5,800		139,000	91,000
2,000		85,000	56,000	6,000		139,000	91,000
2,100		85,000	56,000	6,100		148,000	97,000
2,150		90,000	59,000	6,200		148,000	97,000
2,200		90,000	59,000	6,300		148,000	97,000
2,250		90,000	59,000	6,400		148,000	97,000
2,500		95,000	62,000	6,500		148,000	97,000
2,550		95,000	62,000	6,600		148,000	97,000
2,700		100,000	66,000	6,700		148,000	97,000
2,850		100,000	66,000	6,750	17/64	156,000	102,000
2,900		100,000	66,000	6,800		156,000	102,000
3,000		100,000	66,000	6,900		156,000	102,000
3,050		106,000	69,000	7,000		156,000	102,000
3,200		106,000	69,000	7,100		156,000	102,000
3,250		106,000	69,000	7,200		156,000	102,000
3,300		106,000	69,000	7,300		156,000	102,000
3,350		106,000	69,000	7,400		156,000	102,000
3,400		112,000	73,000	7,500		156,000	102,000
3,450		112,000	73,000	7,600		165,000	109,000
3,500		112,000	73,000	7,700		165,000	109,000
3,600		112,000	73,000	7,750		165,000	109,000
3,650		112,000	73,000	7,800		165,000	109,000
3,700		112,000	73,000	7,900		165,000	109,000



长系列麻花钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
8,000		165,000	109,000	9,750		184,000	121,000
8,100		165,000	109,000	10,200		184,000	121,000
8,200		165,000	109,000	10,500		184,000	121,000
8,300		165,000	109,000	11,000		195,000	128,000
8,400		165,000	109,000	11,300		195,000	128,000
8,500		165,000	109,000	11,500		195,000	128,000
8,600		175,000	115,000	12,000		205,000	134,000
8,800		175,000	115,000	13,000		205,000	134,000
9,000		175,000	115,000	13,500		214,000	140,000
9,100		175,000	115,000	14,500		220,000	144,000
9,200		175,000	115,000	17,000		235,000	154,000
9,300		175,000	115,000				



# HARTNER

## 长系列麻花钻

产品代号 81340

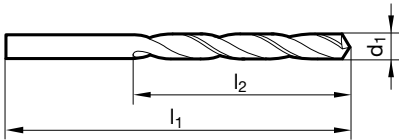


P	M	K	N	S	H
•		•	•		



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 宽槽 • 适合排屑条件不佳的场所

适于加工: ≤1000N/mm<sup>2</sup>的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,900		51,000	29,000	4,750		126,000	82,000
1,000		56,000	33,000	4,800		132,000	87,000
1,100		60,000	37,000	5,000		132,000	87,000
1,200		65,000	41,000	5,100		132,000	87,000
1,300		65,000	41,000	5,200		132,000	87,000
1,400		70,000	45,000	5,400		139,000	91,000
1,500		70,000	45,000	5,500		139,000	91,000
1,600		76,000	50,000	5,900		139,000	91,000
1,700		76,000	50,000	6,000		139,000	91,000
1,800		80,000	53,000	6,100		148,000	97,000
1,900		80,000	53,000	6,200		148,000	97,000
2,000		85,000	56,000	6,300		148,000	97,000
2,100		85,000	56,000	6,500		148,000	97,000
2,200		90,000	59,000	6,600		148,000	97,000
2,300		90,000	59,000	6,800		156,000	102,000
2,400		95,000	62,000	6,900		156,000	102,000
2,500		95,000	62,000	7,000		156,000	102,000
2,600		95,000	62,000	7,100		156,000	102,000
2,700		100,000	66,000	7,300		156,000	102,000
2,800		100,000	66,000	7,500		156,000	102,000
2,900		100,000	66,000	7,600		165,000	109,000
3,000		100,000	66,000	7,800		165,000	109,000
3,100		106,000	69,000	8,000		165,000	109,000
3,170	1/8	106,000	69,000	8,400		165,000	109,000
3,200		106,000	69,000	8,500		165,000	109,000
3,250		106,000	69,000	8,600		175,000	115,000
3,300		106,000	69,000	8,700		175,000	115,000
3,400		112,000	73,000	8,800		175,000	115,000
3,500		112,000	73,000	9,000		175,000	115,000
3,600		112,000	73,000	9,100		175,000	115,000
3,700		112,000	73,000	9,200		175,000	115,000
3,750		112,000	73,000	9,400		175,000	115,000
3,800		119,000	78,000	9,500		175,000	115,000
3,900		119,000	78,000	9,800		184,000	121,000
4,000		119,000	78,000	9,900		184,000	121,000
4,100		119,000	78,000	10,000		184,000	121,000
4,200		119,000	78,000	10,300		184,000	121,000
4,250		119,000	78,000	10,500		184,000	121,000
4,300		126,000	82,000	10,800		195,000	128,000
4,400		126,000	82,000	11,000		195,000	128,000
4,500		126,000	82,000	11,200		195,000	128,000
4,700		126,000	82,000	11,250		195,000	128,000



HARTNER

### 长系列麻花钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
11,500		195,000	128,000	14,000		214,000	140,000
11,800		195,000	128,000				
12,000		205,000	134,000				
12,500		205,000	134,000				
12,800		205,000	134,000				
13,000		205,000	134,000				



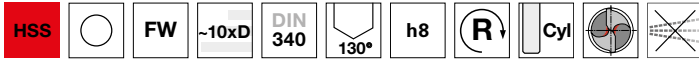
# HARTNER

## 长系列麻花钻

产品代号 81350

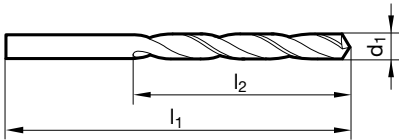


P	M	K	N	S	H
○			●		



芯厚 ≥ Ø 2,400 • 圆弧后刀面 • 特别宽的排屑槽

适于加工: 软/长屑材料 • ≤500N/mm<sup>2</sup> • 低碳钢 • 铝及铝合金 • 锌,精炼铜,硅,电子材料 • 锌合金, 铝, 软塑料、木头



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		56,000	33,000	6,600		148,000	97,000
1,100		60,000	37,000	6,700		148,000	97,000
1,500		70,000	45,000	6,900		156,000	102,000
2,000		85,000	56,000	7,000		156,000	102,000
2,100		85,000	56,000	7,100		156,000	102,000
2,200		90,000	59,000	7,200		156,000	102,000
2,400		95,000	62,000	7,500		156,000	102,000
2,500		95,000	62,000	7,600		165,000	109,000
2,700		100,000	66,000	7,700		165,000	109,000
2,800		100,000	66,000	7,800		165,000	109,000
2,900		100,000	66,000	7,900		165,000	109,000
3,000		100,000	66,000	8,000		165,000	109,000
3,100		106,000	69,000	8,100		165,000	109,000
3,200		106,000	69,000	8,300		165,000	109,000
3,250		106,000	69,000	8,400		165,000	109,000
3,300		106,000	69,000	8,500		165,000	109,000
3,400		112,000	73,000	8,600		175,000	115,000
3,500		112,000	73,000	8,800		175,000	115,000
3,600		112,000	73,000	8,900		175,000	115,000
3,700		112,000	73,000	9,000		175,000	115,000
3,800		119,000	78,000	9,100		175,000	115,000
3,900		119,000	78,000	9,200		175,000	115,000
4,000		119,000	78,000	9,300		175,000	115,000
4,100		119,000	78,000	9,400		175,000	115,000
4,200		119,000	78,000	9,600		184,000	121,000
4,400		126,000	82,000	9,700		184,000	121,000
4,500		126,000	82,000	9,800		184,000	121,000
4,700		126,000	82,000	10,000		184,000	121,000
4,800		132,000	87,000	10,100		184,000	121,000
4,900		132,000	87,000	10,500		184,000	121,000
5,000		132,000	87,000	10,700		195,000	128,000
5,400		139,000	91,000	10,800		195,000	128,000
5,500		139,000	91,000	11,200		195,000	128,000
5,600		139,000	91,000	11,500		195,000	128,000
5,700		139,000	91,000	11,600		195,000	128,000
5,800		139,000	91,000	11,800		195,000	128,000
5,900		139,000	91,000	12,000		205,000	134,000
6,000		139,000	91,000	12,200		205,000	134,000
6,100		148,000	97,000	12,300	31/64	205,000	134,000
6,200		148,000	97,000	12,400		205,000	134,000
6,300		148,000	97,000	12,500		205,000	134,000
6,500		148,000	97,000	12,800		205,000	134,000



HARTNER

### 长系列麻花钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
13,000		205,000	134,000				
13,500		214,000	140,000				
14,000		214,000	140,000				



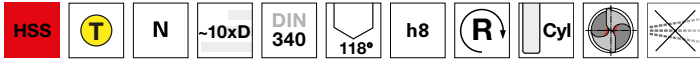
# HARTNER

## 长系列麻花钻

产品代号 84418

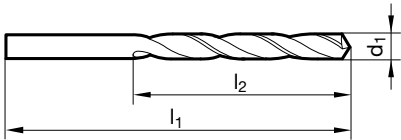


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 尤其适合加工深孔 • 使用钻套钻削

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		32,000	12,000	6,800		156,000	102,000
0,700		42,000	21,000	6,900		156,000	102,000
1,000		56,000	33,000	7,000		156,000	102,000
1,200		65,000	41,000	7,200		156,000	102,000
1,500		70,000	45,000	7,300		156,000	102,000
1,600		76,000	50,000	7,500		156,000	102,000
1,700		76,000	50,000	7,600		165,000	109,000
1,900		80,000	53,000	7,700		165,000	109,000
2,000		85,000	56,000	7,800		165,000	109,000
2,200		90,000	59,000	7,900		165,000	109,000
2,400		95,000	62,000	8,000		165,000	109,000
2,500		95,000	62,000	8,100		165,000	109,000
2,700		100,000	66,000	8,200		165,000	109,000
2,800		100,000	66,000	8,500		165,000	109,000
2,900		100,000	66,000	8,700		175,000	115,000
3,000		100,000	66,000	8,800		175,000	115,000
3,100		106,000	69,000	8,900		175,000	115,000
3,300		106,000	69,000	9,000		175,000	115,000
3,400		112,000	73,000	9,400		175,000	115,000
3,500		112,000	73,000	9,800		184,000	121,000
3,800		119,000	78,000	9,900		184,000	121,000
3,900		119,000	78,000	10,000		184,000	121,000
4,000		119,000	78,000	10,200		184,000	121,000
4,100		119,000	78,000	10,800		195,000	128,000
4,200		119,000	78,000	11,000		195,000	128,000
4,300		126,000	82,000	11,500		195,000	128,000
4,500		126,000	82,000	12,000		205,000	134,000
4,600		126,000	82,000	12,500		205,000	134,000
4,800		132,000	87,000	12,700	1/2	205,000	134,000
4,900		132,000	87,000	13,000		205,000	134,000
5,000		132,000	87,000	14,000		214,000	140,000
5,300		132,000	87,000	14,500		220,000	144,000
5,500		139,000	91,000	14,800		220,000	144,000
5,700		139,000	91,000	15,000		220,000	144,000
5,800		139,000	91,000	16,000		227,000	149,000
5,900		139,000	91,000				
6,000		139,000	91,000				
6,100		148,000	97,000				
6,200		148,000	97,000				
6,400		148,000	97,000				
6,500		148,000	97,000				
6,600		148,000	97,000				



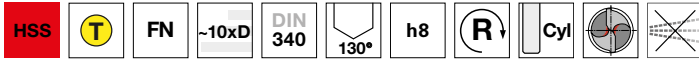
# HARTNER

## 长系列麻花钻

### 产品代号 84423



P	M	K	N	S	H
•		•	•		

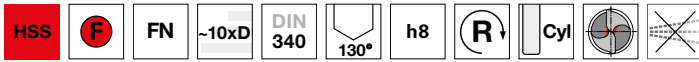


芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 宽槽 • 适合排屑条件不佳的场所  
 适于加工: ≤1000N/mm<sup>2</sup>的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨

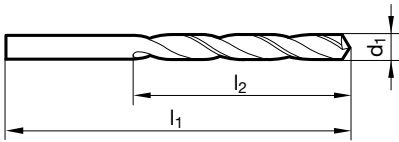
### 产品代号 84506



P	M	K	N	S	H
•		•	•		



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 宽槽 • 适合排屑条件不佳的场所  
 适于加工: ≤1000N/mm<sup>2</sup>的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	56,000	33,000	5,200	132,000	87,000
1,100	60,000	37,000	5,400	139,000	91,000
1,500	70,000	45,000	5,500	139,000	91,000
1,600	76,000	50,000	5,800	139,000	91,000
1,700	76,000	50,000	5,900	139,000	91,000
1,800	80,000	53,000	6,000	139,000	91,000
1,900	80,000	53,000	6,100	148,000	97,000
2,000	85,000	56,000	6,200	148,000	97,000
2,100	85,000	56,000	6,300	148,000	97,000
2,300	90,000	59,000	6,500	148,000	97,000
2,400	95,000	62,000	6,800	156,000	102,000
2,500	95,000	62,000	6,900	156,000	102,000
2,600	95,000	62,000	7,000	156,000	102,000
2,700	100,000	66,000	7,200	156,000	102,000
2,800	100,000	66,000	7,300	156,000	102,000
2,900	100,000	66,000	7,400	156,000	102,000
3,000	100,000	66,000	7,600	165,000	109,000
3,100	106,000	69,000	7,900	165,000	109,000
3,200	106,000	69,000	8,000	165,000	109,000
3,300	106,000	69,000	8,100	165,000	109,000
3,400	112,000	73,000	8,200	165,000	109,000
3,500	112,000	73,000	8,500	165,000	109,000
3,800	119,000	78,000	8,700	175,000	115,000
4,000	119,000	78,000	9,000	175,000	115,000
4,200	119,000	78,000	9,800	184,000	121,000
4,500	126,000	82,000	10,000	184,000	121,000
4,600	126,000	82,000	11,000	195,000	128,000
4,800	132,000	87,000	11,500	195,000	128,000
4,900	132,000	87,000	12,000	205,000	134,000
5,000	132,000	87,000	12,700	205,000	134,000





HARTNER

### 长系列麻花钻

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
14,000	214,000	140,000			



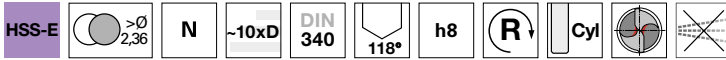


## 长系列麻花钻

产品代号 81311

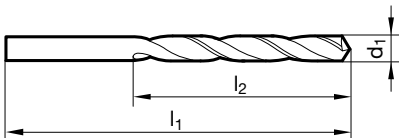


P	M	K	N	S	H
●	○	●	●	○	



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度

适于加工: 强度大于800 N/mm²的合金/非合金钢和铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
0,500	32,000	12,000	6,000	139,000	91,000
0,600	35,000	15,000	6,300	148,000	97,000
0,700	42,000	21,000	6,400	148,000	97,000
0,800	46,000	25,000	6,500	148,000	97,000
0,900	51,000	29,000	6,600	148,000	97,000
1,000	56,000	33,000	6,900	156,000	102,000
1,100	60,000	37,000	7,200	156,000	102,000
1,200	65,000	41,000	7,300	156,000	102,000
1,400	70,000	45,000	7,600	165,000	109,000
1,500	70,000	45,000	7,800	165,000	109,000
1,900	80,000	53,000	7,900	165,000	109,000
2,000	85,000	56,000	8,000	165,000	109,000
2,200	90,000	59,000	8,400	165,000	109,000
3,000	100,000	66,000	8,700	175,000	115,000
3,100	106,000	69,000	8,800	175,000	115,000
3,200	106,000	69,000	8,900	175,000	115,000
3,300	106,000	69,000	9,000	175,000	115,000
3,400	112,000	73,000	9,100	175,000	115,000
3,500	112,000	73,000	9,300	175,000	115,000
3,900	119,000	78,000	9,400	175,000	115,000
4,000	119,000	78,000	9,500	175,000	115,000
4,100	119,000	78,000	9,600	184,000	121,000
4,200	119,000	78,000	9,800	184,000	121,000
4,300	126,000	82,000	9,900	184,000	121,000
4,400	126,000	82,000	10,000	184,000	121,000
4,500	126,000	82,000	10,500	184,000	121,000
4,600	126,000	82,000	10,800	195,000	128,000
4,700	126,000	82,000	11,000	195,000	128,000
4,800	132,000	87,000	11,200	195,000	128,000
4,900	132,000	87,000	12,000	205,000	134,000
5,000	132,000	87,000	12,500	205,000	134,000
5,300	132,000	87,000			
5,500	139,000	91,000			
5,600	139,000	91,000			
5,700	139,000	91,000			
5,900	139,000	91,000			



## 长系列麻花钻

产品代号 81341

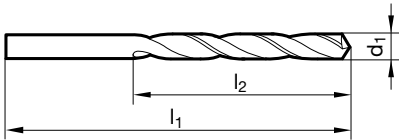


P	M	K	N	S	H
•	•	•	•		○



芯厚  $\geq \varnothing 1,100$  • 圆弧后刀面 • 高耐磨强度 • 宽槽 • 耐磨损 高强度 • 适合排屑条件不佳的场所

适于加工: 强度大于800 N/mm<sup>2</sup>的合金/非合金钢和铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1	inch	l1	l2	d1	inch	l1	l2
mm		mm	mm	mm		mm	mm
1,000		56,000	33,000	5,200		132,000	87,000
1,200		65,000	41,000	5,300		132,000	87,000
1,250		65,000	41,000	5,400		139,000	91,000
1,300		65,000	41,000	5,500		139,000	91,000
1,400		70,000	45,000	5,600		139,000	91,000
1,500		70,000	45,000	5,700		139,000	91,000
1,600		76,000	50,000	5,800		139,000	91,000
1,700		76,000	50,000	5,900		139,000	91,000
1,800		80,000	53,000	6,000		139,000	91,000
1,900		80,000	53,000	6,100		148,000	97,000
2,000		85,000	56,000	6,150		148,000	97,000
2,100		85,000	56,000	6,200		148,000	97,000
2,200		90,000	59,000	6,250		148,000	97,000
2,400		95,000	62,000	6,300		148,000	97,000
2,440		95,000	62,000	6,350	1/4	148,000	97,000
2,500		95,000	62,000	6,400		148,000	97,000
2,600		95,000	62,000	6,500		148,000	97,000
2,700		100,000	66,000	6,600		148,000	97,000
2,800		100,000	66,000	6,700		148,000	97,000
2,900		100,000	66,000	6,800		156,000	102,000
3,000		100,000	66,000	6,900		156,000	102,000
3,050		106,000	69,000	7,000		156,000	102,000
3,100		106,000	69,000	7,200		156,000	102,000
3,200		106,000	69,000	7,300		156,000	102,000
3,300		106,000	69,000	7,400		156,000	102,000
3,400		112,000	73,000	7,500		156,000	102,000
3,500		112,000	73,000	7,600		165,000	109,000
3,700		112,000	73,000	7,700		165,000	109,000
3,800		119,000	78,000	7,800		165,000	109,000
3,900		119,000	78,000	7,900		165,000	109,000
4,000		119,000	78,000	8,000		165,000	109,000
4,050		119,000	78,000	8,100		165,000	109,000
4,100		119,000	78,000	8,200		165,000	109,000
4,200		119,000	78,000	8,300		165,000	109,000
4,300		126,000	82,000	8,400		165,000	109,000
4,400		126,000	82,000	8,500		165,000	109,000
4,500		126,000	82,000	8,600		175,000	115,000
4,700		126,000	82,000	8,700		175,000	115,000
4,800		132,000	87,000	8,800		175,000	115,000
4,900		132,000	87,000	8,900		175,000	115,000
5,000		132,000	87,000	9,000		175,000	115,000
5,100		132,000	87,000	9,100		175,000	115,000



## 长系列麻花钻

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,200		175,000	115,000	11,000		195,000	128,000
9,300		175,000	115,000	11,500		195,000	128,000
9,500		175,000	115,000	11,800		195,000	128,000
9,600		184,000	121,000	11,910	15/32	205,000	134,000
9,700		184,000	121,000	12,000		205,000	134,000
9,800		184,000	121,000	12,500		205,000	134,000
9,900		184,000	121,000	12,700	1/2	205,000	134,000
10,000		184,000	121,000	13,000		205,000	134,000
10,200		184,000	121,000	16,000		227,000	149,000
10,500		184,000	121,000				
10,800		195,000	128,000				
10,900		195,000	128,000				



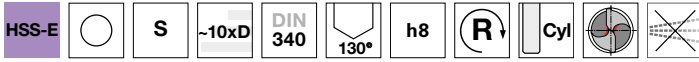
# HARTNER

## 长系列麻花钻

### 产品代号 81361



P	M	K	N	S	H
○	●			●	

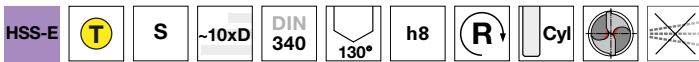


芯厚 ≥ Ø 1,400 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 钛及钛合金 • 不锈钢/耐酸-/耐热奥氏体钢 • 强度超过900 N/mm<sup>2</sup>的高强度/短屑钢 • 耐磨轴承钢 • 哈氏合金, 镍合金, 锰合金

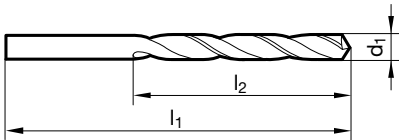
### 产品代号 81362



P	M	K	N	S	H
○	●			●	



芯厚 ≥ Ø 1,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 钛及钛合金 • 不锈钢/耐酸-/耐热奥氏体钢 • 强度超过900 N/mm<sup>2</sup>的高强度/短屑钢 • 耐磨轴承钢 • 哈氏合金, 镍合金, 锰合金



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	56,000	33,000	4,000	119,000	78,000
1,100	60,000	37,000	4,100	119,000	78,000
1,200	65,000	41,000	4,200	119,000	78,000
1,300	65,000	41,000	4,300	126,000	82,000
1,400	70,000	45,000	4,400	126,000	82,000
1,500	70,000	45,000	4,500	126,000	82,000
1,600	76,000	50,000	4,600	126,000	82,000
1,700	76,000	50,000	4,700	126,000	82,000
1,800	80,000	53,000	4,800	132,000	87,000
1,900	80,000	53,000	4,900	132,000	87,000
2,000	85,000	56,000	5,000	132,000	87,000
2,100	85,000	56,000	5,100	132,000	87,000
2,200	90,000	59,000	5,200	132,000	87,000
2,300	90,000	59,000	5,300	132,000	87,000
2,400	95,000	62,000	5,400	139,000	91,000
2,500	95,000	62,000	5,500	139,000	91,000
2,600	95,000	62,000	5,600	139,000	91,000
2,700	100,000	66,000	5,700	139,000	91,000
2,800	100,000	66,000	5,800	139,000	91,000
2,900	100,000	66,000	5,900	139,000	91,000
3,000	100,000	66,000	6,000	139,000	91,000
3,100	106,000	69,000	6,100	148,000	97,000
3,200	106,000	69,000	6,200	148,000	97,000
3,300	106,000	69,000	6,300	148,000	97,000
3,400	112,000	73,000	6,400	148,000	97,000
3,500	112,000	73,000	6,500	148,000	97,000
3,600	112,000	73,000	6,600	148,000	97,000
3,700	112,000	73,000	6,700	148,000	97,000
3,800	119,000	78,000	6,800	156,000	102,000
3,900	119,000	78,000	6,900	156,000	102,000



HARTNER

长系列麻花钻

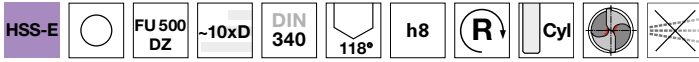
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
7,000	156,000	102,000	8,500	165,000	109,000
7,100	156,000	102,000	8,700	175,000	115,000
7,200	156,000	102,000	8,800	175,000	115,000
7,300	156,000	102,000	9,000	175,000	115,000
7,500	156,000	102,000	9,500	175,000	115,000
7,700	165,000	109,000	10,000	184,000	121,000
7,800	165,000	109,000	10,500	184,000	121,000
8,000	165,000	109,000	11,000	195,000	128,000
8,100	165,000	109,000	11,500	195,000	128,000
8,200	165,000	109,000	12,000	205,000	134,000
8,300	165,000	109,000	12,500	205,000	134,000
8,400	165,000	109,000	13,000	205,000	134,000

## 长系列麻花钻

### 产品代号 84814



P	M	K	N	S	H
•	•	•	•		

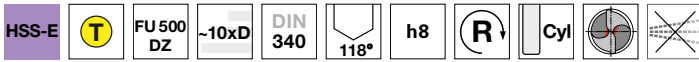


芯厚  $\geq \varnothing 1,000$  • 双后刀面 • 高耐磨强度 • 要求适合低进给率 • 要求低扭矩 • 耐磨损 高强度 • 普遍适用  
强度小于800N/mm<sup>2</sup>的合金/非合金钢 • 热/冷锻钢 • 耐磨轴承钢 • 有色金属 • 铸件材料 • 不锈钢 • 塑料

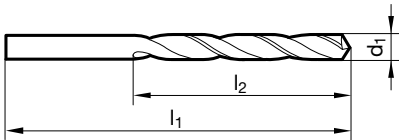
### 产品代号 84812



P	M	K	N	S	H
•	•	•	•		



芯厚  $\geq \varnothing 1,000$  • 双后刀面 • 高耐磨强度 • 要求低扭矩 • 要求适合低进给率 • 耐磨损 高强度 • 普遍适用  
强度小于800N/mm<sup>2</sup>的合金/非合金钢 • 热/冷锻钢 • 耐磨轴承钢 • 有色金属 • 铸件材料 • 塑料 • 不锈钢



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	56,000	33,000	4,000	119,000	78,000
1,100	60,000	37,000	4,100	119,000	78,000
1,200	65,000	41,000	4,200	119,000	78,000
1,300	65,000	41,000	4,300	126,000	82,000
1,400	70,000	45,000	4,400	126,000	82,000
1,500	70,000	45,000	4,500	126,000	82,000
1,600	76,000	50,000	4,600	126,000	82,000
1,700	76,000	50,000	4,700	126,000	82,000
1,800	80,000	53,000	4,800	132,000	87,000
1,900	80,000	53,000	4,900	132,000	87,000
2,000	85,000	56,000	5,000	132,000	87,000
2,100	85,000	56,000	5,100	132,000	87,000
2,200	90,000	59,000	5,200	132,000	87,000
2,300	90,000	59,000	5,300	132,000	87,000
2,400	95,000	62,000	5,400	139,000	91,000
2,500	95,000	62,000	5,500	139,000	91,000
2,600	95,000	62,000	5,600	139,000	91,000
2,700	100,000	66,000	5,700	139,000	91,000
2,800	100,000	66,000	5,800	139,000	91,000
2,900	100,000	66,000	5,900	139,000	91,000
3,000	100,000	66,000	6,000	139,000	91,000
3,100	106,000	69,000	6,100	148,000	97,000
3,200	106,000	69,000	6,200	148,000	97,000
3,300	106,000	69,000	6,300	148,000	97,000
3,400	112,000	73,000	6,400	148,000	97,000
3,500	112,000	73,000	6,500	148,000	97,000
3,600	112,000	73,000	6,600	148,000	97,000
3,700	112,000	73,000	6,700	148,000	97,000
3,800	119,000	78,000	6,800	156,000	102,000
3,900	119,000	78,000	6,900	156,000	102,000



## 长系列麻花钻

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
7,000	156,000	102,000	9,500	175,000	115,000
7,100	156,000	102,000	9,600	184,000	121,000
7,200	156,000	102,000	9,700	184,000	121,000
7,300	156,000	102,000	9,800	184,000	121,000
7,400	156,000	102,000	9,900	184,000	121,000
7,500	156,000	102,000	10,000	184,000	121,000
7,600	165,000	109,000	10,100	184,000	121,000
7,700	165,000	109,000	10,200	184,000	121,000
7,800	165,000	109,000	10,300	184,000	121,000
7,900	165,000	109,000	10,400	184,000	121,000
8,000	165,000	109,000	10,500	184,000	121,000
8,100	165,000	109,000	11,000	195,000	128,000
8,200	165,000	109,000	11,500	195,000	128,000
8,300	165,000	109,000	12,000	205,000	134,000
8,400	165,000	109,000	12,500	205,000	134,000
8,500	165,000	109,000	13,000	205,000	134,000
8,600	175,000	115,000	13,500	214,000	140,000
8,700	175,000	115,000	14,000	214,000	140,000
8,800	175,000	115,000			
9,000	175,000	115,000			
9,100	175,000	115,000			
9,200	175,000	115,000			
9,300	175,000	115,000			
9,400	175,000	115,000			





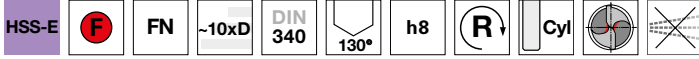
# HARTNER

## 长系列麻花钻

产品代号 84508

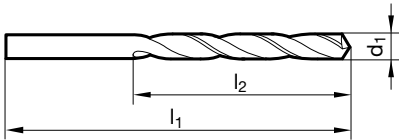


P	M	K	N	S	H
•	•	•	•		○



圆弧后刀面 • 高耐磨强度 • 宽槽 • 出色的耐磨性 • 适合排屑条件不佳的场所

强度大于800 N/mm<sup>2</sup>的合金/非合金钢和铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,000	56,000	33,000	5,800	139,000	91,000
1,100	60,000	37,000	6,000	139,000	91,000
1,200	65,000	41,000	6,100	148,000	97,000
1,300	65,000	41,000	6,200	148,000	97,000
1,400	70,000	45,000	6,500	148,000	97,000
1,500	70,000	45,000	6,600	148,000	97,000
1,600	76,000	50,000	6,700	148,000	97,000
1,700	76,000	50,000	6,800	156,000	102,000
1,800	80,000	53,000	6,900	156,000	102,000
2,000	85,000	56,000	7,000	156,000	102,000
2,100	85,000	56,000	7,200	156,000	102,000
2,200	90,000	59,000	7,400	156,000	102,000
2,300	90,000	59,000	7,500	156,000	102,000
2,400	95,000	62,000	7,600	165,000	109,000
2,500	95,000	62,000	7,800	165,000	109,000
2,600	95,000	62,000	8,000	165,000	109,000
2,800	100,000	66,000	8,100	165,000	109,000
2,900	100,000	66,000	8,200	165,000	109,000
3,000	100,000	66,000	8,400	165,000	109,000
3,100	106,000	69,000	8,500	165,000	109,000
3,200	106,000	69,000	8,600	175,000	115,000
3,300	106,000	69,000	8,800	175,000	115,000
3,400	112,000	73,000	8,900	175,000	115,000
3,500	112,000	73,000	9,000	175,000	115,000
3,600	112,000	73,000	9,300	175,000	115,000
3,700	112,000	73,000	9,400	175,000	115,000
3,800	119,000	78,000	9,500	175,000	115,000
3,900	119,000	78,000	9,600	184,000	121,000
4,000	119,000	78,000	9,700	184,000	121,000
4,100	119,000	78,000	9,800	184,000	121,000
4,200	119,000	78,000	10,000	184,000	121,000
4,300	126,000	82,000	10,200	184,000	121,000
4,500	126,000	82,000	10,500	184,000	121,000
4,700	126,000	82,000	11,000	195,000	128,000
4,800	132,000	87,000	11,500	195,000	128,000
5,000	132,000	87,000	12,000	205,000	134,000
5,100	132,000	87,000			
5,200	132,000	87,000			
5,300	132,000	87,000			
5,400	139,000	91,000			
5,500	139,000	91,000			
5,600	139,000	91,000			



# HARTNER

## 长系列麻花钻

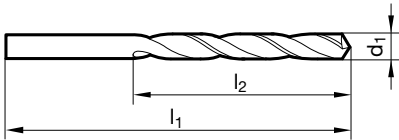
产品代号 89286



P	M	K	N	S	H
○		○			○



双后刀面 • 精密磨削过的主切削刃  
 玻璃纤维增强塑料 • 加工热固性塑料在切削刃和刃带上易磨损



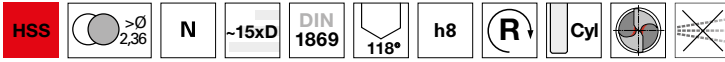
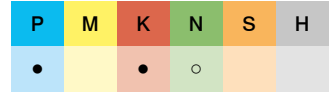
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
0,500	38,000	8,500	1,300	38,000	17,000
0,600	38,000	9,500	1,400	38,000	17,000
0,650	38,000	10,500	1,450	38,000	17,000
0,700	38,000	10,500	1,500	38,000	17,000
0,750	38,000	12,500			
0,800	38,000	12,500			
0,850	38,000	14,500			
0,900	38,000	14,500			
1,000	38,000	17,000			
1,050	38,000	17,000			
1,100	38,000	17,000			
1,200	38,000	17,000			



# HARTNER

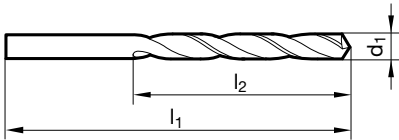
## 超长麻花钻,系列1

产品代号 81410



芯厚 ≥ Ø 2,400 • 圆弧后刀面 • 适合加工深孔

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
1,600	115,000	75,000	5,800	205,000	140,000
1,800	120,000	80,000	5,900	205,000	140,000
1,900	120,000	80,000	6,000	205,000	140,000
2,000	125,000	85,000	6,200	215,000	150,000
2,200	135,000	90,000	6,300	215,000	150,000
2,300	135,000	90,000	6,400	215,000	150,000
2,400	140,000	95,000	6,500	215,000	150,000
2,500	140,000	95,000	6,600	215,000	150,000
2,700	150,000	100,000	6,700	215,000	150,000
2,800	150,000	100,000	6,800	225,000	155,000
3,000	150,000	100,000	7,000	225,000	155,000
3,100	155,000	105,000	7,500	225,000	155,000
3,200	155,000	105,000	7,600	240,000	165,000
3,250	155,000	105,000	7,700	240,000	165,000
3,300	155,000	105,000	7,800	240,000	165,000
3,400	165,000	115,000	8,000	240,000	165,000
3,500	165,000	115,000	8,100	240,000	165,000
3,700	165,000	115,000	8,200	240,000	165,000
3,800	175,000	120,000	8,500	240,000	165,000
3,900	175,000	120,000	8,800	250,000	175,000
4,000	175,000	120,000	9,000	250,000	175,000
4,100	175,000	120,000	9,400	250,000	175,000
4,200	175,000	120,000	9,500	250,000	175,000
4,300	185,000	125,000	10,000	265,000	185,000
4,500	185,000	125,000	10,200	265,000	185,000
4,600	185,000	125,000	10,500	265,000	185,000
4,700	185,000	125,000	11,000	280,000	195,000
4,800	195,000	135,000	11,500	280,000	195,000
4,900	195,000	135,000	11,800	280,000	195,000
5,000	195,000	135,000	12,000	295,000	205,000
5,100	195,000	135,000	12,500	295,000	205,000
5,200	195,000	135,000	13,000	295,000	205,000
5,300	195,000	135,000			
5,400	205,000	140,000			
5,500	205,000	140,000			
5,700	205,000	140,000			



# HARTNER

## 超长麻花钻,系列1

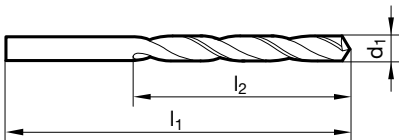
产品代号 81440



P	M	K	N	S	H
•		•	•		



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工: ≤1000N/mm<sup>2</sup>的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		125,000	85,000	6,500		215,000	150,000
2,200		135,000	90,000	6,600		215,000	150,000
2,300		135,000	90,000	6,700		215,000	150,000
2,400		140,000	95,000	6,800		225,000	155,000
2,500		140,000	95,000	7,000		225,000	155,000
2,600		140,000	95,000	7,100		225,000	155,000
2,700		150,000	100,000	7,400		225,000	155,000
2,850		150,000	100,000	7,500		225,000	155,000
2,900		150,000	100,000	7,600		240,000	165,000
2,950		150,000	100,000	7,800		240,000	165,000
3,000		150,000	100,000	8,000		240,000	165,000
3,100		155,000	105,000	8,100		240,000	165,000
3,170	1/8	155,000	105,000	8,200		240,000	165,000
3,200		155,000	105,000	8,300		240,000	165,000
3,300		155,000	105,000	8,400		240,000	165,000
3,400		165,000	115,000	8,500		240,000	165,000
3,500		165,000	115,000	8,600		250,000	175,000
3,600		165,000	115,000	8,800		250,000	175,000
3,700		165,000	115,000	9,000		250,000	175,000
3,750		165,000	115,000	9,200		250,000	175,000
3,800		175,000	120,000	9,300		250,000	175,000
3,900		175,000	120,000	9,400		250,000	175,000
4,000		175,000	120,000	9,500		250,000	175,000
4,100		175,000	120,000	9,600		265,000	185,000
4,200		175,000	120,000	9,700		265,000	185,000
4,500		185,000	125,000	9,800		265,000	185,000
4,700		185,000	125,000	9,900		265,000	185,000
4,800		195,000	135,000	10,000		265,000	185,000
5,000		195,000	135,000	10,200		265,000	185,000
5,100		195,000	135,000	10,500		265,000	185,000
5,200		195,000	135,000	11,000		280,000	195,000
5,300		195,000	135,000	11,500		280,000	195,000
5,400		205,000	140,000	11,750		280,000	195,000
5,500		205,000	140,000	11,800		280,000	195,000
5,600		205,000	140,000	12,000		295,000	205,000
5,700		205,000	140,000	12,500		295,000	205,000
5,800		205,000	140,000	12,700	1/2	295,000	205,000
5,900		205,000	140,000	13,000		295,000	205,000
6,000		205,000	140,000				
6,200		215,000	150,000				
6,300		215,000	150,000				
6,400		215,000	150,000				



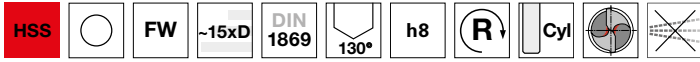
# HARTNER

## 超长麻花钻,系列1

产品代号 81450

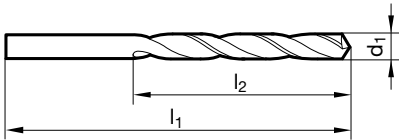


P	M	K	N	S	H
○			●		



芯厚 ≥ Ø 2,500 • 圆弧后刀面 • 适合加工深孔

≤500 N/mm²的长屑材料 • 低碳钢 • 铝及铝合金 • 锌,精炼铜,硅,电子材料 • 锌合金, 铝, 软塑料、木头



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
2,000	125,000	85,000	9,500	250,000	175,000
2,500	140,000	95,000			
2,600	140,000	95,000			
3,000	150,000	100,000			
3,200	155,000	105,000			
4,000	175,000	120,000			
5,000	195,000	135,000			
6,000	205,000	140,000			
6,500	215,000	150,000			
7,000	225,000	155,000			
8,000	240,000	165,000			
9,000	250,000	175,000			



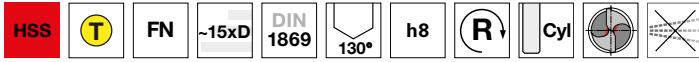
# HARTNER

## 超长麻花钻,系列1

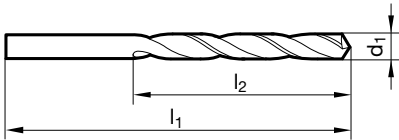
产品代号 84425



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
2,000	125,000	85,000	6,000	205,000	140,000
2,100	125,000	85,000	7,000	225,000	155,000
2,500	140,000	95,000	8,000	240,000	165,000
3,000	150,000	100,000	9,000	250,000	175,000
3,200	155,000	105,000	10,000	265,000	185,000
3,500	165,000	115,000	11,000	280,000	195,000
4,000	175,000	120,000	12,000	295,000	205,000
4,200	175,000	120,000			
4,500	185,000	125,000			
4,600	185,000	125,000			
5,000	195,000	135,000			
5,500	205,000	140,000			



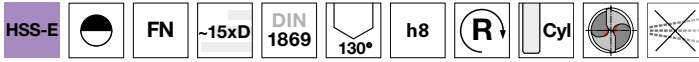
# HARTNER

## 超长麻花钻,系列1

产品代号 81441

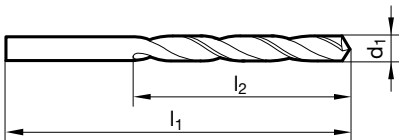


P	M	K	N	S	H
•	•	•	•	•	○



芯厚  $\geq \varnothing 3,000$  • 圆弧后刀面 • 高耐磨强度 • 宽槽 • 耐磨损 高强度 • 适合加工深孔 • 适合排屑条件不佳的场所

适于加工: 强度大于 $800\text{N/mm}^2$ 的钢 (合金 以及 非合金) 和铸铁 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
3,000		150,000	100,000	7,000		225,000	155,000
3,500		165,000	115,000	8,000		240,000	165,000
4,000		175,000	120,000	8,200		240,000	165,000
4,300		185,000	125,000	8,500		240,000	165,000
4,500		185,000	125,000	9,000		250,000	175,000
4,760	3/16	195,000	135,000	9,500		250,000	175,000
4,800		195,000	135,000	10,000		265,000	185,000
5,000		195,000	135,000				
5,400		205,000	140,000				
5,500		205,000	140,000				
6,000		205,000	140,000				
6,500		215,000	150,000				



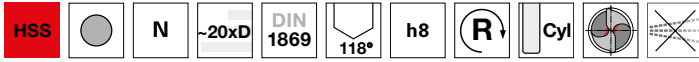
# HARTNER

## 超长麻花钻,系列2

产品代号 81510

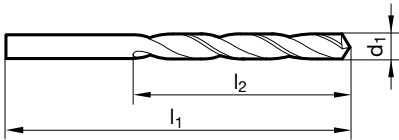


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 适合加工深孔

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
3,000		190,000	130,000	8,500		305,000	210,000
3,170	1/8	200,000	135,000	9,000		320,000	220,000
3,300		200,000	135,000	9,500		320,000	220,000
3,500		210,000	145,000	10,000		340,000	235,000
4,000		220,000	150,000	10,500		340,000	235,000
4,200		220,000	150,000	11,000		365,000	250,000
4,500		235,000	160,000	11,500		365,000	250,000
4,800		245,000	170,000	12,000		375,000	260,000
5,000		245,000	170,000				
5,200		245,000	170,000				
5,500		260,000	180,000				
5,800		260,000	180,000				
6,000		260,000	180,000				
6,500		275,000	190,000				
6,800		290,000	200,000				
7,000		290,000	200,000				
7,500		290,000	200,000				
8,000		305,000	210,000				





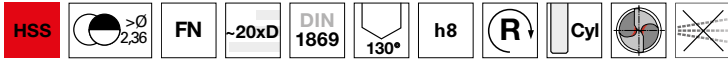
# HARTNER

## 超长麻花钻,系列2

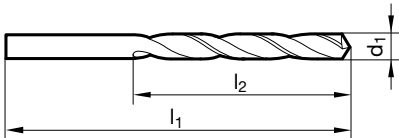
产品代号 81540



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,000		160,000	110,000	8,200		305,000	210,000
2,500		180,000	120,000	8,500		305,000	210,000
2,800		190,000	130,000	9,000		320,000	220,000
3,000		190,000	130,000	9,500		320,000	220,000
3,200		200,000	135,000	9,800		340,000	235,000
3,300		200,000	135,000	10,000		340,000	235,000
3,500		210,000	145,000	10,200		340,000	235,000
4,000		220,000	150,000	10,500		340,000	235,000
4,100		220,000	150,000	10,720	27/64	365,000	250,000
4,200		220,000	150,000	11,000		365,000	250,000
4,500		235,000	160,000	11,500		365,000	250,000
5,000		245,000	170,000	12,000		375,000	260,000
5,500		260,000	180,000	12,500		375,000	260,000
6,000		260,000	180,000	12,700	1/2	375,000	260,000
6,500		275,000	190,000	13,000		375,000	260,000
7,000		290,000	200,000				
7,500		290,000	200,000				
8,000		305,000	210,000				



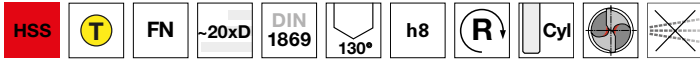
# HARTNER

## 超长麻花钻,系列2

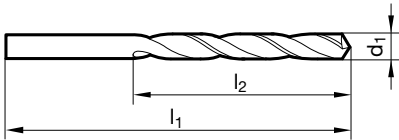
产品代号 84426



P	M	K	N	S	H
•		•	•	○	



芯厚  $\geq \varnothing 3,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
3,000	190,000	130,000	8,000	305,000	210,000
4,000	220,000	150,000	8,500	305,000	210,000
5,000	245,000	170,000			
6,000	260,000	180,000			
6,800	290,000	200,000			
7,000	290,000	200,000			



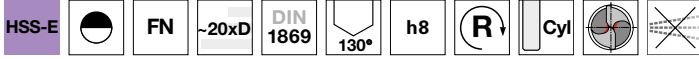
# HARTNER

## 超长麻花钻,系列2

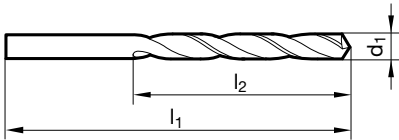
产品代号 81541



P	M	K	N	S	H
•	•	•	•		○



芯厚  $\geq \varnothing 3,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工: 强度大于800 N/mm<sup>2</sup>的合金/非合金钢和铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
3,000		190,000	130,000	7,500		290,000	200,000
3,170	1/8	200,000	135,000	8,000		305,000	210,000
3,200		200,000	135,000	8,500		305,000	210,000
3,500		210,000	145,000	9,000		320,000	220,000
4,000		220,000	150,000	10,000		340,000	235,000
4,200		220,000	150,000				
5,000		245,000	170,000				
6,000		260,000	180,000				
6,200		275,000	190,000				
6,350	1/4	275,000	190,000				
6,500		275,000	190,000				
7,000		290,000	200,000				



# HARTNER

## 超长麻花钻,系列3

产品代号 81610

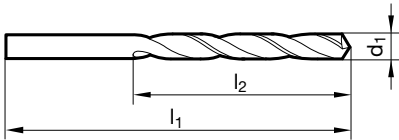


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 4,000 • 圆弧后刀面 • 适合加工深孔

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
3,500	265,000	180,000	10,000	430,000	295,000
4,000	280,000	190,000	11,000	455,000	310,000
5,000	315,000	210,000	12,000	480,000	330,000
5,500	330,000	225,000			
5,800	330,000	225,000			
5,900	330,000	225,000			
6,000	330,000	225,000			
7,000	370,000	250,000			
7,800	390,000	265,000			
8,000	390,000	265,000			
9,000	410,000	280,000			
9,500	410,000	280,000			



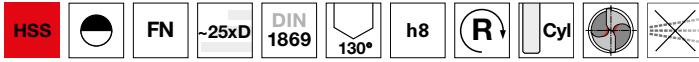
# HARTNER

## 超长麻花钻,系列3

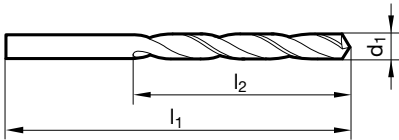
产品代号 81640



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 3,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,500		225,000	150,000	8,200		390,000	265,000
3,000		240,000	160,000	8,500		390,000	265,000
3,170	1/8	250,000	170,000	9,000		410,000	280,000
3,500		265,000	180,000	9,500		410,000	280,000
3,700		265,000	180,000	9,520	3/8	430,000	295,000
4,000		280,000	190,000	10,000		430,000	295,000
4,200		280,000	190,000	10,500		430,000	295,000
4,500		295,000	200,000	11,000		455,000	310,000
5,000		315,000	210,000	11,500		455,000	310,000
5,100		315,000	210,000	12,000		480,000	330,000
5,500		330,000	225,000	12,500		480,000	330,000
6,000		330,000	225,000	13,000		480,000	330,000
6,350	1/4	350,000	235,000				
6,500		350,000	235,000				
6,800		370,000	250,000				
7,000		370,000	250,000				
7,500		370,000	250,000				
8,000		390,000	265,000				



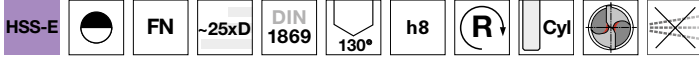
# HARTNER

## 超长麻花钻,系列3

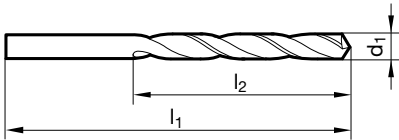
产品代号 81641



P	M	K	N	S	H
•	•		•	•	



圆弧后刀面 • 高耐磨强度 • 宽槽 • 耐磨性增强 • 适合加工深孔 • 适合排屑条件不佳的场合  
 适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁



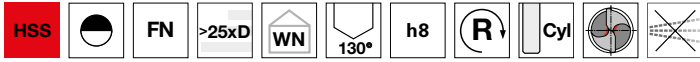
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,500		225,000	150,000	6,300		350,000	235,000
3,000		240,000	160,000	6,350	1/4	350,000	235,000
3,100		250,000	170,000	6,400		350,000	235,000
3,170	1/8	250,000	170,000	6,500		350,000	235,000
3,200		250,000	170,000	6,700		350,000	235,000
3,300		250,000	170,000	6,800		370,000	250,000
3,400		265,000	180,000	7,000		370,000	250,000
3,500		265,000	180,000	7,200		370,000	250,000
3,700		265,000	180,000	7,500		370,000	250,000
3,800		280,000	190,000	7,800		390,000	265,000
3,900		280,000	190,000	7,940	5/16	390,000	265,000
3,970	5/32	280,000	190,000	8,000		390,000	265,000
4,000		280,000	190,000	8,200		390,000	265,000
4,200		280,000	190,000	8,500		390,000	265,000
4,300		295,000	200,000	8,600		410,000	280,000
4,500		295,000	200,000	8,730	11/32	410,000	280,000
4,600		295,000	200,000	8,800		410,000	280,000
4,760	3/16	315,000	210,000	9,000		410,000	280,000
4,800		315,000	210,000	9,500		410,000	280,000
4,900		315,000	210,000	9,520	3/8	430,000	295,000
5,000		315,000	210,000	10,000		430,000	295,000
5,100		315,000	210,000	10,320	13/32	430,000	295,000
5,200		315,000	210,000	10,500		430,000	295,000
5,500		330,000	225,000	11,000		455,000	310,000
5,560	7/32	330,000	225,000	11,110	7/16	455,000	310,000
5,800		330,000	225,000	11,500		455,000	310,000
5,950	15/64	330,000	225,000	12,000		480,000	330,000
6,000		330,000	225,000	12,200		480,000	330,000
6,100		350,000	235,000	12,500		480,000	330,000
6,200		350,000	235,000	13,000		480,000	330,000

## 超长麻花钻

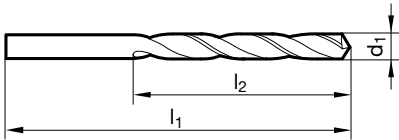
产品代号 81740



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 6,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



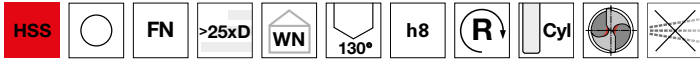
d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
6,000	500,000	400,000			
8,000	500,000	400,000			
10,000	600,000	500,000			
11,000	600,000	500,000			
12,000	600,000	500,000			

## 超长麻花钻

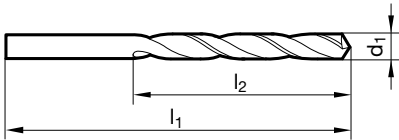
产品代号 81750



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 8,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
8,000	750,000	650,000			
10,000	750,000	650,000			
11,000	750,000	650,000			
12,000	750,000	650,000			

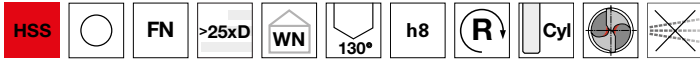


## 超长麻花钻

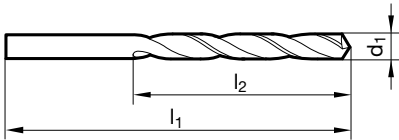
产品代号 81760



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 10,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的情况  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
10,000	1000,000	850,000			
12,000	1000,000	850,000			

## 锥孔钻

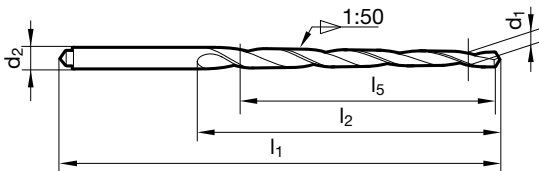
产品代号 81810



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 适合加工锥孔 • 柄齿, DIN 1809标准



d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm
2,000	3,150	86,000	52,000	48,000	10,000	12,500	245,000	190,000	175,000
3,000	4,000	100,000	63,000	58,000	12,000	16,000	290,000	228,000	228,500
4,000	5,000	112,000	74,000	68,000					
5,000	6,300	122,000	81,000	73,000					
6,000	8,000	160,000	114,000	105,000					
8,000	10,000	207,000	157,000	145,000					



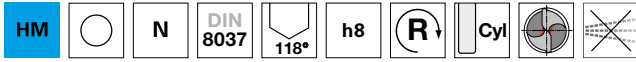
# HARTNER

## 硬质合金刀片螺旋槽钻

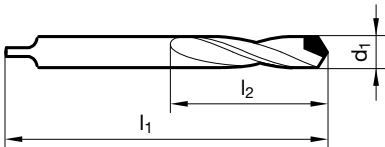
产品代号 89301



P	M	K	N	S	H
○		○			○



芯厚 ≥ Ø 2,600 • 双后刀面 • 镶硬质合金 • 柄齿, DIN 1809标准  
 适合加工弹簧钢 • 大于300HB 硬铸铁 • 纯铝 • 硬青铜



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
2,600	50,000	20,000	7,800	80,000	40,000
3,000	50,000	20,000	8,000	80,000	40,000
3,100	56,000	25,000	8,200	90,000	50,000
3,200	56,000	25,000	8,400	90,000	50,000
3,300	56,000	25,000	8,500	90,000	50,000
3,400	56,000	25,000	8,600	90,000	50,000
3,500	56,000	25,000	8,800	90,000	50,000
3,600	56,000	25,000	9,000	90,000	50,000
3,700	56,000	25,000	9,100	90,000	50,000
3,800	56,000	25,000	9,500	90,000	50,000
3,900	56,000	25,000	9,700	100,000	56,000
4,000	56,000	25,000	9,800	100,000	56,000
4,100	63,000	28,000	10,000	100,000	56,000
4,200	63,000	28,000	10,200	100,000	56,000
4,300	63,000	28,000	10,500	100,000	56,000
4,400	63,000	28,000	11,000	100,000	56,000
4,500	63,000	28,000	11,500	112,000	63,000
4,800	63,000	28,000	12,000	112,000	63,000
4,900	63,000	28,000	12,500	112,000	63,000
5,000	63,000	28,000	13,000	112,000	63,000
5,100	71,000	32,000	13,500	125,000	71,000
5,200	71,000	32,000	14,000	125,000	71,000
5,400	71,000	32,000	14,500	125,000	71,000
5,500	71,000	32,000	15,000	125,000	71,000
5,600	71,000	32,000	15,500	140,000	80,000
5,700	71,000	32,000	16,000	140,000	80,000
5,800	71,000	32,000	16,500	140,000	80,000
6,000	71,000	32,000	17,000	140,000	80,000
6,100	71,000	32,000	17,500	160,000	90,000
6,200	71,000	32,000	18,000	160,000	90,000
6,300	71,000	32,000	18,500	160,000	90,000
6,400	71,000	32,000	19,000	160,000	90,000
6,500	71,000	32,000	19,500	160,000	90,000
6,700	80,000	40,000	20,000	160,000	90,000
6,800	80,000	40,000			
7,000	80,000	40,000			
7,100	80,000	40,000			
7,200	80,000	40,000			
7,400	80,000	40,000			
7,500	80,000	40,000			
7,600	80,000	40,000			
7,700	80,000	40,000			



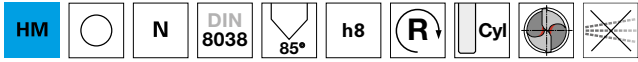
# HARTNER

## 硬质合金刀片螺旋槽钻

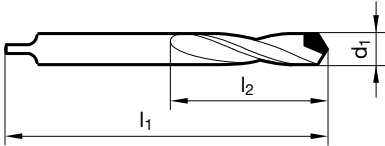
产品代号 89303



P	M	K	N	S	H
○		○			○



芯厚  $\geq \varnothing 3,100$  • 双后刀面 • 镶硬质合金 • 柄齿, DIN 1809标准  
 玻璃纤维增强塑料 • 加工热固性塑料在切削刃和刃带上易磨损



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
3,100	56,000	25,000	6,900	80,000	40,000
3,200	56,000	25,000	7,000	80,000	40,000
4,100	63,000	28,000	7,500	80,000	40,000
4,200	63,000	28,000	8,000	80,000	40,000
4,600	63,000	28,000	8,300	90,000	50,000
5,000	63,000	28,000	8,500	90,000	50,000
5,100	71,000	32,000	9,000	90,000	50,000
5,200	71,000	32,000	10,000	100,000	56,000
5,300	71,000	32,000	10,500	100,000	56,000
5,800	71,000	32,000	11,500	112,000	63,000
6,100	71,000	32,000	13,000	112,000	63,000
6,400	71,000	32,000	19,000	160,000	90,000

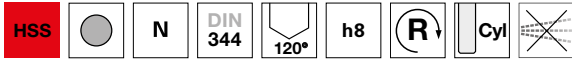


## 直柄扩孔钻

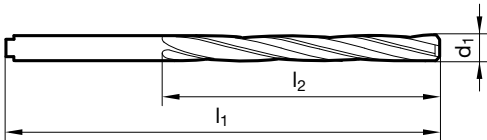
产品代号 86010



P	M	K	N	S	H
●	○	●	○		



圆弧后刀面 • 刚性好 • 柄齿, DIN 1809标准 • 适合加工有预钻//预铸//预冲的孔 • 纠正直线度误差 • 纠正圆度误差 • 改善了孔的表面质量 • 倒角直径<底孔直径 • 使用时, 需严格遵守最小底孔直径的要求



d1	inch	d0	l1	l2	d1	inch	d0	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
3,800		2,8	96,000	64,000	10,200		7,0	162,000	116,000
4,000		2,8	96,000	64,000	10,500		7,0	162,000	116,000
4,750		3,2	102,000	69,000	10,600		7,0	162,000	116,000
4,800		3,5	108,000	74,000	11,000		7,7	173,000	125,000
4,900		3,5	108,000	74,000	11,300		7,7	173,000	125,000
5,000		3,5	108,000	74,000	11,750		8,4	184,000	134,000
5,800		4,2	116,000	80,000	12,000		8,4	184,000	134,000
6,000		4,2	116,000	80,000	12,750		9,1	184,000	134,000
6,200		4,2	124,000	86,000	13,000		9,1	184,000	134,000
6,400		4,2	124,000	86,000	13,750		9,8	194,000	142,000
6,800		4,9	133,000	93,000	14,000		9,8	194,000	142,000
7,500		4,9	133,000	93,000	14,750		10,5	202,000	147,000
7,700		5,6	142,000	100,000	15,000		10,5	202,000	147,000
7,800		5,6	142,000	100,000					
8,000		5,6	142,000	100,000					
8,200		5,6	142,000	100,000					
9,800		7,0	162,000	116,000					
10,000		7,0	162,000	116,000					

# 高的柔性化与灵活性 系统特性

- ▼ 带有自动打开式卷门的旋转柜系统
- ▼ 100%派发可控
- ▼ 快速个性化配置储物隔间
- ▼ 定制不同尺寸的储物隔间
- ▼ 通过Hartner TM 软件可实现从可转位刀片、 $\varnothing 6$  mm麻花钻、手套、深孔钻等产品的管理存放和派发
- ▼ 通过Hartner TM 软件可实现自动订单流程
- ▼ 量身定制储物隔间高度,从25~1525mm均可实现
- ▼ 最多可分配987 个储物格 (采用最小配置)
- ▼ 提取时间小于10秒
- ▼ 全天候可用
- ▼ 最大载重量达到 544 kg
- ▼ 低维护成本设计





# HARTNER

Precision Cutting Tools



## **TOOL MANAGEMENT**

TM 826







# HARTNER

Precision Cutting Tools

锥柄麻花钻








## 锥柄麻花钻

HSS, HSS-E, 硬质合金  
抛光处理或涂层





P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 麻花钻

		DIN 345	N	HSS		右手	MK	~5xD	3,000 - 75,000	<b>82010</b>	173
		DIN 345	W	HSS		右手	MK	~5xD	6,800 - 30,500	<b>82030</b>	175
		DIN 345	N	HSS		右手	MK	~5xD	8,000 - 30,000	<b>84460</b>	176
		DIN 345	N	HSS-E		右手	MK	~5xD	5,000 - 50,000	<b>82011</b>	177
		DIN 345	IS	HSS-E		右手	MK	~5xD	11,500 - 32,000	<b>82012</b>	178
		DIN 345	FN	HSS-E		右手	MK	~5xD	19,000 - 19,500	<b>84660</b>	179
		DIN 345	N	HSS-E		右手	MK	~5xD	8,000 - 23,000	<b>84859</b>	180

## 工具钻

		哈特纳标准	V	HSS-E		右手	MK	~3xD	10,000 - 28,000	<b>82971</b>	181
		哈特纳标准	IS	HSS-E		右手	MK	~3xD	10,000 - 31,000	<b>82972</b>	182

## NC 点钻










		哈特纳标准	N	HSS		右手	MK		12,000 - 25,000	<b>82191</b>	183
		哈特纳标准	N	HSS		右手	MK		12,000 - 25,000	<b>82192</b>	183

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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
## 长系列麻花钻

		DIN 341	N	HSS		右手	MK	~10xD	4,000 - 50,000	<b>82210</b>	184
		DIN 341	N	HSS-E		右手	MK	~10xD	5,000 - 30,000	<b>82211</b>	185













## 超长麻花钻,系列1

		DIN 1870	N	HSS		右手	MK	~15xD	8,500 - 38,000	<b>82310</b>	186
		DIN 1870	FN	HSS		右手	MK	~15xD	8,000 - 30,000	<b>82340</b>	187
		DIN 1870	FN	HSS-E		右手	MK	~15xD	10,000 - 20,000	<b>82341</b>	188

## 超长麻花钻,系列2










		DIN 1870	N	HSS		右手	MK	~20xD	8,500 - 30,000	<b>82410</b>	189
		DIN 1870	FN	HSS		右手	MK	~20xD	8,000 - 30,000	<b>82440</b>	190

## 超长麻花钻




		哈特纳标准	FN	HSS		右手	MK	>20xD	8,000 - 20,000	<b>82466</b>	191
		哈特纳标准	FN	HSS		右手	MK	20xD	14,000 - 38,000	<b>82467</b>	192
		哈特纳标准	FN	HSS		右手	MK	>20xD	14,000 - 18,000	<b>82468</b>	193
		哈特纳标准	FN	HSS		右手	MK	>20xD	15,000 - 18,000	<b>82469</b>	194

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 长系列油孔钻

		哈特纳标准	N	HSS		右手	MK	~10xD	10,000 - 40,000	82521	195
		哈特纳标准	FN	HSS		右手	MK	~10xD	10,000 - 20,000	82535	196
		哈特纳标准	FN	HSS-E		右手	MK	~10xD	15,000 - 32,500	82525	197







## 超长油孔钻

		哈特纳标准	FN	HSS-E		右手	MK	~15xD	14,000 - 20,000	82515	198
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## 硬质合金刀片螺旋槽钻

		DIN 8041	N	硬质合金		右手	MK		8,500 - 40,000	89302	199
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## 锥柄扩孔钻

		DIN 343	N	HSS		右手	MK		8,000 - 40,000	86110	200
		DIN 343	N	HSS-E		右手	MK		12,000 - 22,000	86111	201

## 锥孔钻

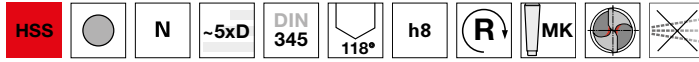
		DIN 1898	N	HSS		右手	MK		5,000 - 20,000	82810	202
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## 麻花钻

产品代号 82010

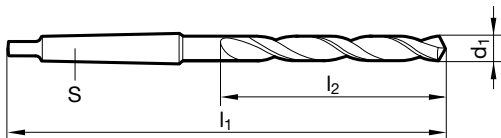


P	M	K	N	S	H
●		●	○		



芯厚 ≥ Ø 14,100 • 圆弧后刀面

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
3,000		MK-1	114,000	33,000	10,250		MK-1	168,000	87,000
3,300		MK-1	117,000	36,000	10,300		MK-1	168,000	87,000
3,600		MK-1	120,000	39,000	10,500		MK-1	168,000	87,000
3,750		MK-1	120,000	39,000	10,600		MK-1	168,000	87,000
4,000		MK-1	124,000	43,000	10,700		MK-1	175,000	94,000
4,200		MK-1	124,000	43,000	10,750		MK-1	175,000	94,000
4,250		MK-1	124,000	43,000	10,800		MK-1	175,000	94,000
4,500		MK-1	128,000	47,000	11,000		MK-1	175,000	94,000
4,900		MK-1	133,000	52,000	11,100		MK-1	175,000	94,000
5,000		MK-1	133,000	52,000	11,200		MK-1	175,000	94,000
5,200		MK-1	133,000	52,000	11,250		MK-1	175,000	94,000
5,500		MK-1	138,000	57,000	11,500		MK-1	175,000	94,000
5,700		MK-1	138,000	57,000	11,750		MK-1	175,000	94,000
6,000		MK-1	138,000	57,000	11,800		MK-1	175,000	94,000
6,200		MK-1	144,000	63,000	12,000		MK-1	182,000	101,000
6,500		MK-1	144,000	63,000	12,100		MK-1	182,000	101,000
6,700		MK-1	144,000	63,000	12,200		MK-1	182,000	101,000
6,750	17/64	MK-1	150,000	69,000	12,250		MK-1	182,000	101,000
6,800		MK-1	150,000	69,000	12,300	31/64	MK-1	182,000	101,000
7,000		MK-1	150,000	69,000	12,500		MK-1	182,000	101,000
7,250		MK-1	150,000	69,000	12,750		MK-1	182,000	101,000
7,500		MK-1	150,000	69,000	12,800		MK-1	182,000	101,000
7,900		MK-1	156,000	75,000	13,000		MK-1	182,000	101,000
8,000		MK-1	156,000	75,000	13,200		MK-1	182,000	101,000
8,100		MK-1	156,000	75,000	13,250		MK-1	189,000	108,000
8,200		MK-1	156,000	75,000	13,490	17/32	MK-1	189,000	108,000
8,250		MK-1	156,000	75,000	13,500		MK-1	189,000	108,000
8,400		MK-1	156,000	75,000	13,750		MK-1	189,000	108,000
8,500		MK-1	156,000	75,000	13,800		MK-1	189,000	108,000
8,700		MK-1	162,000	81,000	14,000		MK-1	189,000	108,000
8,750		MK-1	162,000	81,000	14,100		MK-2	212,000	114,000
8,800		MK-1	162,000	81,000	14,200		MK-2	212,000	114,000
9,000		MK-1	162,000	81,000	14,250		MK-2	212,000	114,000
9,200		MK-1	162,000	81,000	14,300		MK-2	212,000	114,000
9,250		MK-1	162,000	81,000	14,500		MK-2	212,000	114,000
9,500		MK-1	162,000	81,000	14,600		MK-2	212,000	114,000
9,700		MK-1	168,000	87,000	14,750		MK-2	212,000	114,000
9,750		MK-1	168,000	87,000	15,000		MK-2	212,000	114,000
9,800		MK-1	168,000	87,000	15,250		MK-2	218,000	120,000
10,000		MK-1	168,000	87,000	15,500		MK-2	218,000	120,000
10,100		MK-1	168,000	87,000	15,750		MK-2	218,000	120,000
10,200		MK-1	168,000	87,000	15,800		MK-2	218,000	120,000



## 麻花钻

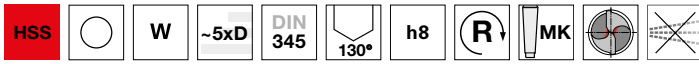
d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
16,000		MK-2	218,000	120,000	29,750		MK-3	296,000	175,000
16,100		MK-2	223,000	125,000	30,000		MK-3	296,000	175,000
16,200		MK-2	223,000	125,000	30,250		MK-3	301,000	180,000
16,250		MK-2	223,000	125,000	30,500		MK-3	301,000	180,000
16,500		MK-2	223,000	125,000	30,600		MK-3	301,000	180,000
16,750		MK-2	223,000	125,000	30,750		MK-3	301,000	180,000
17,000		MK-2	223,000	125,000	31,000		MK-3	301,000	180,000
17,250		MK-2	228,000	130,000	31,250		MK-3	301,000	180,000
17,500		MK-2	228,000	130,000	31,500		MK-3	301,000	180,000
17,750		MK-2	228,000	130,000	31,750	1 1/4	MK-3	306,000	185,000
18,000		MK-2	228,000	130,000	32,000		MK-4	334,000	185,000
18,200		MK-2	233,000	135,000	32,500		MK-4	334,000	185,000
18,250		MK-2	233,000	135,000	33,000		MK-4	334,000	185,000
18,500		MK-2	233,000	135,000	33,500		MK-4	334,000	185,000
18,750		MK-2	233,000	135,000	34,000		MK-4	339,000	190,000
19,000		MK-2	233,000	135,000	34,500		MK-4	339,000	190,000
19,250		MK-2	238,000	140,000	35,000		MK-4	339,000	190,000
19,500		MK-2	238,000	140,000	35,500		MK-4	339,000	190,000
19,700		MK-2	238,000	140,000	36,000		MK-4	344,000	195,000
19,750		MK-2	238,000	140,000	36,500		MK-4	344,000	195,000
20,000		MK-2	238,000	140,000	37,000		MK-4	344,000	195,000
20,100		MK-2	243,000	145,000	37,500		MK-4	344,000	195,000
20,200		MK-2	243,000	145,000	38,000		MK-4	349,000	200,000
20,250		MK-2	243,000	145,000	38,500	1 33/64	MK-4	349,000	200,000
20,400		MK-2	243,000	145,000	39,000		MK-4	349,000	200,000
20,500		MK-2	243,000	145,000	39,500		MK-4	349,000	200,000
20,750		MK-2	243,000	145,000	40,000		MK-4	349,000	200,000
21,000		MK-2	243,000	145,000	40,500		MK-4	354,000	205,000
21,250		MK-2	248,000	150,000	41,000		MK-4	354,000	205,000
21,500		MK-2	248,000	150,000	41,500		MK-4	354,000	205,000
21,750		MK-2	248,000	150,000	42,000		MK-4	354,000	205,000
22,000		MK-2	248,000	150,000	42,500		MK-4	354,000	205,000
22,100		MK-2	248,000	150,000	43,000		MK-4	359,000	210,000
22,200		MK-2	248,000	150,000	43,500		MK-4	359,000	210,000
22,250		MK-2	248,000	150,000	44,000		MK-4	359,000	210,000
22,500		MK-2	253,000	155,000	44,500		MK-4	359,000	210,000
22,750		MK-2	253,000	155,000	45,000		MK-4	359,000	210,000
23,000		MK-2	253,000	155,000	45,500		MK-4	364,000	215,000
23,250		MK-3	276,000	155,000	46,000		MK-4	364,000	215,000
23,500		MK-3	276,000	155,000	46,500		MK-4	364,000	215,000
23,750		MK-3	281,000	160,000	47,000		MK-4	364,000	215,000
24,000		MK-3	281,000	160,000	47,500		MK-4	364,000	215,000
24,250		MK-3	281,000	160,000	48,000		MK-4	369,000	220,000
24,500		MK-3	281,000	160,000	48,500		MK-4	369,000	220,000
24,750		MK-3	281,000	160,000	49,000		MK-4	369,000	220,000
25,000	63/64	MK-3	281,000	160,000	49,500		MK-4	369,000	220,000
25,200		MK-3	286,000	165,000	50,000		MK-4	369,000	220,000
25,250		MK-3	286,000	165,000	50,500		MK-4	374,000	225,000
25,400	1	MK-3	286,000	165,000	51,000		MK-5	412,000	225,000
25,500		MK-3	286,000	165,000	52,000		MK-5	412,000	225,000
25,750		MK-3	286,000	165,000	53,000		MK-5	412,000	225,000
25,800	1 1/64	MK-3	286,000	165,000	54,000		MK-5	417,000	230,000
26,000		MK-3	286,000	165,000	55,000		MK-5	417,000	230,000
26,250		MK-3	286,000	165,000	56,000		MK-5	417,000	230,000
26,500		MK-3	286,000	165,000	56,500		MK-5	422,000	235,000
27,000		MK-3	291,000	170,000	57,000		MK-5	422,000	235,000
27,250		MK-3	291,000	170,000	58,000		MK-5	422,000	235,000
27,500		MK-3	291,000	170,000	59,000		MK-5	422,000	235,000
27,750		MK-3	291,000	170,000	60,000		MK-5	422,000	235,000
28,000		MK-3	291,000	170,000	62,000		MK-5	427,000	240,000
28,250		MK-3	296,000	175,000	63,000		MK-5	427,000	240,000
28,500		MK-3	296,000	175,000	65,000		MK-5	432,000	245,000
28,750		MK-3	296,000	175,000	70,000		MK-5	437,000	250,000
29,000		MK-3	296,000	175,000	75,000		MK-5	442,000	255,000
29,250		MK-3	296,000	175,000					
29,500		MK-3	296,000	175,000					

## 麻花钻

产品代号 82030

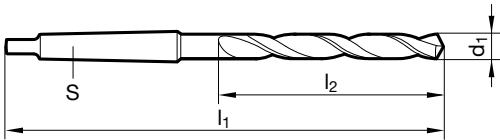


P	M	K	N	S	H
			•		



芯厚  $\geq \varnothing 15,000$  • 圆弧后刀面

适于加工: 软/长屑材料 • 铝及铝合金 • 锌, 精炼铜, 硅, 电子材料



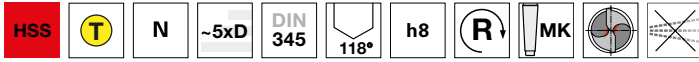
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
6,800	MK-1	150,000	69,000	15,000	MK-2	212,000	114,000
8,500	MK-1	156,000	75,000	24,300	MK-3	281,000	160,000
9,000	MK-1	162,000	81,000	30,500	MK-3	301,000	180,000
9,500	MK-1	162,000	81,000				
10,000	MK-1	168,000	87,000				
12,000	MK-1	182,000	101,000				

## 麻花钻

产品代号 84460

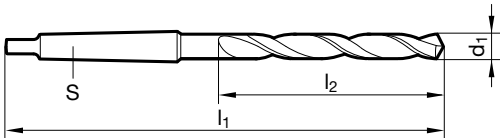


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 5,500 • 圆弧后刀面

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1 mm	inch	S	l1 mm	l2 mm	d1 mm	inch	S	l1 mm	l2 mm
8,000		MK-1	156,000	75,000	18,000		MK-2	228,000	130,000
8,500		MK-1	156,000	75,000	18,500		MK-2	233,000	135,000
9,000		MK-1	162,000	81,000	19,000		MK-2	233,000	135,000
9,500		MK-1	162,000	81,000	19,500		MK-2	238,000	140,000
10,000		MK-1	168,000	87,000	20,000		MK-2	238,000	140,000
10,200		MK-1	168,000	87,000	20,500		MK-2	243,000	145,000
10,250		MK-1	168,000	87,000	21,000		MK-2	243,000	145,000
10,500		MK-1	168,000	87,000	22,000		MK-2	248,000	150,000
10,750		MK-1	175,000	94,000	22,500		MK-2	253,000	155,000
11,000		MK-1	175,000	94,000	23,000		MK-2	253,000	155,000
11,250		MK-1	175,000	94,000	24,000		MK-3	281,000	160,000
11,500		MK-1	175,000	94,000	24,500		MK-3	281,000	160,000
12,000		MK-1	182,000	101,000	25,000	63/64	MK-3	281,000	160,000
12,500		MK-1	182,000	101,000	25,500		MK-3	286,000	165,000
12,750		MK-1	182,000	101,000	26,000		MK-3	286,000	165,000
13,000		MK-1	182,000	101,000	26,500		MK-3	286,000	165,000
13,250		MK-1	189,000	108,000	27,000		MK-3	291,000	170,000
13,500		MK-1	189,000	108,000	28,000		MK-3	291,000	170,000
13,750		MK-1	189,000	108,000	28,500		MK-3	296,000	175,000
14,000		MK-1	189,000	108,000	29,000		MK-3	296,000	175,000
14,250		MK-2	212,000	114,000	29,500		MK-3	296,000	175,000
14,500		MK-2	212,000	114,000	30,000		MK-3	296,000	175,000
14,750		MK-2	212,000	114,000					
15,000		MK-2	212,000	114,000					
15,500		MK-2	218,000	120,000					
16,000		MK-2	218,000	120,000					
16,250		MK-2	223,000	125,000					
16,500		MK-2	223,000	125,000					
17,000		MK-2	223,000	125,000					
17,500		MK-2	228,000	130,000					

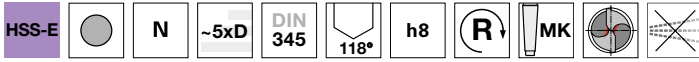


## 麻花钻

产品代号 82011

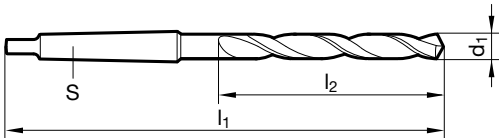


P	M	K	N	S	H
●	○	●	○		



芯厚 ≥ Ø 5,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度

适于加工: 强度大于800 N/mm<sup>2</sup>的合金/非合金钢和铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	inch	S	l1 mm	l2 mm	d1 mm	inch	S	l1 mm	l2 mm
5,000		MK-1	133,000	52,000	18,500		MK-2	233,000	135,000
6,000		MK-1	138,000	57,000	19,000		MK-2	233,000	135,000
7,000		MK-1	150,000	69,000	19,050	3/4	MK-2	238,000	140,000
7,500		MK-1	150,000	69,000	19,500		MK-2	238,000	140,000
8,000		MK-1	156,000	75,000	20,000		MK-2	238,000	140,000
8,500		MK-1	156,000	75,000	20,500		MK-2	243,000	145,000
9,000		MK-1	162,000	81,000	20,750		MK-2	243,000	145,000
9,500		MK-1	162,000	81,000	21,000		MK-2	243,000	145,000
10,000		MK-1	168,000	87,000	21,500		MK-2	248,000	150,000
10,250		MK-1	168,000	87,000	22,000		MK-2	248,000	150,000
10,500		MK-1	168,000	87,000	22,500		MK-2	253,000	155,000
11,000		MK-1	175,000	94,000	23,000		MK-2	253,000	155,000
11,500		MK-1	175,000	94,000	23,500		MK-3	276,000	155,000
12,000		MK-1	182,000	101,000	24,000		MK-3	281,000	160,000
12,200		MK-1	182,000	101,000	24,500		MK-3	281,000	160,000
12,250		MK-1	182,000	101,000	25,000	63/64	MK-3	281,000	160,000
12,500		MK-1	182,000	101,000	25,250		MK-3	286,000	165,000
12,750		MK-1	182,000	101,000	25,500		MK-3	286,000	165,000
13,000		MK-1	182,000	101,000	26,000		MK-3	286,000	165,000
13,200		MK-1	182,000	101,000	26,500		MK-3	286,000	165,000
13,500		MK-1	189,000	108,000	27,000		MK-3	291,000	170,000
13,800		MK-1	189,000	108,000	27,500		MK-3	291,000	170,000
14,000		MK-1	189,000	108,000	28,000		MK-3	291,000	170,000
14,200		MK-2	212,000	114,000	28,500		MK-3	296,000	175,000
14,290	9/16	MK-2	212,000	114,000	28,570	1 1/8	MK-3	296,000	175,000
14,500		MK-2	212,000	114,000	29,000		MK-3	296,000	175,000
14,750		MK-2	212,000	114,000	29,500		MK-3	296,000	175,000
15,000		MK-2	212,000	114,000	30,000		MK-3	296,000	175,000
15,250		MK-2	218,000	120,000	31,000		MK-3	301,000	180,000
15,500		MK-2	218,000	120,000	31,500		MK-3	301,000	180,000
15,750		MK-2	218,000	120,000	32,000		MK-4	334,000	185,000
16,000		MK-2	218,000	120,000	33,000		MK-4	334,000	185,000
16,250		MK-2	223,000	125,000	34,000		MK-4	339,000	190,000
16,500		MK-2	223,000	125,000	35,000		MK-4	339,000	190,000
16,750		MK-2	223,000	125,000	36,000		MK-4	344,000	195,000
17,000		MK-2	223,000	125,000	38,000		MK-4	349,000	200,000
17,250		MK-2	228,000	130,000	40,000		MK-4	349,000	200,000
17,460	11/16	MK-2	228,000	130,000	50,000		MK-4	369,000	220,000
17,500		MK-2	228,000	130,000					
17,750		MK-2	228,000	130,000					
18,000		MK-2	228,000	130,000					
18,200		MK-2	233,000	135,000					

## 麻花钻

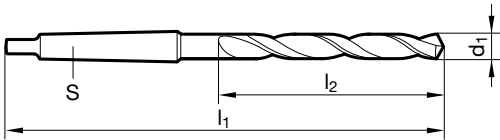
产品代号 82012



P	M	K	N	S	H
○	●		○	●	



INOX-钻头 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 适于加工: 不锈钢/耐酸/耐热奥氏体钢



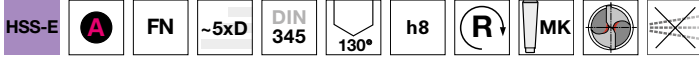
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
11,500	MK-1	175,000	94,000	20,000	MK-2	238,000	140,000
12,000	MK-1	182,000	101,000	20,500	MK-2	243,000	145,000
14,000	MK-1	189,000	108,000	21,000	MK-2	243,000	145,000
15,000	MK-2	212,000	114,000	22,000	MK-2	248,000	150,000
15,500	MK-2	218,000	120,000	22,500	MK-2	253,000	155,000
16,000	MK-2	218,000	120,000	23,000	MK-2	253,000	155,000
16,500	MK-2	223,000	125,000	26,000	MK-3	286,000	165,000
17,000	MK-2	223,000	125,000	27,500	MK-3	291,000	170,000
17,250	MK-2	228,000	130,000	28,000	MK-3	291,000	170,000
17,500	MK-2	228,000	130,000	31,500	MK-3	301,000	180,000
18,000	MK-2	228,000	130,000	32,000	MK-4	334,000	185,000
19,500	MK-2	238,000	140,000				

## 麻花钻

产品代号 84660

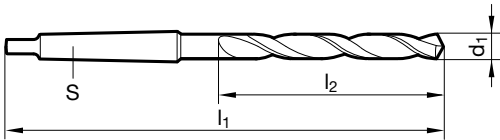


P	M	K	N	S	H
○		●	○		

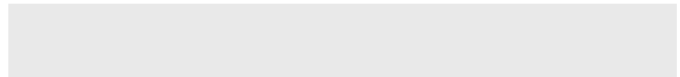
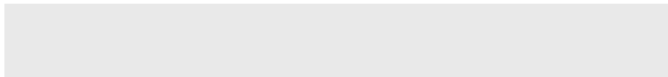


芯厚  $\geq \varnothing 14,200$  • 圆弧后刀面 • 宽槽 • 高耐磨强度 • 耐磨性增强 • 尤其适合孔深超过3xD

适于加工: 强度大于1000 N/mm<sup>2</sup>的合金/非合金钢和铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
19,000	MK-2	233,000	135,000				
19,500	MK-2	238,000	140,000				



## 麻花钻

产品代号 84859

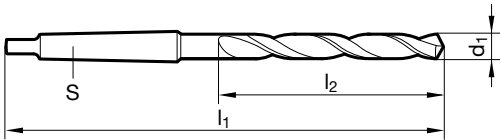


P	M	K	N	S	H
•	○	•	○		



芯厚  $\geq \varnothing 8,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨性增强

适于加工: 强度大于800 N/mm<sup>2</sup>的合金/非合金钢和铸件 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



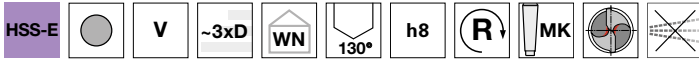
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
8,000	MK-1	156,000	75,000	15,000	MK-2	212,000	114,000
10,000	MK-1	168,000	87,000	23,000	MK-2	253,000	155,000
11,000	MK-1	175,000	94,000				
12,000	MK-1	182,000	101,000				
13,000	MK-1	182,000	101,000				
14,000	MK-1	189,000	108,000				

## 工具钻

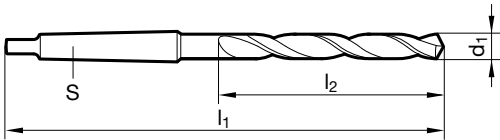
产品代号 82971



P	M	K	N	S	H
•	•	•	○	•	○



芯厚  $\geq \varnothing 10,000$  • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 适于加工: 加工难加工材料 • 不锈钢/耐酸钢 • 弹簧钢,奥氏体钢



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
10,000	MK-1	138,000	57,000	20,000	MK-3	212,000	91,000
10,200	MK-1	138,000	57,000	21,000	MK-3	216,000	95,000
10,500	MK-1	138,000	57,000	21,500	MK-3	219,000	98,000
11,500	MK-1	142,000	61,000	22,000	MK-3	219,000	98,000
12,000	MK-1	147,000	66,000	23,000	MK-3	222,000	101,000
12,500	MK-1	147,000	66,000	24,000	MK-3	225,000	104,000
13,000	MK-1	147,000	66,000	25,000	MK-3	225,000	104,000
13,500	MK-2	168,000	70,000	26,000	MK-4	256,000	107,000
14,000	MK-2	168,000	70,000	27,000	MK-4	259,000	110,000
14,500	MK-2	172,000	74,000	28,000	MK-4	259,000	110,000
15,000	MK-2	172,000	74,000				
15,500	MK-2	176,000	78,000				
16,000	MK-2	176,000	78,000				
17,000	MK-2	179,000	81,000				
17,500	MK-2	183,000	85,000				
18,000	MK-2	183,000	85,000				
18,500	MK-2	186,000	88,000				
19,000	MK-2	186,000	88,000				

## 工具钻

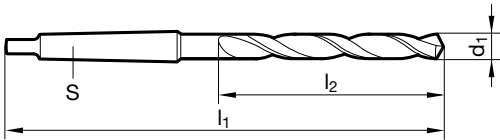
产品代号 82972



P	M	K	N	S	H
○	●	○	○	○	○



INOX-钻头 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度  
 适于加工: 不锈钢/耐酸/耐热奥氏体钢



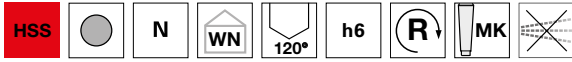
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
10,000	MK-1	138,000	57,000	27,500	MK-4	259,000	110,000
10,500	MK-1	138,000	57,000	28,500	MK-4	263,000	114,000
10,800	MK-1	142,000	61,000	29,000	MK-4	263,000	114,000
11,500	MK-1	142,000	61,000	29,500	MK-4	263,000	114,000
11,800	MK-1	142,000	61,000	30,500	MK-4	266,000	117,000
12,000	MK-1	147,000	66,000	31,000	MK-4	266,000	117,000
15,000	MK-2	172,000	74,000				
19,750	MK-3	212,000	91,000				
21,750	MK-3	219,000	98,000				
22,750	MK-3	222,000	101,000				
26,000	MK-4	256,000	107,000				
27,000	MK-4	259,000	110,000				

## NC 点钻

产品代号 82191



P	M	K	N	S	H
•	○	•	•	○	

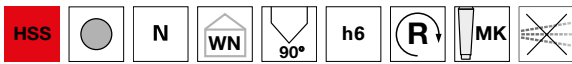


圆弧后刀面 • 仅适合打定位孔 • 刚性好

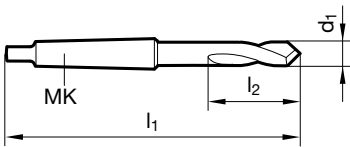
产品代号 82192



P	M	K	N	S	H
•	○	•	•	○	



圆弧后刀面 • 仅适合打定位孔 • 刚性好



d1 mm	inch	S	l1 mm	l2 mm	d1 mm	inch	S	l1 mm	l2 mm
12,000		MK-1	122,000	30,000					
16,000		MK-2	148,000	37,500					
20,000		MK-2	148,000	45,000					
25,000		MK-3	171,000	53,000					

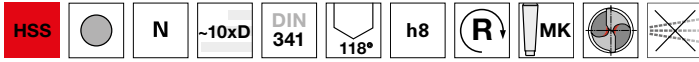


## 长系列麻花钻

产品代号 82210

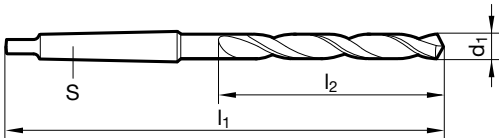


P	M	K	N	S	H
●	●	●	○	○	○



芯厚 ≥ Ø 14,500 • 圆弧后刀面 • 使用钻套钻削

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁, 铜镍锌合金,石墨



d1	inch	S	l1	l2	d1	inch	S	l1	l2
mm			mm	mm	mm			mm	mm
4,000		MK-1	145,000	64,000	21,000		MK-2	282,000	184,000
4,200		MK-1	145,000	64,000	21,400		MK-2	289,000	191,000
5,000		MK-1	155,000	74,000	21,500		MK-2	289,000	191,000
5,200		MK-1	155,000	74,000	22,000		MK-2	289,000	191,000
5,500		MK-1	161,000	80,000	22,500		MK-2	296,000	198,000
6,000		MK-1	161,000	80,000	23,000		MK-2	296,000	198,000
6,500		MK-1	167,000	86,000	23,250		MK-3	319,000	198,000
6,800		MK-1	174,000	93,000	24,000		MK-3	327,000	206,000
7,800		MK-1	181,000	100,000	24,500		MK-3	327,000	206,000
8,000		MK-1	181,000	100,000	25,000	63/64	MK-3	327,000	206,000
8,200		MK-1	181,000	100,000	25,500		MK-3	335,000	214,000
8,500		MK-1	181,000	100,000	26,000		MK-3	335,000	214,000
9,000		MK-1	188,000	107,000	26,500		MK-3	335,000	214,000
9,900		MK-1	197,000	116,000	27,000		MK-3	343,000	222,000
10,000		MK-1	197,000	116,000	27,500		MK-3	343,000	222,000
10,200		MK-1	197,000	116,000	28,000		MK-3	343,000	222,000
10,500		MK-1	197,000	116,000	29,000		MK-3	351,000	230,000
11,000		MK-1	206,000	125,000	29,500		MK-3	351,000	230,000
11,500		MK-1	206,000	125,000	30,000		MK-3	351,000	230,000
11,800		MK-1	206,000	125,000	31,000		MK-3	360,000	239,000
12,000		MK-1	215,000	134,000	32,000		MK-4	397,000	248,000
12,500		MK-1	215,000	134,000	33,000		MK-4	397,000	248,000
13,000		MK-1	215,000	134,000	34,000		MK-4	406,000	257,000
13,500		MK-1	223,000	142,000	35,000		MK-4	406,000	257,000
13,750		MK-1	223,000	142,000	36,000		MK-4	416,000	267,000
14,000		MK-1	223,000	142,000	37,000		MK-4	416,000	267,000
14,500		MK-2	245,000	147,000	38,000		MK-4	426,000	277,000
14,750		MK-2	245,000	147,000	39,000		MK-4	426,000	277,000
15,000		MK-2	245,000	147,000	39,500		MK-4	426,000	277,000
15,500		MK-2	251,000	153,000	40,000		MK-4	426,000	277,000
15,750		MK-2	251,000	153,000	41,000		MK-4	436,000	287,000
16,000		MK-2	251,000	153,000	42,000		MK-4	436,000	287,000
16,500		MK-2	257,000	159,000	44,000		MK-4	447,000	298,000
17,000		MK-2	257,000	159,000	45,000		MK-4	447,000	298,000
17,250		MK-2	263,000	165,000	48,000		MK-4	470,000	321,000
17,500		MK-2	263,000	165,000	49,000		MK-4	470,000	321,000
18,000		MK-2	263,000	165,000	50,000		MK-4	470,000	321,000
18,750		MK-2	269,000	171,000					
19,000		MK-2	269,000	171,000					
19,500		MK-2	275,000	177,000					
20,000		MK-2	275,000	177,000					
20,500		MK-2	282,000	184,000					



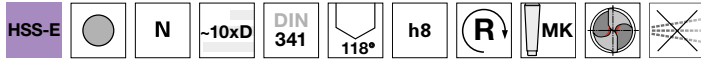


## 长系列麻花钻

产品代号 82211

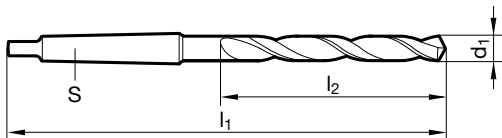


P	M	K	N	S	H
●	○	●	●	○	



芯厚 ≥ Ø 5,000 • 圆弧后刀面 • 高耐磨强度 • 耐磨损 高强度 • 使用钻套钻削

适于加工: 强度大于800N/mm<sup>2</sup>的钢 (合金 以及 非合金) 和铸铁 • 热轧和冷轧钢 • 耐磨轴承钢 • 适于加工: 高合金钢 • 热处理钢和淬硬钢



d1 mm	inch	S	l1 mm	l2 mm	d1 mm	inch	S	l1 mm	l2 mm
5,000		MK-1	155,000	74,000	20,000		MK-2	275,000	177,000
6,800		MK-1	174,000	93,000	25,000	63/64	MK-3	327,000	206,000
8,500		MK-1	181,000	100,000	30,000		MK-3	351,000	230,000
10,000		MK-1	197,000	116,000					
10,200		MK-1	197,000	116,000					
11,500		MK-1	206,000	125,000					
12,000		MK-1	215,000	134,000					
13,000		MK-1	215,000	134,000					
14,000		MK-1	223,000	142,000					
14,500		MK-2	245,000	147,000					
16,000		MK-2	251,000	153,000					
18,000		MK-2	263,000	165,000					



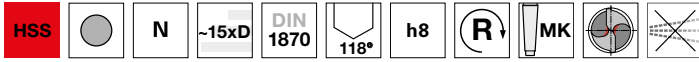
# HARTNER

## 超长麻花钻,系列1

产品代号 82310

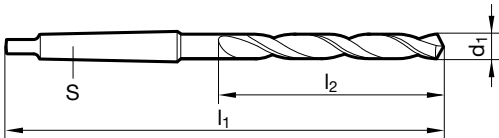


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 8,500 • 圆弧后刀面 • 适合加工深孔

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
8,500	MK-1	265,000	165,000	22,000	MK-2	405,000	270,000
9,000	MK-1	275,000	175,000	22,500	MK-2	405,000	270,000
9,500	MK-1	275,000	175,000	23,000	MK-2	405,000	270,000
10,000	MK-1	285,000	185,000	23,500	MK-3	425,000	270,000
10,200	MK-1	285,000	185,000	24,000	MK-3	440,000	290,000
11,000	MK-1	300,000	195,000	24,500	MK-3	440,000	290,000
11,800	MK-1	300,000	195,000	25,000	MK-3	440,000	290,000
12,500	MK-1	310,000	205,000	26,000	MK-3	440,000	290,000
13,000	MK-1	310,000	205,000	26,500	MK-3	440,000	290,000
14,000	MK-1	325,000	220,000	30,000	MK-3	460,000	305,000
14,500	MK-2	340,000	220,000	30,500	MK-3	480,000	320,000
15,000	MK-2	340,000	220,000	33,000	MK-4	505,000	320,000
15,750	MK-2	355,000	230,000	38,000	MK-4	555,000	360,000
15,800	MK-2	355,000	230,000				
16,000	MK-2	355,000	230,000				
16,250	MK-2	355,000	230,000				
17,000	MK-2	355,000	230,000				
17,500	MK-2	370,000	245,000				
17,750	MK-2	370,000	245,000				
18,000	MK-2	370,000	245,000				
18,500	MK-2	370,000	245,000				
19,000	MK-2	370,000	245,000				
20,000	MK-2	385,000	260,000				
21,000	MK-2	385,000	260,000				



## 超长麻花钻,系列1

产品代号 82340

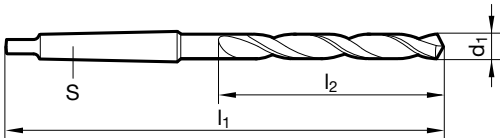


P	M	K	N	S	H
•		•	•		



芯厚 ≥ Ø 8,000 • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所

适于加工: ≤1000N/mm²的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1	inch	S	l1	l2	d1	inch	S	l1	l2
mm			mm	mm	mm			mm	mm
8,000		MK-1	265,000	165,000	17,500		MK-2	370,000	245,000
8,500		MK-1	265,000	165,000	18,000		MK-2	370,000	245,000
9,000		MK-1	275,000	175,000	19,000		MK-2	370,000	245,000
10,000		MK-1	285,000	185,000	19,500		MK-2	385,000	260,000
10,500		MK-1	285,000	185,000	20,000		MK-2	385,000	260,000
11,000		MK-1	300,000	195,000	20,500		MK-2	385,000	260,000
11,500		MK-1	300,000	195,000	21,000		MK-2	385,000	260,000
12,000		MK-1	310,000	205,000	22,000		MK-2	405,000	270,000
12,500		MK-1	310,000	205,000	23,000		MK-2	405,000	270,000
13,000		MK-1	310,000	205,000	24,000		MK-3	440,000	290,000
13,500		MK-1	325,000	220,000	25,000	63/64	MK-3	440,000	290,000
14,000		MK-1	325,000	220,000	26,000		MK-3	440,000	290,000
14,500		MK-2	340,000	220,000	28,000		MK-3	460,000	305,000
15,000		MK-2	340,000	220,000	29,000		MK-3	460,000	305,000
15,500		MK-2	355,000	230,000	30,000		MK-3	460,000	305,000
16,000		MK-2	355,000	230,000					
16,500		MK-2	355,000	230,000					
17,000		MK-2	355,000	230,000					



# HARTNER

## 超长麻花钻,系列1

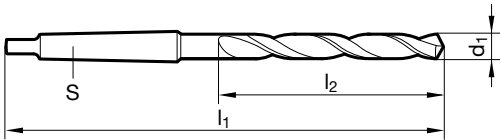
产品代号 82341



P	M	K	N	S	H
•	•	•	•	•	○



芯厚  $\geq \varnothing 10,000$  • 圆弧后刀面 • 宽槽 • 耐磨损 高强度 • 高耐磨强度 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
10,000	MK-1	285,000	185,000	16,000	MK-2	355,000	230,000
12,000	MK-1	310,000	205,000	16,500	MK-2	355,000	230,000
12,500	MK-1	310,000	205,000	17,000	MK-2	355,000	230,000
13,000	MK-1	310,000	205,000	18,000	MK-2	370,000	245,000
14,000	MK-1	325,000	220,000	19,000	MK-2	370,000	245,000
15,000	MK-2	340,000	220,000	20,000	MK-2	385,000	260,000



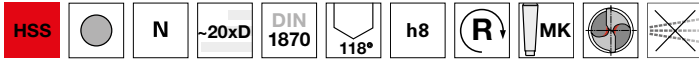
# HARTNER

## 超长麻花钻,系列2

产品代号 82410

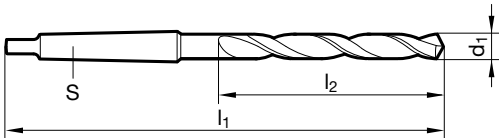


P	M	K	N	S	H
•		•	○		



芯厚 ≥ Ø 8,500 • 圆弧后刀面 • 适合加工深孔

适于加工: 合金/非合金钢和铸钢 • 灰铸铁,可锻铸铁和球墨铸铁 • 粉末冶金铁和石墨



d1 mm	inch	S	l1 mm	l2 mm	d1 mm	inch	S	l1 mm	l2 mm
8,500		MK-1	330,000	210,000	19,000		MK-2	465,000	310,000
9,000		MK-1	345,000	220,000	20,000		MK-2	490,000	325,000
9,500		MK-1	345,000	220,000	21,000		MK-2	490,000	325,000
10,000		MK-1	360,000	235,000	22,000		MK-2	515,000	345,000
10,500		MK-1	360,000	235,000	23,000		MK-2	515,000	345,000
11,000		MK-1	375,000	250,000	25,000	63/64	MK-3	555,000	365,000
11,750		MK-1	375,000	250,000	28,000		MK-3	580,000	385,000
11,800		MK-1	375,000	250,000	30,000		MK-3	580,000	385,000
13,000		MK-1	395,000	260,000					
13,500		MK-1	410,000	275,000					
14,000		MK-1	410,000	275,000					
14,500		MK-2	425,000	275,000					
15,000		MK-2	425,000	275,000					
15,500		MK-2	445,000	295,000					
15,750		MK-2	445,000	295,000					
16,000		MK-2	445,000	295,000					
16,250		MK-2	445,000	295,000					
18,000		MK-2	465,000	310,000					



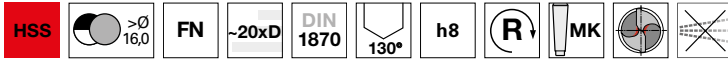
# HARTNER

## 超长麻花钻,系列2

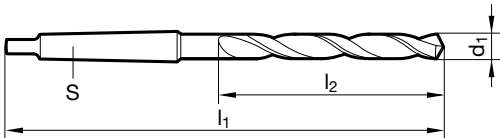
产品代号 82440



P	M	K	N	S	H
•		•	•		



芯厚 ≥ Ø 8,000 • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工: ≤1000N/mm²的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	inch	S	l1 mm	l2 mm	d1 mm	inch	S	l1 mm	l2 mm
8,000		MK-1	330,000	210,000	18,000		MK-2	465,000	310,000
8,500		MK-1	330,000	210,000	18,500		MK-2	465,000	310,000
9,500		MK-1	345,000	220,000	19,000		MK-2	465,000	310,000
10,000		MK-1	360,000	235,000	19,500		MK-2	490,000	325,000
10,500		MK-1	360,000	235,000	20,000		MK-2	490,000	325,000
11,000		MK-1	375,000	250,000	20,500		MK-2	490,000	325,000
12,000		MK-1	395,000	260,000	21,000		MK-2	490,000	325,000
12,500		MK-1	395,000	260,000	21,500		MK-2	515,000	345,000
13,000		MK-1	395,000	260,000	22,000		MK-2	515,000	345,000
13,500		MK-1	410,000	275,000	23,000		MK-2	515,000	345,000
14,000		MK-1	410,000	275,000	24,000		MK-3	555,000	365,000
14,500		MK-2	425,000	275,000	25,000	63/64	MK-3	555,000	365,000
15,000		MK-2	425,000	275,000	26,000		MK-3	555,000	365,000
15,500		MK-2	445,000	295,000	28,000		MK-3	580,000	385,000
16,000		MK-2	445,000	295,000	29,000		MK-3	580,000	385,000
16,500		MK-2	445,000	295,000	30,000		MK-3	580,000	385,000
17,000		MK-2	445,000	295,000					
17,500		MK-2	465,000	310,000					

## 超长麻花钻

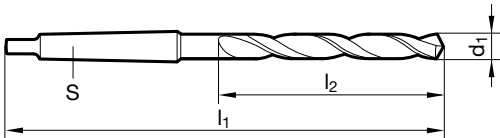
产品代号 82466



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 8,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
8,000	MK-1	500,000	420,000	20,000	MK-2	500,000	400,000
8,500	MK-1	500,000	420,000				
9,000	MK-1	500,000	420,000				
10,000	MK-1	500,000	420,000				
12,000	MK-1	500,000	420,000				
13,000	MK-1	500,000	420,000				
14,000	MK-1	500,000	420,000				
15,000	MK-2	500,000	400,000				
16,000	MK-2	500,000	400,000				
17,000	MK-2	500,000	400,000				
18,000	MK-2	500,000	400,000				
19,000	MK-2	500,000	400,000				

## 超长麻花钻

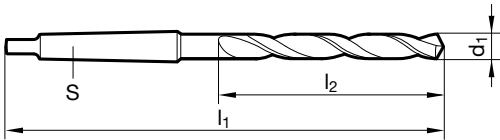
产品代号 82467



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 14,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
14,000	MK-1	600,000	500,000	32,000	MK-4	600,000	450,000
15,000	MK-2	600,000	500,000	35,000	MK-4	600,000	450,000
16,000	MK-2	600,000	500,000	38,000	MK-4	600,000	450,000
18,000	MK-2	600,000	500,000				
19,000	MK-2	600,000	500,000				
20,000	MK-2	600,000	500,000				
21,000	MK-2	600,000	500,000				
22,000	MK-2	600,000	500,000				
23,000	MK-2	600,000	500,000				
24,000	MK-3	600,000	475,000				
25,000	MK-3	600,000	475,000				
30,000	MK-3	600,000	475,000				

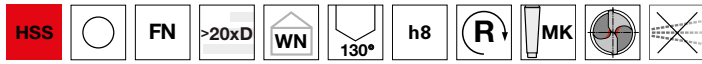


## 超长麻花钻

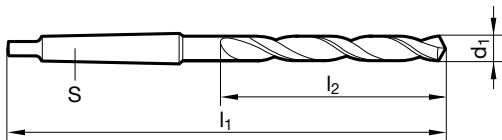
产品代号 82468



P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 14,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



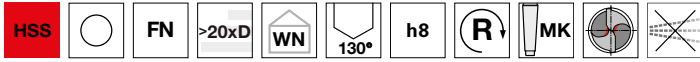
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
14,000	MK-1	750,000	650,000				
15,000	MK-2	750,000	650,000				
16,000	MK-2	750,000	650,000				
18,000	MK-2	750,000	650,000				

## 超长麻花钻

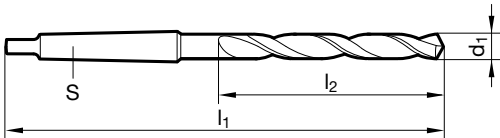
产品代号 82469



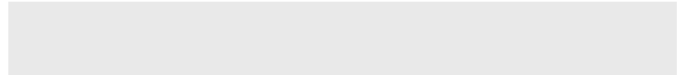
P	M	K	N	S	H
•		•	•		



芯厚  $\geq \varnothing 15,000$  • 圆弧后刀面 • 宽槽 • 适合加工深孔 • 适合排屑条件不佳的场所  
 适于加工:  $\leq 1000\text{N/mm}^2$ 的铸铁和钢 • 灰铸铁,可锻铸铁和球墨铸铁 - 粉末冶金铁和石墨



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
15,000	MK-2	1000,000	850,000				
18,000	MK-2	1000,000	850,000				



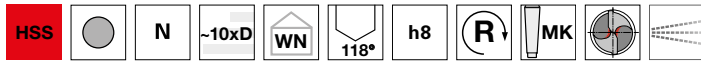


## 长系列油孔钻

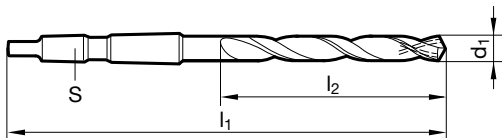
产品代号 82521



P	M	K	N	S	H
●	○	●	●	○	



芯厚 ≥ Ø 10,000 • 圆弧后刀面 • 莫氏锥柄轴向冷却 • 使用钻套钻削  
 适于加工: 叠层金属薄板件 • 钢和铸钢,灰铸铁 • ≤800N/mm²的奥氏体钢



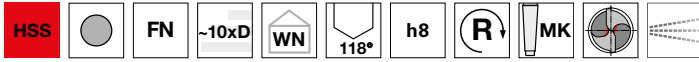
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
10,000	MK-2	233,000	116,000	22,000	MK-3	327,000	191,000
11,000	MK-2	242,000	125,000	23,000	MK-3	334,000	198,000
12,000	MK-2	251,000	134,000	24,000	MK-3	342,000	206,000
13,000	MK-2	251,000	134,000	25,000	MK-3	342,000	206,000
13,200	MK-2	251,000	134,000	26,000	MK-3	350,000	214,000
13,500	MK-2	259,000	142,000	26,500	MK-3	350,000	214,000
13,800	MK-2	259,000	142,000	27,000	MK-4	385,000	222,000
14,000	MK-2	259,000	142,000	28,000	MK-4	385,000	222,000
15,000	MK-2	264,000	147,000	29,000	MK-4	393,000	230,000
16,000	MK-2	270,000	153,000	30,000	MK-4	393,000	230,000
17,000	MK-2	276,000	159,000	32,000	MK-4	421,000	248,000
18,000	MK-2	282,000	165,000	34,000	MK-4	430,000	257,000
18,500	MK-3	307,000	171,000	35,000	MK-4	430,000	257,000
18,750	MK-3	307,000	171,000	40,000	MK-4	450,000	277,000
19,000	MK-3	307,000	171,000				
19,500	MK-3	313,000	177,000				
20,000	MK-3	313,000	177,000				
21,000	MK-3	320,000	184,000				

## 长系列油孔钻

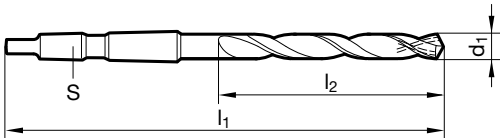
产品代号 82535



P	M	K	N	S	H
•	○	•	•		



芯厚  $\geq \varnothing 10,000$  • 圆弧后刀面 • 莫氏锥柄轴向冷却 • 使用钻套钻削  
 适于加工: 叠层金属薄板件 • 钢和铸钢, 灰铸铁 •  $\leq 800\text{N/mm}^2$  的奥氏体钢



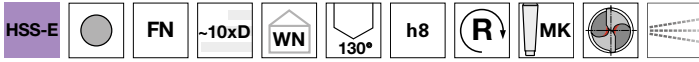
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
10,000	MK-2	224,000	116,000	18,500	MK-3	303,000	171,000
10,500	MK-2	224,000	116,000	19,000	MK-3	303,000	171,000
11,000	MK-2	233,000	125,000	19,500	MK-3	309,000	177,000
11,500	MK-2	233,000	125,000	20,000	MK-3	309,000	177,000
12,000	MK-2	242,000	134,000				
12,500	MK-2	242,000	134,000				
15,000	MK-2	255,000	147,000				
16,000	MK-2	261,000	153,000				
16,500	MK-2	267,000	159,000				
17,000	MK-2	267,000	159,000				
17,500	MK-2	273,000	165,000				
18,000	MK-2	273,000	165,000				

## 长系列油孔钻

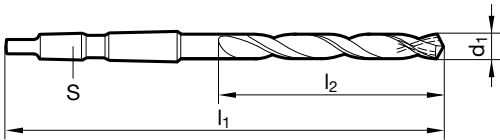
产品代号 82525



P	M	K	N	S	H
•	•	•	•	•	○



芯厚  $\geq \varnothing 15,000$  • 圆弧后刀面 • 莫氏锥柄轴向冷却 • 高耐磨强度 • 耐磨损 高强度 • 使用钻套钻削  
 适合加工高拉伸强度钢 • 铸钢,灰铸铁 • 不锈钢/耐酸/耐热钢 • 强度达到1300 N/mm<sup>2</sup>



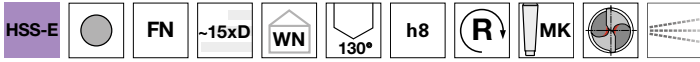
d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
15,000	MK-2	264,000	147,000				
17,000	MK-2	276,000	159,000				
18,000	MK-2	282,000	165,000				
21,000	MK-3	320,000	184,000				
22,000	MK-3	327,000	191,000				
32,500	MK-4	421,000	248,000				

## 超长油孔钻

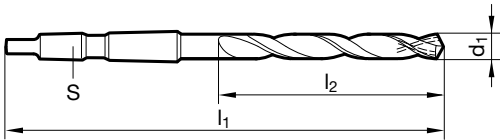
产品代号 82515



P	M	K	N	S	H
•	•	•	•	•	○



芯厚  $\geq \varnothing 14,000$  • 圆弧后刀面 • 莫氏锥柄轴向冷却 • 高耐磨强度 • 耐磨损 高强度 • 使用钻套钻削  
 适合加工高拉伸强度钢 • 铸钢,灰铸铁 • 不锈钢/耐酸/耐热钢 • 强度达到1300 N/mm<sup>2</sup>



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
14,000	MK-2	337,000	220,000				
16,000	MK-2	347,000	230,000				
18,000	MK-2	362,000	245,000				
20,000	MK-3	396,000	260,000				



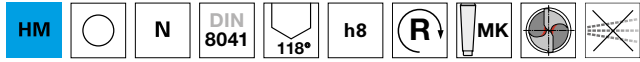
# HARTNER

## 硬质合金刀片螺旋槽钻

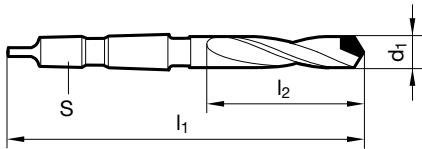
产品代号 89302



P	M	K	N	S	H
○		○			○



芯厚 ≥ Ø 8,500 • 双后刀面 • 镶硬质合金  
 适合加工弹簧钢 • 大于300HB 硬铸铁 • 纯铝 • 硬青铜



d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
8,500	MK-1	135,000	45,000	18,000	MK-2	185,000	80,000
10,000	MK-1	140,000	50,000	19,000	MK-2	185,000	80,000
10,200	MK-1	140,000	50,000	20,000	MK-3	215,000	90,000
10,500	MK-1	140,000	50,000	21,500	MK-3	215,000	90,000
11,000	MK-1	140,000	50,000	22,000	MK-3	215,000	90,000
11,500	MK-1	146,000	56,000	25,000	MK-3	225,000	100,000
12,000	MK-1	146,000	56,000	26,500	MK-4	260,000	110,000
12,500	MK-1	146,000	56,000	27,000	MK-4	260,000	110,000
13,000	MK-1	146,000	56,000	29,000	MK-4	275,000	125,000
13,500	MK-2	168,000	63,000	30,000	MK-4	275,000	125,000
14,000	MK-2	168,000	63,000	32,000	MK-4	275,000	125,000
14,500	MK-2	168,000	63,000	33,000	MK-4	290,000	140,000
15,000	MK-2	168,000	63,000	40,000	MK-4	310,000	160,000
15,500	MK-2	175,000	70,000				
16,000	MK-2	175,000	70,000				
16,500	MK-2	175,000	70,000				
17,000	MK-2	175,000	70,000				
17,500	MK-2	185,000	80,000				



## 锥柄扩孔钻

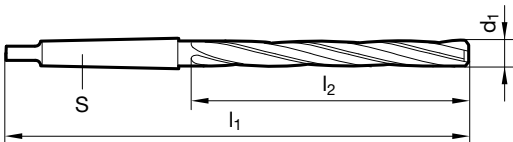
产品代号 86110



P	M	K	N	S	H
●	○	●	○		



圆弧后刀面 • 三刃 • 刚性好 • 适合加工有预钻//预铸//预冲的孔 • 纠正直线度误差 • 纠正圆度误差 • 改善了孔的表面质量 • 倒角直径 < 底孔直径 • 使用时，需严格遵守最小底孔直径的要求 • 扩孔后可以进行精较



d1 mm	d0 mm	S	l1 mm	l2 mm	d1 mm	d0 mm	S	l1 mm	l2 mm
8,000	5,6	MK-1	156,000	75,000	22,700	16,0	MK-2	253,000	155,000
9,000	6,3	MK-1	162,000	81,000	23,000	16,0	MK-2	253,000	155,000
9,800	7,0	MK-1	168,000	87,000	24,000	16,6	MK-3	281,000	160,000
10,000	7,0	MK-1	168,000	87,000	25,000	17,3	MK-3	281,000	160,000
10,100	7,0	MK-1	168,000	87,000	25,700	18,0	MK-3	286,000	165,000
11,000	7,7	MK-1	175,000	94,000	26,000	18,0	MK-3	286,000	165,000
11,500	7,7	MK-1	175,000	94,000	26,700	18,6	MK-3	291,000	170,000
11,750	8,4	MK-1	182,000	101,000	27,000	18,6	MK-3	291,000	170,000
13,000	9,1	MK-1	182,000	101,000	27,700	19,3	MK-3	291,000	170,000
13,750	9,8	MK-1	189,000	108,000	28,000	19,3	MK-3	291,000	170,000
14,000	9,8	MK-1	189,000	108,000	29,000	20,0	MK-3	296,000	175,000
14,100	10,5	MK-2	212,000	114,000	29,700	20,5	MK-3	296,000	175,000
14,750	10,5	MK-2	212,000	114,000	30,000	20,5	MK-3	296,000	175,000
15,000	10,5	MK-2	212,000	114,000	31,000	21,0	MK-3	301,000	180,000
15,750	11,2	MK-2	218,000	120,000	31,600	22,0	MK-4	334,000	185,000
16,000	11,2	MK-2	218,000	120,000	32,000	22,0	MK-4	334,000	185,000
16,250	11,9	MK-2	223,000	125,000	32,600	23,0	MK-4	334,000	185,000
16,750	11,9	MK-2	223,000	125,000	33,000	23,0	MK-4	334,000	185,000
17,000	11,9	MK-2	223,000	125,000	34,000	24,0	MK-4	339,000	190,000
17,750	12,6	MK-2	228,000	130,000	35,000	25,0	MK-4	339,000	190,000
18,000	12,6	MK-2	228,000	130,000	35,600	25,5	MK-4	344,000	195,000
18,700	13,3	MK-2	233,000	135,000	36,000	25,5	MK-4	344,000	195,000
19,000	13,3	MK-2	233,000	135,000	36,600	26,0	MK-4	344,000	195,000
19,700	14,0	MK-2	238,000	140,000	37,600	26,5	MK-4	349,000	200,000
19,750	14,0	MK-2	238,000	140,000	38,000	26,5	MK-4	349,000	200,000
20,000	14,0	MK-2	238,000	140,000	39,000	27,0	MK-4	349,000	200,000
20,700	14,6	MK-2	243,000	145,000	40,000	28,0	MK-4	349,000	200,000
21,000	14,6	MK-2	243,000	145,000					
21,700	15,3	MK-2	248,000	150,000					
22,000	15,3	MK-2	248,000	150,000					



## 锥柄扩孔钻

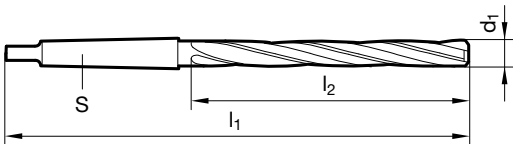
产品代号 86111



P	M	K	N	S	H
•	○	•	•	○	



圆弧后刀面 • 三刃 • 刚性好 • 适合加工有预钻//预铸//预冲的孔 • 纠正直线度误差 • 纠正圆度误差 • 改善了孔的表面质量 • 倒角直径 < 底孔直径 • 使用时, 需严格遵守最小底孔直径的要求 • 扩孔后可以进行精铰



d1 mm	d0 mm	S	l1 mm	l2 mm	d1 mm	d0 mm	S	l1 mm	l2 mm
12,000	8,400	MK-1	182,000	101,000					
14,000	9,800	MK-1	189,000	108,000					
22,000	15,300	MK-2	248,000	150,000					



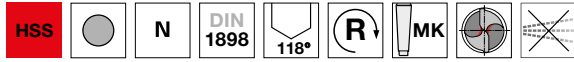
# HARTNER

## 锥孔钻

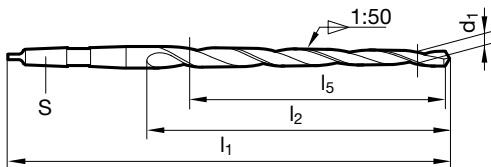
产品代号 82810



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 13,000$  • 圆弧后刀面 • 用于锥形孔配合锥形销 (DIN 1 (new: DIN EN 22 339), DIN 7978 (new: DIN EN 28 736), DIN 7977 (new: DIN EN 28737) 和 DIN 258)



d1 mm	S	l1 mm	l2 mm	l5 mm	d1 mm	S	l1 mm	l2 mm	l5 mm
5,000	MK-1	155,000	81,000	75,000	14,000	MK-2	325,000	229,000	220,000
6,000	MK-1	187,000	108,000	105,000	16,000	MK-2	335,000	239,000	230,000
8,000	MK-1	227,000	149,000	145,000	20,000	MK-3	377,000	263,000	250,000
10,000	MK-1	257,000	180,000	175,000					
12,000	MK-2	315,000	219,000	210,000					
13,000	MK-2	325,000	229,000	220,000					



# HARTNER

Precision Cutting Tools

## 头部磨削

- ▼ 独特的内凹型圆弧切削刃-短屑
- ▼ 额外的刃口保护(负槽前角)加强了刀具刃口强度

## 排屑槽抛光处理

- ▼ 最佳排屑效果
- ▼ 减少切屑与排屑槽之间摩擦, 减少加工阻力

NEW

## 微观几何结构

- ▼ 涂层前切削刃湿式喷砂和抛光
- ▼ 降低切削阻力和加工温度

## 4刃带设计

最佳的孔壁质量和钻孔稳定

# TS 100 HPC





# HARTNER

Precision Cutting Tools

TS钻头







## TS钻头

硬质合金高性能刀具  
抛光处理或涂层











P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 不带内冷TS钻头





	•	○	•	○	○	DIN 6537K	TS 100 U	整硬		右手	HE	3xD	3,000 - 19,500	89264	210
	•	○	•	○	○	DIN 6537K	TS 100 U	整硬		右手	HA	3xD	3,000 - 20,000	89413	212
	•	○	•	○	○	DIN 6537K	TS 100 U	整硬		右手	HE	3xD	3,000 - 20,000	89402	212
	•	○	○	○	○	DIN 6537K	TS 100 H	整硬		右手	HA	3xD	3,000 - 20,000	89422	214
	•	○	•	○	○	DIN 6539	TS 100 U	整硬		右手	圆柱形	3xD	3,000 - 16,000	89237	216
	•	○	•	○	○	DIN 6539	TS 100 U	整硬		右手	圆柱形	3xD	3,000 - 16,000	89401	216
	•	○	•	○	○	DIN 6537L	TS 100 U	整硬		右手	HA	5xD	3,000 - 20,000	89414	218
	•	○	•	○	○	DIN 6537L	TS 100 U	整硬		右手	HE	5xD	3,000 - 20,000	89417	218
	•	○	•	○	○	哈特纳标准	TS 100 U	整硬		右手	圆柱形	5xD	5,160 - 16,000	89275	220

## 带内冷TS钻头

	•	○	○	○	○	DIN 6538K	TS 80 U	硬质合金		右手	HE	3xD	10,000 - 25,000	89306	221
	•	○	•	○	○	DIN 6537K	TS 100 U	整硬		右手	HE	3xD	3,000 - 20,000	89266	222
	•	○	•	○	○	DIN 6537K	TS 100 U	整硬		右手	HA	3xD	3,000 - 20,000	89410	223
	•	○	•	○	○	DIN 6537K	TS 100 U	整硬		右手	HE	3xD	3,000 - 20,000	89415	223

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 带内冷TS钻头

	•				•	○	DIN 6537K TS 100 H	整硬		右手	HA	3xD	3,000 - 20,000	89423	225
	•				•	○	DIN 6537K TS 100 H	整硬		右手	HE	3xD	3,000 - 20,000	89424	225
	○	•				○	DIN 6537K TS 100 INOX	整硬		右手	HA	3xD	3,000 - 20,000	89450	227
	○	•				○	DIN 6537K TS 100 INOX	整硬		右手	HE	3xD	3,000 - 20,000	89550	227
		•				○	哈特纳标准 TS 150 GG	整硬		右手	HA	4xD	3,000 - 20,000	89292	229
	•	○	○	○			DIN 6538M TS 80 U	硬质合金		右手	HE	5xD	9,800 - 25,000	89307	230
	•	○	•	○	○	○	DIN 6537L TS 100 U	整硬		右手	HE	5xD	3,000 - 19,500	89272	231
	•	○	•	○	○	○	DIN 6537L TS 100 U	整硬		右手	HA	5xD	3,000 - 20,000	89411	232
	•	○	•	○	○	○	DIN 6537L TS 100 U	整硬		右手	HE	5xD	3,000 - 20,000	89408	232
		•					DIN 6537L TS 100 R	整硬		右手	HA	5xD	3,000 - 20,000	89420	234
	•				•	○	DIN 6537L TS 100 H	整硬		右手	HA	5xD	3,000 - 20,000	89425	236
	•				•	○	DIN 6537L TS 100 H	整硬		右手	HE	5xD	3,000 - 20,000	89426	236
	○	•				○	DIN 6537L TS 100 INOX	整硬		右手	HA	5xD	3,000 - 20,000	89451	238
	○	•				○	DIN 6537L TS 100 INOX	整硬		右手	HE	5xD	3,000 - 20,000	89551	238

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 带内冷TS钻头

		DIN 6537L	TS 100 ALU	整硬	○	右手	HA	5xD	3,000 - 20,000	89560	240
		DIN 6537L	TS 100 HPC	整硬	Ⓡ	右手	HA	5xD	3,000 - 20,000	89460	242
		DIN 6538L	TS 80 U	硬质合金	Ⓡ	右手	HE	7xD	10,000 - 22,000	89308	244
		哈特纳标准	TS 150 GG	整硬	○	右手	HA	7xD	3,000 - 20,000	89294	245
		哈特纳标准	TS 100 U	整硬	Ⓡ	右手	HA	7xD	3,000 - 20,000	89412	246
		哈特纳标准	TS 100 U	整硬	Ⓡ	右手	HE	7xD	3,000 - 20,000	89416	246
		哈特纳标准	TS 100 R	整硬	Ⓡ	右手	HA	7xD	4,000 - 20,000	89421	248
		哈特纳标准	TS 100 H	整硬	Ⓡ	右手	HA	7xD	3,000 - 16,000	89427	250
		哈特纳标准	TS 100 HPC	整硬	Ⓡ	右手	HA	7xD	3,000 - 20,000	89461	251
		哈特纳标准	TS 150 GG	整硬	○	右手	HA	10xD	3,000 - 20,000	89293	253
		哈特纳标准	TS 150 GG	整硬	○	右手	HA	10xD	3,000 - 20,000	89295	253
		哈特纳标准	TS 100 U	整硬	Ⓡ	右手	HA	12xD	3,000 - 20,000	89418	255
		哈特纳标准	TS 100 T	整硬	Ⓡ	右手	HA	15xD	3,000 - 16,000	86509	257
		哈特纳标准	TS 100 T	整硬	Ⓡ	右手	HA	20xD	3,000 - 16,000	86511	258



P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 带内冷TS钻头



•	•	•	○	○		哈特纳标准	TS 100 T	整硬	A	右手	HA	25xD	3,000 - 16,000	86512	259
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•	•	•	○	○		哈特纳标准	TS 100 T	整硬	A	右手	HA	30xD	3,000 - 14,000	86513	260
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•	•	•	○	○		哈特纳标准	TS 100 T	整硬	A	右手	HA	40xD	3,000 - 10,000	86514	261
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## 3刃TS钻



		•	•			DIN 6537L	TS 3 G	整硬	○	右手	HA	5xD	3,000 - 20,000	89247	262
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		○	○			DIN 6539	TS 3 G	整硬	○	右手	圆柱形	5xD	3,000 - 20,000	89239	263
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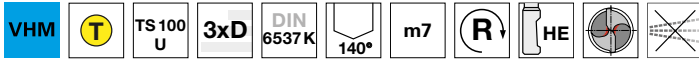


## 不带内冷TS钻头

产品代号 89264

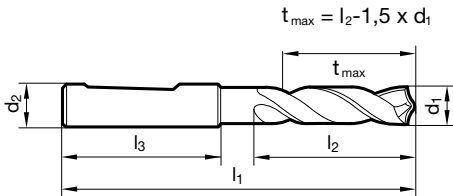


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢（合金/非合金），强度小于 1200N/mm² • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	7,800		8,000	79,000	41,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	7,900		8,000	79,000	41,000	36,000
3,200		6,000	62,000	20,000	36,000	8,000		8,000	79,000	41,000	36,000
3,300		6,000	62,000	20,000	36,000	8,100		10,000	89,000	47,000	40,000
3,400		6,000	62,000	20,000	36,000	8,200		10,000	89,000	47,000	40,000
3,500		6,000	62,000	20,000	36,000	8,300		10,000	89,000	47,000	40,000
3,600		6,000	62,000	20,000	36,000	8,400		10,000	89,000	47,000	40,000
3,700		6,000	62,000	20,000	36,000	8,500		10,000	89,000	47,000	40,000
3,900		6,000	66,000	24,000	36,000	8,600		10,000	89,000	47,000	40,000
4,000		6,000	66,000	24,000	36,000	8,700		10,000	89,000	47,000	40,000
4,100		6,000	66,000	24,000	36,000	8,800		10,000	89,000	47,000	40,000
4,200		6,000	66,000	24,000	36,000	8,900		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	9,000		10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	9,100		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	9,300		10,000	89,000	47,000	40,000
4,700		6,000	66,000	24,000	36,000	9,400		10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	9,600		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	9,900		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	10,000		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	10,100		12,000	102,000	55,000	45,000
5,400		6,000	66,000	28,000	36,000	10,200		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	10,300		12,000	102,000	55,000	45,000
5,560	7/32	6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,700		6,000	66,000	28,000	36,000	10,600		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	10,800		12,000	102,000	55,000	45,000
5,900		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,100		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,200		12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	11,400		12,000	102,000	55,000	45,000
6,300		8,000	79,000	34,000	36,000	11,500		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	11,600		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	11,700		12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	11,900		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
7,400		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
7,600		8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,700		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000



HARTNER

不带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
13,200		14,000	107,000	60,000	45,000	16,200		18,000	123,000	73,000	48,000
13,300		14,000	107,000	60,000	45,000	16,300		18,000	123,000	73,000	48,000
13,500		14,000	107,000	60,000	45,000	16,500		18,000	123,000	73,000	48,000
14,000		14,000	107,000	60,000	45,000	17,000		18,000	123,000	73,000	48,000
14,200		16,000	115,000	65,000	48,000	17,500		18,000	123,000	73,000	48,000
14,300		16,000	115,000	65,000	48,000	18,000		18,000	123,000	73,000	48,000
14,500		16,000	115,000	65,000	48,000	19,000		20,000	131,000	79,000	50,000
15,000		16,000	115,000	65,000	48,000	19,200		20,000	131,000	79,000	50,000
15,800		16,000	115,000	65,000	48,000	19,500		20,000	131,000	79,000	50,000
15,870	5/8	16,000	115,000	65,000	48,000						
16,000		16,000	115,000	65,000	48,000						
16,100		18,000	123,000	73,000	48,000						



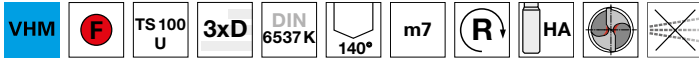
# HARTNER

## 不带内冷TS钻头

### 产品代号 89413



P	M	K	N	S	H
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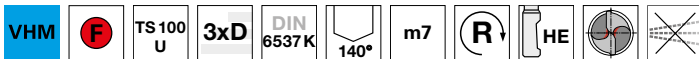
芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金

### 产品代号 89402

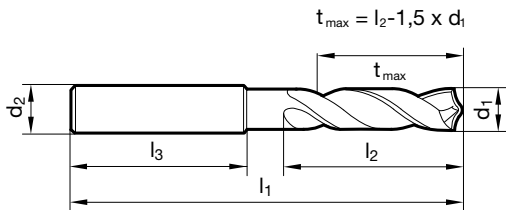


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		6,000	62,000	20,000	36,000	4,760	3/16	6,000	66,000	28,000	36,000
3,100		6,000	62,000	20,000	36,000	4,800		6,000	66,000	28,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	4,900		6,000	66,000	28,000	36,000
3,200		6,000	62,000	20,000	36,000	5,000		6,000	66,000	28,000	36,000
3,250		6,000	62,000	20,000	36,000	5,100		6,000	66,000	28,000	36,000
3,300		6,000	62,000	20,000	36,000	5,160	13/64	6,000	66,000	28,000	36,000
3,400		6,000	62,000	20,000	36,000	5,200		6,000	66,000	28,000	36,000
3,500		6,000	62,000	20,000	36,000	5,300		6,000	66,000	28,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	5,400		6,000	66,000	28,000	36,000
3,600		6,000	62,000	20,000	36,000	5,500		6,000	66,000	28,000	36,000
3,700		6,000	62,000	20,000	36,000	5,550		6,000	66,000	28,000	36,000
3,800		6,000	66,000	24,000	36,000	5,560	7/32	6,000	66,000	28,000	36,000
3,900		6,000	66,000	24,000	36,000	5,600		6,000	66,000	28,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	5,700		6,000	66,000	28,000	36,000
4,000		6,000	66,000	24,000	36,000	5,800		6,000	66,000	28,000	36,000
4,100		6,000	66,000	24,000	36,000	5,900		6,000	66,000	28,000	36,000
4,200		6,000	66,000	24,000	36,000	5,950	15/64	6,000	66,000	28,000	36,000
4,300		6,000	66,000	24,000	36,000	6,000		6,000	66,000	28,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	6,100		8,000	79,000	34,000	36,000
4,400		6,000	66,000	24,000	36,000	6,200		8,000	79,000	34,000	36,000
4,500		6,000	66,000	24,000	36,000	6,300		8,000	79,000	34,000	36,000
4,600		6,000	66,000	24,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
4,650		6,000	66,000	24,000	36,000	6,400		8,000	79,000	34,000	36,000
4,700		6,000	66,000	24,000	36,000	6,500		8,000	79,000	34,000	36,000



## 不带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	79,000	34,000	36,000	11,400		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	11,500		12,000	102,000	55,000	45,000
6,750	17/64	8,000	79,000	34,000	36,000	11,600		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	11,700		12,000	102,000	55,000	45,000
6,900		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	11,900		12,000	102,000	55,000	45,000
7,100		8,000	79,000	41,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
7,140	9/32	8,000	79,000	41,000	36,000	12,000		12,000	102,000	55,000	45,000
7,200		8,000	79,000	41,000	36,000	12,100		14,000	107,000	60,000	45,000
7,300		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000
7,400		8,000	79,000	41,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	12,400		14,000	107,000	60,000	45,000
7,540	19/64	8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,600		8,000	79,000	41,000	36,000	12,600		14,000	107,000	60,000	45,000
7,700		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,800		8,000	79,000	41,000	36,000	12,800		14,000	107,000	60,000	45,000
7,900		8,000	79,000	41,000	36,000	12,900		14,000	107,000	60,000	45,000
7,940	5/16	8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	13,100	33/64	14,000	107,000	60,000	45,000
8,100		10,000	89,000	47,000	40,000	13,200		14,000	107,000	60,000	45,000
8,200		10,000	89,000	47,000	40,000	13,300		14,000	107,000	60,000	45,000
8,300		10,000	89,000	47,000	40,000	13,500		14,000	107,000	60,000	45,000
8,330	21/64	10,000	89,000	47,000	40,000	13,600		14,000	107,000	60,000	45,000
8,400		10,000	89,000	47,000	40,000	13,700		14,000	107,000	60,000	45,000
8,500		10,000	89,000	47,000	40,000	13,800		14,000	107,000	60,000	45,000
8,600		10,000	89,000	47,000	40,000	13,900		14,000	107,000	60,000	45,000
8,700		10,000	89,000	47,000	40,000	14,000		14,000	107,000	60,000	45,000
8,730	11/32	10,000	89,000	47,000	40,000	14,100		16,000	115,000	65,000	48,000
8,800		10,000	89,000	47,000	40,000	14,200		16,000	115,000	65,000	48,000
8,900		10,000	89,000	47,000	40,000	14,290	9/16	16,000	115,000	65,000	48,000
9,000		10,000	89,000	47,000	40,000	14,300		16,000	115,000	65,000	48,000
9,100		10,000	89,000	47,000	40,000	14,500		16,000	115,000	65,000	48,000
9,130	23/64	10,000	89,000	47,000	40,000	14,700		16,000	115,000	65,000	48,000
9,200		10,000	89,000	47,000	40,000	14,900		16,000	115,000	65,000	48,000
9,250		10,000	89,000	47,000	40,000	15,000		16,000	115,000	65,000	48,000
9,300		10,000	89,000	47,000	40,000	15,100		16,000	115,000	65,000	48,000
9,400		10,000	89,000	47,000	40,000	15,200		16,000	115,000	65,000	48,000
9,500		10,000	89,000	47,000	40,000	15,300		16,000	115,000	65,000	48,000
9,520	3/8	10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
9,600		10,000	89,000	47,000	40,000	15,700		16,000	115,000	65,000	48,000
9,700		10,000	89,000	47,000	40,000	15,800		16,000	115,000	65,000	48,000
9,800		10,000	89,000	47,000	40,000	16,000		16,000	115,000	65,000	48,000
9,900		10,000	89,000	47,000	40,000	16,200		18,000	123,000	73,000	48,000
9,920	25/64	10,000	89,000	47,000	40,000	16,500		18,000	123,000	73,000	48,000
10,000		10,000	89,000	47,000	40,000	17,000		18,000	123,000	73,000	48,000
10,100		12,000	102,000	55,000	45,000	17,500		18,000	123,000	73,000	48,000
10,200		12,000	102,000	55,000	45,000	18,000		18,000	123,000	73,000	48,000
10,300		12,000	102,000	55,000	45,000	18,500		20,000	131,000	79,000	50,000
10,320	13/32	12,000	102,000	55,000	45,000	19,000		20,000	131,000	79,000	50,000
10,400		12,000	102,000	55,000	45,000	19,500		20,000	131,000	79,000	50,000
10,500		12,000	102,000	55,000	45,000	20,000		20,000	131,000	79,000	50,000
10,600		12,000	102,000	55,000	45,000						
10,700		12,000	102,000	55,000	45,000						
10,800		12,000	102,000	55,000	45,000						
10,900		12,000	102,000	55,000	45,000						
11,000		12,000	102,000	55,000	45,000						
11,100		12,000	102,000	55,000	45,000						
11,110	7/16	12,000	102,000	55,000	45,000						
11,200		12,000	102,000	55,000	45,000						
11,300		12,000	102,000	55,000	45,000						

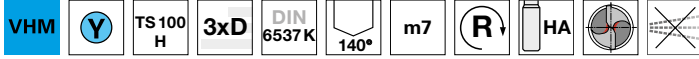


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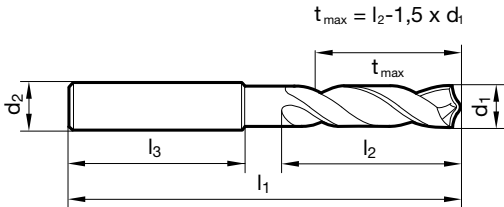
产品代号 89422



P	M	K	N	S	H
•				•	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 主切削刃轻微内凹 • 优化了的切削几何参数  
 强度小于1400 N/mm<sup>2</sup>的合金和高强度钢 • 镍合金, 哈氏合金, 锰合金 • 钛及钛合金



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000



## 不带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,400		10,000	89,000	47,000	40,000	13,000		14,000	107,000	60,000	45,000
9,500		10,000	89,000	47,000	40,000	13,300		14,000	107,000	60,000	45,000
9,520	3/8	10,000	89,000	47,000	40,000	13,500		14,000	107,000	60,000	45,000
9,600		10,000	89,000	47,000	40,000	13,700		14,000	107,000	60,000	45,000
9,700		10,000	89,000	47,000	40,000	14,000		14,000	107,000	60,000	45,000
9,800		10,000	89,000	47,000	40,000	14,200		16,000	115,000	65,000	48,000
9,900		10,000	89,000	47,000	40,000	14,290	9/16	16,000	115,000	65,000	48,000
9,920	25/64	10,000	89,000	47,000	40,000	14,300		16,000	115,000	65,000	48,000
10,000		10,000	89,000	47,000	40,000	14,500		16,000	115,000	65,000	48,000
10,100		12,000	102,000	55,000	45,000	14,700		16,000	115,000	65,000	48,000
10,200		12,000	102,000	55,000	45,000	15,000		16,000	115,000	65,000	48,000
10,300		12,000	102,000	55,000	45,000	15,200		16,000	115,000	65,000	48,000
10,320	13/32	12,000	102,000	55,000	45,000	15,300		16,000	115,000	65,000	48,000
10,400		12,000	102,000	55,000	45,000	15,500		16,000	115,000	65,000	48,000
10,500		12,000	102,000	55,000	45,000	15,700		16,000	115,000	65,000	48,000
10,600		12,000	102,000	55,000	45,000	16,000		16,000	115,000	65,000	48,000
10,700		12,000	102,000	55,000	45,000	16,300		18,000	123,000	73,000	48,000
10,800		12,000	102,000	55,000	45,000	16,500		18,000	123,000	73,000	48,000
10,900		12,000	102,000	55,000	45,000	16,900		18,000	123,000	73,000	48,000
11,000		12,000	102,000	55,000	45,000	17,000		18,000	123,000	73,000	48,000
11,100		12,000	102,000	55,000	45,000	17,300		18,000	123,000	73,000	48,000
11,110	7/16	12,000	102,000	55,000	45,000	17,500		18,000	123,000	73,000	48,000
11,200		12,000	102,000	55,000	45,000	18,000		18,000	123,000	73,000	48,000
11,300		12,000	102,000	55,000	45,000	18,500		20,000	131,000	79,000	50,000
11,400		12,000	102,000	55,000	45,000	18,900		20,000	131,000	79,000	50,000
11,500		12,000	102,000	55,000	45,000	19,000		20,000	131,000	79,000	50,000
11,600		12,000	102,000	55,000	45,000	19,050	3/4	20,000	131,000	79,000	50,000
11,700		12,000	102,000	55,000	45,000	19,300		20,000	131,000	79,000	50,000
11,800		12,000	102,000	55,000	45,000	19,500		20,000	131,000	79,000	50,000
11,900		12,000	102,000	55,000	45,000	20,000		20,000	131,000	79,000	50,000
11,910	15/32	12,000	102,000	55,000	45,000						
12,000		12,000	102,000	55,000	45,000						
12,200		14,000	107,000	60,000	45,000						
12,500		14,000	107,000	60,000	45,000						
12,700	1/2	14,000	107,000	60,000	45,000						
12,800		14,000	107,000	60,000	45,000						

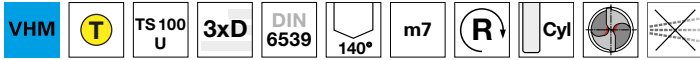


## 不带内冷TS钻头

### 产品代号 89237



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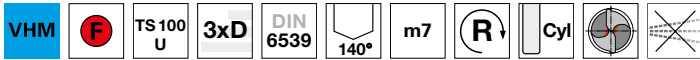
芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金

### 产品代号 89401

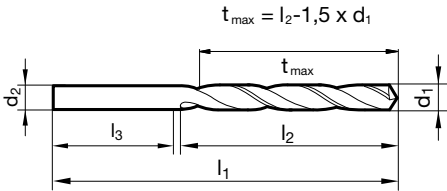


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		3,000	46,000	16,000	30,000	6,700		6,700	70,000	31,000	39,000
3,100		3,100	49,000	18,000	31,000	6,800		6,800	74,000	34,000	40,000
3,200		3,200	49,000	18,000	31,000	7,000		7,000	74,000	34,000	40,000
3,300		3,300	49,000	18,000	31,000	7,100		7,100	74,000	34,000	40,000
3,500		3,500	52,000	20,000	32,000	7,140	9/32	7,140	74,000	34,000	40,000
3,600		3,600	52,000	20,000	32,000	7,500		7,500	74,000	34,000	40,000
3,700		3,700	52,000	20,000	32,000	7,800		7,800	79,000	37,000	42,000
3,800		3,800	55,000	22,000	33,000	8,000		8,000	79,000	37,000	42,000
3,900		3,900	55,000	22,000	33,000	8,200		8,200	79,000	37,000	42,000
4,000		4,000	55,000	22,000	33,000	8,400		8,400	79,000	37,000	42,000
4,100		4,100	55,000	22,000	33,000	8,500		8,500	79,000	37,000	42,000
4,200		4,200	55,000	22,000	33,000	8,600		8,600	84,000	40,000	44,000
4,500		4,500	58,000	24,000	34,000	8,700		8,700	84,000	40,000	44,000
5,000		5,000	62,000	26,000	36,000	8,800		8,800	84,000	40,000	44,000
5,100		5,100	62,000	26,000	36,000	9,000		9,000	84,000	40,000	44,000
5,200		5,200	62,000	26,000	36,000	9,500		9,500	84,000	40,000	44,000
5,500		5,500	66,000	28,000	38,000	9,800		9,800	89,000	43,000	46,000
5,600		5,600	66,000	28,000	38,000	10,000		10,000	89,000	43,000	46,000
5,700		5,700	66,000	28,000	38,000	10,100		10,100	89,000	43,000	46,000
5,800		5,800	66,000	28,000	38,000	10,200		10,200	89,000	43,000	46,000
6,000		6,000	66,000	28,000	38,000	10,300		10,300	89,000	43,000	46,000
6,100		6,100	70,000	31,000	39,000	10,500		10,500	89,000	43,000	46,000
6,400		6,400	70,000	31,000	39,000	10,600		10,600	89,000	43,000	46,000
6,500		6,500	70,000	31,000	39,000	10,800		10,800	95,000	47,000	48,000





HARTNER

不带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
11,000		11,000	95,000	47,000	48,000	15,500		15,500	115,000	58,000	57,000
11,110	7/16	11,110	95,000	47,000	48,000	16,000		16,000	115,000	58,000	57,000
11,500		11,500	95,000	47,000	48,000						
11,800		11,800	95,000	47,000	48,000						
12,000		12,000	102,000	51,000	51,000						
12,500		12,500	102,000	51,000	51,000						
12,700	1/2	12,700	102,000	51,000	51,000						
13,000		13,000	102,000	51,000	51,000						
13,500		13,500	107,000	54,000	53,000						
14,000		14,000	107,000	54,000	53,000						
14,500		14,500	111,000	56,000	55,000						
15,000		15,000	111,000	56,000	55,000						



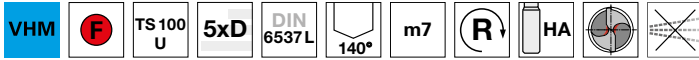
# HARTNER

## 不带内冷TS钻头

### 产品代号 89414



P	M	K	N	S	H
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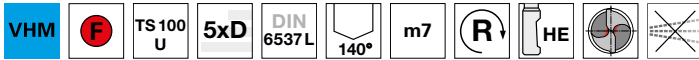
芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金

### 产品代号 89417

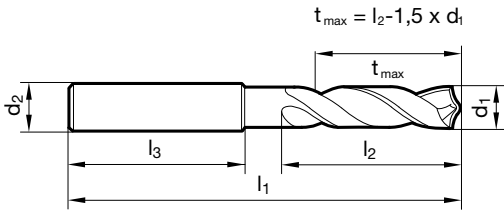


P	M	K	N	S	H
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芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		6,000	66,000	28,000	36,000	4,760	3/16	6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	4,800		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	4,900		6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	5,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	5,100		6,000	82,000	44,000	36,000
3,300		6,000	66,000	28,000	36,000	5,160	13/64	6,000	82,000	44,000	36,000
3,400		6,000	66,000	28,000	36,000	5,200		6,000	82,000	44,000	36,000
3,500		6,000	66,000	28,000	36,000	5,300		6,000	82,000	44,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	5,400		6,000	82,000	44,000	36,000
3,600		6,000	66,000	28,000	36,000	5,500		6,000	82,000	44,000	36,000
3,700		6,000	66,000	28,000	36,000	5,550		6,000	82,000	44,000	36,000
3,800		6,000	74,000	36,000	36,000	5,560	7/32	6,000	82,000	44,000	36,000
3,900		6,000	74,000	36,000	36,000	5,600		6,000	82,000	44,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	5,700		6,000	82,000	44,000	36,000
4,000		6,000	74,000	36,000	36,000	5,800		6,000	82,000	44,000	36,000
4,100		6,000	74,000	36,000	36,000	5,900		6,000	82,000	44,000	36,000
4,200		6,000	74,000	36,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
4,300		6,000	74,000	36,000	36,000	6,000		6,000	82,000	44,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	6,100		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	6,200		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	6,300		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	6,400		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	6,500		8,000	91,000	53,000	36,000



## 不带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	11,300		12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	11,400		12,000	118,000	71,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
7,200		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
7,300		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
7,400		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
7,500		8,000	91,000	53,000	36,000	11,900		12,000	118,000	71,000	45,000
7,540	19/64	8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000
7,600		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
7,700		8,000	91,000	53,000	36,000	12,100		14,000	124,000	77,000	45,000
7,800		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
7,900		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
7,940	5/16	8,000	91,000	53,000	36,000	12,700	1/2	14,000	124,000	77,000	45,000
8,000		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
8,100		10,000	103,000	61,000	40,000	13,100	33/64	14,000	124,000	77,000	45,000
8,200		10,000	103,000	61,000	40,000	13,500		14,000	124,000	77,000	45,000
8,300		10,000	103,000	61,000	40,000	13,700		14,000	124,000	77,000	45,000
8,330	21/64	10,000	103,000	61,000	40,000	13,800		14,000	124,000	77,000	45,000
8,400		10,000	103,000	61,000	40,000	14,000		14,000	124,000	77,000	45,000
8,500		10,000	103,000	61,000	40,000	14,100		16,000	133,000	83,000	48,000
8,600		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
8,700		10,000	103,000	61,000	40,000	14,290	9/16	16,000	133,000	83,000	48,000
8,730	11/32	10,000	103,000	61,000	40,000	14,500		16,000	133,000	83,000	48,000
8,800		10,000	103,000	61,000	40,000	14,700		16,000	133,000	83,000	48,000
8,900		10,000	103,000	61,000	40,000	15,000		16,000	133,000	83,000	48,000
9,000		10,000	103,000	61,000	40,000	15,100		16,000	133,000	83,000	48,000
9,100		10,000	103,000	61,000	40,000	15,200		16,000	133,000	83,000	48,000
9,130	23/64	10,000	103,000	61,000	40,000	15,500		16,000	133,000	83,000	48,000
9,200		10,000	103,000	61,000	40,000	15,700		16,000	133,000	83,000	48,000
9,250		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
9,300		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
9,400		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
9,500		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
9,520	3/8	10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000
9,600		10,000	103,000	61,000	40,000	18,500		20,000	153,000	101,000	50,000
9,700		10,000	103,000	61,000	40,000	19,000		20,000	153,000	101,000	50,000
9,800		10,000	103,000	61,000	40,000	19,500		20,000	153,000	101,000	50,000
9,900		10,000	103,000	61,000	40,000	20,000		20,000	153,000	101,000	50,000
9,920	25/64	10,000	103,000	61,000	40,000						
10,000		10,000	103,000	61,000	40,000						
10,100		12,000	118,000	71,000	45,000						
10,200		12,000	118,000	71,000	45,000						
10,300		12,000	118,000	71,000	45,000						
10,320	13/32	12,000	118,000	71,000	45,000						
10,400		12,000	118,000	71,000	45,000						
10,500		12,000	118,000	71,000	45,000						
10,600		12,000	118,000	71,000	45,000						
10,700		12,000	118,000	71,000	45,000						
10,800		12,000	118,000	71,000	45,000						

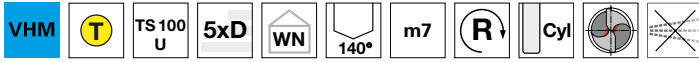


## 不带内冷TS钻头

产品代号 89275

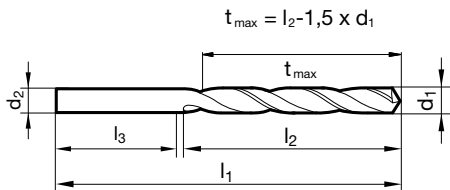


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 5,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢（合金/非合金），强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
5,160	13/64	5,160	76,000	38,000	38,000	9,520	3/8	9,520	105,000	60,000	45,000
5,560	7/32	5,560	81,000	41,000	40,000	9,800		9,800	105,000	60,000	45,000
5,700		5,700	81,000	41,000	40,000	10,000		10,000	105,000	60,000	45,000
5,800		5,800	81,000	41,000	40,000	10,200		10,200	112,000	66,000	46,000
6,350	1/4	6,350	81,000	41,000	40,000	10,300		10,300	112,000	66,000	46,000
6,400		6,400	81,000	41,000	40,000	10,320	13/32	10,320	112,000	66,000	46,000
6,500		6,500	81,000	41,000	40,000	10,500		10,500	112,000	66,000	46,000
6,750	17/64	6,750	83,000	43,000	40,000	10,720	27/64	10,720	114,000	68,000	46,000
6,800		6,800	83,000	43,000	40,000	10,800		10,800	114,000	68,000	46,000
7,000		7,000	83,000	43,000	40,000	11,110	7/16	11,110	118,000	71,000	47,000
7,500		7,500	87,000	45,000	42,000	11,500		11,500	118,000	71,000	47,000
7,800		7,800	90,000	48,000	42,000	11,800		11,800	121,000	73,000	48,000
7,940	5/16	7,940	90,000	48,000	42,000	11,910	15/32	11,910	121,000	73,000	48,000
8,000		8,000	90,000	48,000	42,000	12,000		12,000	121,000	73,000	48,000
8,100		8,100	96,000	53,000	43,000	12,700	1/2	12,700	137,000	78,000	59,000
8,330	21/64	8,330	96,000	53,000	43,000	13,000		13,000	137,000	78,000	59,000
8,400		8,400	96,000	53,000	43,000	13,500		13,500	144,000	84,000	60,000
8,500		8,500	96,000	53,000	43,000	14,000		14,000	147,000	86,000	61,000
8,600		8,600	98,000	55,000	43,000	14,500		14,500	151,000	89,000	62,000
8,730	11/32	8,730	98,000	55,000	43,000	15,000		15,000	153,000	91,000	62,000
8,800		8,800	98,000	55,000	43,000	15,500		15,500	157,000	94,000	63,000
9,000		9,000	98,000	55,000	43,000	16,000		16,000	160,000	96,000	64,000
9,130	23/64	9,130	102,000	58,000	44,000						
9,500		9,500	102,000	58,000	44,000						



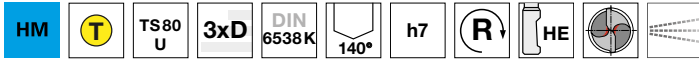
# HARTNER

## 带内冷TS钻头

产品代号 89306

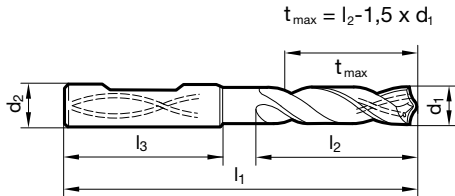


P	M	K	N	S	H
●	○	○	○		



芯厚 ≥ Ø 10,000 • 圆弧后刀面 • 抗振动和冲击性好 • 高速钢刀柄焊接硬质合金刀片

非合金钢/低合金钢 • 灰铸铁,球墨铸铁 • 黄铜, 青铜, 塑料, 石墨 • 玻璃纤维增强塑料 • 加工热固性塑料在切削刃和刃带上易磨损



d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm
10,000	16,000	103,000	51,000	48,000	17,500	20,000	130,000	76,000	50,000
10,500	16,000	103,000	51,000	48,000	18,500	25,000	144,000	84,000	56,000
10,600	16,000	103,000	51,000	48,000	19,000	25,000	144,000	84,000	56,000
11,000	16,000	103,000	51,000	48,000	19,100	25,000	144,000	84,000	56,000
12,000	16,000	103,000	51,000	48,000	19,700	25,000	144,000	84,000	56,000
12,200	16,000	111,000	59,000	48,000	20,000	25,000	144,000	84,000	56,000
12,500	16,000	111,000	59,000	48,000	20,500	25,000	153,000	93,000	56,000
13,000	16,000	111,000	59,000	48,000	21,000	25,000	153,000	93,000	56,000
13,700	16,000	111,000	59,000	48,000	21,500	25,000	153,000	93,000	56,000
14,000	16,000	111,000	59,000	48,000	22,000	25,000	153,000	93,000	56,000
14,200	20,000	122,000	68,000	50,000	22,500	25,000	161,000	101,000	56,000
14,500	20,000	122,000	68,000	50,000	23,500	25,000	161,000	101,000	56,000
14,600	20,000	122,000	68,000	50,000	25,000	32,000	174,000	110,000	60,000
15,000	20,000	122,000	68,000	50,000					
15,300	20,000	122,000	68,000	50,000					
16,000	20,000	122,000	68,000	50,000					
16,500	20,000	130,000	76,000	50,000					
17,000	20,000	130,000	76,000	50,000					

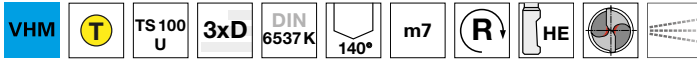


## 带内冷TS钻头

产品代号 89266

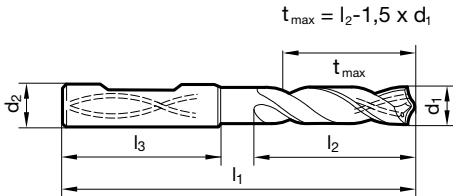


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 4,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



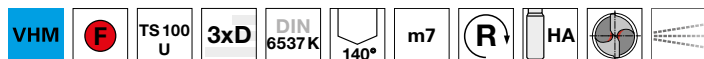
d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	9,300		10,000	89,000	47,000	40,000
3,100		6,000	62,000	20,000	36,000	9,500		10,000	89,000	47,000	40,000
3,200		6,000	62,000	20,000	36,000	9,700		10,000	89,000	47,000	40,000
3,300		6,000	62,000	20,000	36,000	9,800		10,000	89,000	47,000	40,000
3,400		6,000	62,000	20,000	36,000	10,000		10,000	89,000	47,000	40,000
3,500		6,000	62,000	20,000	36,000	10,200		12,000	102,000	55,000	45,000
3,600		6,000	62,000	20,000	36,000	10,300		12,000	102,000	55,000	45,000
3,700		6,000	62,000	20,000	36,000	10,500		12,000	102,000	55,000	45,000
3,800		6,000	66,000	24,000	36,000	10,700		12,000	102,000	55,000	45,000
4,000		6,000	66,000	24,000	36,000	10,800		12,000	102,000	55,000	45,000
4,200		6,000	66,000	24,000	36,000	11,000		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	11,100		12,000	102,000	55,000	45,000
4,800		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	11,700		12,000	102,000	55,000	45,000
5,100		6,000	66,000	28,000	36,000	11,800		12,000	102,000	55,000	45,000
5,200		6,000	66,000	28,000	36,000	12,000		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	12,100		14,000	107,000	60,000	45,000
5,800		6,000	66,000	28,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
6,000		6,000	66,000	28,000	36,000	12,500		14,000	107,000	60,000	45,000
6,400		8,000	79,000	34,000	36,000	13,000		14,000	107,000	60,000	45,000
6,500		8,000	79,000	34,000	36,000	13,500		14,000	107,000	60,000	45,000
6,600		8,000	79,000	34,000	36,000	14,000		14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	14,500		16,000	115,000	65,000	48,000
6,900		8,000	79,000	34,000	36,000	15,200		16,000	115,000	65,000	48,000
7,000		8,000	79,000	34,000	36,000	15,500		16,000	115,000	65,000	48,000
7,400		8,000	79,000	41,000	36,000	16,000		16,000	115,000	65,000	48,000
7,500		8,000	79,000	41,000	36,000	16,500		18,000	123,000	73,000	48,000
7,800		8,000	79,000	41,000	36,000	17,500		18,000	123,000	73,000	48,000
8,000		8,000	79,000	41,000	36,000	18,000		18,000	123,000	73,000	48,000
8,100		10,000	89,000	47,000	40,000	18,500		20,000	131,000	79,000	50,000
8,400		10,000	89,000	47,000	40,000	19,000		20,000	131,000	79,000	50,000
8,500		10,000	89,000	47,000	40,000	20,000		20,000	131,000	79,000	50,000
8,600		10,000	89,000	47,000	40,000						
8,700		10,000	89,000	47,000	40,000						
8,800		10,000	89,000	47,000	40,000						
9,000		10,000	89,000	47,000	40,000						

## 带内冷TS钻头

### 产品代号 89410



P	M	K	N	S	H
●	○	●	○	○	○



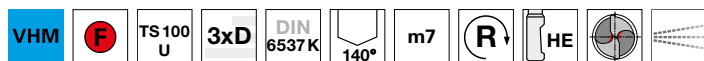
芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金

### 产品代号 89415

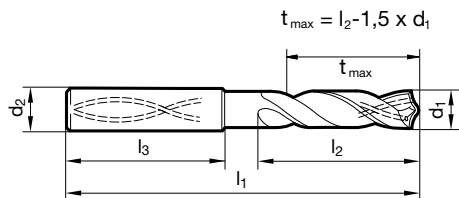


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		6,000	62,000	20,000	36,000	4,760	3/16	6,000	66,000	28,000	36,000
3,100		6,000	62,000	20,000	36,000	4,800		6,000	66,000	28,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	4,900		6,000	66,000	28,000	36,000
3,200		6,000	62,000	20,000	36,000	5,000		6,000	66,000	28,000	36,000
3,250		6,000	62,000	20,000	36,000	5,100		6,000	66,000	28,000	36,000
3,300		6,000	62,000	20,000	36,000	5,160	13/64	6,000	66,000	28,000	36,000
3,400		6,000	62,000	20,000	36,000	5,200		6,000	66,000	28,000	36,000
3,500		6,000	62,000	20,000	36,000	5,300		6,000	66,000	28,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	5,400		6,000	66,000	28,000	36,000
3,600		6,000	62,000	20,000	36,000	5,500		6,000	66,000	28,000	36,000
3,700		6,000	62,000	20,000	36,000	5,550		6,000	66,000	28,000	36,000
3,800		6,000	66,000	24,000	36,000	5,560	7/32	6,000	66,000	28,000	36,000
3,900		6,000	66,000	24,000	36,000	5,600		6,000	66,000	28,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	5,700		6,000	66,000	28,000	36,000
4,000		6,000	66,000	24,000	36,000	5,800		6,000	66,000	28,000	36,000
4,100		6,000	66,000	24,000	36,000	5,900		6,000	66,000	28,000	36,000
4,200		6,000	66,000	24,000	36,000	5,950	15/64	6,000	66,000	28,000	36,000
4,300		6,000	66,000	24,000	36,000	6,000		6,000	66,000	28,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	6,100		8,000	79,000	34,000	36,000
4,400		6,000	66,000	24,000	36,000	6,200		8,000	79,000	34,000	36,000
4,500		6,000	66,000	24,000	36,000	6,300		8,000	79,000	34,000	36,000
4,600		6,000	66,000	24,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
4,650		6,000	66,000	24,000	36,000	6,400		8,000	79,000	34,000	36,000
4,700		6,000	66,000	24,000	36,000	6,500		8,000	79,000	34,000	36,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	79,000	34,000	36,000	10,900		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	11,000		12,000	102,000	55,000	45,000
6,750	17/64	8,000	79,000	34,000	36,000	11,100		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
6,900		8,000	79,000	34,000	36,000	11,200		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	11,300		12,000	102,000	55,000	45,000
7,100		8,000	79,000	41,000	36,000	11,400		12,000	102,000	55,000	45,000
7,140	9/32	8,000	79,000	41,000	36,000	11,500		12,000	102,000	55,000	45,000
7,200		8,000	79,000	41,000	36,000	11,600		12,000	102,000	55,000	45,000
7,300		8,000	79,000	41,000	36,000	11,700		12,000	102,000	55,000	45,000
7,400		8,000	79,000	41,000	36,000	11,800		12,000	102,000	55,000	45,000
7,500		8,000	79,000	41,000	36,000	11,900		12,000	102,000	55,000	45,000
7,540	19/64	8,000	79,000	41,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
7,600		8,000	79,000	41,000	36,000	12,000		12,000	102,000	55,000	45,000
7,700		8,000	79,000	41,000	36,000	12,100		14,000	107,000	60,000	45,000
7,800		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000
7,900		8,000	79,000	41,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
7,940	5/16	8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
8,100		10,000	89,000	47,000	40,000	13,000		14,000	107,000	60,000	45,000
8,200		10,000	89,000	47,000	40,000	13,100	33/64	14,000	107,000	60,000	45,000
8,300		10,000	89,000	47,000	40,000	13,200		14,000	107,000	60,000	45,000
8,330	21/64	10,000	89,000	47,000	40,000	13,300		14,000	107,000	60,000	45,000
8,400		10,000	89,000	47,000	40,000	13,500		14,000	107,000	60,000	45,000
8,500		10,000	89,000	47,000	40,000	13,700		14,000	107,000	60,000	45,000
8,600		10,000	89,000	47,000	40,000	14,000		14,000	107,000	60,000	45,000
8,700		10,000	89,000	47,000	40,000	14,100		16,000	115,000	65,000	48,000
8,730	11/32	10,000	89,000	47,000	40,000	14,200		16,000	115,000	65,000	48,000
8,800		10,000	89,000	47,000	40,000	14,290	9/16	16,000	115,000	65,000	48,000
8,900		10,000	89,000	47,000	40,000	14,400		16,000	115,000	65,000	48,000
9,000		10,000	89,000	47,000	40,000	14,500		16,000	115,000	65,000	48,000
9,100		10,000	89,000	47,000	40,000	14,600		16,000	115,000	65,000	48,000
9,130	23/64	10,000	89,000	47,000	40,000	14,700		16,000	115,000	65,000	48,000
9,200		10,000	89,000	47,000	40,000	15,000		16,000	115,000	65,000	48,000
9,250		10,000	89,000	47,000	40,000	15,200		16,000	115,000	65,000	48,000
9,300		10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
9,400		10,000	89,000	47,000	40,000	15,700		16,000	115,000	65,000	48,000
9,500		10,000	89,000	47,000	40,000	16,000		16,000	115,000	65,000	48,000
9,520	3/8	10,000	89,000	47,000	40,000	16,100		18,000	123,000	73,000	48,000
9,600		10,000	89,000	47,000	40,000	16,500		18,000	123,000	73,000	48,000
9,700		10,000	89,000	47,000	40,000	16,900		18,000	123,000	73,000	48,000
9,800		10,000	89,000	47,000	40,000	17,000		18,000	123,000	73,000	48,000
9,900		10,000	89,000	47,000	40,000	17,300		18,000	123,000	73,000	48,000
9,920	25/64	10,000	89,000	47,000	40,000	17,500		18,000	123,000	73,000	48,000
10,000		10,000	89,000	47,000	40,000	17,700		18,000	123,000	73,000	48,000
10,100		12,000	102,000	55,000	45,000	18,000		18,000	123,000	73,000	48,000
10,200		12,000	102,000	55,000	45,000	18,500		20,000	131,000	79,000	50,000
10,300		12,000	102,000	55,000	45,000	18,900		20,000	131,000	79,000	50,000
10,320	13/32	12,000	102,000	55,000	45,000	19,000		20,000	131,000	79,000	50,000
10,400		12,000	102,000	55,000	45,000	19,500		20,000	131,000	79,000	50,000
10,500		12,000	102,000	55,000	45,000	20,000		20,000	131,000	79,000	50,000
10,600		12,000	102,000	55,000	45,000						
10,700		12,000	102,000	55,000	45,000						
10,800		12,000	102,000	55,000	45,000						



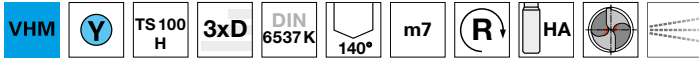


## 带内冷TS钻头

### 产品代号 89423



P	M	K	N	S	H
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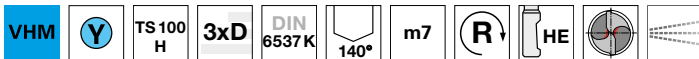


芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 主切削刃轻微内凹 • 优化了的切削几何参数  
 强度小于1400 N/mm<sup>2</sup>的合金和高强度钢 • 镍合金, 哈氏合金, 锰合金 • 钛及钛合金

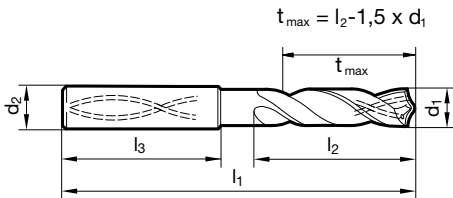
### 产品代号 89424



P	M	K	N	S	H
•				•	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 主切削刃轻微内凹 • 优化了的切削几何参数  
 强度小于1400 N/mm<sup>2</sup>的合金和高强度钢 • 镍合金, 哈氏合金, 锰合金 • 钛及钛合金



d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	4,760	3/16	6,000	66,000	28,000	36,000
3,100		6,000	62,000	20,000	36,000	4,800		6,000	66,000	28,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	4,900		6,000	66,000	28,000	36,000
3,200		6,000	62,000	20,000	36,000	5,000		6,000	66,000	28,000	36,000
3,250		6,000	62,000	20,000	36,000	5,100		6,000	66,000	28,000	36,000
3,300		6,000	62,000	20,000	36,000	5,160	13/64	6,000	66,000	28,000	36,000
3,400		6,000	62,000	20,000	36,000	5,200		6,000	66,000	28,000	36,000
3,500		6,000	62,000	20,000	36,000	5,300		6,000	66,000	28,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	5,400		6,000	66,000	28,000	36,000
3,600		6,000	62,000	20,000	36,000	5,500		6,000	66,000	28,000	36,000
3,700		6,000	62,000	20,000	36,000	5,550		6,000	66,000	28,000	36,000
3,800		6,000	66,000	24,000	36,000	5,560	7/32	6,000	66,000	28,000	36,000
3,900		6,000	66,000	24,000	36,000	5,600		6,000	66,000	28,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	5,700		6,000	66,000	28,000	36,000
4,000		6,000	66,000	24,000	36,000	5,800		6,000	66,000	28,000	36,000
4,100		6,000	66,000	24,000	36,000	5,900		6,000	66,000	28,000	36,000
4,200		6,000	66,000	24,000	36,000	5,950	15/64	6,000	66,000	28,000	36,000
4,300		6,000	66,000	24,000	36,000	6,000		6,000	66,000	28,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	6,100		8,000	79,000	34,000	36,000
4,400		6,000	66,000	24,000	36,000	6,200		8,000	79,000	34,000	36,000
4,500		6,000	66,000	24,000	36,000	6,300		8,000	79,000	34,000	36,000
4,600		6,000	66,000	24,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
4,650		6,000	66,000	24,000	36,000	6,400		8,000	79,000	34,000	36,000
4,700		6,000	66,000	24,000	36,000	6,500		8,000	79,000	34,000	36,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	79,000	34,000	36,000	10,900		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	11,000		12,000	102,000	55,000	45,000
6,750	17/64	8,000	79,000	34,000	36,000	11,100		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
6,900		8,000	79,000	34,000	36,000	11,200		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	11,300		12,000	102,000	55,000	45,000
7,100		8,000	79,000	41,000	36,000	11,400		12,000	102,000	55,000	45,000
7,140	9/32	8,000	79,000	41,000	36,000	11,500		12,000	102,000	55,000	45,000
7,200		8,000	79,000	41,000	36,000	11,600		12,000	102,000	55,000	45,000
7,300		8,000	79,000	41,000	36,000	11,700		12,000	102,000	55,000	45,000
7,400		8,000	79,000	41,000	36,000	11,800		12,000	102,000	55,000	45,000
7,500		8,000	79,000	41,000	36,000	11,900		12,000	102,000	55,000	45,000
7,540	19/64	8,000	79,000	41,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
7,600		8,000	79,000	41,000	36,000	12,000		12,000	102,000	55,000	45,000
7,700		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000
7,800		8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,900		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,940	5/16	8,000	79,000	41,000	36,000	12,800		14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
8,100		10,000	89,000	47,000	40,000	13,300		14,000	107,000	60,000	45,000
8,200		10,000	89,000	47,000	40,000	13,500		14,000	107,000	60,000	45,000
8,300		10,000	89,000	47,000	40,000	13,700		14,000	107,000	60,000	45,000
8,330	21/64	10,000	89,000	47,000	40,000	14,000		14,000	107,000	60,000	45,000
8,400		10,000	89,000	47,000	40,000	14,200		16,000	115,000	65,000	48,000
8,500		10,000	89,000	47,000	40,000	14,290	9/16	16,000	115,000	65,000	48,000
8,600		10,000	89,000	47,000	40,000	14,300		16,000	115,000	65,000	48,000
8,700		10,000	89,000	47,000	40,000	14,500		16,000	115,000	65,000	48,000
8,730	11/32	10,000	89,000	47,000	40,000	14,700		16,000	115,000	65,000	48,000
8,800		10,000	89,000	47,000	40,000	15,000		16,000	115,000	65,000	48,000
8,900		10,000	89,000	47,000	40,000	15,200		16,000	115,000	65,000	48,000
9,000		10,000	89,000	47,000	40,000	15,300		16,000	115,000	65,000	48,000
9,100		10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
9,130	23/64	10,000	89,000	47,000	40,000	15,700		16,000	115,000	65,000	48,000
9,200		10,000	89,000	47,000	40,000	16,000		16,000	115,000	65,000	48,000
9,250		10,000	89,000	47,000	40,000	16,300		18,000	123,000	73,000	48,000
9,300		10,000	89,000	47,000	40,000	16,500		18,000	123,000	73,000	48,000
9,400		10,000	89,000	47,000	40,000	16,900		18,000	123,000	73,000	48,000
9,500		10,000	89,000	47,000	40,000	17,000		18,000	123,000	73,000	48,000
9,520	3/8	10,000	89,000	47,000	40,000	17,300		18,000	123,000	73,000	48,000
9,600		10,000	89,000	47,000	40,000	17,500		18,000	123,000	73,000	48,000
9,700		10,000	89,000	47,000	40,000	18,000		18,000	123,000	73,000	48,000
9,800		10,000	89,000	47,000	40,000	18,500		20,000	131,000	79,000	50,000
9,900		10,000	89,000	47,000	40,000	18,900		20,000	131,000	79,000	50,000
9,920	25/64	10,000	89,000	47,000	40,000	19,000		20,000	131,000	79,000	50,000
10,000		10,000	89,000	47,000	40,000	19,050	3/4	20,000	131,000	79,000	50,000
10,100		12,000	102,000	55,000	45,000	19,300		20,000	131,000	79,000	50,000
10,200		12,000	102,000	55,000	45,000	19,500		20,000	131,000	79,000	50,000
10,300		12,000	102,000	55,000	45,000	20,000		20,000	131,000	79,000	50,000
10,320	13/32	12,000	102,000	55,000	45,000						
10,400		12,000	102,000	55,000	45,000						
10,500		12,000	102,000	55,000	45,000						
10,600		12,000	102,000	55,000	45,000						
10,700		12,000	102,000	55,000	45,000						
10,800		12,000	102,000	55,000	45,000						

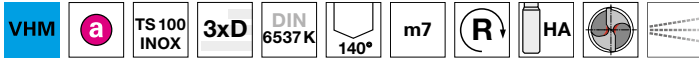


## 带内冷TS钻头

### 产品代号 89450



P	M	K	N	S	H
○	●			○	

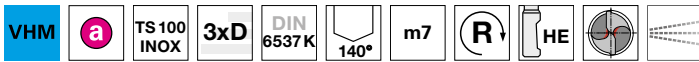


芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数  
 不锈钢/耐酸/耐热钢 • 钛及钛合金 • 镍合金, 哈氏合金, 锰合金

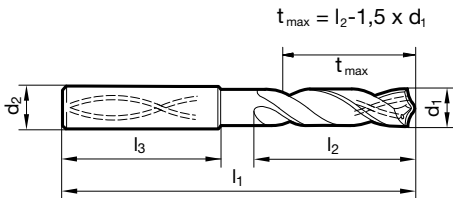
### 产品代号 89550



P	M	K	N	S	H
○	●			○	



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数  
 不锈钢/耐酸/耐热钢 • 钛及钛合金 • 镍合金, 哈氏合金, 锰合金



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		6,000	62,000	20,000	36,000	4,760	3/16	6,000	66,000	28,000	36,000
3,100		6,000	62,000	20,000	36,000	4,800		6,000	66,000	28,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	4,900		6,000	66,000	28,000	36,000
3,200		6,000	62,000	20,000	36,000	5,000		6,000	66,000	28,000	36,000
3,250		6,000	62,000	20,000	36,000	5,100		6,000	66,000	28,000	36,000
3,300		6,000	62,000	20,000	36,000	5,160	13/64	6,000	66,000	28,000	36,000
3,400		6,000	62,000	20,000	36,000	5,200		6,000	66,000	28,000	36,000
3,500		6,000	62,000	20,000	36,000	5,300		6,000	66,000	28,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	5,400		6,000	66,000	28,000	36,000
3,600		6,000	62,000	20,000	36,000	5,500		6,000	66,000	28,000	36,000
3,700		6,000	62,000	20,000	36,000	5,550		6,000	66,000	28,000	36,000
3,800		6,000	66,000	24,000	36,000	5,560	7/32	6,000	66,000	28,000	36,000
3,900		6,000	66,000	24,000	36,000	5,600		6,000	66,000	28,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	5,700		6,000	66,000	28,000	36,000
4,000		6,000	66,000	24,000	36,000	5,800		6,000	66,000	28,000	36,000
4,100		6,000	66,000	24,000	36,000	5,900		6,000	66,000	28,000	36,000
4,200		6,000	66,000	24,000	36,000	5,950	15/64	6,000	66,000	28,000	36,000
4,300		6,000	66,000	24,000	36,000	6,000		6,000	66,000	28,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	6,100		8,000	79,000	34,000	36,000
4,400		6,000	66,000	24,000	36,000	6,200		8,000	79,000	34,000	36,000
4,500		6,000	66,000	24,000	36,000	6,300		8,000	79,000	34,000	36,000
4,600		6,000	66,000	24,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
4,650		6,000	66,000	24,000	36,000	6,400		8,000	79,000	34,000	36,000
4,700		6,000	66,000	24,000	36,000	6,500		8,000	79,000	34,000	36,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	79,000	34,000	36,000	10,900		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	11,000		12,000	102,000	55,000	45,000
6,750	17/64	8,000	79,000	34,000	36,000	11,100		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
6,900		8,000	79,000	34,000	36,000	11,200		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	11,300		12,000	102,000	55,000	45,000
7,100		8,000	79,000	41,000	36,000	11,400		12,000	102,000	55,000	45,000
7,140	9/32	8,000	79,000	41,000	36,000	11,500		12,000	102,000	55,000	45,000
7,200		8,000	79,000	41,000	36,000	11,600		12,000	102,000	55,000	45,000
7,300		8,000	79,000	41,000	36,000	11,700		12,000	102,000	55,000	45,000
7,400		8,000	79,000	41,000	36,000	11,800		12,000	102,000	55,000	45,000
7,500		8,000	79,000	41,000	36,000	11,900		12,000	102,000	55,000	45,000
7,540	19/64	8,000	79,000	41,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
7,600		8,000	79,000	41,000	36,000	12,000		12,000	102,000	55,000	45,000
7,700		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000
7,800		8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,900		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,940	5/16	8,000	79,000	41,000	36,000	12,800		14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
8,100		10,000	89,000	47,000	40,000	13,300		14,000	107,000	60,000	45,000
8,200		10,000	89,000	47,000	40,000	13,500		14,000	107,000	60,000	45,000
8,300		10,000	89,000	47,000	40,000	13,700		14,000	107,000	60,000	45,000
8,330	21/64	10,000	89,000	47,000	40,000	14,000		14,000	107,000	60,000	45,000
8,400		10,000	89,000	47,000	40,000	14,200		16,000	115,000	65,000	48,000
8,500		10,000	89,000	47,000	40,000	14,290	9/16	16,000	115,000	65,000	48,000
8,600		10,000	89,000	47,000	40,000	14,300		16,000	115,000	65,000	48,000
8,700		10,000	89,000	47,000	40,000	14,500		16,000	115,000	65,000	48,000
8,730	11/32	10,000	89,000	47,000	40,000	14,700		16,000	115,000	65,000	48,000
8,800		10,000	89,000	47,000	40,000	15,000		16,000	115,000	65,000	48,000
8,900		10,000	89,000	47,000	40,000	15,200		16,000	115,000	65,000	48,000
9,000		10,000	89,000	47,000	40,000	15,300		16,000	115,000	65,000	48,000
9,100		10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
9,130	23/64	10,000	89,000	47,000	40,000	15,700		16,000	115,000	65,000	48,000
9,200		10,000	89,000	47,000	40,000	16,000		16,000	115,000	65,000	48,000
9,250		10,000	89,000	47,000	40,000	16,300		18,000	123,000	73,000	48,000
9,300		10,000	89,000	47,000	40,000	16,500		18,000	123,000	73,000	48,000
9,400		10,000	89,000	47,000	40,000	16,900		18,000	123,000	73,000	48,000
9,500		10,000	89,000	47,000	40,000	17,000		18,000	123,000	73,000	48,000
9,520	3/8	10,000	89,000	47,000	40,000	17,300		18,000	123,000	73,000	48,000
9,600		10,000	89,000	47,000	40,000	17,500		18,000	123,000	73,000	48,000
9,700		10,000	89,000	47,000	40,000	18,000		18,000	123,000	73,000	48,000
9,800		10,000	89,000	47,000	40,000	18,500		20,000	131,000	79,000	50,000
9,900		10,000	89,000	47,000	40,000	18,900		20,000	131,000	79,000	50,000
9,920	25/64	10,000	89,000	47,000	40,000	19,000		20,000	131,000	79,000	50,000
10,000		10,000	89,000	47,000	40,000	19,300		20,000	131,000	79,000	50,000
10,100		12,000	102,000	55,000	45,000	19,500		20,000	131,000	79,000	50,000
10,200		12,000	102,000	55,000	45,000	20,000		20,000	131,000	79,000	50,000
10,300		12,000	102,000	55,000	45,000						
10,320	13/32	12,000	102,000	55,000	45,000						
10,400		12,000	102,000	55,000	45,000						
10,500		12,000	102,000	55,000	45,000						
10,600		12,000	102,000	55,000	45,000						
10,700		12,000	102,000	55,000	45,000						
10,800		12,000	102,000	55,000	45,000						

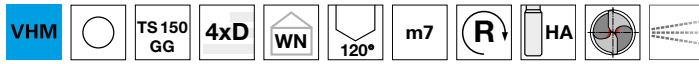


## 带内冷TS钻头

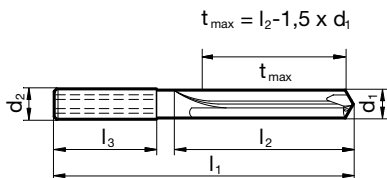
产品代号 89292



P	M	K	N	S	H
		•	○		



芯厚 ≥ Ø 3,000 • 双后刀面 • 紧直径公差 • 很好的孔表面质量 • 注意冷却压力  
 灰铸铁,可锻铸铁和球墨铸铁



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	24,000	36,000	8,700		10,000	103,000	61,000	40,000
3,100		6,000	66,000	24,000	36,000	9,000		10,000	103,000	61,000	40,000
3,200		6,000	66,000	24,000	36,000	9,400		10,000	103,000	61,000	40,000
3,300		6,000	66,000	24,000	36,000	10,000		10,000	103,000	61,000	40,000
3,400		6,000	66,000	24,000	36,000	10,200		12,000	118,000	71,000	45,000
3,500		6,000	66,000	24,000	36,000	10,500		12,000	118,000	71,000	45,000
3,700		6,000	66,000	24,000	36,000	11,000		12,000	118,000	71,000	45,000
4,000		6,000	74,000	30,000	36,000	11,500		12,000	118,000	71,000	45,000
4,200		6,000	74,000	30,000	36,000	12,000		12,000	118,000	71,000	45,000
5,000		6,000	74,000	36,000	36,000	12,300	31/64	14,000	124,000	74,000	45,000
5,100		6,000	74,000	36,000	36,000	12,500		14,000	124,000	74,000	45,000
5,300		6,000	74,000	36,000	36,000	12,700	1/2	14,000	124,000	74,000	45,000
5,400		6,000	74,000	36,000	36,000	13,000		14,000	124,000	74,000	45,000
5,900		6,000	74,000	36,000	36,000	14,000		14,000	124,000	74,000	45,000
6,000		6,000	74,000	36,000	36,000	15,000		16,000	133,000	83,000	48,000
6,200		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
6,300		8,000	91,000	53,000	36,000	16,500		18,000	143,000	93,000	48,000
6,400		8,000	91,000	53,000	36,000	17,000		18,000	143,000	93,000	48,000
6,600		8,000	91,000	53,000	36,000	17,500		18,000	143,000	93,000	48,000
6,700		8,000	91,000	53,000	36,000	19,000		20,000	153,000	101,000	50,000
6,800		8,000	91,000	53,000	36,000	20,000		20,000	153,000	101,000	50,000
7,000		8,000	91,000	53,000	36,000						
7,400		8,000	91,000	53,000	36,000						
7,500		8,000	91,000	53,000	36,000						
8,000		8,000	91,000	53,000	36,000						
8,100		10,000	103,000	61,000	40,000						
8,200		10,000	103,000	61,000	40,000						
8,300		10,000	103,000	61,000	40,000						
8,400		10,000	103,000	61,000	40,000						
8,500		10,000	103,000	61,000	40,000						



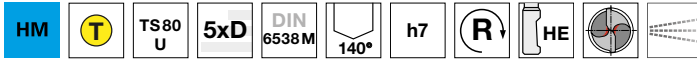
# HARTNER

## 带内冷TS钻头

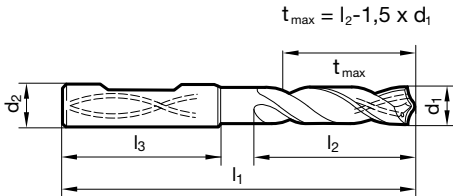
产品代号 89307



P	M	K	N	S	H
●	○	○	○		



芯厚 ≥ Ø 9,800 • 圆弧后刀面 • 高速钢刀柄焊接硬质合金刀片 • 抗振动和冲击性好  
 非合金钢/低合金钢 • 灰铸铁,球墨铸铁 • 黄铜, 青铜, 塑料, 石墨



d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,800	16,000	127,000	75,000	48,000	17,200	20,000	166,000	112,000	50,000
10,000	16,000	127,000	75,000	48,000	17,300	20,000	166,000	112,000	50,000
10,200	16,000	127,000	75,000	48,000	17,500	20,000	166,000	112,000	50,000
10,500	16,000	127,000	75,000	48,000	18,000	20,000	166,000	112,000	50,000
10,600	16,000	127,000	75,000	48,000	18,300	25,000	184,000	124,000	56,000
10,800	16,000	127,000	75,000	48,000	19,000	25,000	184,000	124,000	56,000
11,000	16,000	127,000	75,000	48,000	19,500	25,000	184,000	124,000	56,000
11,800	16,000	127,000	75,000	48,000	19,700	25,000	184,000	124,000	56,000
12,000	16,000	127,000	75,000	48,000	20,000	25,000	184,000	124,000	56,000
12,200	16,000	139,000	87,000	48,000	20,500	25,000	197,000	137,000	56,000
12,300	16,000	139,000	87,000	48,000	21,000	25,000	197,000	137,000	56,000
12,500	16,000	139,000	87,000	48,000	22,000	25,000	197,000	137,000	56,000
12,700	16,000	139,000	87,000	48,000	22,220	25,000	209,000	149,000	56,000
12,900	16,000	139,000	87,000	48,000	22,500	25,000	209,000	149,000	56,000
13,000	16,000	139,000	87,000	48,000	23,000	25,000	209,000	149,000	56,000
13,100	16,000	139,000	87,000	48,000	23,500	25,000	209,000	149,000	56,000
13,500	16,000	139,000	87,000	48,000	24,000	25,000	209,000	149,000	56,000
13,600	16,000	139,000	87,000	48,000	24,500	32,000	226,000	162,000	60,000
13,700	16,000	139,000	87,000	48,000	25,000	32,000	226,000	162,000	60,000
14,000	16,000	139,000	87,000	48,000					
14,500	20,000	154,000	100,000	50,000					
14,800	20,000	154,000	100,000	50,000					
15,000	20,000	154,000	100,000	50,000					
15,100	20,000	154,000	100,000	50,000					
15,500	20,000	154,000	100,000	50,000					
15,700	20,000	154,000	100,000	50,000					
16,000	20,000	154,000	100,000	50,000					
16,200	20,000	166,000	112,000	50,000					
16,500	20,000	166,000	112,000	50,000					
17,000	20,000	166,000	112,000	50,000					



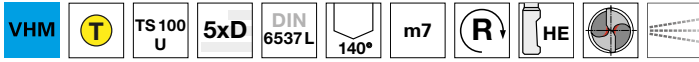
# HARTNER

## 带内冷TS钻头

产品代号 89272

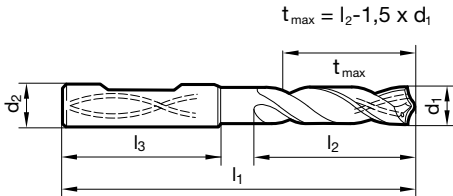


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,700 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢（合金/非合金），强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
3,100		6,000	66,000	28,000	36,000	9,700		10,000	103,000	61,000	40,000
3,200		6,000	66,000	28,000	36,000	9,800		10,000	103,000	61,000	40,000
3,300		6,000	66,000	28,000	36,000	10,000		10,000	103,000	61,000	40,000
3,400		6,000	66,000	28,000	36,000	10,200		12,000	118,000	71,000	45,000
3,500		6,000	66,000	28,000	36,000	10,500		12,000	118,000	71,000	45,000
3,600		6,000	66,000	28,000	36,000	10,800		12,000	118,000	71,000	45,000
3,700		6,000	66,000	28,000	36,000	11,000		12,000	118,000	71,000	45,000
3,800		6,000	74,000	36,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
3,900		6,000	74,000	36,000	36,000	11,200		12,000	118,000	71,000	45,000
5,000		6,000	82,000	44,000	36,000	11,500		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	11,800		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	12,000		12,000	118,000	71,000	45,000
5,950	15/64	6,000	82,000	44,000	36,000	12,500		14,000	124,000	77,000	45,000
6,000		6,000	82,000	44,000	36,000	13,000		14,000	124,000	77,000	45,000
6,400		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
6,500		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
6,800		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
7,000		8,000	91,000	53,000	36,000	15,500		16,000	133,000	83,000	48,000
7,140	9/32	8,000	91,000	53,000	36,000	15,870	5/8	16,000	133,000	83,000	48,000
7,500		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
7,800		8,000	91,000	53,000	36,000	16,500		18,000	143,000	93,000	48,000
8,000		8,000	91,000	53,000	36,000	17,000		18,000	143,000	93,000	48,000
8,500		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
8,600		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000
8,800		10,000	103,000	61,000	40,000	19,000		20,000	153,000	101,000	50,000
9,000		10,000	103,000	61,000	40,000	19,500		20,000	153,000	101,000	50,000
9,300		10,000	103,000	61,000	40,000						
9,500		10,000	103,000	61,000	40,000						



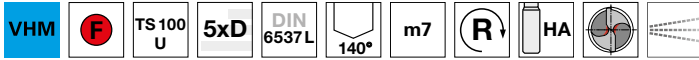
# HARTNER

## 带内冷TS钻头

### 产品代号 89411



P	M	K	N	S	H
●	○	●	○	○	○



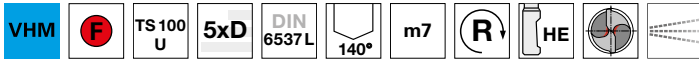
芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金

### 产品代号 89408

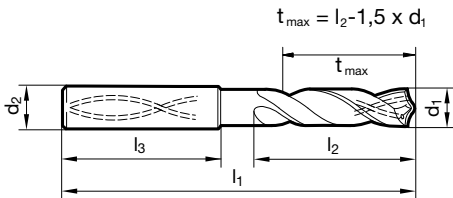


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	4,760	3/16	6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	4,800		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	4,900		6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	5,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	5,100		6,000	82,000	44,000	36,000
3,300		6,000	66,000	28,000	36,000	5,160	13/64	6,000	82,000	44,000	36,000
3,400		6,000	66,000	28,000	36,000	5,200		6,000	82,000	44,000	36,000
3,500		6,000	66,000	28,000	36,000	5,300		6,000	82,000	44,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	5,400		6,000	82,000	44,000	36,000
3,600		6,000	66,000	28,000	36,000	5,500		6,000	82,000	44,000	36,000
3,700		6,000	66,000	28,000	36,000	5,550		6,000	82,000	44,000	36,000
3,800		6,000	74,000	36,000	36,000	5,560	7/32	6,000	82,000	44,000	36,000
3,900		6,000	74,000	36,000	36,000	5,600		6,000	82,000	44,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	5,700		6,000	82,000	44,000	36,000
4,000		6,000	74,000	36,000	36,000	5,800		6,000	82,000	44,000	36,000
4,100		6,000	74,000	36,000	36,000	5,900		6,000	82,000	44,000	36,000
4,200		6,000	74,000	36,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
4,300		6,000	74,000	36,000	36,000	6,000		6,000	82,000	44,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	6,100		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	6,200		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	6,300		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	6,400		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	6,500		8,000	91,000	53,000	36,000





## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	91,000	53,000	36,000	11,400		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	11,900		12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
7,200		8,000	91,000	53,000	36,000	12,100		14,000	124,000	77,000	45,000
7,300		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
7,400		8,000	91,000	53,000	36,000	12,300	31/64	14,000	124,000	77,000	45,000
7,500		8,000	91,000	53,000	36,000	12,400		14,000	124,000	77,000	45,000
7,540	19/64	8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
7,600		8,000	91,000	53,000	36,000	12,600		14,000	124,000	77,000	45,000
7,700		8,000	91,000	53,000	36,000	12,700	1/2	14,000	124,000	77,000	45,000
7,800		8,000	91,000	53,000	36,000	12,800		14,000	124,000	77,000	45,000
7,900		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
7,940	5/16	8,000	91,000	53,000	36,000	13,100	33/64	14,000	124,000	77,000	45,000
8,000		8,000	91,000	53,000	36,000	13,300		14,000	124,000	77,000	45,000
8,100		10,000	103,000	61,000	40,000	13,500		14,000	124,000	77,000	45,000
8,200		10,000	103,000	61,000	40,000	13,700		14,000	124,000	77,000	45,000
8,300		10,000	103,000	61,000	40,000	13,800		14,000	124,000	77,000	45,000
8,330	21/64	10,000	103,000	61,000	40,000	14,000		14,000	124,000	77,000	45,000
8,400		10,000	103,000	61,000	40,000	14,100		16,000	133,000	83,000	48,000
8,500		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
8,600		10,000	103,000	61,000	40,000	14,290	9/16	16,000	133,000	83,000	48,000
8,700		10,000	103,000	61,000	40,000	14,500		16,000	133,000	83,000	48,000
8,730	11/32	10,000	103,000	61,000	40,000	14,600		16,000	133,000	83,000	48,000
8,800		10,000	103,000	61,000	40,000	14,700		16,000	133,000	83,000	48,000
8,900		10,000	103,000	61,000	40,000	14,800		16,000	133,000	83,000	48,000
9,000		10,000	103,000	61,000	40,000	15,000		16,000	133,000	83,000	48,000
9,100		10,000	103,000	61,000	40,000	15,100		16,000	133,000	83,000	48,000
9,130	23/64	10,000	103,000	61,000	40,000	15,200		16,000	133,000	83,000	48,000
9,200		10,000	103,000	61,000	40,000	15,300		16,000	133,000	83,000	48,000
9,250		10,000	103,000	61,000	40,000	15,500		16,000	133,000	83,000	48,000
9,300		10,000	103,000	61,000	40,000	15,700		16,000	133,000	83,000	48,000
9,400		10,000	103,000	61,000	40,000	15,800		16,000	133,000	83,000	48,000
9,500		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
9,520	3/8	10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
9,600		10,000	103,000	61,000	40,000	16,900		18,000	143,000	93,000	48,000
9,700		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
9,800		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
9,900		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000
9,920	25/64	10,000	103,000	61,000	40,000	18,500		20,000	153,000	101,000	50,000
10,000		10,000	103,000	61,000	40,000	18,900		20,000	153,000	101,000	50,000
10,100		12,000	118,000	71,000	45,000	19,000		20,000	153,000	101,000	50,000
10,200		12,000	118,000	71,000	45,000	19,050	3/4	20,000	153,000	101,000	50,000
10,300		12,000	118,000	71,000	45,000	19,500		20,000	153,000	101,000	50,000
10,320	13/32	12,000	118,000	71,000	45,000	20,000		20,000	153,000	101,000	50,000
10,400		12,000	118,000	71,000	45,000						
10,500		12,000	118,000	71,000	45,000						
10,600		12,000	118,000	71,000	45,000						
10,700		12,000	118,000	71,000	45,000						
10,800		12,000	118,000	71,000	45,000						
10,900		12,000	118,000	71,000	45,000						
11,000		12,000	118,000	71,000	45,000						
11,100		12,000	118,000	71,000	45,000						
11,110	7/16	12,000	118,000	71,000	45,000						
11,200		12,000	118,000	71,000	45,000						
11,300		12,000	118,000	71,000	45,000						

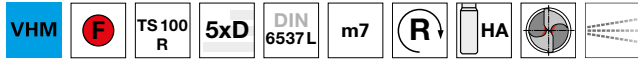


## 带内冷TS钻头

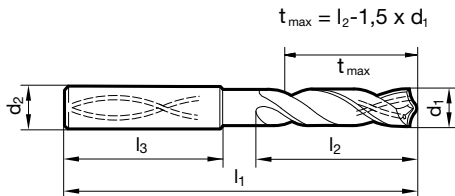
产品代号 89420



P	M	K	N	S	H
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芯厚 ≥ Ø 3,000 • 专利弧形钻尖 • 直型切削刃 (通过刃修正)  
 蠕墨铸铁GGV 和 ADI、CDI • 灰铸铁,可锻铸铁和球墨铸铁



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,400		10,000	103,000	61,000	40,000	13,000		14,000	124,000	77,000	45,000
9,500		10,000	103,000	61,000	40,000	13,100	33/64	14,000	124,000	77,000	45,000
9,520	3/8	10,000	103,000	61,000	40,000	13,300		14,000	124,000	77,000	45,000
9,600		10,000	103,000	61,000	40,000	13,400		14,000	124,000	77,000	45,000
9,700		10,000	103,000	61,000	40,000	13,500		14,000	124,000	77,000	45,000
9,800		10,000	103,000	61,000	40,000	13,700		14,000	124,000	77,000	45,000
9,900		10,000	103,000	61,000	40,000	13,800		14,000	124,000	77,000	45,000
9,920	25/64	10,000	103,000	61,000	40,000	13,900		14,000	124,000	77,000	45,000
10,000		10,000	103,000	61,000	40,000	14,000		14,000	124,000	77,000	45,000
10,100		12,000	118,000	71,000	45,000	14,100		16,000	133,000	83,000	48,000
10,200		12,000	118,000	71,000	45,000	14,200		16,000	133,000	83,000	48,000
10,300		12,000	118,000	71,000	45,000	14,290	9/16	16,000	133,000	83,000	48,000
10,320	13/32	12,000	118,000	71,000	45,000	14,300		16,000	133,000	83,000	48,000
10,400		12,000	118,000	71,000	45,000	14,400		16,000	133,000	83,000	48,000
10,500		12,000	118,000	71,000	45,000	14,500		16,000	133,000	83,000	48,000
10,600		12,000	118,000	71,000	45,000	14,600		16,000	133,000	83,000	48,000
10,700		12,000	118,000	71,000	45,000	14,700		16,000	133,000	83,000	48,000
10,720	27/64	12,000	118,000	71,000	45,000	14,900		16,000	133,000	83,000	48,000
10,800		12,000	118,000	71,000	45,000	15,000		16,000	133,000	83,000	48,000
10,900		12,000	118,000	71,000	45,000	15,100		16,000	133,000	83,000	48,000
11,000		12,000	118,000	71,000	45,000	15,200		16,000	133,000	83,000	48,000
11,100		12,000	118,000	71,000	45,000	15,300		16,000	133,000	83,000	48,000
11,110	7/16	12,000	118,000	71,000	45,000	15,400		16,000	133,000	83,000	48,000
11,200		12,000	118,000	71,000	45,000	15,500		16,000	133,000	83,000	48,000
11,300		12,000	118,000	71,000	45,000	15,600		16,000	133,000	83,000	48,000
11,400		12,000	118,000	71,000	45,000	15,700		16,000	133,000	83,000	48,000
11,500		12,000	118,000	71,000	45,000	15,800		16,000	133,000	83,000	48,000
11,600		12,000	118,000	71,000	45,000	15,870	5/8	16,000	133,000	83,000	48,000
11,700		12,000	118,000	71,000	45,000	15,900		16,000	133,000	83,000	48,000
11,800		12,000	118,000	71,000	45,000	16,000		16,000	133,000	83,000	48,000
11,900		12,000	118,000	71,000	45,000	16,500		18,000	143,000	93,000	48,000
11,910	15/32	12,000	118,000	71,000	45,000	16,670	21/32	18,000	143,000	93,000	48,000
12,000		12,000	118,000	71,000	45,000	17,000		18,000	143,000	93,000	48,000
12,100		14,000	124,000	77,000	45,000	17,500		18,000	143,000	93,000	48,000
12,200		14,000	124,000	77,000	45,000	18,000		18,000	143,000	93,000	48,000
12,300	31/64	14,000	124,000	77,000	45,000	18,500		20,000	153,000	101,000	50,000
12,400		14,000	124,000	77,000	45,000	19,000		20,000	153,000	101,000	50,000
12,500		14,000	124,000	77,000	45,000	19,500		20,000	153,000	101,000	50,000
12,600		14,000	124,000	77,000	45,000	20,000		20,000	153,000	101,000	50,000
12,700	1/2	14,000	124,000	77,000	45,000						
12,800		14,000	124,000	77,000	45,000						
12,900		14,000	124,000	77,000	45,000						



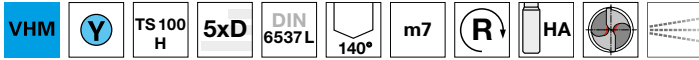
# HARTNER

## 带内冷TS钻头

### 产品代号 89425



P	M	K	N	S	H
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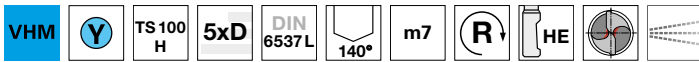


芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 主切削刃轻微内凹 • 优化了的切削几何参数  
 强度小于1400 N/mm<sup>2</sup>的合金和高强度钢 • 镍合金, 哈氏合金, 锰合金 • 钛及钛合金

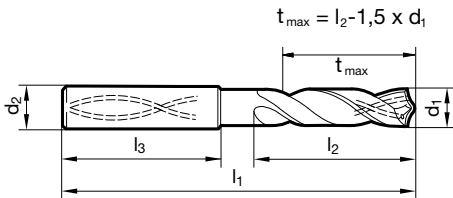
### 产品代号 89426



P	M	K	N	S	H
•				•	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 主切削刃轻微内凹 • 优化了的切削几何参数  
 强度小于1400 N/mm<sup>2</sup>的合金和高强度钢 • 镍合金, 哈氏合金, 锰合金 • 钛及钛合金



d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	4,760	3/16	6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	4,800		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	4,900		6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	5,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	5,100		6,000	82,000	44,000	36,000
3,300		6,000	66,000	28,000	36,000	5,160	13/64	6,000	82,000	44,000	36,000
3,400		6,000	66,000	28,000	36,000	5,200		6,000	82,000	44,000	36,000
3,500		6,000	66,000	28,000	36,000	5,300		6,000	82,000	44,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	5,400		6,000	82,000	44,000	36,000
3,600		6,000	66,000	28,000	36,000	5,500		6,000	82,000	44,000	36,000
3,700		6,000	66,000	28,000	36,000	5,550		6,000	82,000	44,000	36,000
3,800		6,000	74,000	36,000	36,000	5,560	7/32	6,000	82,000	44,000	36,000
3,900		6,000	74,000	36,000	36,000	5,600		6,000	82,000	44,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	5,700		6,000	82,000	44,000	36,000
4,000		6,000	74,000	36,000	36,000	5,800		6,000	82,000	44,000	36,000
4,100		6,000	74,000	36,000	36,000	5,900		6,000	82,000	44,000	36,000
4,200		6,000	74,000	36,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
4,300		6,000	74,000	36,000	36,000	6,000		6,000	82,000	44,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	6,100		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	6,200		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	6,300		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	6,400		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	6,500		8,000	91,000	53,000	36,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	11,300		12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	11,400		12,000	118,000	71,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
7,200		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
7,300		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
7,400		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
7,500		8,000	91,000	53,000	36,000	11,900		12,000	118,000	71,000	45,000
7,540	19/64	8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000
7,600		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
7,700		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
7,800		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
7,900		8,000	91,000	53,000	36,000	12,700	1/2	14,000	124,000	77,000	45,000
7,940	5/16	8,000	91,000	53,000	36,000	12,800		14,000	124,000	77,000	45,000
8,000		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
8,100		10,000	103,000	61,000	40,000	13,300		14,000	124,000	77,000	45,000
8,200		10,000	103,000	61,000	40,000	13,500		14,000	124,000	77,000	45,000
8,300		10,000	103,000	61,000	40,000	13,700		14,000	124,000	77,000	45,000
8,330	21/64	10,000	103,000	61,000	40,000	14,000		14,000	124,000	77,000	45,000
8,400		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
8,500		10,000	103,000	61,000	40,000	14,290	9/16	16,000	133,000	83,000	48,000
8,600		10,000	103,000	61,000	40,000	14,300		16,000	133,000	83,000	48,000
8,700		10,000	103,000	61,000	40,000	14,500		16,000	133,000	83,000	48,000
8,730	11/32	10,000	103,000	61,000	40,000	14,700		16,000	133,000	83,000	48,000
8,800		10,000	103,000	61,000	40,000	15,000		16,000	133,000	83,000	48,000
8,900		10,000	103,000	61,000	40,000	15,200		16,000	133,000	83,000	48,000
9,000		10,000	103,000	61,000	40,000	15,300		16,000	133,000	83,000	48,000
9,100		10,000	103,000	61,000	40,000	15,500		16,000	133,000	83,000	48,000
9,130	23/64	10,000	103,000	61,000	40,000	15,700		16,000	133,000	83,000	48,000
9,200		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
9,250		10,000	103,000	61,000	40,000	16,300		18,000	143,000	93,000	48,000
9,300		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
9,400		10,000	103,000	61,000	40,000	16,900		18,000	143,000	93,000	48,000
9,500		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
9,520	3/8	10,000	103,000	61,000	40,000	17,300		18,000	143,000	93,000	48,000
9,600		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
9,700		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000
9,800		10,000	103,000	61,000	40,000	18,500		20,000	153,000	101,000	50,000
9,900		10,000	103,000	61,000	40,000	18,900		20,000	153,000	101,000	50,000
9,920	25/64	10,000	103,000	61,000	40,000	19,000		20,000	153,000	101,000	50,000
10,000		10,000	103,000	61,000	40,000	19,050	3/4	20,000	153,000	101,000	50,000
10,100		12,000	118,000	71,000	45,000	19,300		20,000	153,000	101,000	50,000
10,200		12,000	118,000	71,000	45,000	19,500		20,000	153,000	101,000	50,000
10,300		12,000	118,000	71,000	45,000	20,000		20,000	153,000	101,000	50,000
10,320	13/32	12,000	118,000	71,000	45,000						
10,400		12,000	118,000	71,000	45,000						
10,500		12,000	118,000	71,000	45,000						
10,600		12,000	118,000	71,000	45,000						
10,700		12,000	118,000	71,000	45,000						
10,800		12,000	118,000	71,000	45,000						

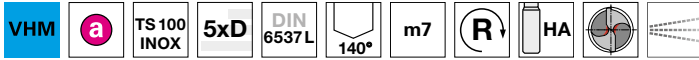


## 带内冷TS钻头

### 产品代号 89451



P	M	K	N	S	H
○	●			○	

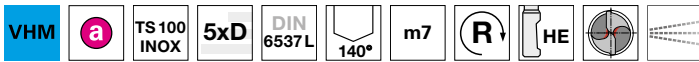


芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数  
 不锈钢/耐酸/耐热钢 • 钛及钛合金 • 镍合金, 哈氏合金, 锰合金

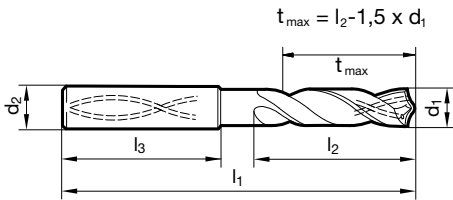
### 产品代号 89551



P	M	K	N	S	H
○	●			○	



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数  
 不锈钢/耐酸/耐热钢 • 钛及钛合金 • 镍合金, 哈氏合金, 锰合金



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		6,000	66,000	28,000	36,000	4,760	3/16	6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	4,800		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	4,900		6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	5,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	5,100		6,000	82,000	44,000	36,000
3,300		6,000	66,000	28,000	36,000	5,160	13/64	6,000	82,000	44,000	36,000
3,400		6,000	66,000	28,000	36,000	5,200		6,000	82,000	44,000	36,000
3,500		6,000	66,000	28,000	36,000	5,300		6,000	82,000	44,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	5,400		6,000	82,000	44,000	36,000
3,600		6,000	66,000	28,000	36,000	5,500		6,000	82,000	44,000	36,000
3,700		6,000	66,000	28,000	36,000	5,550		6,000	82,000	44,000	36,000
3,800		6,000	74,000	36,000	36,000	5,560	7/32	6,000	82,000	44,000	36,000
3,900		6,000	74,000	36,000	36,000	5,600		6,000	82,000	44,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	5,700		6,000	82,000	44,000	36,000
4,000		6,000	74,000	36,000	36,000	5,800		6,000	82,000	44,000	36,000
4,100		6,000	74,000	36,000	36,000	5,900		6,000	82,000	44,000	36,000
4,200		6,000	74,000	36,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
4,300		6,000	74,000	36,000	36,000	6,000		6,000	82,000	44,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	6,100		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	6,200		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	6,300		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	6,400		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	6,500		8,000	91,000	53,000	36,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,600		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	11,300		12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	11,400		12,000	118,000	71,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
7,200		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
7,300		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
7,400		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
7,500		8,000	91,000	53,000	36,000	11,900		12,000	118,000	71,000	45,000
7,540	19/64	8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000
7,600		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
7,700		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
7,800		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
7,900		8,000	91,000	53,000	36,000	12,700	1/2	14,000	124,000	77,000	45,000
7,940	5/16	8,000	91,000	53,000	36,000	12,800		14,000	124,000	77,000	45,000
8,000		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
8,100		10,000	103,000	61,000	40,000	13,300		14,000	124,000	77,000	45,000
8,200		10,000	103,000	61,000	40,000	13,500		14,000	124,000	77,000	45,000
8,300		10,000	103,000	61,000	40,000	13,700		14,000	124,000	77,000	45,000
8,330	21/64	10,000	103,000	61,000	40,000	14,000		14,000	124,000	77,000	45,000
8,400		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
8,500		10,000	103,000	61,000	40,000	14,290	9/16	16,000	133,000	83,000	48,000
8,600		10,000	103,000	61,000	40,000	14,300		16,000	133,000	83,000	48,000
8,700		10,000	103,000	61,000	40,000	14,500		16,000	133,000	83,000	48,000
8,730	11/32	10,000	103,000	61,000	40,000	14,700		16,000	133,000	83,000	48,000
8,800		10,000	103,000	61,000	40,000	15,000		16,000	133,000	83,000	48,000
8,900		10,000	103,000	61,000	40,000	15,200		16,000	133,000	83,000	48,000
9,000		10,000	103,000	61,000	40,000	15,300		16,000	133,000	83,000	48,000
9,100		10,000	103,000	61,000	40,000	15,500		16,000	133,000	83,000	48,000
9,130	23/64	10,000	103,000	61,000	40,000	15,700		16,000	133,000	83,000	48,000
9,200		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
9,250		10,000	103,000	61,000	40,000	16,300		18,000	143,000	93,000	48,000
9,300		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
9,400		10,000	103,000	61,000	40,000	16,900		18,000	143,000	93,000	48,000
9,500		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
9,520	3/8	10,000	103,000	61,000	40,000	17,300		18,000	143,000	93,000	48,000
9,600		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
9,700		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000
9,800		10,000	103,000	61,000	40,000	18,500		20,000	153,000	101,000	50,000
9,900		10,000	103,000	61,000	40,000	18,900		20,000	153,000	101,000	50,000
9,920	25/64	10,000	103,000	61,000	40,000	19,000		20,000	153,000	101,000	50,000
10,000		10,000	103,000	61,000	40,000	19,050	3/4	20,000	153,000	101,000	50,000
10,100		12,000	118,000	71,000	45,000	19,300		20,000	153,000	101,000	50,000
10,200		12,000	118,000	71,000	45,000	19,500		20,000	153,000	101,000	50,000
10,300		12,000	118,000	71,000	45,000	20,000		20,000	153,000	101,000	50,000
10,320	13/32	12,000	118,000	71,000	45,000						
10,400		12,000	118,000	71,000	45,000						
10,500		12,000	118,000	71,000	45,000						
10,600		12,000	118,000	71,000	45,000						
10,700		12,000	118,000	71,000	45,000						
10,800		12,000	118,000	71,000	45,000						

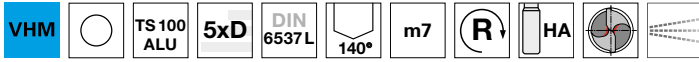


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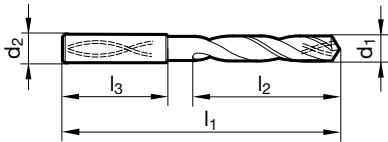
产品代号 89560



P	M	K	N	S	H
			•		



圆弧后刀面 • 主切削刃轻微内凹 • 优化了的切削几何参数 • 锋利的切削性能  
 铝和铝合金 • • 塑料



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000





## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,340		10,000	103,000	61,000	40,000	13,300		14,000	124,000	77,000	45,000
9,400		10,000	103,000	61,000	40,000	13,400		14,000	124,000	77,000	45,000
9,500		10,000	103,000	61,000	40,000	13,500		14,000	124,000	77,000	45,000
9,520	3/8	10,000	103,000	61,000	40,000	13,700		14,000	124,000	77,000	45,000
9,600		10,000	103,000	61,000	40,000	13,800		14,000	124,000	77,000	45,000
9,700		10,000	103,000	61,000	40,000	14,000		14,000	124,000	77,000	45,000
9,800		10,000	103,000	61,000	40,000	14,100		16,000	133,000	83,000	48,000
9,900		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
9,920	25/64	10,000	103,000	61,000	40,000	14,290	9/16	16,000	133,000	83,000	48,000
10,000		10,000	103,000	61,000	40,000	14,300		16,000	133,000	83,000	48,000
10,100		12,000	118,000	71,000	45,000	14,400		16,000	133,000	83,000	48,000
10,200		12,000	118,000	71,000	45,000	14,500		16,000	133,000	83,000	48,000
10,300		12,000	118,000	71,000	45,000	14,700		16,000	133,000	83,000	48,000
10,320	13/32	12,000	118,000	71,000	45,000	14,800		16,000	133,000	83,000	48,000
10,400		12,000	118,000	71,000	45,000	15,000		16,000	133,000	83,000	48,000
10,500		12,000	118,000	71,000	45,000	15,100		16,000	133,000	83,000	48,000
10,600		12,000	118,000	71,000	45,000	15,200		16,000	133,000	83,000	48,000
10,700		12,000	118,000	71,000	45,000	15,300		16,000	133,000	83,000	48,000
10,800		12,000	118,000	71,000	45,000	15,500		16,000	133,000	83,000	48,000
10,900		12,000	118,000	71,000	45,000	15,700		16,000	133,000	83,000	48,000
11,000		12,000	118,000	71,000	45,000	15,800		16,000	133,000	83,000	48,000
11,100		12,000	118,000	71,000	45,000	16,000		16,000	133,000	83,000	48,000
11,110	7/16	12,000	118,000	71,000	45,000	16,500		18,000	143,000	93,000	48,000
11,200		12,000	118,000	71,000	45,000	16,700		18,000	143,000	93,000	48,000
11,300		12,000	118,000	71,000	45,000	16,900		18,000	143,000	93,000	48,000
11,400		12,000	118,000	71,000	45,000	17,000		18,000	143,000	93,000	48,000
11,500		12,000	118,000	71,000	45,000	17,500		18,000	143,000	93,000	48,000
11,600		12,000	118,000	71,000	45,000	17,700		18,000	143,000	93,000	48,000
11,700		12,000	118,000	71,000	45,000	18,000		18,000	143,000	93,000	48,000
11,800		12,000	118,000	71,000	45,000	18,500		20,000	153,000	101,000	50,000
11,900		12,000	118,000	71,000	45,000	18,900		20,000	153,000	101,000	50,000
11,910	15/32	12,000	118,000	71,000	45,000	19,000		20,000	153,000	101,000	50,000
12,000		12,000	118,000	71,000	45,000	19,050	3/4	20,000	153,000	101,000	50,000
12,100		14,000	124,000	77,000	45,000	19,300		20,000	153,000	101,000	50,000
12,200		14,000	124,000	77,000	45,000	19,500		20,000	153,000	101,000	50,000
12,500		14,000	124,000	77,000	45,000	20,000		20,000	153,000	101,000	50,000
12,600		14,000	124,000	77,000	45,000						
12,700	1/2	14,000	124,000	77,000	45,000						
12,800		14,000	124,000	77,000	45,000						
12,900		14,000	124,000	77,000	45,000						
13,000		14,000	124,000	77,000	45,000						
13,100	33/64	14,000	124,000	77,000	45,000						

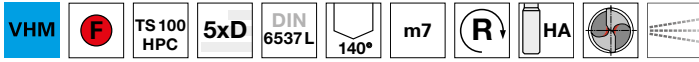


## 带内冷TS钻头

产品代号 89460

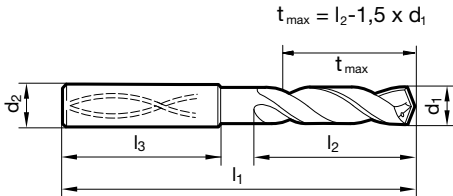


P	M	K	N	S	H
●	○	○	○	○	○



圆弧后刀面 • 凹形主切削刃 • 优化了的切削几何参数 • 最高性能

高性能加工结构钢, 硬化钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1400N/mm<sup>2</sup> • 不锈钢/耐酸/耐热钢 • 钛及钛合金  
• 特殊合金



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	5,900		6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,000		6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,530		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,550		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	6,600		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	6,700		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	6,800		8,000	91,000	53,000	36,000
4,040		6,000	74,000	36,000	36,000	6,900		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,550		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	7,600		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	7,650		8,000	91,000	53,000	36,000
4,900		6,000	82,000	44,000	36,000	7,700		8,000	91,000	53,000	36,000
5,000		6,000	82,000	44,000	36,000	7,800		8,000	91,000	53,000	36,000
5,100		6,000	82,000	44,000	36,000	7,900		8,000	91,000	53,000	36,000
5,110		6,000	82,000	44,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
5,160	13/64	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
5,200		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,410		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
8,900		10,000	103,000	61,000	40,000	14,100		16,000	133,000	83,000	48,000
9,000		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
9,100		10,000	103,000	61,000	40,000	14,290	9/16	16,000	133,000	83,000	48,000
9,130	23/64	10,000	103,000	61,000	40,000	14,300		16,000	133,000	83,000	48,000
9,200		10,000	103,000	61,000	40,000	14,400		16,000	133,000	83,000	48,000
9,250		10,000	103,000	61,000	40,000	14,500		16,000	133,000	83,000	48,000
9,300		10,000	103,000	61,000	40,000	14,600		16,000	133,000	83,000	48,000
9,340		10,000	103,000	61,000	40,000	14,680	37/64	16,000	133,000	83,000	48,000
9,400		10,000	103,000	61,000	40,000	14,700		16,000	133,000	83,000	48,000
9,500		10,000	103,000	61,000	40,000	14,800		16,000	133,000	83,000	48,000
9,520	3/8	10,000	103,000	61,000	40,000	14,900		16,000	133,000	83,000	48,000
9,550		10,000	103,000	61,000	40,000	15,000		16,000	133,000	83,000	48,000
9,600		10,000	103,000	61,000	40,000	15,080	19/32	16,000	133,000	83,000	48,000
9,700		10,000	103,000	61,000	40,000	15,100		16,000	133,000	83,000	48,000
9,800		10,000	103,000	61,000	40,000	15,200		16,000	133,000	83,000	48,000
9,900		10,000	103,000	61,000	40,000	15,300		16,000	133,000	83,000	48,000
9,920	25/64	10,000	103,000	61,000	40,000	15,400		16,000	133,000	83,000	48,000
10,000		10,000	103,000	61,000	40,000	15,480	39/64	16,000	133,000	83,000	48,000
10,100		12,000	118,000	71,000	45,000	15,500		16,000	133,000	83,000	48,000
10,200		12,000	118,000	71,000	45,000	15,550		16,000	133,000	83,000	48,000
10,300		12,000	118,000	71,000	45,000	15,600		16,000	133,000	83,000	48,000
10,320	13/32	12,000	118,000	71,000	45,000	15,700		16,000	133,000	83,000	48,000
10,400		12,000	118,000	71,000	45,000	15,800		16,000	133,000	83,000	48,000
10,500		12,000	118,000	71,000	45,000	15,870	5/8	16,000	133,000	83,000	48,000
10,600		12,000	118,000	71,000	45,000	15,900		16,000	133,000	83,000	48,000
10,700		12,000	118,000	71,000	45,000	16,000		16,000	133,000	83,000	48,000
10,720	27/64	12,000	118,000	71,000	45,000	16,270	41/64	18,000	143,000	93,000	48,000
10,800		12,000	118,000	71,000	45,000	16,300		18,000	143,000	93,000	48,000
10,900		12,000	118,000	71,000	45,000	16,500		18,000	143,000	93,000	48,000
11,000		12,000	118,000	71,000	45,000	16,670	21/32	18,000	143,000	93,000	48,000
11,100		12,000	118,000	71,000	45,000	16,700		18,000	143,000	93,000	48,000
11,110	7/16	12,000	118,000	71,000	45,000	16,900		18,000	143,000	93,000	48,000
11,200		12,000	118,000	71,000	45,000	17,000		18,000	143,000	93,000	48,000
11,300		12,000	118,000	71,000	45,000	17,070	43/64	18,000	143,000	93,000	48,000
11,400		12,000	118,000	71,000	45,000	17,460	11/16	18,000	143,000	93,000	48,000
11,500		12,000	118,000	71,000	45,000	17,500		18,000	143,000	93,000	48,000
11,510	29/64	12,000	118,000	71,000	45,000	17,550		18,000	143,000	93,000	48,000
11,550		12,000	118,000	71,000	45,000	17,700		18,000	143,000	93,000	48,000
11,600		12,000	118,000	71,000	45,000	17,860	45/64	18,000	143,000	93,000	48,000
11,700		12,000	118,000	71,000	45,000	18,000		18,000	143,000	93,000	48,000
11,800		12,000	118,000	71,000	45,000	18,260	23/32	20,000	153,000	101,000	50,000
11,900		12,000	118,000	71,000	45,000	18,500		20,000	153,000	101,000	50,000
11,910	15/32	12,000	118,000	71,000	45,000	18,700		20,000	153,000	101,000	50,000
12,000		12,000	118,000	71,000	45,000	18,900		20,000	153,000	101,000	50,000
12,100		14,000	124,000	77,000	45,000	19,000		20,000	153,000	101,000	50,000
12,200		14,000	124,000	77,000	45,000	19,050	3/4	20,000	153,000	101,000	50,000
12,300	31/64	14,000	124,000	77,000	45,000	19,250		20,000	153,000	101,000	50,000
12,400		14,000	124,000	77,000	45,000	19,300		20,000	153,000	101,000	50,000
12,500		14,000	124,000	77,000	45,000	19,450	49/64	20,000	153,000	101,000	50,000
12,600		14,000	124,000	77,000	45,000	19,500		20,000	153,000	101,000	50,000
12,700	1/2	14,000	124,000	77,000	45,000	19,550		20,000	153,000	101,000	50,000
12,800		14,000	124,000	77,000	45,000	19,700		20,000	153,000	101,000	50,000
12,900		14,000	124,000	77,000	45,000	19,800		20,000	153,000	101,000	50,000
13,000		14,000	124,000	77,000	45,000	19,840	25/32	20,000	153,000	101,000	50,000
13,100	33/64	14,000	124,000	77,000	45,000	20,000		20,000	153,000	101,000	50,000
13,200		14,000	124,000	77,000	45,000						
13,300		14,000	124,000	77,000	45,000						
13,400		14,000	124,000	77,000	45,000						
13,490	17/32	14,000	124,000	77,000	45,000						
13,500		14,000	124,000	77,000	45,000						
13,600		14,000	124,000	77,000	45,000						
13,700		14,000	124,000	77,000	45,000						
13,800		14,000	124,000	77,000	45,000						
13,890	35/64	14,000	124,000	77,000	45,000						
13,900		14,000	124,000	77,000	45,000						
14,000		14,000	124,000	77,000	45,000						



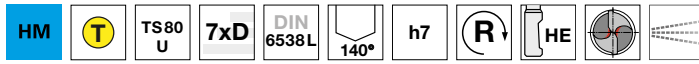
# HARTNER

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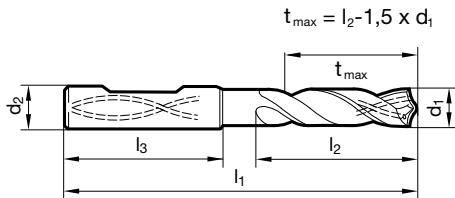
产品代号 89308



P	M	K	N	S	H
●	○	○	○		



芯厚 ≥ Ø 10,000 • 圆弧后刀面 • 抗振动和冲击性好 • 高速钢刀柄焊接硬质合金刀片  
 非合金钢/低合金钢 • 灰铸铁,球墨铸铁 • 黄铜, 青铜, 塑料, 石墨



d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm
10,000	16,000	151,000	99,000	48,000	16,500	20,000	202,000	148,000	50,000
13,000	16,000	167,000	115,000	48,000	17,000	20,000	202,000	148,000	50,000
13,500	16,000	167,000	115,000	48,000	18,000	20,000	202,000	148,000	50,000
14,000	16,000	167,000	115,000	48,000	19,000	25,000	224,000	164,000	56,000
15,000	20,000	186,000	132,000	50,000	20,000	25,000	224,000	164,000	56,000
16,000	20,000	186,000	132,000	50,000	22,000	25,000	241,000	181,000	56,000

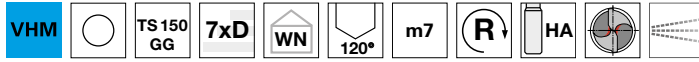


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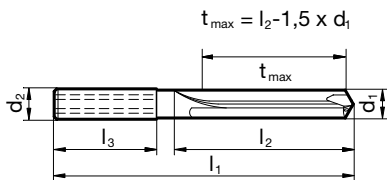
产品代号 89294



P	M	K	N	S	H
		•	○		



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 紧直径公差 • 很好的孔表面质量 • 注意最佳冷却压力  
灰铸铁, 可锻铸铁和球墨铸铁



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	74,000	32,000	36,000	11,500		12,000	163,000	114,000	45,000
3,100		6,000	74,000	32,000	36,000	12,000		12,000	163,000	114,000	45,000
3,200		6,000	74,000	32,000	36,000	12,300	31/64	14,000	182,000	133,000	45,000
3,500		6,000	74,000	34,000	36,000	12,500		14,000	182,000	133,000	45,000
3,600		6,000	74,000	34,000	36,000	12,700	1/2	14,000	182,000	133,000	45,000
3,700		6,000	74,000	34,000	36,000	13,000		14,000	182,000	133,000	45,000
3,800		6,000	97,000	45,000	36,000	13,500		14,000	182,000	133,000	45,000
4,000		6,000	97,000	45,000	36,000	14,000		14,000	182,000	133,000	45,000
4,100		6,000	97,000	45,000	36,000	14,500		16,000	204,000	152,000	48,000
4,200		6,000	97,000	45,000	36,000	15,000		16,000	204,000	152,000	48,000
4,300		6,000	97,000	45,000	36,000	15,500		16,000	204,000	152,000	48,000
4,400		6,000	97,000	45,000	36,000	16,000		16,000	204,000	152,000	48,000
4,500		6,000	97,000	45,000	36,000	16,500		18,000	223,000	171,000	48,000
4,700		6,000	97,000	45,000	36,000	17,000		18,000	223,000	171,000	48,000
4,800		6,000	97,000	57,000	36,000	17,500		18,000	223,000	171,000	48,000
4,900		6,000	97,000	57,000	36,000	18,000		18,000	223,000	171,000	48,000
5,000		6,000	97,000	57,000	36,000	18,500		20,000	244,000	190,000	50,000
5,500		6,000	97,000	57,000	36,000	19,000		20,000	244,000	190,000	50,000
6,000		6,000	97,000	57,000	36,000	19,500		20,000	244,000	190,000	50,000
6,500		8,000	116,000	76,000	36,000	20,000		20,000	244,000	190,000	50,000
6,800		8,000	116,000	76,000	36,000						
7,000		8,000	116,000	76,000	36,000						
7,800		8,000	116,000	76,000	36,000						
8,000		8,000	116,000	76,000	36,000						
8,500		10,000	139,000	95,000	40,000						
9,000		10,000	139,000	95,000	40,000						
10,000		10,000	139,000	95,000	40,000						
10,200		12,000	163,000	114,000	45,000						
10,500		12,000	163,000	114,000	45,000						
11,000		12,000	163,000	114,000	45,000						

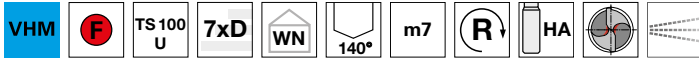


## 带内冷TS钻头

### 产品代号 89412



P	M	K	N	S	H
●	○	●	○	○	○



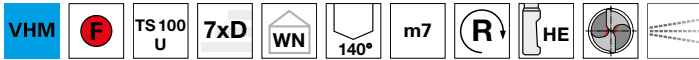
芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金

### 产品代号 89416

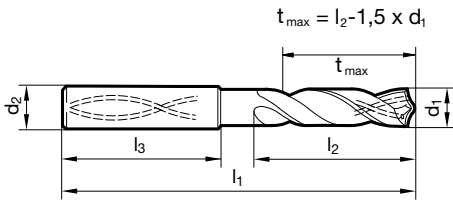


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,000 • 双后刀面 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	4,760	3/16	6,000	90,000	50,000	36,000
3,100		6,000	70,000	30,000	36,000	4,800		6,000	90,000	50,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	4,900		6,000	90,000	50,000	36,000
3,200		6,000	70,000	30,000	36,000	5,000		6,000	90,000	50,000	36,000
3,250		6,000	70,000	30,000	36,000	5,100		6,000	90,000	50,000	36,000
3,300		6,000	70,000	30,000	36,000	5,160	13/64	6,000	90,000	50,000	36,000
3,400		6,000	75,000	35,500	36,000	5,200		6,000	90,000	50,000	36,000
3,500		6,000	75,000	35,500	36,000	5,300		6,000	90,000	50,000	36,000
3,570	9/64	6,000	75,000	35,500	36,000	5,400		6,000	97,000	57,000	36,000
3,600		6,000	75,000	35,500	36,000	5,500		6,000	97,000	57,000	36,000
3,700		6,000	75,000	35,500	36,000	5,560	7/32	6,000	97,000	57,000	36,000
3,800		6,000	75,000	37,500	36,000	5,600		6,000	97,000	57,000	36,000
3,900		6,000	75,000	37,500	36,000	5,700		6,000	97,000	57,000	36,000
3,970	5/32	6,000	75,000	37,500	36,000	5,800		6,000	97,000	57,000	36,000
4,000		6,000	75,000	37,500	36,000	5,900		6,000	97,000	57,000	36,000
4,100		6,000	75,000	37,500	36,000	5,950	15/64	6,000	97,000	57,000	36,000
4,200		6,000	75,000	37,500	36,000	6,000		6,000	97,000	57,000	36,000
4,300		6,000	85,000	45,000	36,000	6,100		8,000	106,000	66,000	36,000
4,370	11/64	6,000	85,000	45,000	36,000	6,200		8,000	106,000	66,000	36,000
4,400		6,000	85,000	45,000	36,000	6,300		8,000	106,000	66,000	36,000
4,500		6,000	85,000	45,000	36,000	6,350	1/4	8,000	106,000	66,000	36,000
4,600		6,000	85,000	45,000	36,000	6,400		8,000	106,000	66,000	36,000
4,650		6,000	85,000	45,000	36,000	6,500		8,000	106,000	66,000	36,000
4,700		6,000	85,000	45,000	36,000	6,600		8,000	106,000	66,000	36,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
6,700		8,000	106,000	66,000	36,000	10,600		12,000	155,000	106,000	45,000
6,800		8,000	106,000	66,000	36,000	10,700		12,000	155,000	106,000	45,000
6,900		8,000	116,000	76,000	36,000	10,800		12,000	155,000	106,000	45,000
7,000		8,000	116,000	76,000	36,000	10,900		12,000	155,000	106,000	45,000
7,100		8,000	116,000	76,000	36,000	11,000		12,000	155,000	106,000	45,000
7,140	9/32	8,000	116,000	76,000	36,000	11,110	7/16	12,000	163,000	114,000	45,000
7,200		8,000	116,000	76,000	36,000	11,200		12,000	163,000	114,000	45,000
7,300		8,000	116,000	76,000	36,000	11,300		12,000	163,000	114,000	45,000
7,400		8,000	116,000	76,000	36,000	11,400		12,000	163,000	114,000	45,000
7,500		8,000	116,000	76,000	36,000	11,500		12,000	163,000	114,000	45,000
7,540	19/64	8,000	116,000	76,000	36,000	11,600		12,000	163,000	114,000	45,000
7,600		8,000	116,000	76,000	36,000	11,700		12,000	163,000	114,000	45,000
7,700		8,000	116,000	76,000	36,000	11,800		12,000	163,000	114,000	45,000
7,800		8,000	116,000	76,000	36,000	11,900		12,000	163,000	114,000	45,000
7,900		8,000	116,000	76,000	36,000	12,000		12,000	163,000	114,000	45,000
7,940	5/16	8,000	116,000	76,000	36,000	12,100		14,000	182,000	133,000	45,000
8,000		8,000	116,000	76,000	36,000	12,200		14,000	182,000	133,000	45,000
8,100		10,000	131,000	87,000	40,000	12,300	31/64	14,000	182,000	133,000	45,000
8,200		10,000	131,000	87,000	40,000	12,500		14,000	182,000	133,000	45,000
8,300		10,000	131,000	87,000	40,000	12,700	1/2	14,000	182,000	133,000	45,000
8,330	21/64	10,000	131,000	87,000	40,000	13,000		14,000	182,000	133,000	45,000
8,400		10,000	131,000	87,000	40,000	13,100	33/64	14,000	182,000	133,000	45,000
8,500		10,000	131,000	87,000	40,000	13,500		14,000	182,000	133,000	45,000
8,600		10,000	131,000	87,000	40,000	14,000		14,000	182,000	133,000	45,000
8,700		10,000	131,000	87,000	40,000	14,100		16,000	204,000	152,000	48,000
8,730	11/32	10,000	131,000	87,000	40,000	14,200		16,000	204,000	152,000	48,000
8,800		10,000	131,000	87,000	40,000	14,290	9/16	16,000	204,000	152,000	48,000
8,900		10,000	131,000	87,000	40,000	14,500		16,000	204,000	152,000	48,000
9,000		10,000	131,000	87,000	40,000	15,000		16,000	204,000	152,000	48,000
9,100		10,000	139,000	95,000	40,000	15,100		16,000	204,000	152,000	48,000
9,130	23/64	10,000	139,000	95,000	40,000	15,500		16,000	204,000	152,000	48,000
9,200		10,000	139,000	95,000	40,000	16,000		16,000	204,000	152,000	48,000
9,250		10,000	139,000	95,000	40,000	16,500		18,000	223,000	171,000	48,000
9,300		10,000	139,000	95,000	40,000	16,900		18,000	223,000	171,000	48,000
9,400		10,000	139,000	95,000	40,000	17,000		18,000	223,000	171,000	48,000
9,500		10,000	139,000	95,000	40,000	17,500		18,000	223,000	171,000	48,000
9,520	3/8	10,000	139,000	95,000	40,000	18,000		18,000	223,000	171,000	48,000
9,600		10,000	139,000	95,000	40,000	18,500		20,000	244,000	190,000	50,000
9,700		10,000	139,000	95,000	40,000	18,900		20,000	244,000	190,000	50,000
9,800		10,000	139,000	95,000	40,000	19,000		20,000	244,000	190,000	50,000
9,900		10,000	139,000	95,000	40,000	19,050	3/4	20,000	244,000	190,000	50,000
9,920	25/64	10,000	139,000	95,000	40,000	19,500		20,000	244,000	190,000	50,000
10,000		10,000	139,000	95,000	40,000	20,000		20,000	244,000	190,000	50,000
10,100		12,000	155,000	106,000	45,000						
10,200		12,000	155,000	106,000	45,000						
10,300		12,000	155,000	106,000	45,000						
10,400		12,000	155,000	106,000	45,000						
10,500		12,000	155,000	106,000	45,000						



## 带内冷TS钻头

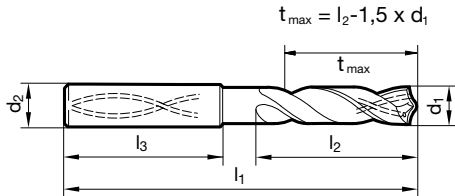
产品代号 89421



P	M	K	N	S	H
		•			



芯厚 ≥ Ø 4,000 • 专利弧形钻尖 • 直型切削刃 (通过刃修正)  
 蠕墨铸铁GGV 和 ADI、CDI • 灰铸铁,可锻铸铁和球墨铸铁



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
4,000		6,000	75,000	37,500	36,000	7,200		8,000	116,000	76,000	36,000
4,100		6,000	75,000	37,500	36,000	7,300		8,000	116,000	76,000	36,000
4,200		6,000	75,000	37,500	36,000	7,400		8,000	116,000	76,000	36,000
4,300		6,000	85,000	45,000	36,000	7,500		8,000	116,000	76,000	36,000
4,370	11/64	6,000	85,000	45,000	36,000	7,540	19/64	8,000	116,000	76,000	36,000
4,400		6,000	85,000	45,000	36,000	7,600		8,000	116,000	76,000	36,000
4,500		6,000	85,000	45,000	36,000	7,700		8,000	116,000	76,000	36,000
4,600		6,000	85,000	45,000	36,000	7,800		8,000	116,000	76,000	36,000
4,650		6,000	85,000	45,000	36,000	7,900		8,000	116,000	76,000	36,000
4,700		6,000	85,000	45,000	36,000	7,940	5/16	8,000	116,000	76,000	36,000
4,760	3/16	6,000	90,000	50,000	36,000	8,000		8,000	116,000	76,000	36,000
4,800		6,000	90,000	50,000	36,000	8,100		10,000	131,000	87,000	40,000
4,900		6,000	90,000	50,000	36,000	8,200		10,000	131,000	87,000	40,000
5,000		6,000	90,000	50,000	36,000	8,300		10,000	131,000	87,000	40,000
5,100		6,000	90,000	50,000	36,000	8,330	21/64	10,000	131,000	87,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	8,400		10,000	131,000	87,000	40,000
5,200		6,000	90,000	50,000	36,000	8,500		10,000	131,000	87,000	40,000
5,300		6,000	90,000	50,000	36,000	8,600		10,000	131,000	87,000	40,000
5,400		6,000	97,000	57,000	36,000	8,700		10,000	131,000	87,000	40,000
5,500		6,000	97,000	57,000	36,000	8,730	11/32	10,000	131,000	87,000	40,000
5,550		6,000	97,000	57,000	36,000	8,800		10,000	131,000	87,000	40,000
5,560	7/32	6,000	97,000	57,000	36,000	8,900		10,000	131,000	87,000	40,000
5,600		6,000	97,000	57,000	36,000	9,000		10,000	131,000	87,000	40,000
5,700		6,000	97,000	57,000	36,000	9,100		10,000	139,000	95,000	40,000
5,800		6,000	97,000	57,000	36,000	9,130	23/64	10,000	139,000	95,000	40,000
5,900		6,000	97,000	57,000	36,000	9,200		10,000	139,000	95,000	40,000
5,950	15/64	6,000	97,000	57,000	36,000	9,250		10,000	139,000	95,000	40,000
6,000		6,000	97,000	57,000	36,000	9,300		10,000	139,000	95,000	40,000
6,100		8,000	106,000	66,000	36,000	9,400		10,000	139,000	95,000	40,000
6,200		8,000	106,000	66,000	36,000	9,500		10,000	139,000	95,000	40,000
6,300		8,000	106,000	66,000	36,000	9,520	3/8	10,000	139,000	95,000	40,000
6,350	1/4	8,000	106,000	66,000	36,000	9,600		10,000	139,000	95,000	40,000
6,400		8,000	106,000	66,000	36,000	9,700		10,000	139,000	95,000	40,000
6,500		8,000	106,000	66,000	36,000	9,800		10,000	139,000	95,000	40,000
6,600		8,000	106,000	66,000	36,000	9,900		10,000	139,000	95,000	40,000
6,700		8,000	106,000	66,000	36,000	9,920	25/64	10,000	139,000	95,000	40,000
6,750	17/64	8,000	106,000	66,000	36,000	10,000		10,000	139,000	95,000	40,000
6,800		8,000	106,000	66,000	36,000	10,100		12,000	155,000	106,000	45,000
6,900		8,000	116,000	76,000	36,000	10,200		12,000	155,000	106,000	45,000
7,000		8,000	116,000	76,000	36,000	10,300		12,000	155,000	106,000	45,000
7,100		8,000	116,000	76,000	36,000	10,320	13/32	12,000	155,000	106,000	45,000
7,140	9/32	8,000	116,000	76,000	36,000	10,400		12,000	155,000	106,000	45,000





## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
10,500		12,000	155,000	106,000	45,000	14,000		14,000	182,000	133,000	45,000
10,600		12,000	155,000	106,000	45,000	14,100		16,000	204,000	152,000	48,000
10,700		12,000	155,000	106,000	45,000	14,200		16,000	204,000	152,000	48,000
10,720	27/64	12,000	155,000	106,000	45,000	14,290	9/16	16,000	204,000	152,000	48,000
10,800		12,000	155,000	106,000	45,000	14,300		16,000	204,000	152,000	48,000
10,900		12,000	155,000	106,000	45,000	14,400		16,000	204,000	152,000	48,000
11,000		12,000	155,000	106,000	45,000	14,500		16,000	204,000	152,000	48,000
11,100		12,000	163,000	114,000	45,000	14,600		16,000	204,000	152,000	48,000
11,110	7/16	12,000	163,000	114,000	45,000	14,700		16,000	204,000	152,000	48,000
11,200		12,000	163,000	114,000	45,000	14,900		16,000	204,000	152,000	48,000
11,300		12,000	163,000	114,000	45,000	15,000		16,000	204,000	152,000	48,000
11,400		12,000	163,000	114,000	45,000	15,100		16,000	204,000	152,000	48,000
11,500		12,000	163,000	114,000	45,000	15,200		16,000	204,000	152,000	48,000
11,600		12,000	163,000	114,000	45,000	15,300		16,000	204,000	152,000	48,000
11,700		12,000	163,000	114,000	45,000	15,400		16,000	204,000	152,000	48,000
11,800		12,000	163,000	114,000	45,000	15,500		16,000	204,000	152,000	48,000
11,900		12,000	163,000	114,000	45,000	15,600		16,000	204,000	152,000	48,000
11,910	15/32	12,000	163,000	114,000	45,000	15,700		16,000	204,000	152,000	48,000
12,000		12,000	163,000	114,000	45,000	15,800		16,000	204,000	152,000	48,000
12,100		14,000	182,000	133,000	45,000	15,870	5/8	16,000	204,000	152,000	48,000
12,200		14,000	182,000	133,000	45,000	15,900		16,000	204,000	152,000	48,000
12,300	31/64	14,000	182,000	133,000	45,000	16,000		16,000	204,000	152,000	48,000
12,400		14,000	182,000	133,000	45,000	16,500		18,000	223,000	171,000	48,000
12,500		14,000	182,000	133,000	45,000	16,670	21/32	18,000	223,000	171,000	48,000
12,600		14,000	182,000	133,000	45,000	17,000		18,000	223,000	171,000	48,000
12,700	1/2	14,000	182,000	133,000	45,000	17,500		18,000	223,000	171,000	48,000
12,800		14,000	182,000	133,000	45,000	18,000		18,000	223,000	171,000	48,000
12,900		14,000	182,000	133,000	45,000	18,500		20,000	244,000	190,000	50,000
13,000		14,000	182,000	133,000	45,000	19,000		20,000	244,000	190,000	50,000
13,100	33/64	14,000	182,000	133,000	45,000	19,500		20,000	244,000	190,000	50,000
13,300		14,000	182,000	133,000	45,000	20,000		20,000	244,000	190,000	50,000
13,400		14,000	182,000	133,000	45,000						
13,500		14,000	182,000	133,000	45,000						
13,700		14,000	182,000	133,000	45,000						
13,800		14,000	182,000	133,000	45,000						
13,900		14,000	182,000	133,000	45,000						



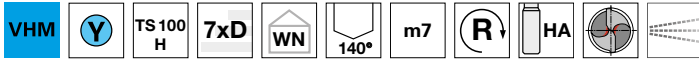
# HARTNER

## 带内冷TS钻头

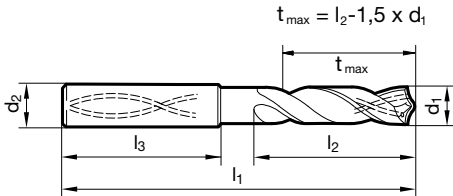
产品代号 89427



P	M	K	N	S	H
•				•	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 主切削刃轻微内凹 • 优化了的切削几何参数  
 强度小于1400 N/mm<sup>2</sup>的合金和高强度钢 • 镍合金, 哈氏合金, 锰合金 • 钛及钛合金



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	9,250		10,000	139,000	95,000	40,000
3,250		6,000	70,000	30,000	36,000	9,400		10,000	139,000	95,000	40,000
3,300		6,000	70,000	30,000	36,000	9,500		10,000	139,000	95,000	40,000
3,400		6,000	75,000	35,500	36,000	10,000		10,000	139,000	95,000	40,000
3,500		6,000	75,000	35,500	36,000	10,200		12,000	155,000	106,000	45,000
3,700		6,000	75,000	35,500	36,000	10,400		12,000	155,000	106,000	45,000
4,000		6,000	75,000	37,500	36,000	10,500		12,000	155,000	106,000	45,000
4,200		6,000	75,000	37,500	36,000	10,800		12,000	155,000	106,000	45,000
4,300		6,000	85,000	45,000	36,000	11,000		12,000	155,000	106,000	45,000
4,500		6,000	85,000	45,000	36,000	11,300		12,000	163,000	114,000	45,000
4,650		6,000	85,000	45,000	36,000	11,400		12,000	163,000	114,000	45,000
5,000		6,000	90,000	50,000	36,000	11,500		12,000	163,000	114,000	45,000
5,100		6,000	90,000	50,000	36,000	12,000		12,000	163,000	114,000	45,000
5,200		6,000	90,000	50,000	36,000	12,500		14,000	182,000	133,000	45,000
5,500		6,000	97,000	57,000	36,000	13,000		14,000	182,000	133,000	45,000
5,550		6,000	97,000	57,000	36,000	13,100	33/64	14,000	182,000	133,000	45,000
6,000		6,000	97,000	57,000	36,000	13,500		14,000	182,000	133,000	45,000
6,500		8,000	106,000	66,000	36,000	14,000		14,000	182,000	133,000	45,000
6,750	17/64	8,000	106,000	66,000	36,000	14,500		16,000	204,000	152,000	48,000
6,800		8,000	106,000	66,000	36,000	15,000		16,000	204,000	152,000	48,000
6,900		8,000	116,000	76,000	36,000	15,100		16,000	204,000	152,000	48,000
7,000		8,000	116,000	76,000	36,000	15,500		16,000	204,000	152,000	48,000
7,400		8,000	116,000	76,000	36,000	16,000		16,000	204,000	152,000	48,000
7,500		8,000	116,000	76,000	36,000						
7,800		8,000	116,000	76,000	36,000						
8,000		8,000	116,000	76,000	36,000						
8,500		10,000	131,000	87,000	40,000						
8,600		10,000	131,000	87,000	40,000						
8,800		10,000	131,000	87,000	40,000						
9,000		10,000	131,000	87,000	40,000						

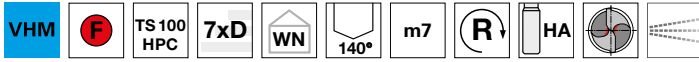


## 带内冷TS钻头

产品代号 89461

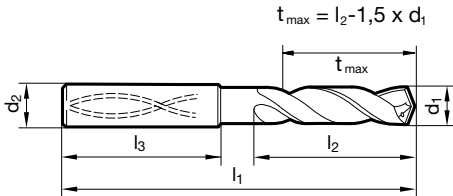


P	M	K	N	S	H
●	○	○	○	○	○



凹形主切削刃 • 圆弧后刀面 • 优化了的切削几何参数 • 最高性能

易切削钢和热处理钢 • 不锈钢/耐酸/耐热钢 • 钛及钛合金 • 钢 (合金/非合金), 强度小于 1400N/mm<sup>2</sup> • 高性能加工结构钢, 硬化钢 • 特殊合金



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	5,900		6,000	97,000	57,000	36,000
3,100		6,000	70,000	30,000	36,000	5,950	15/64	6,000	97,000	57,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	6,000		6,000	97,000	57,000	36,000
3,200		6,000	70,000	30,000	36,000	6,100		8,000	106,000	66,000	36,000
3,250		6,000	70,000	30,000	36,000	6,200		8,000	106,000	66,000	36,000
3,300		6,000	70,000	30,000	36,000	6,300		8,000	106,000	66,000	36,000
3,400		6,000	75,000	35,500	36,000	6,350	1/4	8,000	106,000	66,000	36,000
3,500		6,000	75,000	35,500	36,000	6,400		8,000	106,000	66,000	36,000
3,570	9/64	6,000	75,000	35,500	36,000	6,500		8,000	106,000	66,000	36,000
3,600		6,000	75,000	35,500	36,000	6,530		8,000	106,000	66,000	36,000
3,700		6,000	75,000	35,500	36,000	6,550		8,000	106,000	66,000	36,000
3,800		6,000	75,000	37,500	36,000	6,600		8,000	106,000	66,000	36,000
3,900		6,000	75,000	37,500	36,000	6,700		8,000	106,000	66,000	36,000
3,970	5/32	6,000	75,000	37,500	36,000	6,750	17/64	8,000	106,000	66,000	36,000
4,000		6,000	75,000	37,500	36,000	6,800		8,000	106,000	66,000	36,000
4,040		6,000	75,000	37,500	36,000	6,900		8,000	116,000	76,000	36,000
4,100		6,000	75,000	37,500	36,000	7,000		8,000	116,000	76,000	36,000
4,200		6,000	75,000	37,500	36,000	7,100		8,000	116,000	76,000	36,000
4,300		6,000	85,000	45,000	36,000	7,140	9/32	8,000	116,000	76,000	36,000
4,370	11/64	6,000	85,000	45,000	36,000	7,200		8,000	116,000	76,000	36,000
4,400		6,000	85,000	45,000	36,000	7,300		8,000	116,000	76,000	36,000
4,500		6,000	85,000	45,000	36,000	7,400		8,000	116,000	76,000	36,000
4,600		6,000	85,000	45,000	36,000	7,500		8,000	116,000	76,000	36,000
4,650		6,000	85,000	45,000	36,000	7,540	19/64	8,000	116,000	76,000	36,000
4,700		6,000	85,000	45,000	36,000	7,600		8,000	116,000	76,000	36,000
4,760	3/16	6,000	90,000	50,000	36,000	7,700		8,000	116,000	76,000	36,000
4,800		6,000	90,000	50,000	36,000	7,800		8,000	116,000	76,000	36,000
4,900		6,000	90,000	50,000	36,000	7,900		8,000	116,000	76,000	36,000
5,000		6,000	90,000	50,000	36,000	7,940	5/16	8,000	116,000	76,000	36,000
5,100		6,000	90,000	50,000	36,000	8,000		8,000	116,000	76,000	36,000
5,110		6,000	90,000	50,000	36,000	8,100		10,000	131,000	87,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	8,200		10,000	131,000	87,000	40,000
5,200		6,000	90,000	50,000	36,000	8,300		10,000	131,000	87,000	40,000
5,300		6,000	90,000	50,000	36,000	8,330	21/64	10,000	131,000	87,000	40,000
5,400		6,000	97,000	57,000	36,000	8,400		10,000	131,000	87,000	40,000
5,410		6,000	97,000	57,000	36,000	8,500		10,000	131,000	87,000	40,000
5,500		6,000	97,000	57,000	36,000	8,600		10,000	131,000	87,000	40,000
5,550		6,000	97,000	57,000	36,000	8,700		10,000	131,000	87,000	40,000
5,560	7/32	6,000	97,000	57,000	36,000	8,730	11/32	10,000	131,000	87,000	40,000
5,600		6,000	97,000	57,000	36,000	8,800		10,000	131,000	87,000	40,000
5,700		6,000	97,000	57,000	36,000	8,900		10,000	131,000	87,000	40,000
5,800		6,000	97,000	57,000	36,000	9,000		10,000	131,000	87,000	40,000



## 带内冷TS钻头

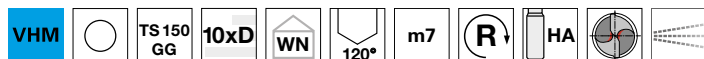
d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,100		10,000	139,000	95,000	40,000	12,900		14,000	182,000	133,000	45,000
9,130	23/64	10,000	139,000	95,000	40,000	13,000		14,000	182,000	133,000	45,000
9,200		10,000	139,000	95,000	40,000	13,100	33/64	14,000	182,000	133,000	45,000
9,250		10,000	139,000	95,000	40,000	13,490	17/32	14,000	182,000	133,000	45,000
9,300		10,000	139,000	95,000	40,000	13,500		14,000	182,000	133,000	45,000
9,340		10,000	139,000	95,000	40,000	13,700		14,000	182,000	133,000	45,000
9,400		10,000	139,000	95,000	40,000	13,890	35/64	14,000	182,000	133,000	45,000
9,500		10,000	139,000	95,000	40,000	14,000		14,000	182,000	133,000	45,000
9,520	3/8	10,000	139,000	95,000	40,000	14,100		16,000	204,000	152,000	48,000
9,600		10,000	139,000	95,000	40,000	14,200		16,000	204,000	152,000	48,000
9,700		10,000	139,000	95,000	40,000	14,290	9/16	16,000	204,000	152,000	48,000
9,800		10,000	139,000	95,000	40,000	14,300		16,000	204,000	152,000	48,000
9,900		10,000	139,000	95,000	40,000	14,500		16,000	204,000	152,000	48,000
9,920	25/64	10,000	139,000	95,000	40,000	14,700		16,000	204,000	152,000	48,000
10,000		10,000	139,000	95,000	40,000	14,800		16,000	204,000	152,000	48,000
10,100		12,000	155,000	106,000	45,000	15,000		16,000	204,000	152,000	48,000
10,200		12,000	155,000	106,000	45,000	15,100		16,000	204,000	152,000	48,000
10,300		12,000	155,000	106,000	45,000	15,300		16,000	204,000	152,000	48,000
10,320	13/32	12,000	155,000	106,000	45,000	15,480	39/64	16,000	204,000	152,000	48,000
10,400		12,000	155,000	106,000	45,000	15,500		16,000	204,000	152,000	48,000
10,500		12,000	155,000	106,000	45,000	15,700		16,000	204,000	152,000	48,000
10,600		12,000	155,000	106,000	45,000	15,800		16,000	204,000	152,000	48,000
10,700		12,000	155,000	106,000	45,000	15,870	5/8	16,000	204,000	152,000	48,000
10,720	27/64	12,000	155,000	106,000	45,000	16,000		16,000	204,000	152,000	48,000
10,800		12,000	155,000	106,000	45,000	16,300		18,000	223,000	171,000	48,000
10,900		12,000	155,000	106,000	45,000	16,500		18,000	223,000	171,000	48,000
11,000		12,000	155,000	106,000	45,000	16,700		18,000	223,000	171,000	48,000
11,100		12,000	163,000	114,000	45,000	16,900		18,000	223,000	171,000	48,000
11,110	7/16	12,000	163,000	114,000	45,000	17,000		18,000	223,000	171,000	48,000
11,200		12,000	163,000	114,000	45,000	17,500		18,000	223,000	171,000	48,000
11,300		12,000	163,000	114,000	45,000	17,700		18,000	223,000	171,000	48,000
11,400		12,000	163,000	114,000	45,000	18,000		18,000	223,000	171,000	48,000
11,500		12,000	163,000	114,000	45,000	18,500		20,000	244,000	190,000	50,000
11,510	29/64	12,000	163,000	114,000	45,000	18,900		20,000	244,000	190,000	50,000
11,600		12,000	163,000	114,000	45,000	19,000		20,000	244,000	190,000	50,000
11,700		12,000	163,000	114,000	45,000	19,050	3/4	20,000	244,000	190,000	50,000
11,800		12,000	163,000	114,000	45,000	19,500		20,000	244,000	190,000	50,000
11,900		12,000	163,000	114,000	45,000	19,800		20,000	244,000	190,000	50,000
11,910	15/32	12,000	163,000	114,000	45,000	20,000		20,000	244,000	190,000	50,000
12,000		12,000	163,000	114,000	45,000						
12,100		14,000	182,000	133,000	45,000						
12,200		14,000	182,000	133,000	45,000						
12,300	31/64	14,000	182,000	133,000	45,000						
12,400		14,000	182,000	133,000	45,000						
12,500		14,000	182,000	133,000	45,000						
12,600		14,000	182,000	133,000	45,000						
12,700	1/2	14,000	182,000	133,000	45,000						
12,800		14,000	182,000	133,000	45,000						

## 带内冷TS钻头

产品代号 89293



P	M	K	N	S	H
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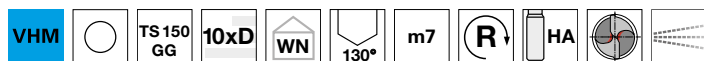


芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 紧直径公差 • 很好的孔表面质量 • 注意最佳冷却压力  
灰铸铁,可锻铸铁和球墨铸铁

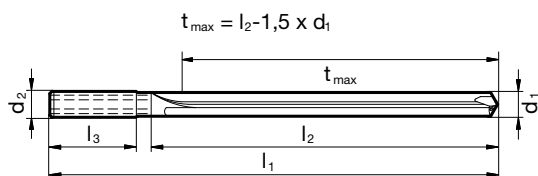
产品代号 89295



P	M	K	N	S	H
		○	•		



芯厚 ≥ Ø 3,000 • 双后刀面 • 紧直径公差 • 很好的孔表面质量 • 注意最佳冷却压力  
铝和铝合金 • 塑料



d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	91,000	42,000	36,000	6,000		6,000	121,000	82,000	36,000
3,100		6,000	91,000	42,000	36,000	6,350	1/4	8,000	146,000	106,000	36,000
3,170	1/8	6,000	91,000	42,000	36,000	6,500		8,000	146,000	106,000	36,000
3,200		6,000	91,000	42,000	36,000	6,800		8,000	146,000	106,000	36,000
3,250		6,000	91,000	42,000	36,000	7,000		8,000	146,000	106,000	36,000
3,300		6,000	91,000	42,000	36,000	7,140	9/32	8,000	146,000	106,000	36,000
3,400		6,000	91,000	48,000	36,000	7,500		8,000	146,000	106,000	36,000
3,500		6,000	91,000	48,000	36,000	7,800		8,000	146,000	106,000	36,000
3,570	9/64	6,000	91,000	48,000	36,000	7,940	5/16	8,000	146,000	106,000	36,000
3,600		6,000	91,000	48,000	36,000	8,000		8,000	146,000	106,000	36,000
3,700		6,000	91,000	48,000	36,000	8,500		10,000	175,000	130,000	40,000
3,800		6,000	121,000	77,000	36,000	8,730	11/32	10,000	175,000	130,000	40,000
3,900		6,000	121,000	77,000	36,000	9,000		10,000	175,000	130,000	40,000
3,970	5/32	6,000	121,000	77,000	36,000	9,500		10,000	175,000	130,000	40,000
4,000		6,000	121,000	77,000	36,000	9,520	3/8	10,000	175,000	130,000	40,000
4,200		6,000	121,000	77,000	36,000	10,000		10,000	175,000	130,000	40,000
4,300		6,000	121,000	77,000	36,000	10,200		12,000	209,000	159,000	45,000
4,400		6,000	121,000	77,000	36,000	10,500		12,000	209,000	159,000	45,000
4,500		6,000	121,000	77,000	36,000	10,720	27/64	12,000	209,000	159,000	45,000
4,700		6,000	121,000	77,000	36,000	11,000		12,000	209,000	159,000	45,000
4,800		6,000	121,000	82,000	36,000	11,110	7/16	12,000	209,000	159,000	45,000
5,000		6,000	121,000	82,000	36,000	11,500		12,000	209,000	159,000	45,000
5,160	13/64	6,000	121,000	82,000	36,000	12,000		12,000	209,000	159,000	45,000
5,500		6,000	121,000	82,000	36,000	12,500		14,000	233,000	183,000	45,000



HARTNER

带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
12,700	1/2	14,000	233,000	183,000	45,000	18,500		20,000	308,000	255,000	50,000
13,000		14,000	233,000	183,000	45,000	20,000		20,000	308,000	255,000	50,000
13,500		14,000	233,000	183,000	45,000						
14,000		14,000	233,000	183,000	45,000						
14,500		16,000	260,000	207,000	48,000						
15,000		16,000	260,000	207,000	48,000						
15,500		16,000	260,000	207,000	48,000						
16,000		16,000	260,000	207,000	48,000						
16,500		18,000	284,000	231,000	48,000						
17,000		18,000	284,000	231,000	48,000						
17,500		18,000	284,000	231,000	48,000						
18,000		18,000	284,000	231,000	48,000						

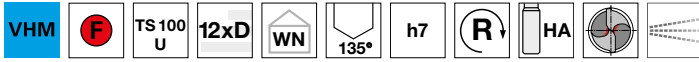


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产品代号 89418

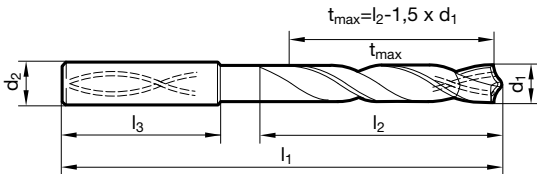


P	M	K	N	S	H
●	○	●	○	○	○



芯厚 ≥ Ø 3,000 • 双后刀面 • 刀尖涂层 • 精密磨削过的主切削刃 • 优化了的切削几何参数

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 钢 (合金/非合金), 强度小于 1200N/mm<sup>2</sup> • 铸件材料 • 青铜、黄铜 • 高硅铝合金



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	90,000	50,000	36,000	6,350	1/4	8,000	146,000	108,000	36,000
3,100		6,000	90,000	50,000	36,000	6,400		8,000	146,000	108,000	36,000
3,170	1/8	6,000	90,000	50,000	36,000	6,500		8,000	146,000	108,000	36,000
3,200		6,000	90,000	50,000	36,000	6,600		8,000	146,000	108,000	36,000
3,300		6,000	90,000	50,000	36,000	6,700		8,000	146,000	108,000	36,000
3,400		6,000	90,000	50,000	36,000	6,750	17/64	8,000	146,000	108,000	36,000
3,500		6,000	90,000	50,000	36,000	6,800		8,000	146,000	108,000	36,000
3,570	9/64	6,000	90,000	50,000	36,000	6,900		8,000	146,000	108,000	36,000
3,600		6,000	90,000	50,000	36,000	7,000		8,000	146,000	108,000	36,000
3,700		6,000	90,000	50,000	36,000	7,100		8,000	146,000	108,000	36,000
3,800		6,000	102,000	64,000	36,000	7,140	9/32	8,000	146,000	108,000	36,000
3,900		6,000	102,000	64,000	36,000	7,200		8,000	146,000	108,000	36,000
3,970	5/32	6,000	102,000	64,000	36,000	7,300		8,000	146,000	108,000	36,000
4,000		6,000	102,000	64,000	36,000	7,400		8,000	146,000	108,000	36,000
4,100		6,000	102,000	64,000	36,000	7,500		8,000	146,000	108,000	36,000
4,200		6,000	102,000	64,000	36,000	7,540	19/64	8,000	146,000	108,000	36,000
4,300		6,000	102,000	64,000	36,000	7,600		8,000	146,000	108,000	36,000
4,370	11/64	6,000	102,000	64,000	36,000	7,700		8,000	146,000	108,000	36,000
4,400		6,000	102,000	64,000	36,000	7,800		8,000	146,000	108,000	36,000
4,500		6,000	102,000	64,000	36,000	7,900		8,000	146,000	108,000	36,000
4,600		6,000	102,000	64,000	36,000	7,940	5/16	8,000	146,000	108,000	36,000
4,700		6,000	102,000	64,000	36,000	8,000		8,000	146,000	108,000	36,000
4,760	3/16	6,000	116,000	78,000	36,000	8,100		10,000	162,000	120,000	40,000
4,800		6,000	116,000	78,000	36,000	8,200		10,000	162,000	120,000	40,000
4,900		6,000	116,000	78,000	36,000	8,300		10,000	162,000	120,000	40,000
5,000		6,000	116,000	78,000	36,000	8,330	21/64	10,000	162,000	120,000	40,000
5,100		6,000	116,000	78,000	36,000	8,400		10,000	162,000	120,000	40,000
5,160	13/64	6,000	116,000	78,000	36,000	8,500		10,000	162,000	120,000	40,000
5,200		6,000	116,000	78,000	36,000	8,600		10,000	162,000	120,000	40,000
5,300		6,000	116,000	78,000	36,000	8,700		10,000	162,000	120,000	40,000
5,400		6,000	116,000	78,000	36,000	8,730	11/32	10,000	162,000	120,000	40,000
5,500		6,000	116,000	78,000	36,000	8,800		10,000	162,000	120,000	40,000
5,560	7/32	6,000	116,000	78,000	36,000	8,900		10,000	162,000	120,000	40,000
5,600		6,000	116,000	78,000	36,000	9,000		10,000	162,000	120,000	40,000
5,700		6,000	116,000	78,000	36,000	9,100		10,000	162,000	120,000	40,000
5,800		6,000	116,000	78,000	36,000	9,130	23/64	10,000	162,000	120,000	40,000
5,900		6,000	116,000	78,000	36,000	9,200		10,000	162,000	120,000	40,000
5,950	15/64	6,000	116,000	78,000	36,000	9,300		10,000	162,000	120,000	40,000
6,000		6,000	116,000	78,000	36,000	9,400		10,000	162,000	120,000	40,000
6,100		8,000	146,000	108,000	36,000	9,500		10,000	162,000	120,000	40,000
6,200		8,000	146,000	108,000	36,000	9,520	3/8	10,000	162,000	120,000	40,000
6,300		8,000	146,000	108,000	36,000	9,600		10,000	162,000	120,000	40,000



## 带内冷TS钻头

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,700		10,000	162,000	120,000	40,000	13,000		14,000	230,000	182,000	45,000
9,800		10,000	162,000	120,000	40,000	13,500		14,000	230,000	182,000	45,000
9,900		10,000	162,000	120,000	40,000	13,890	35/64	14,000	230,000	182,000	45,000
9,920	25/64	10,000	162,000	120,000	40,000	14,000		14,000	230,000	182,000	45,000
10,000		10,000	162,000	120,000	40,000	14,500		16,000	260,000	208,000	48,000
10,100		12,000	204,000	156,000	45,000	15,000		16,000	260,000	208,000	48,000
10,200		12,000	204,000	156,000	45,000	15,500		16,000	260,000	208,000	48,000
10,300		12,000	204,000	156,000	45,000	16,000		16,000	260,000	208,000	48,000
10,320	13/32	12,000	204,000	156,000	45,000	16,500		18,000	285,000	234,000	48,000
10,500		12,000	204,000	156,000	45,000	17,000		18,000	285,000	234,000	48,000
10,600		12,000	204,000	156,000	45,000	17,500		18,000	285,000	234,000	48,000
10,700		12,000	204,000	156,000	45,000	18,000		18,000	285,000	234,000	48,000
10,720	27/64	12,000	204,000	156,000	45,000	18,500		20,000	310,000	258,000	50,000
10,800		12,000	204,000	156,000	45,000	19,000		20,000	310,000	258,000	50,000
10,900		12,000	204,000	156,000	45,000	19,050	3/4	20,000	310,000	258,000	50,000
11,000		12,000	204,000	156,000	45,000	19,500		20,000	310,000	258,000	50,000
11,110	7/16	12,000	204,000	156,000	45,000	20,000		20,000	310,000	258,000	50,000
11,500		12,000	204,000	156,000	45,000						
11,510	29/64	12,000	204,000	156,000	45,000						
11,910	15/32	12,000	204,000	156,000	45,000						
12,000		12,000	204,000	156,000	45,000						
12,300	31/64	14,000	230,000	182,000	45,000						
12,500		14,000	230,000	182,000	45,000						
12,700	1/2	14,000	230,000	182,000	45,000						





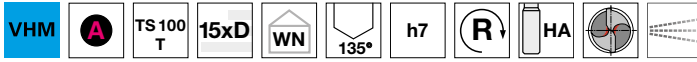
# HARTNER

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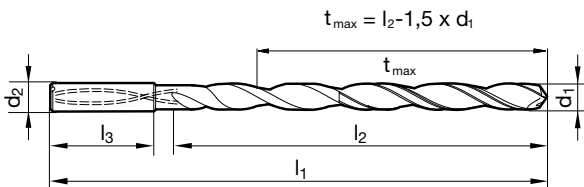
产品代号 86509



P	M	K	N	S	H
•	•	•	○	○	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 刀尖涂层 • 凹形主切屑刃形状 • 优化槽型设计 • 超大冷却孔设计 • 注意冷却压力  
 适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	95,000	55,000	36,000	7,540	19/64	8,000	183,000	143,000	36,000
3,100		6,000	106,000	66,000	36,000	7,800		8,000	183,000	143,000	36,000
3,170	1/8	6,000	106,000	66,000	36,000	7,940	5/16	8,000	183,000	143,000	36,000
3,200		6,000	106,000	66,000	36,000	8,000		8,000	183,000	143,000	36,000
3,300		6,000	106,000	66,000	36,000	8,330	21/64	10,000	204,000	160,000	40,000
3,500		6,000	116,000	76,000	36,000	8,500		10,000	204,000	160,000	40,000
3,570	9/64	6,000	116,000	76,000	36,000	8,730	11/32	10,000	204,000	160,000	40,000
3,700		6,000	116,000	76,000	36,000	8,800		10,000	204,000	160,000	40,000
3,800		6,000	116,000	76,000	36,000	9,000		10,000	204,000	160,000	40,000
3,970	5/32	6,000	116,000	76,000	36,000	9,130	23/64	10,000	221,000	177,000	40,000
4,000		6,000	116,000	76,000	36,000	9,500		10,000	221,000	177,000	40,000
4,200		6,000	133,000	93,000	36,000	9,520	3/8	10,000	221,000	177,000	40,000
4,300		6,000	133,000	93,000	36,000	9,800		10,000	221,000	177,000	40,000
4,370	11/64	6,000	133,000	93,000	36,000	9,920	25/64	10,000	221,000	177,000	40,000
4,500		6,000	133,000	93,000	36,000	10,000		10,000	221,000	177,000	40,000
4,600		6,000	133,000	93,000	36,000	10,320	13/32	12,000	247,000	198,000	45,000
4,760	3/16	6,000	133,000	93,000	36,000	10,500		12,000	247,000	198,000	45,000
4,800		6,000	133,000	93,000	36,000	10,720	27/64	12,000	247,000	198,000	45,000
5,000		6,000	133,000	93,000	36,000	11,000		12,000	247,000	198,000	45,000
5,100		6,000	150,000	110,000	36,000	11,110	7/16	12,000	263,000	214,000	45,000
5,160	13/64	6,000	150,000	110,000	36,000	11,510	29/64	12,000	263,000	214,000	45,000
5,410		6,000	150,000	110,000	36,000	11,800		12,000	263,000	214,000	45,000
5,500		6,000	150,000	110,000	36,000	11,910	15/32	12,000	263,000	214,000	45,000
5,560	7/32	6,000	150,000	110,000	36,000	12,000		12,000	263,000	214,000	45,000
5,600		6,000	150,000	110,000	36,000	12,300	31/64	14,000	297,000	248,000	45,000
5,800		6,000	150,000	110,000	36,000	12,500		14,000	297,000	248,000	45,000
5,950	15/64	6,000	150,000	110,000	36,000	12,700	1/2	14,000	297,000	248,000	45,000
6,000		6,000	150,000	110,000	36,000	13,000		14,000	297,000	248,000	45,000
6,300		8,000	167,000	127,000	36,000	13,100	33/64	14,000	297,000	248,000	45,000
6,350	1/4	8,000	167,000	127,000	36,000	13,490	17/32	14,000	297,000	248,000	45,000
6,500		8,000	167,000	127,000	36,000	13,890	35/64	14,000	297,000	248,000	45,000
6,750	17/64	8,000	167,000	127,000	36,000	14,000		14,000	297,000	248,000	45,000
6,800		8,000	167,000	127,000	36,000	14,290	9/16	16,000	333,000	281,000	48,000
7,000		8,000	167,000	127,000	36,000	15,000		16,000	333,000	281,000	48,000
7,140	9/32	8,000	183,000	143,000	36,000	15,870	5/8	16,000	333,000	281,000	48,000
7,500		8,000	183,000	143,000	36,000	16,000		16,000	333,000	281,000	48,000

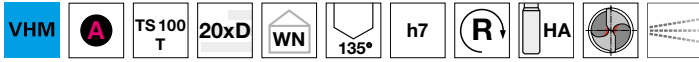


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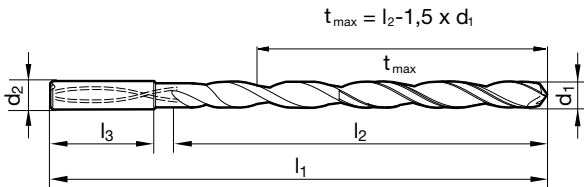
产品代号 86511



P	M	K	N	S	H
•	•	•	○	○	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 刀尖涂层 • 凹形主切屑刃形状 • 优化槽型设计 • 超大冷却孔设计 • 注意冷却压力  
 适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	110,000	70,000	36,000	7,940	5/16	8,000	223,000	183,000	36,000
3,100		6,000	123,000	83,000	36,000	8,000		8,000	223,000	183,000	36,000
3,170	1/8	6,000	123,000	83,000	36,000	8,330	21/64	10,000	249,000	205,000	40,000
3,200		6,000	123,000	83,000	36,000	8,500		10,000	249,000	205,000	40,000
3,300		6,000	123,000	83,000	36,000	8,730	11/32	10,000	249,000	205,000	40,000
3,500		6,000	136,000	96,000	36,000	8,800		10,000	249,000	205,000	40,000
3,570	9/64	6,000	136,000	96,000	36,000	9,000		10,000	249,000	205,000	40,000
3,700		6,000	136,000	96,000	36,000	9,130	23/64	10,000	271,000	227,000	40,000
3,800		6,000	136,000	96,000	36,000	9,520	3/8	10,000	271,000	227,000	40,000
3,970	5/32	6,000	136,000	96,000	36,000	9,920	25/64	10,000	271,000	227,000	40,000
4,000		6,000	136,000	96,000	36,000	10,000		10,000	271,000	227,000	40,000
4,200		6,000	158,000	118,000	36,000	10,200		12,000	302,000	253,000	45,000
4,300		6,000	158,000	118,000	36,000	10,320	13/32	12,000	302,000	253,000	45,000
4,370	11/64	6,000	158,000	118,000	36,000	10,500		12,000	302,000	253,000	45,000
4,500		6,000	158,000	118,000	36,000	10,720	27/64	12,000	302,000	253,000	45,000
4,600		6,000	158,000	118,000	36,000	11,000		12,000	302,000	253,000	45,000
4,760	3/16	6,000	158,000	118,000	36,000	11,110	7/16	12,000	323,000	274,000	45,000
4,800		6,000	158,000	118,000	36,000	11,510	29/64	12,000	323,000	274,000	45,000
5,000		6,000	158,000	118,000	36,000	11,800		12,000	323,000	274,000	45,000
5,100		6,000	180,000	140,000	36,000	11,910	15/32	12,000	323,000	274,000	45,000
5,160	13/64	6,000	180,000	140,000	36,000	12,000		12,000	323,000	274,000	45,000
5,410		6,000	180,000	140,000	36,000	12,300	31/64	14,000	367,000	318,000	45,000
5,500		6,000	180,000	140,000	36,000	12,500		14,000	367,000	318,000	45,000
5,560	7/32	6,000	180,000	140,000	36,000	12,700	1/2	14,000	367,000	318,000	45,000
5,800		6,000	180,000	140,000	36,000	13,000		14,000	367,000	318,000	45,000
5,950	15/64	6,000	180,000	140,000	36,000	13,100	33/64	14,000	367,000	318,000	45,000
6,000		6,000	180,000	140,000	36,000	13,490	17/32	14,000	367,000	318,000	45,000
6,350	1/4	8,000	202,000	162,000	36,000	13,890	35/64	14,000	367,000	318,000	45,000
6,500		8,000	202,000	162,000	36,000	14,000		14,000	367,000	318,000	45,000
6,750	17/64	8,000	202,000	162,000	36,000	14,290	9/16	16,000	413,000	361,000	48,000
6,800		8,000	202,000	162,000	36,000	15,000		16,000	413,000	361,000	48,000
7,000		8,000	202,000	162,000	36,000	15,870	5/8	16,000	413,000	361,000	48,000
7,140	9/32	8,000	223,000	183,000	36,000	16,000		16,000	413,000	361,000	48,000
7,500		8,000	223,000	183,000	36,000						
7,540	19/64	8,000	223,000	183,000	36,000						
7,800		8,000	223,000	183,000	36,000						

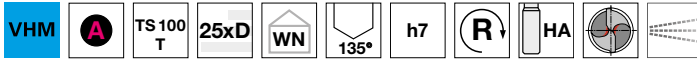


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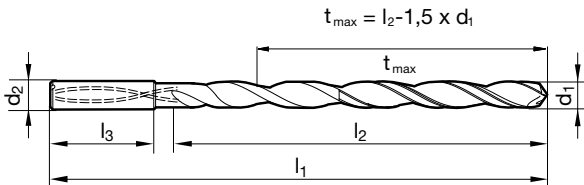
产品代号 86512



P	M	K	N	S	H
•	•	•	○	○	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 刀尖涂层 • 凹形主切屑刃形状 • 优化槽型设计 • 超大冷却孔设计 • 注意冷却压力  
 适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



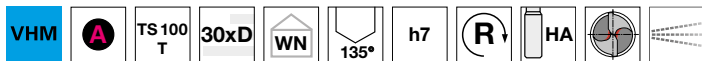
d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	125,000	85,000	36,000	7,940	5/16	8,000	263,000	223,000	36,000
3,100		6,000	141,000	101,000	36,000	8,000		8,000	263,000	223,000	36,000
3,170	1/8	6,000	141,000	101,000	36,000	8,330	21/64	10,000	294,000	250,000	40,000
3,200		6,000	141,000	101,000	36,000	8,500		10,000	294,000	250,000	40,000
3,300		6,000	141,000	101,000	36,000	8,730	11/32	10,000	294,000	250,000	40,000
3,500		6,000	156,000	116,000	36,000	8,800		10,000	294,000	250,000	40,000
3,570	9/64	6,000	156,000	116,000	36,000	9,000		10,000	294,000	250,000	40,000
3,700		6,000	156,000	116,000	36,000	9,130	23/64	10,000	321,000	277,000	40,000
3,800		6,000	156,000	116,000	36,000	9,520	3/8	10,000	321,000	277,000	40,000
3,970	5/32	6,000	156,000	116,000	36,000	9,920	25/64	10,000	321,000	277,000	40,000
4,000		6,000	156,000	116,000	36,000	10,000		10,000	321,000	277,000	40,000
4,200		6,000	183,000	143,000	36,000	10,320	13/32	12,000	359,000	310,000	45,000
4,300		6,000	183,000	143,000	36,000	10,720	27/64	12,000	359,000	310,000	45,000
4,370	11/64	6,000	183,000	143,000	36,000	11,000		12,000	359,000	310,000	45,000
4,500		6,000	183,000	143,000	36,000	11,110	7/16	12,000	386,000	337,000	45,000
4,600		6,000	183,000	143,000	36,000	11,510	29/64	12,000	386,000	337,000	45,000
4,760	3/16	6,000	183,000	143,000	36,000	11,910	15/32	12,000	386,000	337,000	45,000
4,800		6,000	183,000	143,000	36,000	12,000		12,000	386,000	337,000	45,000
5,000		6,000	183,000	143,000	36,000	12,300	31/64	14,000	437,000	388,000	45,000
5,100		6,000	210,000	170,000	36,000	12,700	1/2	14,000	437,000	388,000	45,000
5,160	13/64	6,000	210,000	170,000	36,000	13,000		14,000	437,000	388,000	45,000
5,410		6,000	210,000	170,000	36,000	13,100	33/64	14,000	437,000	388,000	45,000
5,500		6,000	210,000	170,000	36,000	13,490	17/32	14,000	437,000	388,000	45,000
5,560	7/32	6,000	210,000	170,000	36,000	13,890	35/64	14,000	437,000	388,000	45,000
5,800		6,000	210,000	170,000	36,000	14,000		14,000	437,000	388,000	45,000
5,950	15/64	6,000	210,000	170,000	36,000	14,290	9/16	16,000	493,000	441,000	48,000
6,000		6,000	210,000	170,000	36,000	15,000		16,000	493,000	441,000	48,000
6,300		8,000	237,000	197,000	36,000	15,870	5/8	16,000	493,000	441,000	48,000
6,350	1/4	8,000	237,000	197,000	36,000	16,000		16,000	493,000	441,000	48,000
6,500		8,000	237,000	197,000	36,000						
6,750	17/64	8,000	237,000	197,000	36,000						
6,800		8,000	237,000	197,000	36,000						
7,000		8,000	237,000	197,000	36,000						
7,140	9/32	8,000	263,000	223,000	36,000						
7,500		8,000	263,000	223,000	36,000						
7,540	19/64	8,000	263,000	223,000	36,000						

## 带内冷TS钻头

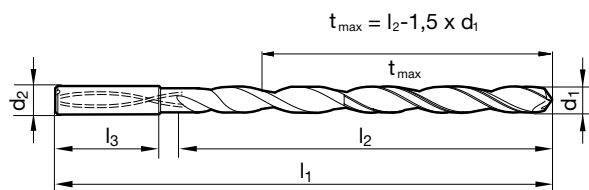
产品代号 86513



P	M	K	N	S	H
•	•	•	○	○	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 刀尖涂层 • 凹形主切屑刃形状 • 优化槽型设计 • 超大冷却孔设计 • 注意冷却压力  
 适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



d1	inch	d2 h6	l1	l2	l3	d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	140,000	100,000	36,000	7,500		8,000	303,000	263,000	36,000
3,100		6,000	158,000	118,000	36,000	7,540	19/64	8,000	303,000	263,000	36,000
3,170	1/8	6,000	158,000	118,000	36,000	7,940	5/16	8,000	303,000	263,000	36,000
3,200		6,000	158,000	118,000	36,000	8,000		8,000	303,000	263,000	36,000
3,300		6,000	158,000	118,000	36,000	8,330	21/64	10,000	339,000	295,000	40,000
3,500		6,000	176,000	136,000	36,000	8,500		10,000	339,000	295,000	40,000
3,570	9/64	6,000	176,000	136,000	36,000	8,730	11/32	10,000	339,000	295,000	40,000
3,700		6,000	176,000	136,000	36,000	8,800		10,000	339,000	295,000	40,000
3,800		6,000	176,000	136,000	36,000	9,000		10,000	339,000	295,000	40,000
3,970	5/32	6,000	176,000	136,000	36,000	9,130	23/64	10,000	371,000	327,000	40,000
4,000		6,000	176,000	136,000	36,000	9,520	3/8	10,000	371,000	327,000	40,000
4,200		6,000	208,000	168,000	36,000	9,920	25/64	10,000	371,000	327,000	40,000
4,370	11/64	6,000	208,000	168,000	36,000	10,000		10,000	371,000	327,000	40,000
4,500		6,000	208,000	168,000	36,000	10,320	13/32	12,000	412,000	363,000	45,000
4,760	3/16	6,000	208,000	168,000	36,000	10,720	27/64	12,000	412,000	363,000	45,000
5,000		6,000	208,000	168,000	36,000	11,000		12,000	412,000	363,000	45,000
5,100		6,000	240,000	200,000	36,000	11,110	7/16	12,000	443,000	394,000	45,000
5,160	13/64	6,000	240,000	200,000	36,000	11,510	29/64	12,000	443,000	394,000	45,000
5,410		6,000	240,000	200,000	36,000	11,910	15/32	12,000	443,000	394,000	45,000
5,500		6,000	240,000	200,000	36,000	12,000		12,000	443,000	394,000	45,000
5,560	7/32	6,000	240,000	200,000	36,000	12,300	31/64	14,000	507,000	458,000	45,000
5,950	15/64	6,000	240,000	200,000	36,000	12,700	1/2	14,000	507,000	458,000	45,000
6,000		6,000	240,000	200,000	36,000	13,000		14,000	507,000	458,000	45,000
6,300		8,000	272,000	232,000	36,000	13,100	33/64	14,000	507,000	458,000	45,000
6,350	1/4	8,000	272,000	232,000	36,000	13,490	17/32	14,000	507,000	458,000	45,000
6,500		8,000	272,000	232,000	36,000	13,890	35/64	14,000	507,000	458,000	45,000
6,750	17/64	8,000	272,000	232,000	36,000	14,000		14,000	507,000	458,000	45,000
6,800		8,000	272,000	232,000	36,000						
7,000		8,000	272,000	232,000	36,000						
7,140	9/32	8,000	303,000	263,000	36,000						



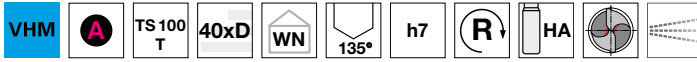
# HARTNER

## 带内冷TS钻头

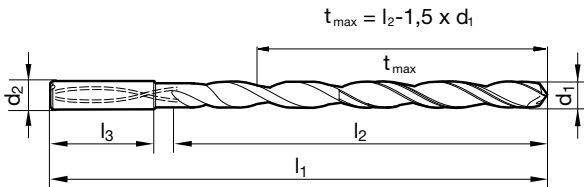
产品代号 86514



P	M	K	N	S	H
•	•	•	○	○	○



芯厚 ≥ Ø 3,000 • 圆弧后刀面 • 刀尖涂层 • 凹形主切屑刀形状 • 优化槽型设计 • 超大冷却孔设计 • 注意冷却压力  
 适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



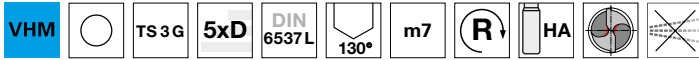
d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	170,000	130,000	36,000	5,500		6,000	280,000	240,000	36,000
3,100		6,000	193,000	153,000	36,000	5,560	7/32	6,000	300,000	260,000	36,000
3,170	1/8	6,000	193,000	153,000	36,000	5,950	15/64	6,000	300,000	260,000	36,000
3,200		6,000	193,000	153,000	36,000	6,000		6,000	300,000	260,000	36,000
3,300		6,000	193,000	153,000	36,000	6,300		8,000	322,000	282,000	36,000
3,500		6,000	193,000	153,000	36,000	6,350	1/4	8,000	322,000	282,000	36,000
3,570	9/64	6,000	216,000	176,000	36,000	6,500		8,000	322,000	282,000	36,000
3,800		6,000	216,000	176,000	36,000	6,750	17/64	8,000	342,000	302,000	36,000
3,970	5/32	6,000	216,000	176,000	36,000	6,800		8,000	342,000	302,000	36,000
4,000		6,000	216,000	176,000	36,000	7,000		8,000	342,000	302,000	36,000
4,200		6,000	238,000	198,000	36,000	7,140	9/32	8,000	363,000	323,000	36,000
4,370	11/64	6,000	238,000	198,000	36,000	7,500		8,000	363,000	323,000	36,000
4,500		6,000	238,000	198,000	36,000	7,540	19/64	8,000	383,000	343,000	36,000
4,760	3/16	6,000	258,000	218,000	36,000	7,940	5/16	8,000	383,000	343,000	36,000
5,000		6,000	258,000	218,000	36,000	8,000		8,000	383,000	343,000	36,000
5,100		6,000	280,000	240,000	36,000	8,500		10,000	409,000	365,000	40,000
5,160	13/64	6,000	280,000	240,000	36,000	9,000		10,000	429,000	386,000	40,000
5,410		6,000	280,000	240,000	36,000	10,000		10,000	471,000	427,000	40,000

## 3刃TS钻

产品代号 89247

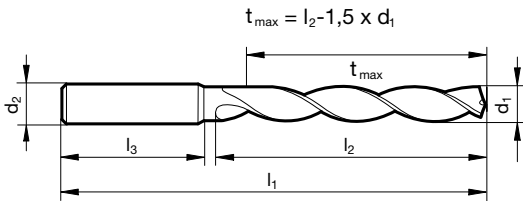


P	M	K	N	S	H
		•	•		



芯厚 ≥ Ø 3,000 • 波刃刀尖 • 宽槽 • 最佳定心 • 适用于断续切削

铸铁 • 长屑铝合金 • 黄铜, 青铜



d1	d2	l1	l2	l3	d1	d2	l1	l2	l3
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
3,000	6,000	66,000	28,000	36,000	8,600	10,000	103,000	61,000	40,000
3,100	6,000	66,000	28,000	36,000	8,700	10,000	103,000	61,000	40,000
3,200	6,000	66,000	28,000	36,000	8,800	10,000	103,000	61,000	40,000
3,300	6,000	66,000	28,000	36,000	9,000	10,000	103,000	61,000	40,000
3,500	6,000	66,000	28,000	36,000	9,100	10,000	103,000	61,000	40,000
3,700	6,000	66,000	28,000	36,000	9,500	10,000	103,000	61,000	40,000
3,800	6,000	74,000	36,000	36,000	9,800	10,000	103,000	61,000	40,000
4,000	6,000	74,000	36,000	36,000	10,000	10,000	103,000	61,000	40,000
4,100	6,000	74,000	36,000	36,000	10,100	12,000	118,000	71,000	45,000
4,200	6,000	74,000	36,000	36,000	10,200	12,000	118,000	71,000	45,000
4,500	6,000	74,000	36,000	36,000	10,300	12,000	118,000	71,000	45,000
4,800	6,000	82,000	44,000	36,000	10,500	12,000	118,000	71,000	45,000
5,000	6,000	82,000	44,000	36,000	11,000	12,000	118,000	71,000	45,000
5,100	6,000	82,000	44,000	36,000	11,200	12,000	118,000	71,000	45,000
5,200	6,000	82,000	44,000	36,000	11,500	12,000	118,000	71,000	45,000
5,300	6,000	82,000	44,000	36,000	11,800	12,000	118,000	71,000	45,000
5,500	6,000	82,000	44,000	36,000	12,000	12,000	118,000	71,000	45,000
5,800	6,000	82,000	44,000	36,000	12,100	14,000	124,000	77,000	45,000
6,000	6,000	82,000	44,000	36,000	12,500	14,000	124,000	77,000	45,000
6,100	8,000	91,000	53,000	36,000	13,000	14,000	124,000	77,000	45,000
6,200	8,000	91,000	53,000	36,000	13,500	14,000	124,000	77,000	45,000
6,400	8,000	91,000	53,000	36,000	14,000	14,000	124,000	77,000	45,000
6,500	8,000	91,000	53,000	36,000	14,100	16,000	133,000	83,000	48,000
6,700	8,000	91,000	53,000	36,000	14,500	16,000	133,000	83,000	48,000
6,800	8,000	91,000	53,000	36,000	15,000	16,000	133,000	83,000	48,000
6,900	8,000	91,000	53,000	36,000	15,500	16,000	133,000	83,000	48,000
7,000	8,000	91,000	53,000	36,000	16,000	16,000	133,000	83,000	48,000
7,100	8,000	91,000	53,000	36,000	16,500	18,000	143,000	93,000	48,000
7,400	8,000	91,000	53,000	36,000	17,000	18,000	143,000	93,000	48,000
7,500	8,000	91,000	53,000	36,000	17,500	18,000	143,000	93,000	48,000
7,800	8,000	91,000	53,000	36,000	18,000	18,000	143,000	93,000	48,000
8,000	8,000	91,000	53,000	36,000	18,500	20,000	153,000	101,000	50,000
8,100	10,000	103,000	61,000	40,000	19,000	20,000	153,000	101,000	50,000
8,200	10,000	103,000	61,000	40,000	19,500	20,000	153,000	101,000	50,000
8,400	10,000	103,000	61,000	40,000	20,000	20,000	153,000	101,000	50,000
8,500	10,000	103,000	61,000	40,000					



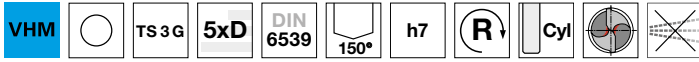
# HARTNER

## 3刃TS钻

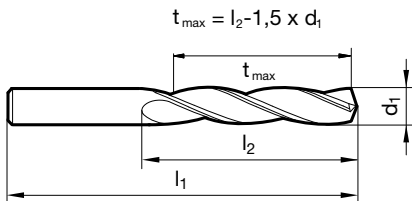
产品代号 89239



P	M	K	N	S	H
		○	○		



芯厚 ≥ Ø 3,000 • 双后刀面 • 孔精度高 • 很好的孔表面质量 • 适用于断续切削  
铸件材料 • 铸铝



d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
3,000	46,000	22,000	7,900	79,000	48,000
3,100	49,000	24,000	8,000	79,000	48,000
3,200	49,000	24,000	8,100	79,000	48,000
3,300	49,000	24,000	8,200	79,000	48,000
3,400	52,000	27,000	8,300	79,000	48,000
3,500	52,000	27,000	8,400	79,000	48,000
3,600	52,000	27,000	8,500	79,000	48,000
3,800	55,000	30,000	8,700	84,000	52,000
3,900	55,000	30,000	8,800	84,000	52,000
4,000	55,000	30,000	9,000	84,000	52,000
4,100	55,000	30,000	9,100	84,000	52,000
4,200	55,000	30,000	9,200	84,000	52,000
4,300	58,000	32,000	9,300	84,000	52,000
4,500	58,000	32,000	9,500	84,000	52,000
4,600	58,000	32,000	9,700	89,000	55,000
4,800	62,000	35,000	9,800	89,000	55,000
4,900	62,000	35,000	10,000	89,000	55,000
5,000	62,000	35,000	10,100	89,000	55,000
5,100	62,000	35,000	10,200	89,000	55,000
5,200	62,000	35,000	10,300	89,000	55,000
5,400	66,000	39,000	10,400	89,000	55,000
5,500	66,000	39,000	10,500	89,000	55,000
5,600	66,000	39,000	10,700	95,000	60,000
5,700	66,000	39,000	11,000	95,000	60,000
5,800	66,000	39,000	11,110	95,000	60,000
5,900	66,000	39,000	11,200	95,000	60,000
6,000	66,000	39,000	11,500	95,000	60,000
6,100	70,000	42,000	11,700	95,000	60,000
6,200	70,000	42,000	11,800	95,000	60,000
6,300	70,000	42,000	12,000	102,000	65,000
6,400	70,000	42,000	12,500	102,000	65,000
6,500	70,000	42,000	12,700	102,000	65,000
6,600	70,000	42,000	13,000	102,000	65,000
6,700	70,000	42,000	13,500	107,000	66,000
6,800	74,000	45,000	13,600	107,000	66,000
7,000	74,000	45,000	13,800	107,000	66,000
7,100	74,000	45,000	14,000	107,000	66,000
7,200	74,000	45,000	14,300	111,000	70,000
7,400	74,000	45,000	14,500	111,000	70,000
7,500	74,000	45,000	14,700	111,000	70,000
7,600	79,000	48,000	15,000	111,000	70,000
7,800	79,000	48,000	15,500	115,000	73,000



HARTNER

### 3刃TS钻

d1 mm	l1 mm	l2 mm	d1 mm	l1 mm	l2 mm
16,000	115,000	73,000			
16,500	119,000	73,000			
17,000	119,000	73,000			
18,500	127,000	76,000			
19,000	127,000	76,000			
20,000	131,000	79,000			





# HARTNER

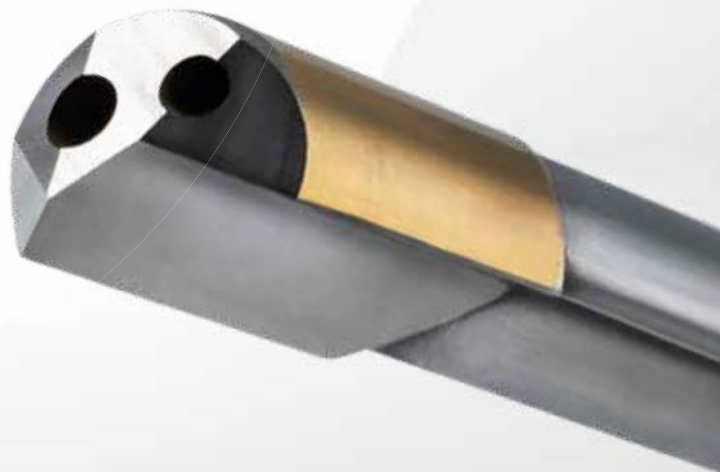
Precision Cutting Tools



**MULTIPLY**

# E 80 XXL

- ▼ 用于深孔专机
- ▼ 总长 800 mm / 1200 mm / 1600 mm / 2000 mm
- ▼ 适用于模具及工具制造行业
- ▼ 槽内抛光有利于排屑顺畅
- ▼ TiN氮化钛涂层适用于大多数材料
- ▼ 柄部形式为 T 3.1





# HARTNER

Precision Cutting Tools

## 枪钻















硬质合金材质,带硬质合金头部或可换式刀片.  
抛光处理和涂层

枪钻



P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## E 100单刃枪钻

	○	○	○	●	●	○	哈特纳标准	TLB E 100	整硬	○	右手	HA	25xD	1,000 - 16,000	89523	271
	●	●	○	●	○	○	哈特纳标准	TLB E 100	整硬	ⓐ	右手	HA	25xD	1,000 - 16,000	89520	271
	○	○	○	●	●	○	哈特纳标准	TLB E 100	整硬	○	右手	HA	50xD	1,000 - 10,000	89524	273
	●	●	○	●	○	○	哈特纳标准	TLB E 100	整硬	ⓐ	右手	HA	50xD	1,000 - 10,000	89521	273
	○	○	○	●	●	○	哈特纳标准	TLB E 100	整硬	○	右手	HA	75xD	1,000 - 7,144	89525	275
	●	●	○	●	○	○	哈特纳标准	TLB E 100	整硬	ⓐ	右手	HA	75xD	1,000 - 7,144	89522	275
	○	○	○	●	●	○	哈特纳标准	TLB E 100	整硬	○	右手	HA	45.000	1,200 - 3,200	89503	276
	●	○	●	○	○	○	哈特纳标准	TLB E 100	整硬	ⓐ	右手	HA	45.000	1,200 - 3,200	89510	276
	○	○	○	●	●	○	哈特纳标准	TLB E 100	整硬	○	右手	HA	80.000	1,200 - 5,000	89501	277
	●	○	●	○	○	○	哈特纳标准	TLB E 100	整硬	ⓐ	右手	HA	80.000	1,200 - 5,000	89511	277
	○	○	○	●	●	○	哈特纳标准	TLB E 100	整硬	○	右手	HA	120.000	1,500 - 5,000	89504	278
	●	○	●	○	○	○	哈特纳标准	TLB E 100	整硬	ⓐ	右手	HA	120.000	1,500 - 5,000	89512	278
	○	○	○	●	●	○	哈特纳标准	TLB E 100	整硬	○	右手	HA	160.000	1,500 - 8,000	89502	279
	●	○	●	○	○	○	哈特纳标准	TLB E 100	整硬	ⓐ	右手	HA	160.000	1,500 - 8,000	89513	279

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## E 80单刃枪钻

	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	20xD	3,970 - 12,700	89505	280
	●	●	○	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	20xD	3,970 - 12,700	89514	280
	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	30xD	3,970 - 12,700	89509	281
	●	●	○	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	30xD	3,970 - 12,700	89515	281
	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	40xD	3,970 - 12,700	89506	282
	●	●	○	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	40xD	3,970 - 12,700	89516	282
	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	80xD	4,950 - 12,650	89507	283
	●	●	○	○	○	哈特纳标准	TLB E 80	硬质合金		右手	HA	80xD	4,950 - 12,650	89517	283

## E 80 XXL单刃枪钻

	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL 600	3,000 - 25,000	89539	284
	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL 800	3,000 - 25,000	89540	285
	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL1000	3,000 - 25,000	89544	286
	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL1200	3,000 - 25,000	89541	287
	●	○	●	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL1400	4,000 - 25,000	89545	288

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## E 80 XXL单刃枪钻

	•	○	•	○	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL1600	4,000 - 25,000	89542	289
	•	○	•	○	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL1800	4,000 - 32,000	89546	290
	•	○	•	○	○	○	哈特纳标准	TLB E 80	硬质合金		右手	T 3.1	GL2000	4,000 - 32,000	89543	291

## 带可换刀片的E 800单刃枪钻

	•	○	○	•	○	○	哈特纳标准	TLB E 800	硬质合金		右手	HB	30xD	12,000 - 24,000	89530	292
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## 单刃枪钻E800的刀片

	•	○	○	•	○	○	哈特纳标准		整硬		右手			12,000 - 40,000	89535	293
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## 单刃枪钻E800的支撑条

	•	○	○	•	○	○	哈特纳标准		整硬					12,000 - 40,000	89536	294
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## Z 80双刃枪钻

				•			哈特纳标准	TLB Z 80	硬质合金	○	右手	HA	30xD	8,000 - 12,000	89508	295
			•				哈特纳标准	TLB Z 80	硬质合金	○	右手	HA	30xD	8,000 - 12,000	89518	295

## E 100单刃枪钻

产品代号 89523

P	M	K	N	S	H
○	○	○	●	●	○



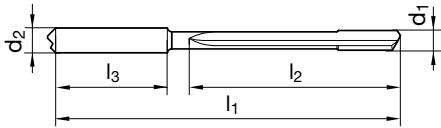
钻深25 x D • 头部形式G型 • MQL柄锥, 冷却槽

产品代号 89520

P	M	K	N	S	H
●	●	○	●	○	○



钻深25 x D • 头部形式G型 • MQL柄锥, 冷却槽



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
1,000		3,000	65,000	32,000	28,000
1,191	3/64	3,000	70,000	39,000	28,000
1,500		4,000	80,000	49,000	28,000
1,588	1/16	4,000	85,000	51,000	28,000
1,984	5/64	4,000	95,000	64,000	28,000
2,000		4,000	95,000	65,000	28,000
2,381	3/32	4,000	100,000	70,000	28,000
2,500		4,000	115,000	85,000	28,000
2,778	7/64	4,000	115,000	85,000	28,000
3,000		6,000	145,000	105,000	36,000
3,175	1/8	6,000	145,000	105,000	36,000
3,500		6,000	145,000	105,000	36,000
3,572	9/64	6,000	160,000	120,000	36,000
3,969	5/32	6,000	160,000	120,000	36,000
4,000		6,000	160,000	120,000	36,000
4,366	11/64	6,000	220,000	180,000	36,000
4,763	3/16	6,000	220,000	180,000	36,000
5,000		6,000	220,000	180,000	36,000
5,159	13/64	6,000	220,000	180,000	36,000
5,556	7/32	6,000	220,000	180,000	36,000
5,953	15/64	6,000	220,000	180,000	36,000
6,000		6,000	220,000	180,000	36,000
6,350	1/4	8,000	260,000	210,000	36,000
6,500		8,000	260,000	210,000	36,000
6,747	17/64	8,000	260,000	210,000	36,000
7,000		8,000	260,000	210,000	36,000
7,144	9/32	8,000	285,000	240,000	36,000
7,541	19/64	8,000	285,000	240,000	36,000
7,938	5/16	8,000	285,000	240,000	36,000
8,000		8,000	285,000	240,000	36,000



HARTNER

### E 100单刃枪钻

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,000		10,000	350,000	300,000	40,000
10,000		10,000	350,000	300,000	40,000
11,000		12,000	420,000	360,000	45,000
11,113	7/16	12,000	420,000	360,000	45,000
12,000		12,000	420,000	360,000	45,000
12,700	1/2	14,000	455,000	396,000	45,000
14,000		14,000	500,000	437,000	45,000
15,000		16,000	535,000	468,000	48,000
15,875	5/8	16,000	560,000	495,000	48,000
16,000		16,000	565,000	499,000	48,000





# HARTNER

## E 100单刃枪钻

产品代号 89524

P	M	K	N	S	H
○	○	○	●	●	○



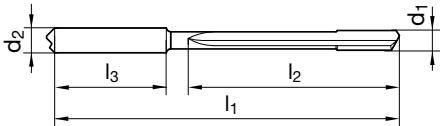
钻深25 x D • 头部形式G型 • MQL柄锥, 冷却槽

产品代号 89521

P	M	K	N	S	H
●	●	○	●	○	○



钻深50 x D • 头部形式G型 • MQL柄锥, 冷却槽



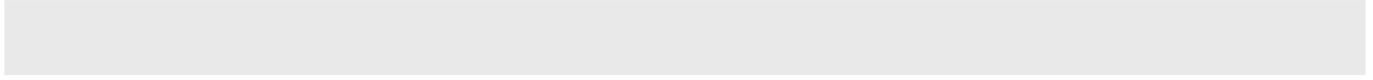
d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
1,000		3,000	90,000	57,000	28,000
1,191	3/64	3,000	100,000	68,000	28,000
1,500		4,000	120,000	86,000	28,000
1,588	1/16	4,000	125,000	91,000	28,000
1,984	5/64	4,000	145,000	114,000	28,000
2,000		4,000	145,000	115,000	28,000
2,381	3/32	4,000	160,000	130,000	28,000
2,500		4,000	185,000	155,000	28,000
2,778	7/64	4,000	185,000	155,000	28,000
3,000		6,000	230,000	190,000	36,000
3,175	1/8	6,000	230,000	190,000	36,000
3,500		6,000	230,000	190,000	36,000
3,572	9/64	6,000	260,000	220,000	36,000
3,969	5/32	6,000	260,000	220,000	36,000
4,000		6,000	260,000	220,000	36,000
4,366	11/64	6,000	290,000	245,000	36,000
4,763	3/16	6,000	310,000	268,000	36,000
5,000		6,000	370,000	330,000	36,000
5,159	13/64	6,000	370,000	330,000	36,000
5,556	7/32	6,000	370,000	330,000	36,000
5,953	15/64	6,000	370,000	330,000	36,000
6,000		6,000	370,000	330,000	36,000
6,350	1/4	8,000	430,000	385,000	36,000
6,500		8,000	430,000	385,000	36,000
6,747	17/64	8,000	430,000	385,000	36,000
7,000		8,000	430,000	385,000	36,000
7,144	9/32	8,000	485,000	440,000	36,000
7,541	19/64	8,000	485,000	440,000	36,000
7,938	5/16	8,000	485,000	440,000	36,000
8,000		8,000	485,000	440,000	36,000



HARTNER

### E 100单刃枪钻

d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
9,000		10,000	555,000	506,000	40,000
10,000		10,000	615,000	562,000	40,000





# HARTNER

## E 100单刃枪钻

产品代号 89525

P	M	K	N	S	H
○	○	○	●	●	○



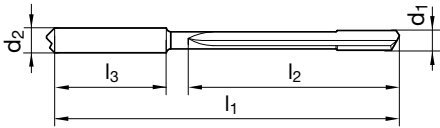
钻深25 x D • 头部形式G型 • MQL柄锥, 冷却槽

产品代号 89522

P	M	K	N	S	H
●	●	○	●	○	○



钻深75 x D • 头部形式G型 • MQL柄锥, 冷却槽



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
1,000		3,000	115,000	82,000	28,000
1,191	3/64	3,000	130,000	98,000	28,000
1,500		4,000	155,000	124,000	28,000
1,588	1/16	4,000	165,000	131,000	28,000
1,984	5/64	4,000	195,000	163,000	28,000
2,000		4,000	195,000	165,000	28,000
2,381	3/32	4,000	220,000	190,000	28,000
2,500		4,000	255,000	220,000	28,000
2,778	7/64	4,000	255,000	220,000	28,000
3,000		6,000	290,000	274,000	36,000
3,175	1/8	6,000	320,000	280,000	36,000
3,500		6,000	320,000	280,000	36,000
3,572	9/64	6,000	360,000	320,000	36,000
3,969	5/32	6,000	360,000	320,000	36,000
4,000		6,000	360,000	320,000	36,000
4,366	11/64	6,000	395,000	355,000	36,000
4,763	3/16	6,000	430,000	387,000	36,000
5,000		6,000	450,000	406,000	36,000
5,159	13/64	6,000	465,000	419,000	36,000
5,556	7/32	6,000	525,000	485,000	36,000
5,953	15/64	6,000	525,000	485,000	36,000
6,000		6,000	525,000	485,000	36,000
6,350	1/4	8,000	560,000	516,000	36,000
6,500		8,000	575,000	528,000	36,000
6,747	17/64	8,000	595,000	548,000	36,000
7,000		8,000	615,000	568,000	36,000
7,144	9/32	8,000	625,000	580,000	36,000



# HARTNER

## E 100单刃枪钻

产品代号 89503



P	M	K	N	S	H
○	○	○	●	●	○



槽长45mm • 头部形式G型

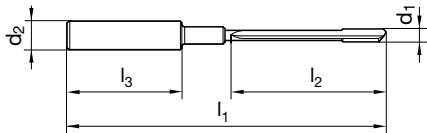
产品代号 89510



P	M	K	N	S	H
●	○	●	○	○	○



槽长45mm • 头部形式G型



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
1,200		4,000	90,000	45,000	28,000
1,500		4,000	90,000	45,000	28,000
1,590	1/16	4,000	90,000	45,000	28,000
1,600		4,000	90,000	45,000	28,000
1,980	5/64	4,000	90,000	45,000	28,000
2,000		4,000	90,000	45,000	28,000
2,500		10,000	100,000	45,000	40,000
2,700		10,000	100,000	45,000	40,000
3,000		10,000	100,000	45,000	40,000
3,200		10,000	100,000	45,000	40,000



# HARTNER

## E 100单刃枪钻

产品代号 89501



P	M	K	N	S	H
○	○	○	●	○	○



槽长80mm • 头部形式G型

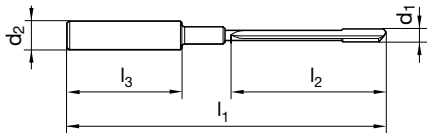
产品代号 89511



P	M	K	N	S	H
●	○	●	○	○	○



槽长80mm • 头部形式G型



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
1,200		4,000	125,000	80,000	28,000
1,500		4,000	125,000	80,000	28,000
1,590	1/16	4,000	125,000	80,000	28,000
1,600		4,000	125,000	80,000	28,000
1,980	5/64	4,000	125,000	80,000	28,000
2,000		4,000	125,000	80,000	28,000
2,500		10,000	135,000	80,000	40,000
2,700		10,000	135,000	80,000	40,000
3,000		10,000	135,000	80,000	40,000
3,200		10,000	135,000	80,000	40,000
3,500		10,000	135,000	80,000	40,000
4,000		10,000	135,000	80,000	40,000
4,200		10,000	135,000	80,000	40,000
4,500		10,000	135,000	80,000	40,000
5,000		10,000	135,000	80,000	40,000



# HARTNER

## E 100单刃枪钻

产品代号 89504



P	M	K	N	S	H
○	○	○	●	○	○



槽长120mm • 头部形式G型

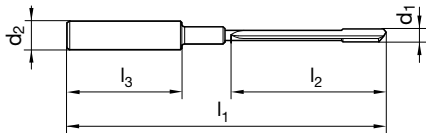
产品代号 89512



P	M	K	N	S	H
●	○	●	○	○	○



槽长120mm • 头部形式G型



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
1,500		4,000	165,000	120,000	28,000
1,590	1/16	4,000	165,000	120,000	28,000
1,600		4,000	165,000	120,000	28,000
1,980	5/64	4,000	165,000	120,000	28,000
2,000		4,000	165,000	120,000	28,000
2,500		10,000	175,000	120,000	40,000
2,700		10,000	175,000	120,000	40,000
3,000		10,000	175,000	120,000	40,000
3,200		10,000	175,000	120,000	40,000
3,500		10,000	175,000	120,000	40,000
4,000		10,000	175,000	120,000	40,000
4,200		10,000	175,000	120,000	40,000
4,500		10,000	175,000	120,000	40,000
5,000		10,000	175,000	120,000	40,000



# HARTNER

## E 100单刃枪钻

产品代号 89502



P	M	K	N	S	H
○	○	○	●	○	○



槽长160mm • 头部形式G型

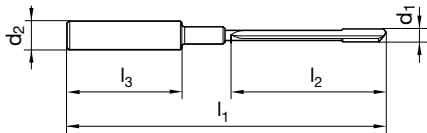
产品代号 89513



P	M	K	N	S	H
●	○	●	○	○	○



槽长160mm • 头部形式G型



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
1,500		4,000	205,000	160,000	28,000
1,590	1/16	4,000	205,000	160,000	28,000
1,600		4,000	205,000	160,000	28,000
1,980	5/64	4,000	205,000	160,000	28,000
2,000		4,000	205,000	160,000	28,000
2,500		10,000	215,000	160,000	40,000
2,700		10,000	215,000	160,000	40,000
3,000		10,000	215,000	160,000	40,000
3,200		10,000	215,000	160,000	40,000
3,500		10,000	215,000	160,000	40,000
4,000		10,000	215,000	160,000	40,000
4,200		10,000	215,000	160,000	40,000
4,500		10,000	215,000	160,000	40,000
5,000		10,000	215,000	160,000	40,000
6,000		16,000	225,000	160,000	48,000
8,000		16,000	225,000	160,000	48,000

## E 80单刃枪钻

产品代号 89505



P	M	K	N	S	H
●	○	●	○	○	○



钻深20 x D • 头部形式G型 • 横向断屑槽

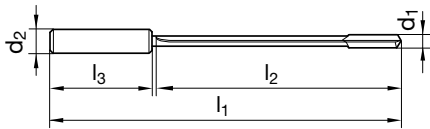
产品代号 89514



P	M	K	N	S	H
●	●	○	○	●	○



钻深20 x D • 头部形式G型 • 适合合金和高合金钢



d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm
3,970	5/32	10,000	150,000	100,000	40,000
4,000		12,000	150,000	100,000	45,000
4,200		12,000	160,000	110,000	45,000
4,500		12,000	170,000	120,000	45,000
5,000		16,000	180,000	130,000	48,000
5,156		16,000	180,000	130,000	48,000
5,500		16,000	190,000	140,000	48,000
6,000		16,000	210,000	160,000	48,000
6,350	1/4	16,000	220,000	170,000	48,000
6,500		16,000	220,000	170,000	48,000
7,000		16,000	235,000	185,000	48,000
7,938	5/16	16,000	260,000	210,000	48,000
8,000		16,000	260,000	210,000	48,000
9,000		16,000	280,000	230,000	48,000
9,525	3/8	16,000	290,000	240,000	48,000
10,000		20,000	320,000	260,000	50,000
11,000		20,000	340,000	290,000	50,000
11,113	7/16	20,000	340,000	290,000	50,000
12,000		20,000	370,000	310,000	50,000
12,700	1/2	20,000	385,000	330,000	50,000



## E 80单刃枪钻

产品代号 89509



P	M	K	N	S	H
●	○	●	○	○	○



钻深30 x D • 头部形式G型 • 横向断屑槽

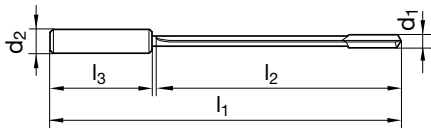
产品代号 89515



P	M	K	N	S	H
●	●	○	○	●	○



钻深30 x D • 头部形式G型 • 适合合金和高合金钢



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,970	5/32	10,000	200,000	155,000	40,000
4,000		12,000	200,000	155,000	45,000
4,200		12,000	210,000	165,000	45,000
4,500		12,000	220,000	175,000	45,000
5,000		16,000	230,000	182,000	48,000
5,156		16,000	230,000	182,000	48,000
5,500		16,000	245,000	197,000	48,000
6,000		16,000	260,000	212,000	48,000
6,350	1/4	16,000	275,000	227,000	48,000
6,500		16,000	275,000	227,000	48,000
7,000		16,000	290,000	242,000	48,000
7,938	5/16	16,000	320,000	272,000	48,000
8,000		16,000	320,000	272,000	48,000
9,000		16,000	350,000	302,000	48,000
9,525	3/8	16,000	380,000	330,000	48,000
10,000		20,000	400,000	350,000	50,000
11,000		20,000	430,000	380,000	50,000
11,113	7/16	20,000	430,000	380,000	50,000
12,000		20,000	450,000	400,000	50,000
12,700	1/2	20,000	500,000	450,000	50,000



# HARTNER

## E 80单刃枪钻

产品代号 89506



P	M	K	N	S	H
●	○	●	○	○	○



钻深40 x D • 头部形式G型 • 横向断屑槽

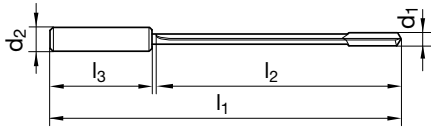
产品代号 89516



P	M	K	N	S	H
●	●	○	○	●	○



钻深40 x D • 头部形式G型 • 适合合金和高合金钢



d1	inch	d2 h6	l1	l2	l3
mm		mm	mm	mm	mm
3,970	5/32	10,000	230,000	185,000	40,000
4,000		12,000	230,000	185,000	45,000
4,200		12,000	240,000	195,000	45,000
4,500		12,000	250,000	205,000	45,000
5,000		16,000	280,000	232,000	48,000
5,156		16,000	280,000	232,000	48,000
5,500		16,000	300,000	252,000	48,000
6,000		16,000	320,000	272,000	48,000
6,350	1/4	16,000	340,000	292,000	48,000
6,500		16,000	340,000	292,000	48,000
7,000		16,000	370,000	322,000	48,000
7,938	5/16	16,000	420,000	372,000	48,000
8,000		16,000	420,000	372,000	48,000
9,000		16,000	450,000	402,000	48,000
9,525	3/8	16,000	480,000	432,000	48,000
10,000		20,000	510,000	460,000	50,000
11,000		20,000	550,000	500,000	50,000
11,113	7/16	20,000	550,000	500,000	50,000
12,000		20,000	600,000	550,000	50,000
12,700	1/2	20,000	635,000	585,000	50,000

## E 80单刃枪钻

产品代号 89507



P	M	K	N	S	H
●	○	●	○	○	○



钻深80 x D • 头部形式G型 • 横向断屑槽 • 适合加工长屑材料 • 40XD最大钻深的首选钻头 物料号No.89506

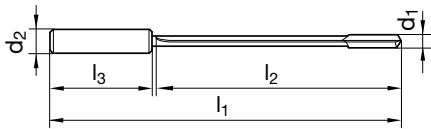
产品代号 89517



P	M	K	N	S	H
●	●	○	○	●	○



钻深80 x D • 头部形式G型 • 40XD最大钻深的首选钻头 样本 No.89516 • 适合合金和高合金钢



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
4,950		16,000	480,000	432,000	48,000
5,106		16,000	480,000	432,000	48,000
5,950	15/64	16,000	560,000	512,000	48,000
6,300		16,000	590,000	542,000	48,000
6,950		16,000	650,000	602,000	48,000
7,888		16,000	740,000	692,000	48,000
7,950		16,000	740,000	692,000	48,000
8,950		16,000	820,000	772,000	48,000
9,475		16,000	870,000	822,000	48,000
9,950		20,000	910,000	860,000	50,000
10,950		20,000	995,000	945,000	50,000
11,063		20,000	995,000	945,000	50,000
11,950		20,000	1080,000	1030,000	50,000
12,650		20,000	1140,000	1090,000	50,000



# HARTNER

## E 80 XXL单刃枪钻

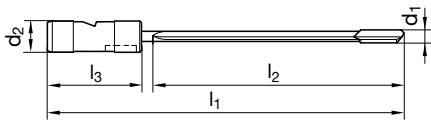
产品代号 89539



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		25,000	600,000	500,000	70,000
4,000		25,000	600,000	500,000	70,000
5,000		25,000	600,000	500,000	70,000
6,000		25,000	600,000	500,000	70,000
7,000		25,000	600,000	500,000	70,000
8,000		25,000	600,000	500,000	70,000
9,000		25,000	600,000	500,000	70,000
10,000		25,000	600,000	500,000	70,000
11,000		25,000	600,000	500,000	70,000
11,500		25,000	600,000	500,000	70,000
12,000		25,000	600,000	500,000	70,000
13,000		25,000	600,000	500,000	70,000
14,000		25,000	600,000	500,000	70,000
15,000		25,000	600,000	500,000	70,000
16,000		25,000	600,000	500,000	70,000
17,000		25,000	600,000	500,000	70,000
18,000		25,000	600,000	500,000	70,000
19,000		25,000	600,000	500,000	70,000
20,000		25,000	600,000	500,000	70,000
21,000		25,000	600,000	500,000	70,000
22,000		25,000	600,000	500,000	70,000
23,000		25,000	600,000	500,000	70,000
24,000		25,000	600,000	500,000	70,000
25,000	63/64	25,000	600,000	500,000	70,000



# HARTNER

## E 80 XXL单刃枪钻

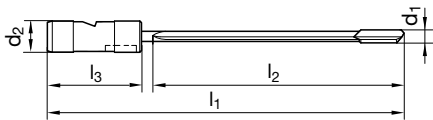
产品代号 89540



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		25,000	800,000	700,000	70,000
4,000		25,000	800,000	700,000	70,000
5,000		25,000	800,000	700,000	70,000
6,000		25,000	800,000	700,000	70,000
7,000		25,000	800,000	700,000	70,000
8,000		25,000	800,000	700,000	70,000
9,000		25,000	800,000	700,000	70,000
10,000		25,000	800,000	700,000	70,000
11,000		25,000	800,000	700,000	70,000
11,500		25,000	800,000	700,000	70,000
12,000		25,000	800,000	700,000	70,000
13,000		25,000	800,000	700,000	70,000
14,000		25,000	800,000	700,000	70,000
15,000		25,000	800,000	700,000	70,000
16,000		25,000	800,000	700,000	70,000
17,000		25,000	800,000	700,000	70,000
18,000		25,000	800,000	700,000	70,000
19,000		25,000	800,000	700,000	70,000
20,000		25,000	800,000	700,000	70,000
21,000		25,000	800,000	700,000	70,000
22,000		25,000	800,000	700,000	70,000
23,000		25,000	800,000	700,000	70,000
24,000		25,000	800,000	700,000	70,000
25,000	63/64	25,000	800,000	700,000	70,000



# HARTNER

## E 80 XXL单刃枪钻

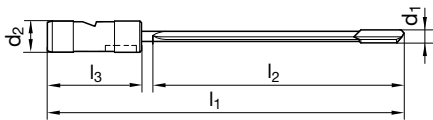
产品代号 89544



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		25,000	1000,000	900,000	70,000
4,000		25,000	1000,000	900,000	70,000
5,000		25,000	1000,000	900,000	70,000
6,000		25,000	1000,000	900,000	70,000
7,000		25,000	1000,000	900,000	70,000
8,000		25,000	1000,000	900,000	70,000
9,000		25,000	1000,000	900,000	70,000
10,000		25,000	1000,000	900,000	70,000
11,000		25,000	1000,000	900,000	70,000
11,500		25,000	1000,000	900,000	70,000
12,000		25,000	1000,000	900,000	70,000
13,000		25,000	1000,000	900,000	70,000
14,000		25,000	1000,000	900,000	70,000
15,000		25,000	1000,000	900,000	70,000
16,000		25,000	1000,000	900,000	70,000
17,000		25,000	1000,000	900,000	70,000
18,000		25,000	1000,000	900,000	70,000
19,000		25,000	1000,000	900,000	70,000
20,000		25,000	1000,000	900,000	70,000
21,000		25,000	1000,000	900,000	70,000
22,000		25,000	1000,000	900,000	70,000
23,000		25,000	1000,000	900,000	70,000
24,000		25,000	1000,000	900,000	70,000
25,000	63/64	25,000	1000,000	900,000	70,000



# HARTNER

## E 80 XXL单刃枪钻

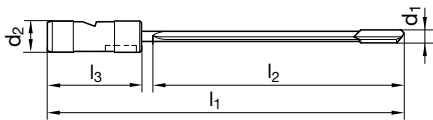
产品代号 89541



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
3,000		25,000	1200,000	1100,000	70,000
4,000		25,000	1200,000	1100,000	70,000
5,000		25,000	1200,000	1100,000	70,000
6,000		25,000	1200,000	1100,000	70,000
7,000		25,000	1200,000	1100,000	70,000
8,000		25,000	1200,000	1100,000	70,000
9,000		25,000	1200,000	1100,000	70,000
10,000		25,000	1200,000	1100,000	70,000
11,000		25,000	1200,000	1100,000	70,000
11,500		25,000	1200,000	1100,000	70,000
12,000		25,000	1200,000	1100,000	70,000
13,000		25,000	1200,000	1100,000	70,000
14,000		25,000	1200,000	1100,000	70,000
15,000		25,000	1200,000	1100,000	70,000
16,000		25,000	1200,000	1100,000	70,000
17,000		25,000	1200,000	1100,000	70,000
18,000		25,000	1200,000	1100,000	70,000
19,000		25,000	1200,000	1100,000	70,000
20,000		25,000	1200,000	1100,000	70,000
21,000		25,000	1200,000	1100,000	70,000
22,000		25,000	1200,000	1100,000	70,000
23,000		25,000	1200,000	1100,000	70,000
24,000		25,000	1200,000	1100,000	70,000
25,000	63/64	25,000	1200,000	1100,000	70,000



# HARTNER

## E 80 XXL单刃枪钻

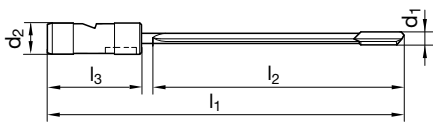
产品代号 89545



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
4,000		25,000	1400,000	1300,000	70,000
5,000		25,000	1400,000	1300,000	70,000
6,000		25,000	1400,000	1300,000	70,000
7,000		25,000	1400,000	1300,000	70,000
8,000		25,000	1400,000	1300,000	70,000
9,000		25,000	1400,000	1300,000	70,000
10,000		25,000	1400,000	1300,000	70,000
11,000		25,000	1400,000	1300,000	70,000
11,500		25,000	1400,000	1300,000	70,000
12,000		25,000	1400,000	1300,000	70,000
13,000		25,000	1400,000	1300,000	70,000
14,000		25,000	1400,000	1300,000	70,000
15,000		25,000	1400,000	1300,000	70,000
16,000		25,000	1400,000	1300,000	70,000
17,000		25,000	1400,000	1300,000	70,000
18,000		25,000	1400,000	1300,000	70,000
19,000		25,000	1400,000	1300,000	70,000
20,000		25,000	1400,000	1300,000	70,000
21,000		25,000	1400,000	1300,000	70,000
22,000		25,000	1400,000	1300,000	70,000
23,000		25,000	1400,000	1300,000	70,000
24,000		25,000	1400,000	1300,000	70,000
25,000	63/64	25,000	1400,000	1300,000	70,000





# HARTNER

## E 80 XXL单刃枪钻

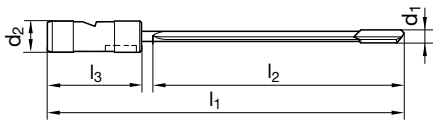
产品代号 89542



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
4,000		25,000	1600,000	1500,000	70,000
5,000		25,000	1600,000	1500,000	70,000
5,500		25,000	1600,000	1500,000	70,000
6,000		25,000	1600,000	1500,000	70,000
6,500		25,000	1600,000	1500,000	70,000
7,000		25,000	1600,000	1500,000	70,000
7,500		25,000	1600,000	1500,000	70,000
8,000		25,000	1600,000	1500,000	70,000
9,000		25,000	1600,000	1500,000	70,000
9,500		25,000	1600,000	1500,000	70,000
10,000		25,000	1600,000	1500,000	70,000
11,000		25,000	1600,000	1500,000	70,000
11,500		25,000	1600,000	1500,000	70,000
12,000		25,000	1600,000	1500,000	70,000
13,000		25,000	1600,000	1500,000	70,000
14,000		25,000	1600,000	1500,000	70,000
15,000		25,000	1600,000	1500,000	70,000
16,000		25,000	1600,000	1500,000	70,000
17,000		25,000	1600,000	1500,000	70,000
18,000		25,000	1600,000	1500,000	70,000
19,000		25,000	1600,000	1500,000	70,000
20,000		25,000	1600,000	1500,000	70,000
21,000		25,000	1600,000	1500,000	70,000
22,000		25,000	1600,000	1500,000	70,000
23,000		25,000	1600,000	1500,000	70,000
24,000		25,000	1600,000	1500,000	70,000
25,000	63/64	25,000	1600,000	1500,000	70,000



# HARTNER

## E 80 XXL单刃枪钻

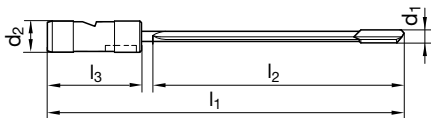
产品代号 89546



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
4,000		25,000	1800,000	1700,000	70,000
5,000		25,000	1800,000	1700,000	70,000
6,000		25,000	1800,000	1700,000	70,000
7,000		25,000	1800,000	1700,000	70,000
8,000		25,000	1800,000	1700,000	70,000
9,000		25,000	1800,000	1700,000	70,000
10,000		25,000	1800,000	1700,000	70,000
11,000		25,000	1800,000	1700,000	70,000
11,500		25,000	1800,000	1700,000	70,000
12,000		25,000	1800,000	1700,000	70,000
13,000		25,000	1800,000	1700,000	70,000
14,000		25,000	1800,000	1700,000	70,000
15,000		25,000	1800,000	1700,000	70,000
16,000		25,000	1800,000	1700,000	70,000
17,000		25,000	1800,000	1700,000	70,000
18,000		25,000	1800,000	1700,000	70,000
19,000		25,000	1800,000	1700,000	70,000
20,000		25,000	1800,000	1700,000	70,000
21,000		25,000	1800,000	1700,000	70,000
22,000		25,000	1800,000	1700,000	70,000
23,000		25,000	1800,000	1700,000	70,000
24,000		25,000	1800,000	1700,000	70,000
25,000	63/64	25,000	1800,000	1700,000	70,000
26,000		25,000	1800,000	1695,000	75,000
27,000		25,000	1800,000	1695,000	75,000
28,000		25,000	1800,000	1695,000	75,000
29,000		25,000	1800,000	1695,000	75,000
30,000		25,000	1800,000	1695,000	75,000
31,000		25,000	1800,000	1695,000	75,000
32,000		25,000	1800,000	1695,000	75,000



# HARTNER

## E 80 XXL单刃枪钻

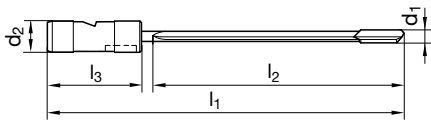
产品代号 89543



P	M	K	N	S	H
●	○	●	○	○	○



用于深孔机床 • 总长固定的库存物品, 用于深孔钻床 • 槽内抛光 • 焊接硬质合金头部, 头部形式G型



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
4,000		25,000	2000,000	1900,000	70,000
5,000		25,000	2000,000	1900,000	70,000
6,000		25,000	2000,000	1900,000	70,000
7,000		25,000	2000,000	1900,000	70,000
8,000		25,000	2000,000	1900,000	70,000
9,000		25,000	2000,000	1900,000	70,000
10,000		25,000	2000,000	1900,000	70,000
11,000		25,000	2000,000	1900,000	70,000
11,500		25,000	2000,000	1900,000	70,000
12,000		25,000	2000,000	1900,000	70,000
13,000		25,000	2000,000	1900,000	70,000
14,000		25,000	2000,000	1900,000	70,000
15,000		25,000	2000,000	1900,000	70,000
16,000		25,000	2000,000	1900,000	70,000
17,000		25,000	2000,000	1900,000	70,000
18,000		25,000	2000,000	1900,000	70,000
19,000		25,000	2000,000	1900,000	70,000
20,000		25,000	2000,000	1900,000	70,000
21,000		25,000	2000,000	1900,000	70,000
22,000		25,000	2000,000	1900,000	70,000
23,000		25,000	2000,000	1900,000	70,000
24,000		25,000	2000,000	1900,000	70,000
25,000	63/64	25,000	2000,000	1900,000	70,000
26,000		25,000	2000,000	1895,000	75,000
27,000		25,000	2000,000	1895,000	75,000
28,000		25,000	2000,000	1895,000	75,000
29,000		25,000	2000,000	1895,000	75,000
30,000		25,000	2000,000	1895,000	75,000
31,000		25,000	2000,000	1895,000	75,000
32,000		25,000	2000,000	1895,000	75,000



# HARTNER

## 带可换刀片的E 800单刃枪钻

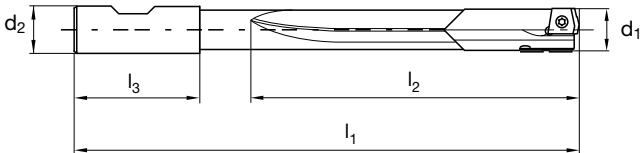
产品代号 89530



P	M	K	N	S	H
●	○	○	●	○	



钻深30 x D • 可换刀片 • 可换支撑导条 • 带扳手 • 带螺钉 • 普遍适用



d1 mm	inch	d2 h6 mm	l1 mm	l2 mm	l3 mm
12,000		20,000	446,000	384,000	50,000
12,700	1/2	20,000	468,000	406,000	50,000
14,000		20,000	510,000	448,000	50,000
15,000		25,000	548,000	480,000	56,000
16,000		25,000	580,000	512,000	56,000
18,000		25,000	644,000	576,000	56,000
20,000		32,000	712,000	640,000	60,000
24,000		32,000	840,000	768,000	60,000



# HARTNER

## 单刃枪钻E800的刀片

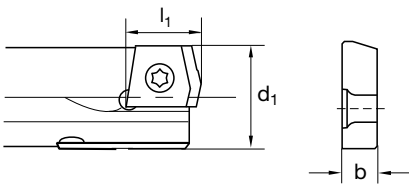
产品代号 89535



P	M	K	N	S	H
●	○	○	●	○	



普遍适用



d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
12,000	10,000	2,800	12,000	25,500	15,000	4,000	25,500
12,500	10,000	2,800	12,500	25,800	15,000	4,000	25,800
12,700	10,000	2,800	12,700	26,000	16,000	5,000	26,000
13,000	10,000	2,800	13,000	26,500	16,000	5,000	26,500
13,500	10,000	2,800	13,500	27,000	16,000	5,000	27,000
14,000	10,000	2,800	14,000	27,500	16,000	5,000	27,500
14,500	10,000	2,800	14,500	28,000	16,000	5,000	28,000
15,000	10,000	2,800	15,000	28,100	16,000	5,000	28,100
16,000	12,000	3,000	16,000	28,500	16,000	5,000	28,500
16,100	12,000	3,000	16,100	29,000	16,000	5,000	29,000
16,300	12,000	3,000	16,300	29,500	16,000	5,000	29,500
16,500	12,000	3,000	16,500	29,700	16,000	5,000	29,700
17,000	12,000	3,000	17,000	30,000	18,000	6,000	30,000
17,500	12,000	3,000	17,500	30,100	18,000	6,000	30,100
18,000	12,000	3,000	18,000	30,500	18,000	6,000	30,500
18,400	12,000	3,000	18,400	31,000	18,000	6,000	31,000
18,500	12,000	3,000	18,500	31,500	18,000	6,000	31,500
19,000	12,000	3,000	19,000	32,000	18,000	6,000	32,000
19,300	12,000	3,000	19,300	32,500	18,000	6,000	32,500
19,500	12,000	3,000	19,500	33,000	18,000	6,000	33,000
19,800	12,000	3,000	19,800	33,500	18,000	6,000	33,500
20,000	15,000	4,000	20,000	34,000	19,000	6,500	34,000
20,200	15,000	4,000	20,200	34,500	19,000	6,500	34,500
20,500	15,000	4,000	20,500	35,000	19,000	6,500	35,000
21,000	15,000	4,000	21,000	35,500	19,000	6,500	35,500
21,500	15,000	4,000	21,500	36,000	19,000	6,500	36,000
22,000	15,000	4,000	22,000	36,500	19,000	6,500	36,500
22,200	15,000	4,000	22,200	37,000	19,000	6,500	37,000
22,500	15,000	4,000	22,500	37,500	19,000	6,500	37,500
23,000	15,000	4,000	23,000	37,700	19,000	6,500	37,700
23,500	15,000	4,000	23,500	38,000	20,000	7,000	38,000
24,000	15,000	4,000	24,000	38,100	20,000	7,000	38,100
24,500	15,000	4,000	24,500	38,500	20,000	7,000	38,500
25,000	15,000	4,000	25,000	39,000	20,000	7,000	39,000
25,100	15,000	4,000	25,100	39,500	20,000	7,000	39,500
25,400	15,000	4,000	25,400	40,000	20,000	7,000	40,000



# HARTNER

## 单刃枪钻E800的支撑条

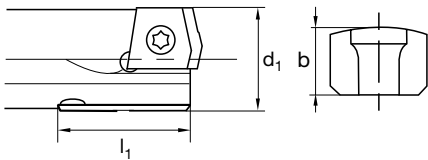
产品代号 89536



P	M	K	N	S	H
●	○	○	●	○	



普遍适用



d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
12,000	19,950	2,150	12,000	25,500	25,000	3,350	25,500
12,500	19,950	2,150	12,500	25,800	25,000	3,500	25,800
12,700	19,950	2,250	12,700	26,000	25,000	3,850	26,000
13,000	19,950	2,150	13,000	26,500	25,000	3,850	26,500
13,500	19,950	2,150	13,500	27,000	25,000	3,850	27,000
14,000	19,950	2,150	14,000	27,500	25,000	3,850	27,500
14,500	19,950	2,150	14,500	28,000	25,000	3,850	28,000
15,000	19,950	2,150	15,000	28,100	25,000	3,900	28,100
16,000	20,000	2,850	16,000	28,500	25,000	3,850	28,500
16,100	20,000	2,900	16,100	29,000	25,000	3,850	29,000
16,300	20,000	3,000	16,300	29,500	25,000	3,850	29,500
16,500	20,000	2,850	16,500	29,700	25,000	3,950	29,700
17,000	20,000	2,850	17,000	30,000	30,000	4,350	30,000
17,500	20,000	2,850	17,500	30,100	30,000	4,400	30,100
18,000	20,000	2,850	18,000	30,500	30,000	4,350	30,500
18,400	20,000	3,050	18,400	31,000	30,000	4,350	31,000
18,500	20,000	2,850	18,500	31,500	30,000	4,350	31,500
19,000	20,000	2,850	19,000	32,000	30,000	4,350	32,000
19,300	20,000	3,000	19,300	32,500	30,000	4,350	32,500
19,500	20,000	2,850	19,500	33,000	30,000	4,350	33,000
19,800	20,000	3,000	19,800	33,500	30,000	4,350	33,500
20,000	25,000	3,350	20,000	34,000	30,000	4,850	34,000
20,200	25,000	3,450	20,200	34,500	30,000	4,850	34,500
20,500	25,000	3,350	20,500	35,000	30,000	4,850	35,000
21,000	25,000	3,350	21,000	35,500	30,000	4,850	35,500
21,500	25,000	3,350	21,500	36,000	30,000	4,850	36,000
22,000	25,000	3,350	22,000	36,500	30,000	4,850	36,500
22,200	25,000	3,450	22,200	37,000	30,000	4,850	37,000
22,500	25,000	3,350	22,500	37,500	30,000	4,850	37,500
23,000	25,000	3,350	23,000	37,700	30,000	4,950	37,700
23,500	25,000	3,350	23,500	38,000	30,000	5,350	38,000
24,000	25,000	3,350	24,000	38,100	30,000	5,400	38,100
24,500	25,000	3,350	24,500	38,500	30,000	5,350	38,500
25,000	25,000	3,350	25,000	39,000	30,000	5,350	39,000
25,100	25,000	3,400	25,100	39,500	30,000	5,350	39,500
25,400	25,000	3,550	25,400	40,000	30,000	5,600	40,000



# HARTNER

## Z 80双刃枪钻

产品代号 89508



P	M	K	N	S	H
			•		



钻深30 x D • 双后刀面枪钻 • 适合加工铝

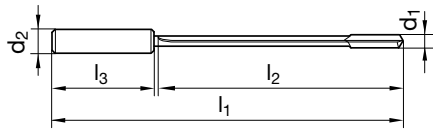
产品代号 89518



P	M	K	N	S	H
		•			



钻深30 x D • 双后刀面枪钻 • 适合加工铸件材料



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,000		16,000	330,000	280,000	48,000
10,000		20,000	390,000	340,000	50,000
12,000		20,000	450,000	400,000	50,000

## 质量特点

在加工技术领域,从 15xD 及以上的钻孔深度开始,我们称之为深孔钻孔:

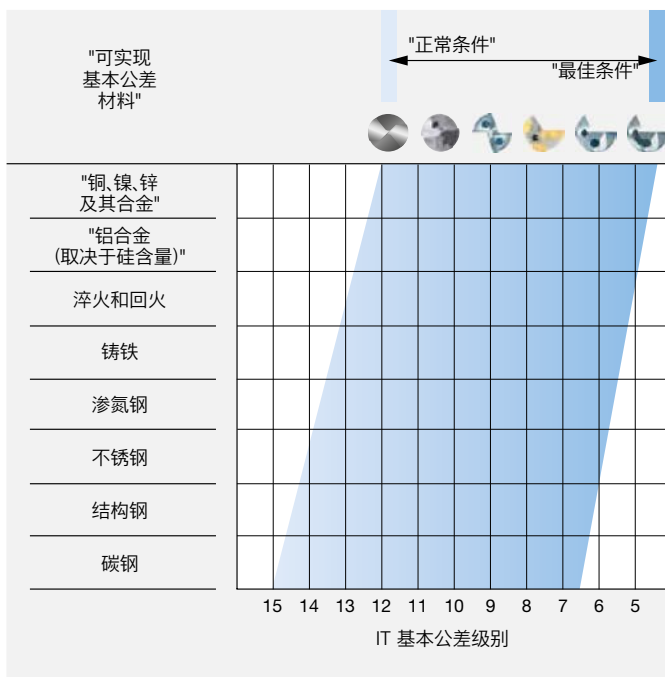
- 由整体硬质合金或焊接硬质合金头制成的传统单刃深孔钻
- 带焊接硬质合金头的传统双刃深孔钻
- 带有可换硬质合金刀头和导条的枪钻
- 整体硬质合金麻花钻或 HSS/HSCO 深孔钻

根据应用和钻孔质量要求选择正确的刀具。

以下图表为选择刀具的指南:

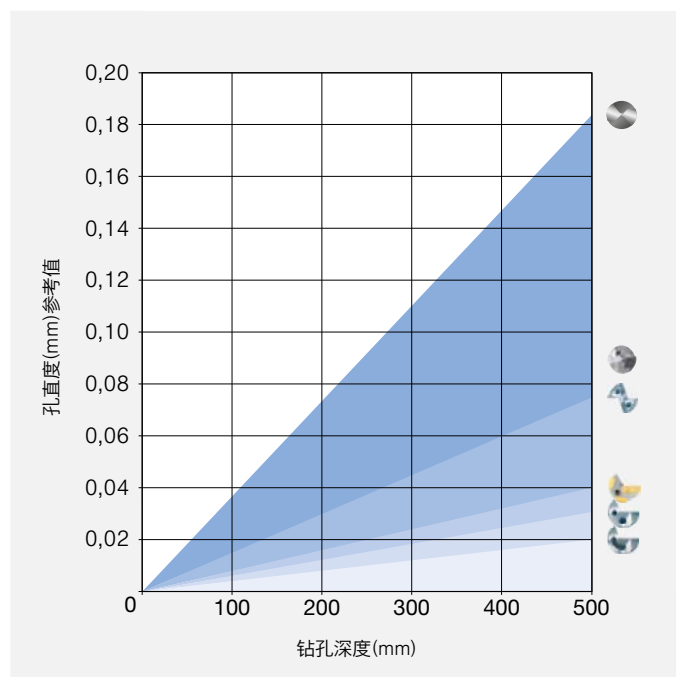
### 基本公差






由于其结构形式,不同型号的刀具会产生不同的基本公差。单刃枪钻可加工出极其精确的孔。使用单刃深孔钻可以在最佳条件下实现最大 IT5 的公差。



### 孔直度

孔直度表示孔方向偏差。这取决于刀具的中心定位,在钻孔时,会受到刀具的形状和位置以及引导孔或钻套定位的影响。材料或工件特性以及刀具和机床稳定性也会影响直线度。



粗糙度等级		N12	N11	N10	N9	N8	N7	N6	N5	N4	N3
E 100/E 80 深钻孔											
E 800 深钻孔											
Z 80/TS 100 T 深钻孔											
HSS/HSS-E 深钻孔											
E 100/80/800 钻孔											
表面值	Rz (µm)	160	100	63	40	15,6	7,87	4,65	2,60	1,74	0,81
粗糙度值	Ra (µm)	50	25	12,5	6,3	3,2	1,6	0,8	0,4	0,2	0,1

■ "正常条件 (参考值)"
 ■ 理想条件

### 表面质量

许多因素会影响钻孔的粗糙度。刀具类型和几何尺寸、材料以及冷却液是关键。与具有多个切削刃的刀具相比,在单刃钻孔时通过引导条使孔壁变得更加平滑。刀具表面(例如涂层)或主切削刃和副切削刃上的刃口状况(磨损)决定了表面质量。

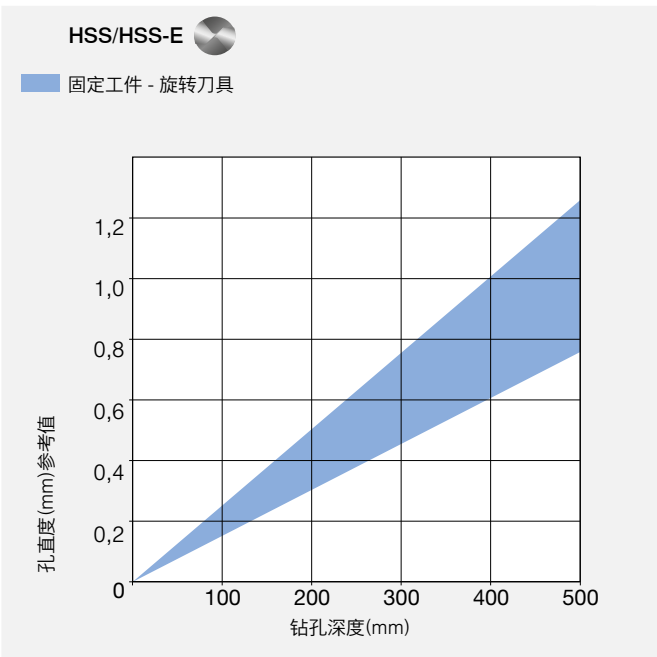
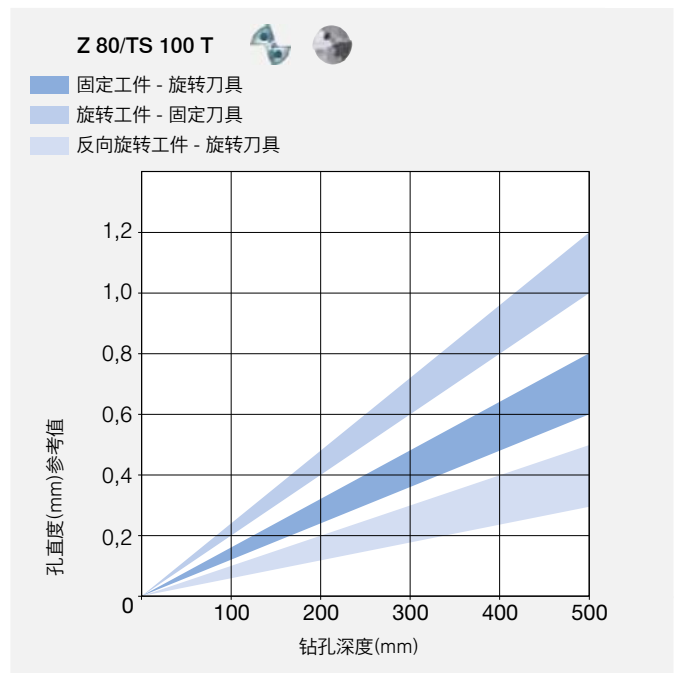
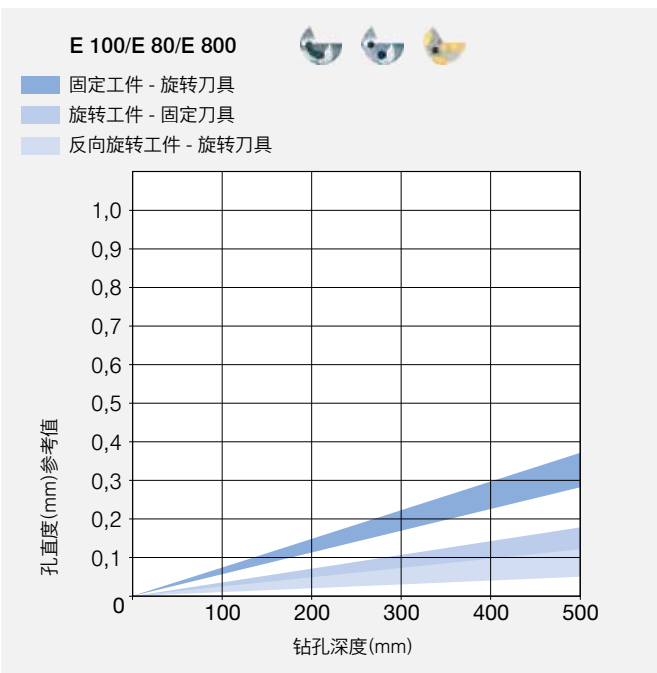




## 质量特点

### 钻孔中心曲线

随着钻孔深度的增加,刀具的连续位移表示钻孔中心走向。除了钻孔设备的几何特性以外,切削条件、材料结构和温度也会影响走向结果。当以工件和刀具的反向旋转速度进行加工时,可以获得最佳的效果。与多刃钻头相比,单刃枪钻产生的中心偏差最小。





## Hartner 涂层应用

材料	ISO 分组	E/Z	TS 100 T	HSS
碳钢, 易切削钢, 锰钢		TiN TiSiN TiAlSiN	TiSiN TiAlZrN FIRE	FIRE - -
低合金钢		不涂层 TiN FIRE	FIRE TiSiN TiAlZrN	FIRE TiN -
合金钢		FIRE TiAlSiN	FIRE TiAlSiN AlTiN nano	FIRE TiN -
硬质钢 <55 HRC		TiAlSiN FIRE TiAlN	TiAlSiN FIRE TiAlN	- - -
硬质钢 55 – 65 HRC		TiAlSiN FIRE TiAlN	TiAlSiN FIRE TiAlN	- - -
防锈和耐酸钢		SuperA AlTiZrN TiAlSiN	AlTiN nano AlTiZrN TiSiN	AlTiZrN FIRE TiN
铸铁		TiAlSiN TiSiN FIRE	TiAlSiN FIRE AlTiN nano	FIRE - -
镍基合金 (例如铬镍铁合金)		AlTiN nano AlTiZrN TiSiN	AlTiN nano TiAlSiN FIRE	FIRE - -
钛/钛合金		不涂层 ZrN AlTiN nano	ZrN AlTiN nano	FIRE -
钴铬合金		AlTiN nano FIRE TiAlSiN	AlTiN nano TiAlSiN FIRE	- - -
贵金属		AlTiN nano DLC	AlTiN nano	-
铝合金		不涂层 DLC -	不涂层 DLC Diamant	不涂层 DLC -
铸铝合金 (<12% 硅)		不涂层 ZrN DLC	不涂层 ZrN DLC	不涂层 ZrN DLC
铸铝合金 (≥12% 硅)		Diamant TiAlSiN -	Diamant - -	- - -
铜/青铜/黄铜		不涂层 DLC CrN	CrN DLC	TiN -
陶瓷		Diamant TiAlSiN	Diamant	-
塑料, 未增强		不涂层	DLC	-
塑料, 纤维增强		Diamant TiAlSiN	Diamant TiAlSiN	- -
石墨		不涂层	-	-

注释: 概述了 Hartner 涂层的一般应用建议。优先级从上到下。



## 深孔钻孔简介

在加工技术中,从 15xD 及以上的钻孔深度开始,我们称之为深孔钻孔,当然也可以使用深孔钻加工较短的孔。因此可以充分利用枪钻钻孔的优点,例如良好表面、直径偏差小、优化的直线度。

### 高压冷却 -

同时也是理所当然的。

由于近年来在所以孔加工刀具中采用了内部冷却,冷却润滑剂通过冷却通道输送到需要的位置。这一措施还显著提高了麻花钻、螺纹刀具和其他加工刀具的使用寿命并减少了刀具破损。今天,每一台传统机床都配备了高压内部冷却装置,因此也适用于钻孔。深孔钻在加工中心、车床和铣床上的比重越来越重要。因此,该工艺在加工技术中变得越来越盛行。

### 小贴士和技巧

- 如果钻孔深度超过 40xD,我们建议,在使用带有钢质刀柄 E 80、E 800 和 Z 80 的传统深孔钻头时,使用两个或多个深孔钻头,例如  $\varnothing 10 \times 400$  mm 和  $\varnothing 9.95 \times 800$  mm。整体硬质合金深孔钻头 E 100 M 和焊接式 E 100 只需一把刀具即可实现 80xD 的最大钻孔深度。
- 钻孔深度超过 40xD 的深孔钻应逆时针进入引导孔。
- 换40xD 起的刀具时,可以通过打开高压内部冷却装置使刀具大约 1 秒钟后再使用刀具。
- 对于加工长钻屑材料,我们建议订购带槽内抛光的深孔钻。
- 我们通常建议将乳化液的油脂含量至少为 8%。
- 用于长钻屑铝的单刃深孔钻应订购带有 180° 头部和冷却槽的钻头。
- 稳定架衬套的紧密配合能够保持钻孔过程平稳并提高钻孔质量。
- 为了避免引导孔和深孔之间的台阶,可以通过 G型刃带形式和稍微过小尺寸的引导来实现平滑过渡。
- 在形成长钻屑的情况下,周期性啄钻(不退出孔口)可以使加工过程顺利进行。



所有深孔钻  
钻孔时必须进行引导。  
深孔钻绝对不能  
在没有支撑的情况下全速  
旋转。

深孔钻不是难以掌握的刀具,  
通过遵守某些先决条件就可以  
掌握。  
Hartner 深孔钻的使用指导  
值可以查阅  
HartnerNAVIGATOR 章节。



## 传统机床(BAZ)上的钻孔方法

### 深孔钻操作步骤

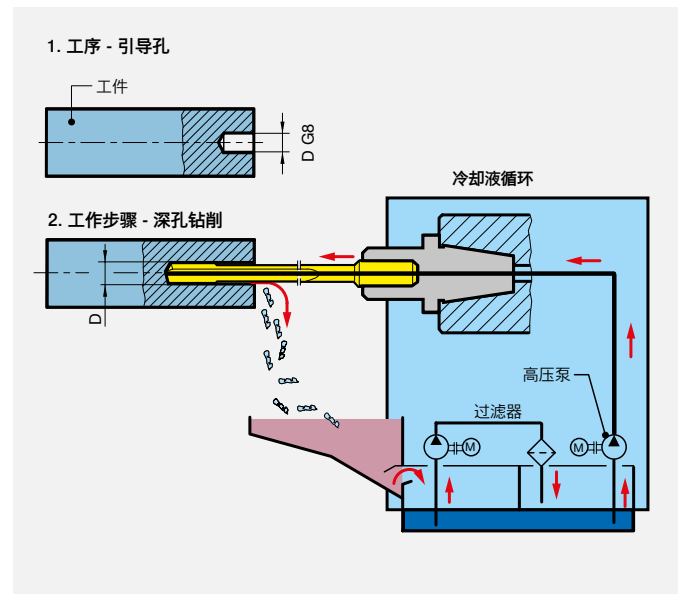
- 加工一个引导孔
- 低速进刀
- 打开冷却液压力和转速
- 连续钻孔至钻孔深度, 无需排屑
- 达到钻孔深度后关闭冷却液
- 从孔中退出刀具

### 操作说明

为了在钻深孔时获得最佳加工效果, 尤其是在圆弧面和/或不平整的表面结构上钻孔时, 我们建议采用以下加工步骤:

1. "1. 铣削表面, 例如使用 TF 100 MULTI-MILL, 包括中心铣削。表面必须垂直于钻孔加工的进给方向。
2. 钻引导孔, 例如使用 TS 100 U。由于其 140° 的中心角和 m7 的  $\varnothing$  公差, 这些钻头非常适合此加工步骤。
3. 以大约 200 rpm 的速度以大约 500 毫米/分钟的进给速率逆时针旋转进入引导孔。
4. 打开冷却液和转速。
5. 连续钻孔至钻孔深度。在使用具有超大长度/直径比例的深孔钻头时(例如整体单刃枪钻总长超过160mm), 我们建议先使用较低的切削参数(大约 75% 的推荐切削速度), 钻深度大约 25 毫米孔。
6. 在直通孔的情况下, 即 90° 垂直面出口, 进给速度  $v_f$  在钻通前大约 1mm 减少 50%。
7. 对于带有倾斜出口的通孔, 进给速度  $v_f$  在钻通前大约 1mm 减少到 40%。
8. 达到钻孔深度后, 关闭转速和冷却液, 以最高 5,000 毫米/分钟的速度退出。"

如果冷却液压力或者流量不足, 则可能以降低的切削参数进行工作。  
建议使用增压系统。

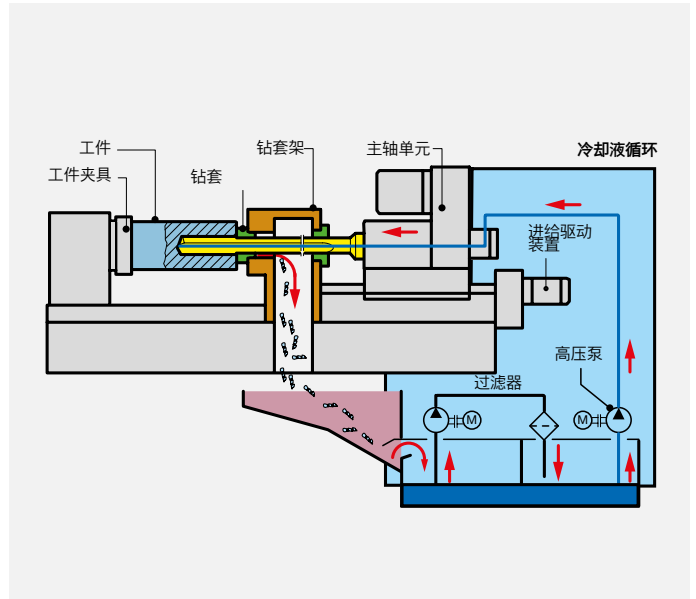




## 在深孔钻床上的钻孔方法

对于非常深的钻孔、大批量生产或对表面、尺寸稳定性和直线度有极高要求时,通常使用深钻钻床。钻孔深度几乎不受限制,钻孔刀具由中心架引导,在钻孔过程中像手风琴一样被推到一起。无需引导孔,因为钻孔时钻套会引导刀具。无需去屑即可在所需钻孔深度上进行钻孔。

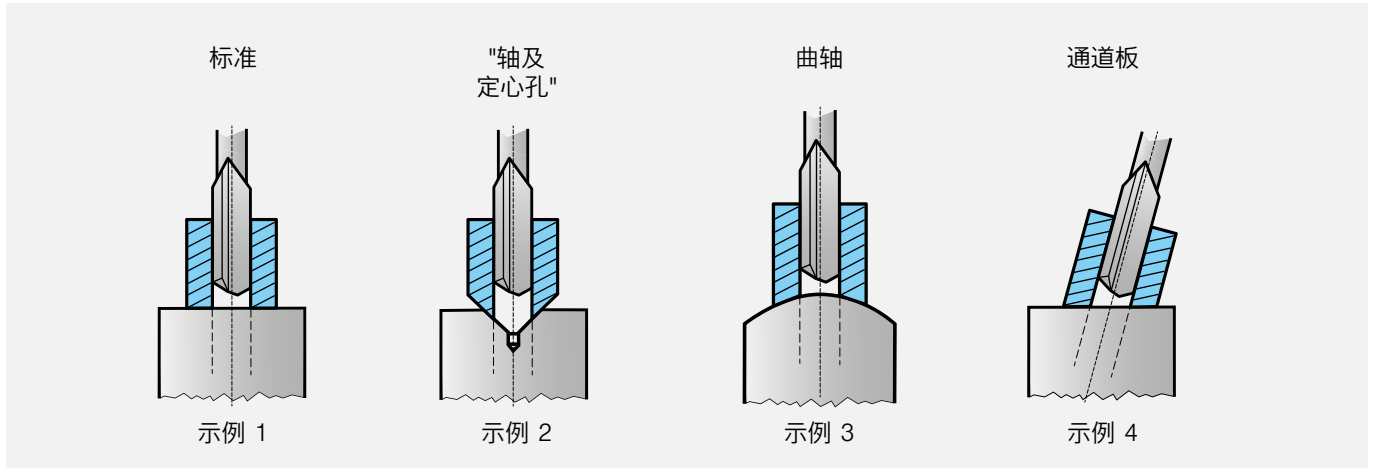
与传统机床相比,深孔钻床有以下优点: 无需引导孔,从而节省了加工时间和换刀时间。孔深可高达几米,同时具有卓越的钻孔质量。适用于大钻孔深度的高压泵和冷却液过滤器有助于提高工艺可靠性。中心架和中心套管架的总长导致损失长度,这在计算刀具长度时起决定性作用。



## 引导和钻套

由于单刃深孔钻是单刃刀具，不能自我定心，刀具必须用钻套或引导孔进行自动定心。但自定心双刃钻也必须通过钻孔或引导孔进行引导，否则钻头可能会起振动。

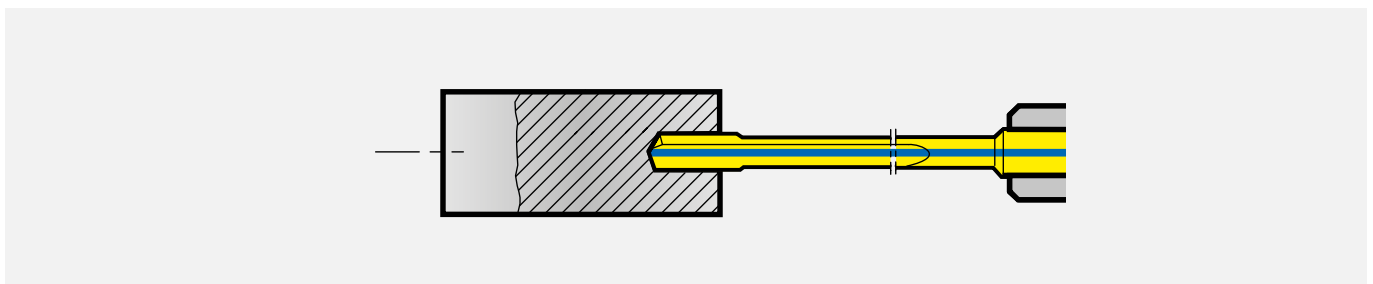
示例, 货号 89600(HSS)/89601(VHM)的钻套



### 使用钻套时的注意事项

- 钻套必须紧密贴合于钻孔轮廓。
- 钻套和刀具之间的间隙应尽可能小。
- 如果深孔钻有引导直径，钻孔时钻套至少要足够长以引导两个头部形式。
- 定期检查钻套的状况，以免对刀具造成负面影响。
- 推荐小批量使用 HSS 钻套，大批量使用整体硬质合金钻套。"

### 引导示例



### 引导深度参考值

传统深孔钻头 钻孔深度	后续刀具标称直径				
	Ø 0,900-1,799	Ø 1,800-3,999	Ø 4,000-7,999	Ø 8,000-11,999	Ø 12,000-52,000
< 20xD	3,0xD	2,5xD	2,0xD	1,5xD	1,5xD
< 30xD		3,0xD	2,5xD	2,0xD	
< 40xD		4,0xD	3,0xD	2,5xD	

## 引导和钻套

### 引导刀具应用范围

	直径范围 [mm]																		
	0,9	1,0	1,4	2,0	3,0	6,0	8,0	11,0	12,0	15,5	16,0	19,5	20,0	25,0	30,0	35,0	40,0	45,0	50,0
微型钻头	产品代号 86400 无 IK 86405 带 IK																		
TS 100 U	产品代号 89413 无 IK 产品代号 89410 带 IK																		
Multiplex HPC	产品代号 86721 用于引导孔的刀片																		
TF 100 Pilot	产品代号 85000 不带 IK 的 4刃刀具																		
TF 100 MULTI-MILL	产品代号 84951 不带 IK 的 4刃刀具																		
型号 V	产品代号 84803 HSS-E 无 IK																		

### 型号

- 用于引导孔  $< \varnothing 3.000$ /E 100, E 80
- 适用于标准/平面钻孔表面

### TS 100 U

- 通用型引导钻  $\varnothing 3.000-19.500$ /E 100, E 80, Z 80, E 800, TS 100 T
- 适用于标准/平面钻孔表面

### Multiplex HPC

- 可换刀片的引导钻  $\varnothing 11.000-40.000$ /E 100, E 80, Z 80, E 800, TS 100 T
- 适用于标准/平面钻孔表面

### TF 100 Pilot

- 高精度引导铣刀  $\varnothing 1.400-12.000$ /E 100, E 80, Z 80, E 800, TS 100 T
- 适用于标准与特殊情形/平面、弯角、立方或其他钻孔面

### TF 100 MULTI-MILL

- 高精度引导铣刀  $\varnothing 4.000-52.000$ /E 100, E 80, Z 80, E 800, TS 100 T
- 适用于标准与特殊情形/平面、弯角、立方或其他钻孔面

### 型号 V

- HSS 引导钻  $\varnothing 0.900-15.500$ /HSS 深孔钻头
- 适用于标准/平面钻孔表面

### 使用引导孔时的注意事项

- 引导孔直径公差应为 G8, 刀具的标称直径一般应为 m7。
- 如果单刃深孔钻有引导直径, 那么引导孔至少要足够深, 以便钻孔时两个头部形式都被引导。
- 根据具体的应用, 如果引导孔孔口倒角时是利于枪钻插入。
- 如果对深孔的位置和方向有很高的要求, 则必须尽可能在车床上铣削或车削引导孔。"

### 重要说明:

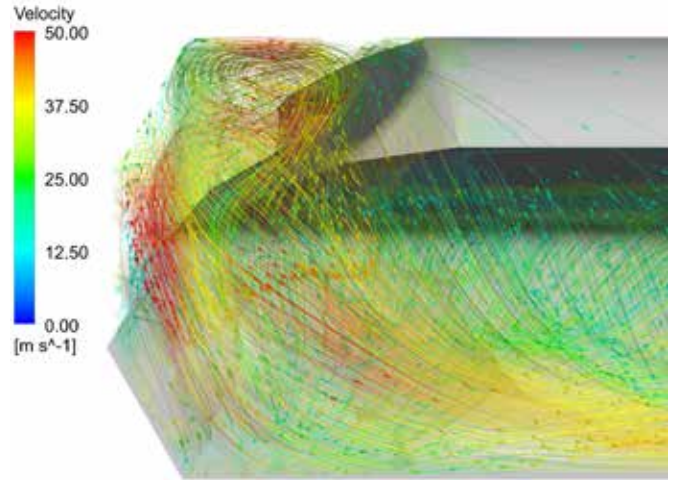
钻套和引导孔的质量对后续刀具的钻孔圆柱度和刀具寿命有着非常大的影响。



## 冷却润滑剂

### 介绍

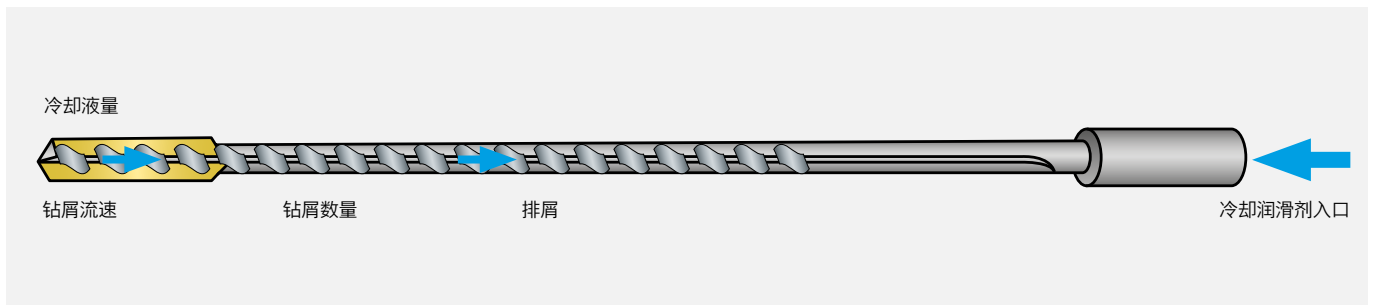
冷却润滑剂对于  $L \times D$  比率大于  $15 \times D$  时或深孔钻孔极为重要。冷却润滑剂供应的选择、其特性以及压力和体积流量等性能对工艺性能以及钻孔质量具有决定性意义。冷却润滑剂压力过高会导致波动和更大的钻孔。



### 功能

冷却润滑剂(油、乳液、MQL、空气)主要是将钻屑从孔中冲出并润滑与工件接触的所有刀具部分(圆周和切削刃)。在高压下进行钻孔。然而,压力“仅”是产生的冷却润滑剂量和阻力(例如冷却通道横截面或刀具长度和钻屑质量)的总和。从液压角度来看,冷却润滑剂的用量和提到的阻力会产生流速,如果使用得当,可以将钻屑与切削刃的接触时间保持在最低限度,防止钻头卡住,

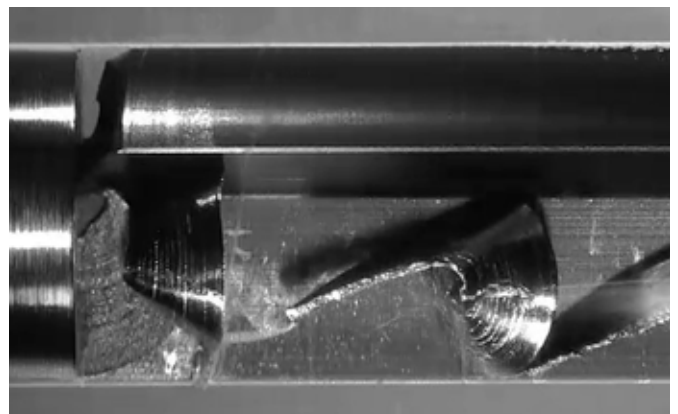
从而直接影响加工过程。冷却润滑剂的润滑特性决定了钻屑形成和表面特性。相应的添加剂,如极压添加剂(Extreme Pressure)确保引导滑动,从而可能会承受巨大的表面压力和滚动力。



### 过滤

为保证可靠的钻孔工艺,必须根据刀具直径提供冷却润滑剂清洁度:

- $< \varnothing 2.000$ , 最大  $15 \mu\text{m}$
- $\varnothing 2.000$  至  $\leq \varnothing 6.000$ , 最大  $40 \mu\text{m}$
- $> \varnothing 6.000$ , 至  $100 \mu\text{m}$







## 冷却润滑剂类型

### 乳液

除了选择的油脂含量外,不同类型的水溶性冷却润滑剂,例如矿物、合成或天然成分,对钻孔过程也有决定性影响。对于深孔钻孔,油脂含量最好在 8-12 % 之间。这个值较低会导致性能下降以及功能故障。



#### 乳液性能\*

- 高压情况时,可在乳化液中使用 EP 添加剂(Extreme Pressure),否则会导致发泡,造成润滑性能丧失。
- 对于乳化液,由于与油类相比粘度较低,压力可降低大约 15%,以实现类似的冲洗性能。
- 对于铬含量大于 12% 的材料类型,刀具寿命小于1.5m。

### 油

与乳化液一样,油的矿物、合成和天然成分也不同。与乳化液相比,油的粘度更高,部分决定了冷却剂阻力增加,这在低粘度油的情况下会导致高流速(小直径),或者在高粘度油的情况下会导致更大的液压力(对于较大的直径是决定性的)。就其粘度和润滑性能而言,油对温度有强烈反应。避免 > 50°C 油温,以便能够安全钻孔。

#### 油属性

- < Ø 2mm 7-10mm<sup>2</sup>/s
- > Ø 2mm 10-20mm<sup>2</sup>/s

### MQL/干燥

深孔钻可以采用干式或 MQL。根据材料、直径和钻孔深度,可以执行相应的工艺。钻屑的形状、尺寸和质量都至关重要。只有在形成粉尘状切屑(例如石墨或碳化物生坯)时才能进行干式加工。



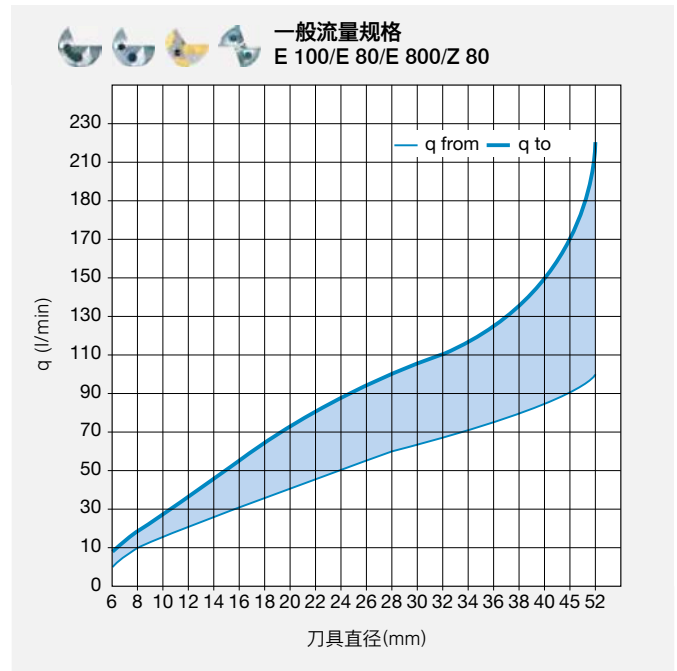
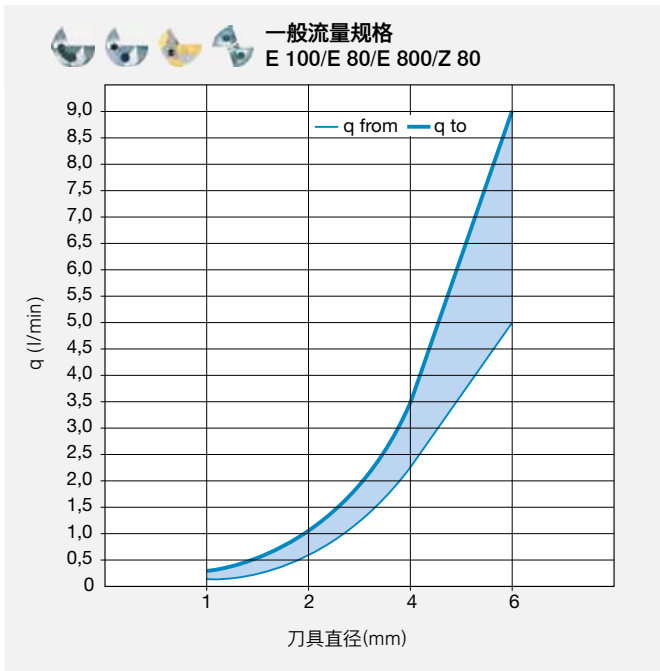
\*如果与制造商的规格存在偏差,概不承担任何责任



## 冷却润滑剂说明

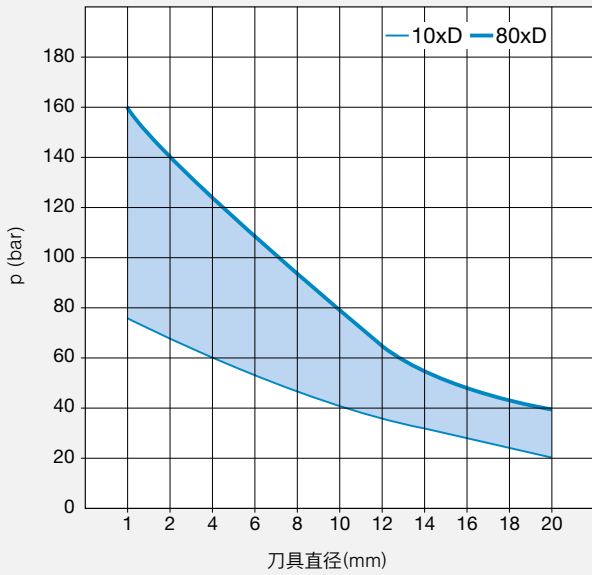
### 请注意:

- 所有深孔钻只能使用内部冷却,无论空气、乳化液还是油。  
采用内部冷却,更便于输送钻屑。
- 所有深孔钻也可使用油作为内部冷却介质。  
然而,与乳化液相比,需要增加压力才能保持相同的冷却剂量。
- 如果使用带 MQL 的深孔钻头,对于较小的标称直径,则可能需要增加压力,  
具体要根据 MQL 系统压力。
- 如果冷却压力或者流量不足,可以采用较低的切削参数。  
还可使用增压系统。
- 深孔钻头的长度增加时,必须考虑到增压,  
以便通过冷却通道输送所需量的冷却剂。

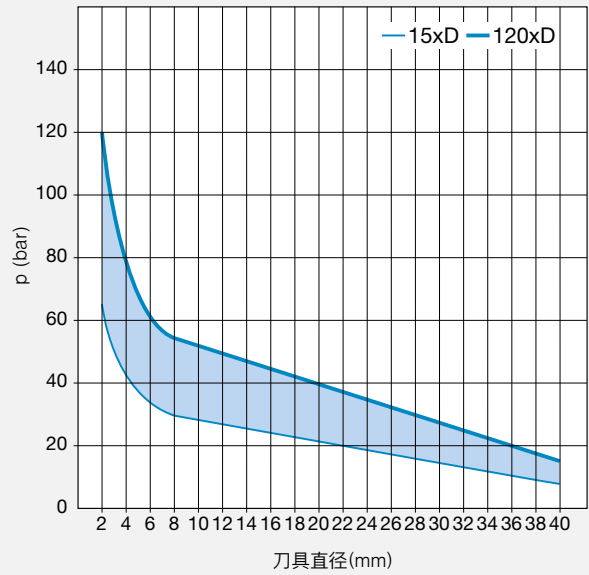




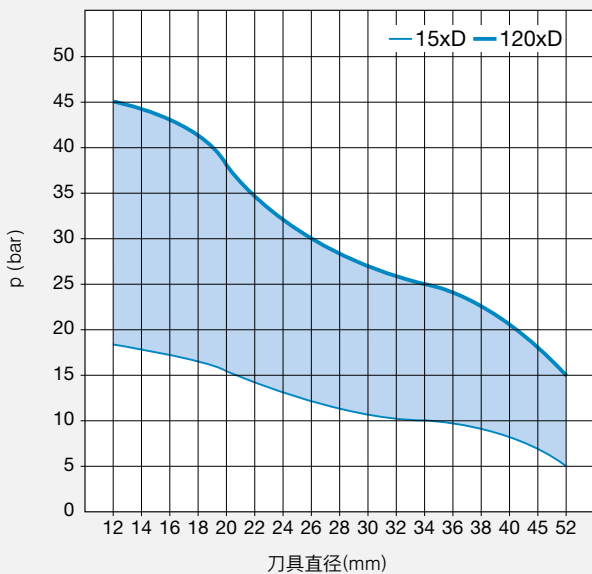
**E 100 压力预设值**  
取决于刀具长度



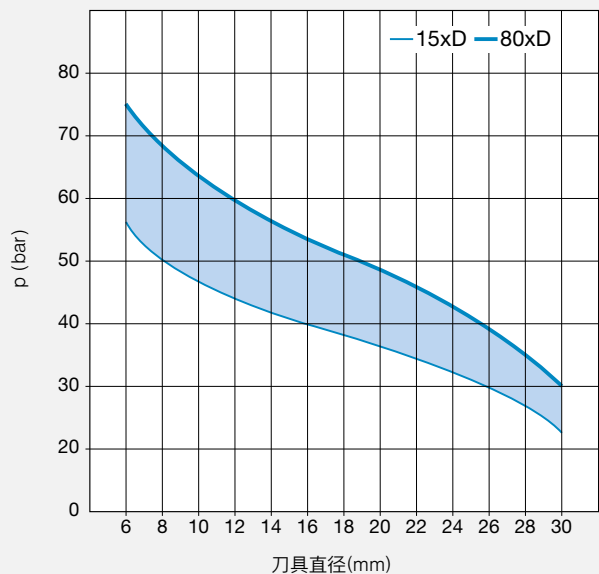
**E 80 压力预设值**  
取决于刀具长度



**E 800 压力预设值**  
取决于刀具长度



**Z 80 压力预设值**  
取决于刀具长度



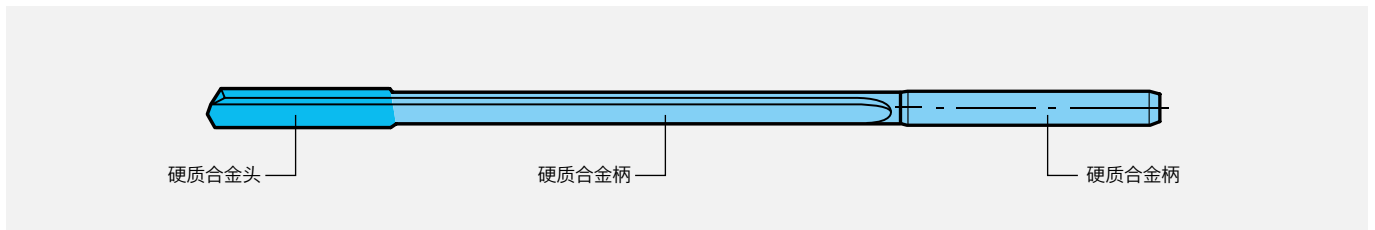


## 特性

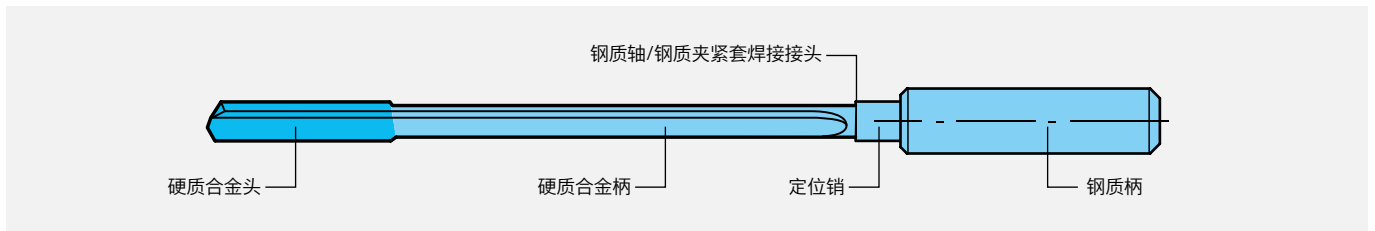
### 应用领域

	直径范围																	
	0,9	1,0	2,0	4,0	6,0	8,0	10,0	12,0	14,0	16,0	18,0	20,0	25,0	30,0	35,0	40,0	45,0	50,0
E 100 M	最大总长度 615mm																	
E 100	最大总长度 615mm																	
E 80	最大总长度 3.600mm																	
Z 80	最大总长度 1.000mm																	
E 800	最大总长度 3.600mm																	

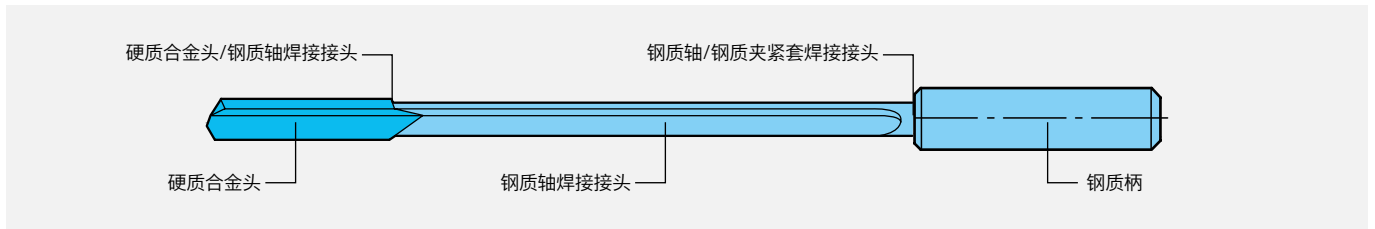
### E 100 M



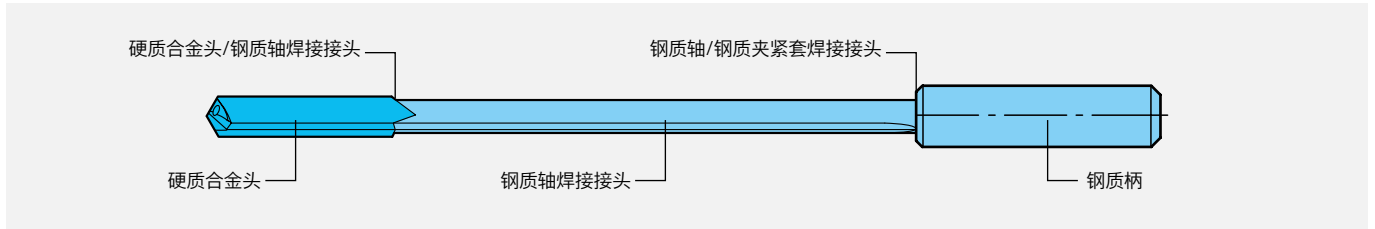
### E 100



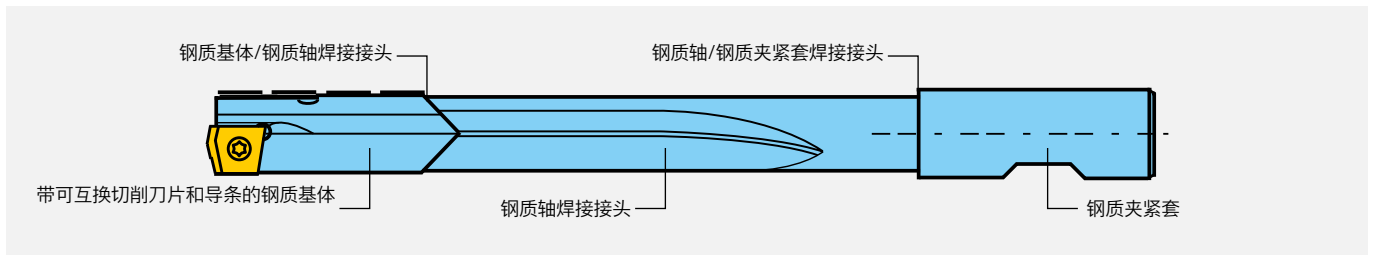
### E 80



### Z 80

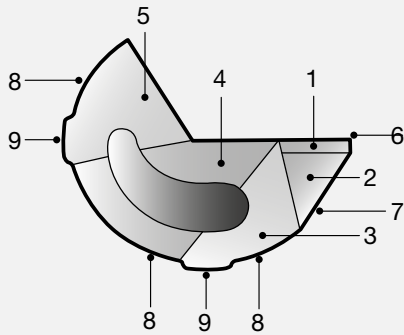


### E 800

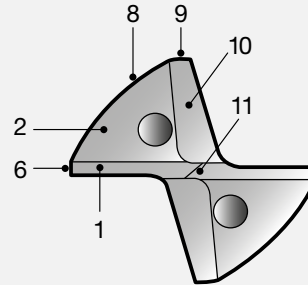


## 特性

特点 - 磨削 E



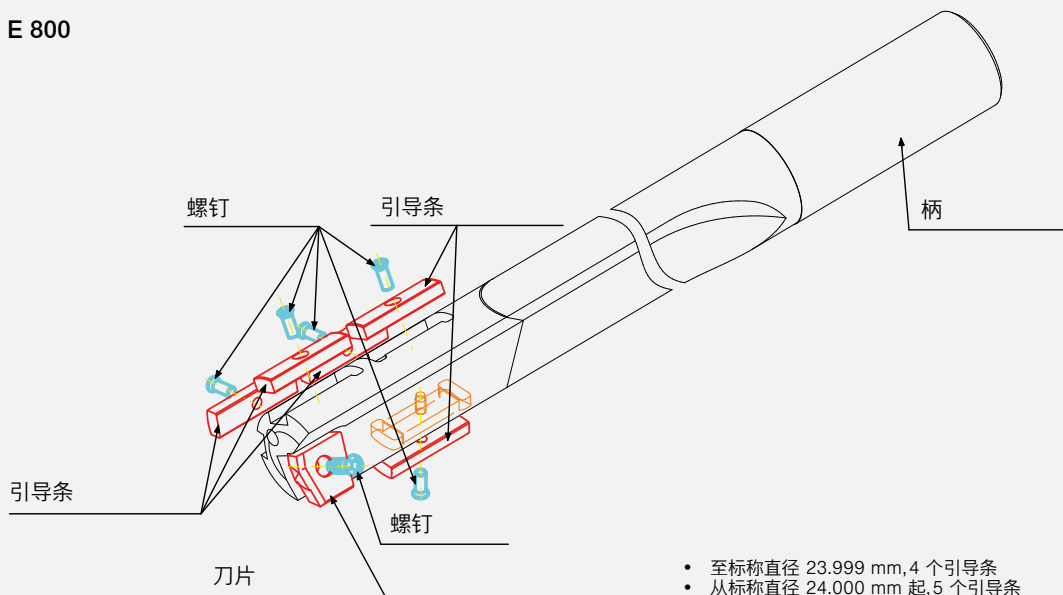
特点 - 磨削 Z



释义:

- 1 - 外刃 1. 开放式空间
- 2 - 外刃 2. 开放式空间
- 3 - 后刀面顶部
- 4 - 内刃
- 5 - 油室
- 6 - 副切削刃(圆形刃)
- 7 - 浮雕式磨削(油袋)
- 8 - 背面直径
- 9 - 支撑条(头部形式)
- 10 - 深切口
- 11 - 横切刃

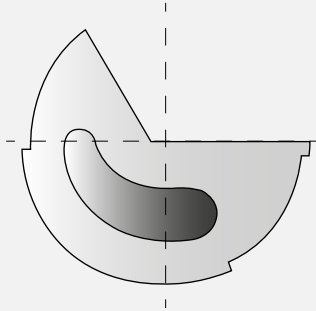
特点 - E 800



- 至标称直径 23.999 mm, 4 个引导条
- 从标称直径 24.000 mm 起, 5 个引导条



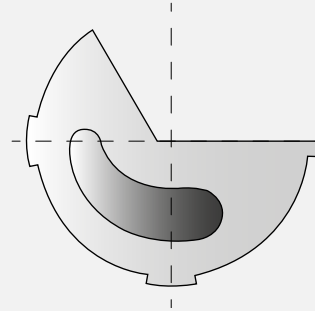
## 标准头部形式



### 头部形式 G

标准采集形式。适用于大多数材料和钻孔作业。使用这种形式,刀具直径在生产后无法再测量。

- 适于几乎所有的钻孔作业
- 适于所有材料
- 钻孔路径小
- 夹紧角小
- 紧配合钻孔公差



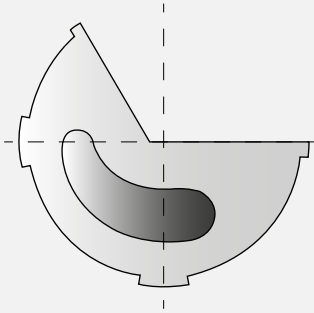
### 头部形式 C

当钻孔直径和表面为紧配合公差时,优先选择这种圆周形状。

- 适于所有材料
- 钢、不锈钢、铝材
- 钻孔路径小
- 夹紧角小



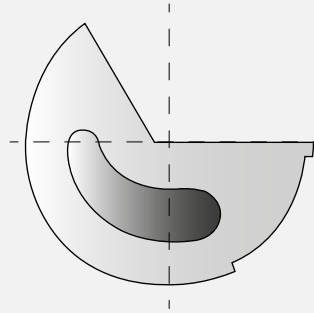
## 特殊头部形式



### 头部形式 A

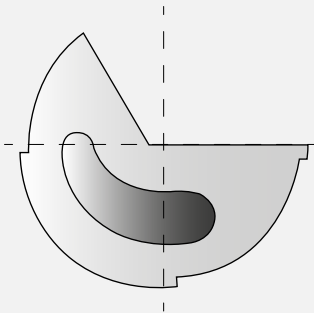
用于钻孔或交叉钻孔时钻孔条件不利的头部形式。加工软质材料和/或冷却润滑剂的润滑性能差。用于紧配合钻孔公差,也可作为超长切削头的引导件。

- 铝质
- 铜



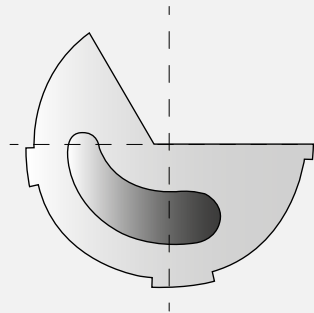
### 头部形式 D

这种头部形式几乎专门用于软质材料,如铸铁、石墨等 - 特别是在与孔径公差紧密相关的情况下。



### 头部形式 E

适用于所有材料,但适合较大的钻孔公差。



### 头部形式 F

适用于较软材料的头部形式、摩擦较低、引导稳定,例如铝材。

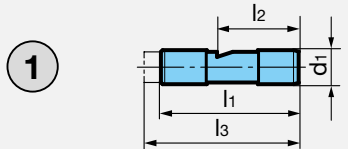
这只是我们特殊头部形式系列的一小部分。根据您的应用要求,可提供其他头部形式。

## 传统深孔钻头

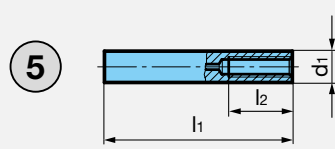
以下介绍的枪钻柄均有库存,但是这仅仅是我们全部枪钻柄规格的一小部分,同时我们也可以根据客户图纸生产高精度的柄。  
注意: E100型枪钻需要使用带校正套的柄.更多信息欢迎垂询

### 柄 E 80

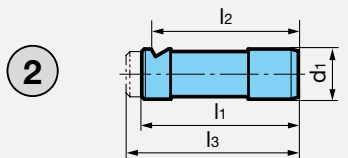
#### 柄 用于深钻床



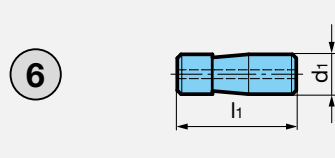
代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
1.1	10	40	24	-
1.2	10	40	24	45
1.3	10	40	24	55
1.4	16	45	31,2	-
1.5	25	70	34	-
1.6	25	70	34	78



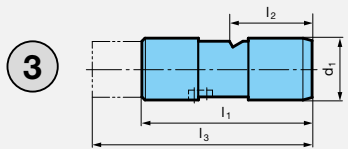
代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
5.1	10	60	20
5.2	16	80	28
5.3	25	100	50
5.4	10	100	20
5.5	10	110	24



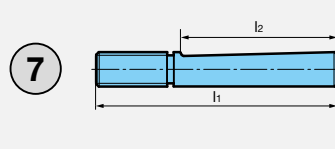
代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
2.1	16	50	47	-
2.2	16	50	47	55
2.3	16	50	47	70



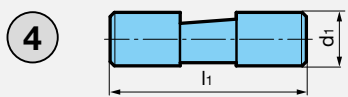
代号	d <sub>1</sub>	l <sub>1</sub>
6.1	12,7	38
6.2	19,05	70
6.3	38,1	70



代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
3.1	25	70	34	-
3.2	25	70	34	100
3.3	25	70	34	105



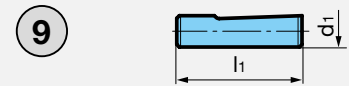
代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
7.1	16	112	73
7.2	20	126	82



代号	d <sub>1</sub>	l <sub>1</sub>
4.1	19,05	70
4.2	12,7	70
4.3	25,4	70
4.4	31,75	70
4.5	38,1	70

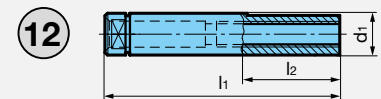
#### 柄 符合 DIN 1835

##### 形状 HE



代号	d <sub>1</sub>	l <sub>1</sub>
9.1	8	36
9.2	10	40
9.3	12	45
9.4	16	48
9.5	20	50
9.6	25	56
9.7	32	60
9.8	31,75	70
9.9	38,1	70
9.10	40	70

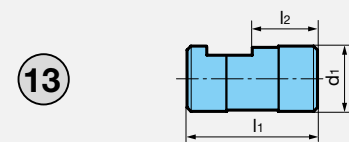
#### 柄 依照 VDI 设计



代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
12.1	10	68	40
12.2	16	90	40
12.3	25	112	50

也可用于深钻床

#### 柄 依照速度位系统



代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
13.1	16	40	14
13.2	25	50	25
13.3	35	60	20

也可用于深钻床



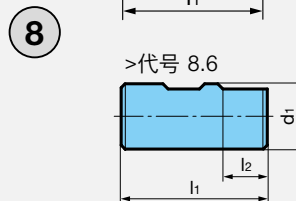
## 传统深孔钻头

### 柄 E 80

#### 夹紧套 符合 DIN 1835



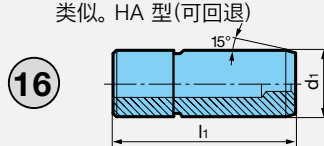
代号	d <sub>1</sub>	l <sub>1</sub>
10.1	8	36
10.2	10	40
10.3	12	45
10.4	16	48
10.5	20	50
10.6	25	56
10.7	32	60
10.8	25	70
10.9	40	70



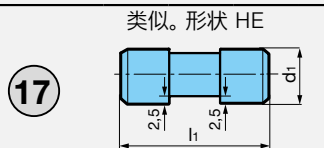
代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
8.1	8	36	-
8.2	10	40	-
8.3	12	45	-
8.4	16	48	-
8.5	20	50	-
8.6	25	56	17
8.7	32	60	19
8.8	40	70	19
8.9	50	80	23
8.10	63	90	23



代号	d <sub>1</sub>	l <sub>1</sub>
11.1	8	36
11.2	10	40
11.3	12	45
11.4	16	48
11.5	20	50
11.6	25,4	70
11.7	25	56
11.8	32	60
11.9	40	70



代号	d <sub>1</sub>	l <sub>1</sub>
16.1	10	50
16.2	16	64
16.3	20	70
16.4	25	81
16.5	32	92

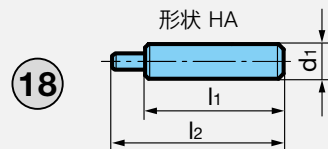


代号	d <sub>1</sub>	l <sub>1</sub>
17.1	19,05	70
17.2	25,4	70
17.3	31,75	70
17.4	38,1	70

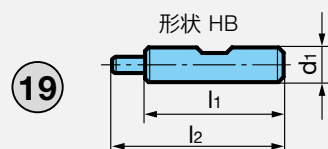
也可用于深钻床

### 柄 E 100

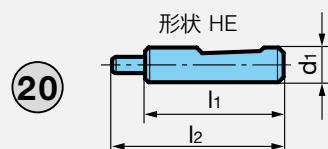
#### 符合 DIN 6535 要求、 带有定位销的夹紧套



代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
4	4	28	40
6	6	36	51
10	10	40	55
12	12	45	60
16	16	48	63



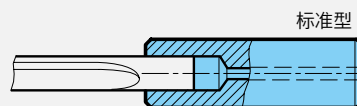
代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
4	4	28	40
6	6	36	51
10	10	40	55
12	12	45	60
16	16	48	63



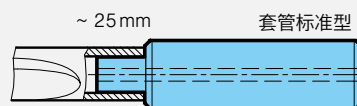
代号	d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>
4	4	28	40
6	6	36	51
10	10	40	55
12	12	45	60
16	16	48	63

### 不同的枪钻钢管与柄的连接

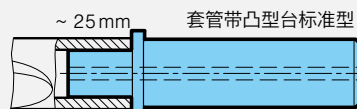
公称直径 < 柄径的解决方案(相差至少6mm):  
钢管插入柄内



标称直径 ≈ 套管直径的解决方案(相差不多):  
钢管套在柄的缩径上



公称直径 > 柄径的解决方案: 钢管套在柄的缩径上,  
钢管内径 > 柄径, 并与凸型台外径齐平





## 重磨和重新加工

即使是高性能工具,由于必须承受巨大的负载,也会在某些时候磨损。 Hartner 通过专业重磨重新恢复刀具的性能。

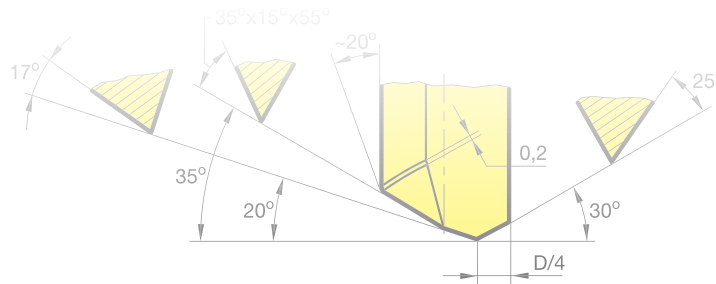
在所有重磨中心使用相同的机床设备,可确保统一的质量标准。

对于整体硬质合金深孔钻或带焊接头的深孔钻,可根据钻头长度和磨损痕迹的宽度重磨多达 10 次。

需注意以下几点:



- 重磨时,刀具必须经过整修,即不含任何磨损痕迹。
- 刀具在重磨后呈裸露状态。
- 随着工作量的增加,可对刀具进行重新涂层。
- 当出现严重磨损或损坏时,可以重新加工带有钎焊头的深孔钻头。
- 带有定位销的深孔钻头会在重磨后检查径向跳动,如有必要,进行校直。
- 重磨时最小钻头长度的参考值,以确保满足钻孔的质量要求:

直径范围	最小钻头长度
Ø0,900 - Ø1,999	5-7 mm
Ø2,000 - Ø3,999	8-10 mm
Ø4,000 - Ø16,999	10-14 mm
Ø17,000 - Ø25,999	14-16 mm
Ø26,000 - Ø40,000	16-18 mm




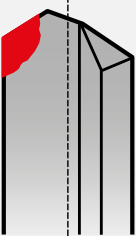
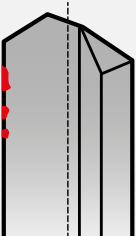
	- 25°	+ 30°	0°	
	+ 20°	+ 17°	0°	D/4
	+ 35°	+ 15°	+ 55°	



故障	原因	措施	
1. 钻孔时刀具破损	刀具	<ul style="list-style-type: none"> <li>- 刀刃钝化</li> <li>- 错误磨削</li> <li>- 进给量过大</li> <li>- 以快进方式钻孔</li> <li>- 刀具预先损坏(断裂等)</li> <li>- 长度 x 直径比过高(LxD)</li> </ul>	<ul style="list-style-type: none"> <li>- 重磨</li> <li>- 修正磨削</li> <li>- 减少进给</li> <li>- 选择钻孔进给</li> <li>- 必要时重磨新刀具</li> <li>- 使用多个刀具/支撑</li> </ul>
	导向孔	<ul style="list-style-type: none"> <li>- 直径过小</li> <li>- 直径过大</li> <li>- 钻孔质量不良(刀具磨损)</li> <li>- 螺纹加工不当</li> </ul>	<ul style="list-style-type: none"> <li>- 其他刀具(大直径)</li> <li>- 其他刀具(小直径)</li> <li>- 使用新刀具</li> <li>- 修正程序</li> </ul>
	钻套	<ul style="list-style-type: none"> <li>- 磨损</li> <li>- 已断裂</li> <li>- 接触压力过小/在钻孔时脱离, 钻屑堵塞</li> <li>- 衬套与工件之间存在间隙/钻屑堵塞, 钻屑堆积</li> </ul>	<ul style="list-style-type: none"> <li>- 新钻套</li> <li>- 新钻套</li> <li>- 增加压力</li> <li>- 校正钻套位置</li> </ul>
	工件	<ul style="list-style-type: none"> <li>- 夹紧不当</li> </ul>	<ul style="list-style-type: none"> <li>- 正确夹紧工件</li> </ul>
	冷却润滑剂	<ul style="list-style-type: none"> <li>- 冷却润滑剂压力过低, 钻屑堵塞</li> <li>- 介质污染严重 -&gt; 堵塞</li> </ul>	<ul style="list-style-type: none"> <li>- 增加冷却润滑剂压力</li> <li>- 检查过滤</li> </ul>
			
2. 刀具在轴杆上断裂(夹紧套)	刀具	<ul style="list-style-type: none"> <li>- 长度 x 直径比过高(LxD)</li> </ul>	<ul style="list-style-type: none"> <li>- 使用多个刀具/支撑</li> </ul>
	工件	<ul style="list-style-type: none"> <li>- 轴位钻孔不正确</li> </ul>	<ul style="list-style-type: none"> <li>- 检查工件夹紧</li> </ul>
	机床	<ul style="list-style-type: none"> <li>- 机床到工件存在偏移量</li> <li>- 钻孔深度过深(编程错误)</li> </ul>	<ul style="list-style-type: none"> <li>- 检查偏移, 必要时予以校正</li> <li>- 检查编程</li> </ul>
			



## 应用说明/故障排除

故障	原因	措施
<b>3. 管弯曲/扭曲</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 长度 x 直径比过高(LxD)</li> <li>- 切削力过高(特殊 转矩)</li> </ul> <b>冷却润滑剂</b> <ul style="list-style-type: none"> <li>- 冷却润滑剂压力过低, 钻屑堵塞</li> </ul>	<ul style="list-style-type: none"> <li>- 使用多个刀具/支撑</li> <li>- 降低切削数据</li> <li>- 增加冷却润滑剂压力</li> </ul>
<b>4. 刀具破损/移位</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 磨削时过热</li> <li>- 副切削刃(圆形刃)过于钝化</li> <li>- 刀具未夹紧, 轴向跳动</li> <li>- 刀具卡住, 退刀时倾斜</li> <li>- 超过最大标准路径</li> <li>- 加工性能太高</li> <li>- 断续切削</li> <li>- 径向跳动误差过大</li> </ul> <b>导向孔</b> <ul style="list-style-type: none"> <li>- 直径过大(间隙过大)</li> </ul> <b>钻套</b> <ul style="list-style-type: none"> <li>- 直径过大(间隙过大)</li> </ul> <b>工件</b> <ul style="list-style-type: none"> <li>- 夹紧不足</li> </ul>	<ul style="list-style-type: none"> <li>- 更正磨削参数</li> <li>- 检查副切削刃上的圆边</li> <li>- 优化刀具夹紧</li> <li>- 修改刀刃几何形状或圆周形状</li> <li>- 缩短换刀间隔</li> <li>- 恢复切削数据</li> <li>- 减小进给值</li> <li>- 检查径向跳动情况/必要时校正</li> <li>- 其他刀具(小直径)</li> <li>- 其他钻套(小直径)</li> <li>- 正确夹紧工件</li> </ul>
<b>5. 圆角处破裂</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 断续切削</li> </ul> <b>导向孔</b> <ul style="list-style-type: none"> <li>- 直径过大(间隙过大)</li> </ul> <b>钻套</b> <ul style="list-style-type: none"> <li>- 直径过大(间隙过大)</li> <li>- 钻套与工件之间的间隙过大</li> </ul> <b>工件</b> <ul style="list-style-type: none"> <li>- 工况不稳定/工件夹紧不足</li> <li>- 横孔未堵(冷却润滑剂流失)</li> </ul> <b>冷却润滑剂</b> <ul style="list-style-type: none"> <li>- 冷却润滑剂对研磨材料不利</li> </ul>	<ul style="list-style-type: none"> <li>- 减小进给值</li> <li>- 其他刀具(小直径)</li> <li>- 其他钻套(小直径)</li> <li>- 减小间隙(理想情况下, 钻套应当贴紧)</li> <li>- 正确夹紧工件</li> <li>- 堵上横孔(Hartner 端塞)</li> <li>- 选择合适的冷却润滑剂, 提高乳液的含油量/使用油</li> </ul>



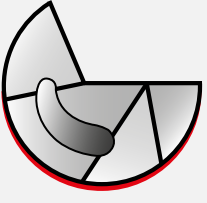
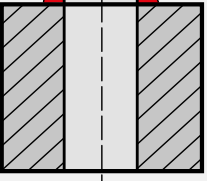
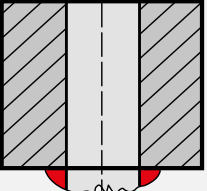
## 应用说明/故障排除

故障	原因	措施
6. 冷却管道断裂	<p><b>刀具</b></p> <ul style="list-style-type: none"> <li>- 间隙角过小</li> <li>- 油室角过小(流量不足)</li> <li>- 端面上材料粘着</li> </ul> <p><b>冷却润滑剂</b></p> <ul style="list-style-type: none"> <li>- 不适用的冷却润滑剂、错误油品(粘度)或乳液(材料粘着)</li> <li>- 因钻屑或其他污垢导致冷却润滑剂脏污</li> </ul>	<ul style="list-style-type: none"> <li>- 增加后角</li> <li>- 增加油室角度/调整</li> <li>- 刀具,如有必要,进行涂层</li> <li>- 选择合适的冷却润滑剂,提高乳液的含油量/使用油</li> <li>- 检查冷却润滑剂的过滤,必要时改善过滤</li> </ul>
7. 切削刃	<p><b>刀具</b></p> <ul style="list-style-type: none"> <li>- 切削速度过慢</li> <li>- 切削刃/圆度过大</li> <li>- 切削刃裸露</li> <li>- 切削材料不佳</li> <li>- 涂层不合适</li> </ul> <p><b>冷却润滑剂</b></p> <ul style="list-style-type: none"> <li>- 不适用的冷却润滑剂、错误油品(粘度)或乳液</li> </ul>	<ul style="list-style-type: none"> <li>- 提高切削速度</li> <li>- 减少切削刃/倒圆</li> <li>- 倒圆,如有必要,对刀具进行涂层,</li> <li>- 使用适当的切削材料</li> <li>- 选择其他涂层</li> <li>- 选择合适的冷却润滑剂,提高乳液的含油量/使用油</li> </ul>
8. 重度冲刷磨损	<p><b>刀具</b></p> <ul style="list-style-type: none"> <li>- 切削速度过高</li> <li>- 钻屑形状不佳</li> <li>- 切削材料不佳</li> </ul> <p><b>冷却润滑剂</b></p> <ul style="list-style-type: none"> <li>- 不适用的冷却润滑剂、错误油品(粘度)或乳液</li> <li>- 冷却润滑剂压力/流量过低</li> </ul>	<ul style="list-style-type: none"> <li>- 减小切削速度</li> <li>- 调整磨削</li> <li>- ,使用合适的切削材料,必要时选择涂层</li> <li>- 选择合适的冷却润滑剂,提高乳液的含油量/使用油</li> <li>- 增加冷却润滑剂压力/流量</li> </ul>



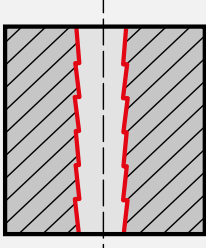
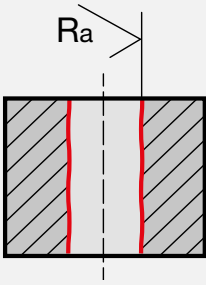
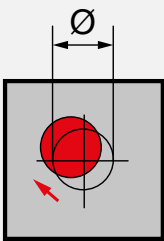
故障	原因	措施
<b>9. 后刀面磨损</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 切削速度过高</li> <li>- 前刀面上钻屑制动过强</li> <li>- 进给量过小</li> <li>- 间隙角过小</li> </ul>	<ul style="list-style-type: none"> <li>- 减小切削速度</li> <li>- 去除前刀面上的涂层</li> <li>- 增加进给</li> <li>- 增加后角</li> </ul>
	<b>冷却润滑剂</b> <ul style="list-style-type: none"> <li>- 不适用的冷却润滑剂、错误油品(粘度)或乳液</li> </ul>	<ul style="list-style-type: none"> <li>- 选择合适的冷却润滑剂,提高乳液的含油量/使用油</li> </ul>
<b>10. 冠部磨损/破碎</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 切削力过大</li> <li>- 断续切削</li> <li>- 选择了错误的硬质金属</li> <li>- 切削温度过高</li> </ul>	<ul style="list-style-type: none"> <li>- 降低切削数据</li> <li>- 减少进给</li> <li>- 选择其他硬质合金</li> <li>- 降低切削数据/更改磨削几何形状(油室角度)</li> </ul>
	<b>冷却润滑剂</b> <ul style="list-style-type: none"> <li>- 不适用的冷却润滑剂、错误油品(粘度)或乳液(由于润滑不足而导致温度过高)</li> </ul>	<ul style="list-style-type: none"> <li>- 选择合适的冷却润滑剂,提高乳液的含油量/使用油</li> </ul>
<b>11. 圆角磨损</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 径向跳动误差过大</li> <li>- 锥度过低</li> <li>- 切削刃/圆度过大</li> <li>- 油室斜角不当(流量过小)</li> </ul>	<ul style="list-style-type: none"> <li>- 检查径向跳动情况/必要时校正</li> <li>- 增加锥度</li> <li>- 减少切削刃/倒圆</li> <li>- 调整油室斜角(角度/偏移/凹槽/第 2 面)</li> </ul>
	<b>工件</b> <ul style="list-style-type: none"> <li>- 工况不稳定/工件夹紧不足</li> </ul>	<ul style="list-style-type: none"> <li>- 正确夹紧工件</li> </ul>
	<b>冷却润滑剂</b> <ul style="list-style-type: none"> <li>- 不适用的冷却润滑剂、错误油品(粘度)或乳液</li> </ul>	<ul style="list-style-type: none"> <li>- 选择合适的冷却润滑剂,提高乳液的含油量/使用油</li> </ul>



故障	原因	措施
<b>12. 圆周形状磨损</b> 	<b>刀具</b> - 径向跳动误差过大 - 断续切削 - 选择了错误的硬质金属 - 锥度过低 - 选择了错误的涂层  <b>工件</b> - 工况不稳定/工件夹紧不足  <b>冷却润滑剂</b> - 冷却润滑剂对研磨材料不利	- 检查径向跳动情况/必要时校正 - 减小进给值 - 正确选择硬质金属 - 增加锥度 - 正确选择涂层  - 正确夹紧工件  - 选择合适的冷却润滑剂,提高乳液的含油量/使用油
<b>13. 钻孔毛刺严重</b> 	<b>刀具</b> - 钻孔时进给过大 - 超过最大标准路径(刀具钝化) - 切削刃/圆度过大 - 间隙角过小  <b>导向孔</b> - 直径过大(间隙过大)  <b>钻套</b> - 直径过大(间隙过大)	- 钻孔时减少进给 - 缩短换刀间隔 - 减少切削刃/倒圆 - 增加后角  - 其他刀具(小直径)  - 其他钻套(小直径)
<b>14. 出口毛刺</b> 	<b>刀具</b> - 钻孔时进给过高 - 超过最大标准路径(刀具钝化) - 切削刃/圆度过大	- 钻孔时减少进给 - 缩短换刀间隔 - 减少切削刃/倒圆

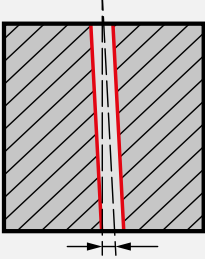
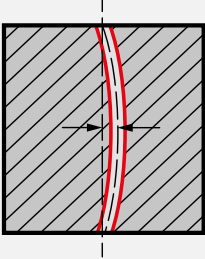
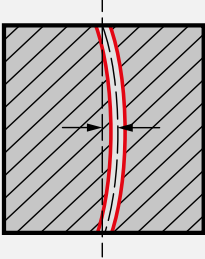


## 应用说明/故障排除

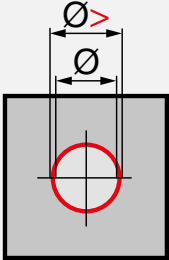
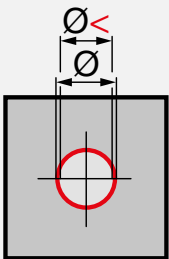

故障	原因	措施
<b>15. 刀具钻孔台阶</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 钻头不在钻杆上的直线轴上 (E 80 / E 800)</li> <li>- 钻头与轴的同轴度过大</li> </ul> <b>机床</b> <ul style="list-style-type: none"> <li>- 主轴夹具与钻套或导向孔之间的轴偏移过大</li> </ul> <b>冷却润滑剂</b> <ul style="list-style-type: none"> <li>- 冷却润滑剂压力过高</li> </ul>	<ul style="list-style-type: none"> <li>- 新焊接的刀头/新刀具</li> <li>- 检查同轴度/使用新刀具</li> <li>- 修正轴偏移。最佳偏差为 0.02 mm</li> <li>- 降低冷却润滑剂压力</li> </ul>
<b>16. 表面质量差</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 刀刃折断</li> <li>- 副切削刃倒角(圆倒角)过宽</li> <li>- 变形倒角过小</li> <li>- 后导杆上压力过小</li> <li>- 径向跳动误差过大</li> <li>- 选择了错误的涂层</li> </ul> <b>工件</b> <ul style="list-style-type: none"> <li>- 工况不稳定/工件夹紧不足</li> </ul> <b>冷却润滑剂</b> <ul style="list-style-type: none"> <li>- 冷却润滑剂类型/乳液不当</li> <li>- 冷却润滑剂量不足</li> </ul>	<ul style="list-style-type: none"> <li>- 重磨刀具</li> <li>- 修正出厂设计</li> <li>- 改善变形倒角</li> <li>- 通过磨削几何形状或硬滚刀倒角/角半径使压力提高</li> <li>- 检查/修正径向跳动</li> <li>- 正确选择涂层</li> <li>- 正确夹紧工件</li> <li>- 尽可能使用油</li> <li>- 增加冷却润滑剂量(流量/压力)</li> </ul>
<b>17. 中心偏移</b> 	<b>刀具</b> <ul style="list-style-type: none"> <li>- 径向跳动误差过大</li> </ul> <b>导向孔</b> <ul style="list-style-type: none"> <li>- 倾斜表面上钻孔</li> <li>- 刀具规格错误</li> </ul> <b>钻套</b> <ul style="list-style-type: none"> <li>- 倾斜表面上钻孔</li> <li>- 钻套磨损(内径过大)</li> </ul> <b>工件</b> <ul style="list-style-type: none"> <li>- 工况不稳定/工件夹紧不足</li> </ul> <b>机床</b> <ul style="list-style-type: none"> <li>- 主轴底座和钻套/导向孔之间轴偏移过大</li> </ul>	<ul style="list-style-type: none"> <li>- 检查径向跳动情况/必要时校正</li> <li>- 用铣刀钻导向孔</li> <li>- 优化 LxD/检查刀具直径</li> <li>- 使用经过调整的钻套</li> <li>- 使用新的钻套</li> <li>- 正确夹紧工件</li> <li>- 修正轴偏移。最佳偏差为 0.02 mm</li> </ul>



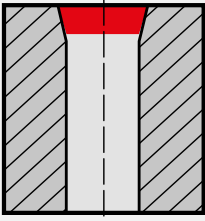
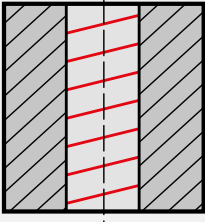
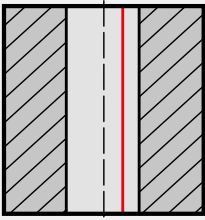


故障	原因	措施
<b>18. 钻孔路径大</b>  	<b>刀具</b> <ul style="list-style-type: none"> <li>- 刀具钝化</li> <li>- 错误磨削</li> <li>- 形状不正确</li> <li>- 进给量过大</li> <li>- 导向过低</li> <li>- 径向跳动误差过大</li> </ul>	<ul style="list-style-type: none"> <li>- 重磨</li> <li>- 修正磨削</li> <li>- 更正圆周形状</li> <li>- 减少进给</li> <li>- 使用长钻头板</li> <li>- 检查径向跳动情况/必要时校正</li> </ul>
	<b>导向孔</b> <ul style="list-style-type: none"> <li>- 导向孔跳动</li> <li>- 导向孔不圆</li> </ul>	<ul style="list-style-type: none"> <li>- 检查导向孔,必要时使用其他刀具</li> <li>- 调整导向刀具</li> </ul>
<b>19. 孔直度差</b>  	<b>钻套</b> <ul style="list-style-type: none"> <li>- 钻套损坏/钻套到钻套底座不正确</li> </ul>	<ul style="list-style-type: none"> <li>- 更换钻套,必要时使用钻套底座</li> </ul>
	<b>工件</b> <ul style="list-style-type: none"> <li>- 工况不稳定/工件夹紧不足</li> <li>- 钻孔回旋不利/壁厚非常小</li> <li>- 工件过热(温度大幅上升)</li> </ul>	<ul style="list-style-type: none"> <li>- 正确夹紧工件</li> <li>- 考虑孔位/必要时加以更改</li> <li>- 降低切削数据</li> </ul>
	<b>机床</b> <ul style="list-style-type: none"> <li>- 主轴底座和钻套/导向孔之间轴偏移过大</li> </ul>	<ul style="list-style-type: none"> <li>- 修正轴偏移。最佳偏差为 0.02 mm</li> </ul>
	<b>刀具</b> <ul style="list-style-type: none"> <li>- 刀具钝化</li> <li>- 错误磨削</li> <li>- 形状不正确</li> <li>- 进给量过大</li> <li>- 导向过低</li> <li>- 径向跳动误差过大</li> <li>- 选择了错误的涂层</li> <li>- 长度 x 直径比过高(LxD)</li> </ul>	<ul style="list-style-type: none"> <li>- 重磨</li> <li>- 修正磨削</li> <li>- 更正圆周形状</li> <li>- 减少进给</li> <li>- 使用长钻头板</li> <li>- 检查径向跳动情况/必要时校正</li> <li>- 正确选择涂层</li> <li>- 使用多个刀具/支撑</li> </ul>
<b>19. 孔直度差</b>  	<b>工件</b> <ul style="list-style-type: none"> <li>- 工况不稳定/工件夹紧不足</li> <li>- 钻孔回旋不利/壁厚非常小</li> <li>- 工件过热(温度大幅上升)</li> </ul>	<ul style="list-style-type: none"> <li>- 正确夹紧工件</li> <li>- 考虑孔位/必要时加以更改</li> <li>- 降低切削数据</li> </ul>
	<b>机床</b> <ul style="list-style-type: none"> <li>- 工件无反向旋转</li> <li>- 主轴底座和钻套/导向孔之间轴偏移过大</li> </ul>	<ul style="list-style-type: none"> <li>- 在机床可能情况下,反方向钻孔</li> <li>- 修正轴偏移。最佳偏差为 0.02 mm</li> </ul>



故障	原因	措施	
<b>20. 钻孔过大</b> 	<b>刀具</b>  <b>冷却润滑剂</b>	<ul style="list-style-type: none"> <li>- 切削装置上压力过大</li> <li>- 径向跳动误差过大</li> <li>- 冷却润滑剂压力过高</li> </ul>	<ul style="list-style-type: none"> <li>- 更改磨削几何形状/降低副切削刃的压力 (D/4 改为 D/3)</li> <li>- 检查径向跳动情况/必要时校正</li> <li>- 降低冷却润滑剂压力</li> </ul>
<b>21. 钻孔太小</b> 	<b>刀具</b>	<ul style="list-style-type: none"> <li>- 副切削刃上压力过小</li> <li>- 形状不正确</li> <li>- 刀具(通常)重磨(锥度)</li> </ul>	<ul style="list-style-type: none"> <li>- 更改磨削几何形状/提高副切削刃的压力(将 D/3 更改为 D/4)</li> <li>- 更正圆周形状("C"形)</li> <li>- 使用新刀具</li> </ul>
<b>22. 钻屑堆积/刀具卡住</b> 	<b>刀具</b>  <b>冷却润滑剂</b>	<ul style="list-style-type: none"> <li>- 切削速度与进给比例不匹配</li> <li>- 磨削几何形状不合适</li> <li>- 连续钻屑</li> <li>- 涂层刀具上的连续钻屑</li> <li>- 油室斜角不当(流量过小)</li> <li>- 刀具夹紧泄漏(冷却润滑剂流失)</li> <li>- 冷却润滑剂量不足</li> </ul>	<ul style="list-style-type: none"> <li>- 校正/调整切削速度与进给的比例</li> <li>- 调整磨削几何形状,以利于钻屑断裂</li> <li>- 必要时,进行进给编程</li> <li>- 去除前刀面上的涂层</li> <li>- 调整油室斜角(角度/偏移/凹槽/第2面)</li> <li>- 优化刀具夹紧</li> <li>- 增加冷却润滑剂量(流量/压力)</li> </ul>



故障	原因	措施
<b>23. 钻孔宽度大</b> 	<ul style="list-style-type: none"> <li>刀具</li> <li>导向孔</li> <li>钻套</li> <li>工件</li> </ul>	<ul style="list-style-type: none"> <li>- 钻孔时进给过大</li> <li>- 导向孔跳动/不圆</li> <li>- 钻套损坏/钻套到钻套底座不正确</li> <li>- 钻孔工况不稳定/工件夹紧不足, 钻孔时振动</li> <li>- 钻孔时降低进给</li> <li>- 检查导向孔, 必要时使用其他刀具</li> <li>- 更换钻套, 必要时使用钻套座</li> <li>- 正确夹紧工件</li> </ul>
<b>24. 刀具钻孔扭曲</b> 	<ul style="list-style-type: none"> <li>刀具</li> <li>工件</li> </ul>	<ul style="list-style-type: none"> <li>- 加工参数太高</li> <li>- 刀刃钝化</li> <li>- 钻头不在钻杆上的直线轴上(E80/E800)</li> <li>- 钻头与主轴的同轴度过大</li> <li>- 圆周形状不正确</li> <li>- 降低切削数据</li> <li>- 重磨刀具/必要时更换</li> <li>- 新焊接的刀头/新刀具</li> <li>- 检查同轴度/使用新刀具</li> <li>- 选用正确的头部</li> <li>- 钻孔工况不稳定/工件夹紧不足, 钻孔时振动</li> <li>- 正确夹紧工件/设置减震器</li> </ul>
<b>25. 刀具拉出退刀标记</b> 	<ul style="list-style-type: none"> <li>刀具</li> <li>工件</li> <li>机床</li> </ul>	<ul style="list-style-type: none"> <li>- 退刀时速度太快</li> <li>- 刀刃过于锋利</li> <li>- 径向跳动误差过大</li> <li>- 头部形状不正确</li> <li>- 降低进给</li> <li>- 切削刃倒圆</li> <li>- 检查径向跳动情况/必要时校正</li> <li>- 选用正确的头部</li> <li>- 工况不稳定/工件夹紧不足</li> <li>- 正确夹紧工件</li> <li>- 主轴底座和钻套/导向孔之间轴偏移过大</li> <li>- 修正主轴偏移。最佳偏差为 0.02 mm</li> </ul>

HARTNER









# HARTNER

Precision Cutting Tools

## 微精密钻头



HSS-E-PM和硬质合金 /  
抛光处理和涂层

微精密钻头






P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	钻深	d1/mm	产品代号	页码
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## 无内冷微钻

		DIN 1899	N	HSS-E-PM	○	右手	圆柱形	~5xD	0,050 - 1,900	<b>87011</b>	329
		DIN 1899	N	HSS-E-PM	○	左手	圆柱形	~5xD	0,160 - 1,450	<b>87016</b>	331
		DIN 1899	N	HSS-E-PM	Ⓜ	右手	圆柱形	~5xD	0,200 - 1,500	<b>84810</b>	332
		哈特纳标准	N	整硬	Ⓜ	右手	圆柱形		0,100 - 3,000	<b>86402</b>	333
		哈特纳标准	N	整硬	Ⓜ	右手	圆柱形	4xD	0,500 - 3,000	<b>86400</b>	334
		哈特纳标准	N	整硬	○	右手	圆柱形	~5xD	0,200 - 1,300	<b>89281</b>	335
		哈特纳标准	N	整硬	Ⓜ	右手	圆柱形	7xD	0,500 - 3,000	<b>86401</b>	336

## 带内冷微钻

		哈特纳标准	N	整硬	Ⓜ	右手	圆柱形	5xD	1,400 - 3,000	<b>86405</b>	337
		哈特纳标准	N	整硬	Ⓜ	右手	圆柱形	8xD	1,400 - 3,000	<b>86408</b>	338
		哈特纳标准	N	整硬	Ⓜ	右手	圆柱形	15xD	1,400 - 3,000	<b>86412</b>	339

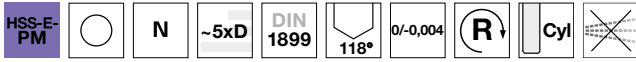




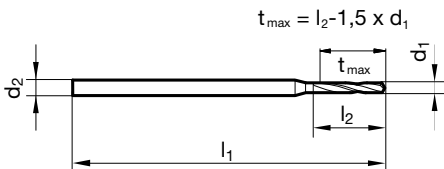
## 无内冷微钻

产品代号 87011

P	M	K	N	S	H
•	•	•	•	○	



双后刀面 • < Φ 0.15 mm 含钴高速钢 • 增强柄  
 适于加工: 高合金钢



d1 mm	d2 mm	l1 mm	l2 mm	d1 mm	d2 mm	l1 mm	l2 mm
0,050	1,000	25,000	0,400	0,355	1,000	25,000	2,400
0,060	1,000	25,000	0,400	0,360	1,000	25,000	2,400
0,080	1,000	25,000	0,500	0,365	1,000	25,000	2,400
0,090	1,000	25,000	0,500	0,370	1,000	25,000	2,400
0,100	1,000	25,000	0,500	0,375	1,000	25,000	2,400
0,110	1,000	25,000	0,500	0,380	1,000	25,000	2,400
0,120	1,000	25,000	0,500	0,390	1,000	25,000	3,000
0,130	1,000	25,000	0,800	0,400	1,000	25,000	3,000
0,140	1,000	25,000	0,800	0,405	1,000	25,000	3,000
0,150	1,000	25,000	0,800	0,410	1,000	25,000	3,000
0,160	1,000	25,000	1,100	0,415	1,000	25,000	3,000
0,170	1,000	25,000	1,100	0,420	1,000	25,000	3,000
0,180	1,000	25,000	1,100	0,425	1,000	25,000	3,000
0,190	1,000	25,000	1,100	0,430	1,000	25,000	3,000
0,200	1,000	25,000	1,500	0,440	1,000	25,000	3,000
0,205	1,000	25,000	1,500	0,450	1,000	25,000	3,000
0,210	1,000	25,000	1,500	0,455	1,000	25,000	3,000
0,215	1,000	25,000	1,500	0,460	1,000	25,000	3,000
0,220	1,000	25,000	1,500	0,470	1,000	25,000	3,000
0,225	1,000	25,000	1,500	0,480	1,000	25,000	3,000
0,230	1,000	25,000	1,500	0,485	1,000	25,000	3,400
0,235	1,000	25,000	1,500	0,490	1,000	25,000	3,400
0,240	1,000	25,000	1,500	0,495	1,000	25,000	3,400
0,245	1,000	25,000	1,900	0,500	1,000	25,000	3,400
0,250	1,000	25,000	1,900	0,510	1,000	25,000	3,400
0,255	1,000	25,000	1,900	0,520	1,000	25,000	3,400
0,260	1,000	25,000	1,900	0,530	1,000	25,000	3,400
0,265	1,000	25,000	1,900	0,540	1,000	25,000	3,900
0,270	1,000	25,000	1,900	0,550	1,000	25,000	3,900
0,275	1,000	25,000	1,900	0,555	1,000	25,000	3,900
0,280	1,000	25,000	1,900	0,560	1,000	25,000	3,900
0,285	1,000	25,000	1,900	0,570	1,000	25,000	3,900
0,290	1,000	25,000	1,900	0,580	1,000	25,000	3,900
0,300	1,000	25,000	1,900	0,585	1,000	25,000	3,900
0,310	1,000	25,000	2,400	0,590	1,000	25,000	3,900
0,315	1,000	25,000	2,400	0,600	1,000	25,000	3,900
0,320	1,000	25,000	2,400	0,610	1,000	25,000	4,200
0,325	1,000	25,000	2,400	0,620	1,000	25,000	4,200
0,330	1,000	25,000	2,400	0,630	1,000	25,000	4,200
0,335	1,000	25,000	2,400	0,640	1,000	25,000	4,200
0,340	1,000	25,000	2,400	0,650	1,000	25,000	4,200
0,350	1,000	25,000	2,400	0,660	1,000	25,000	4,200



## 无内冷微钻

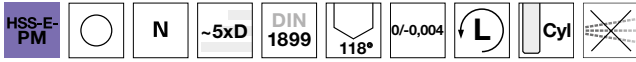
d1 mm	d2 mm	l1 mm	l2 mm	d1 mm	d2 mm	l1 mm	l2 mm
0,665	1,000	25,000	4,200	1,040	1,500	25,000	6,800
0,670	1,000	25,000	4,200	1,050	1,500	25,000	6,800
0,680	1,000	25,000	4,800	1,060	1,500	25,000	6,800
0,690	1,000	25,000	4,800	1,070	1,500	25,000	7,600
0,700	1,000	25,000	4,800	1,080	1,500	25,000	7,600
0,710	1,000	25,000	4,800	1,100	1,500	25,000	7,600
0,720	1,000	25,000	4,800	1,110	1,500	25,000	7,600
0,730	1,000	25,000	4,800	1,120	1,500	25,000	7,600
0,740	1,000	25,000	4,800	1,140	1,500	25,000	7,600
0,750	1,000	25,000	4,800	1,150	1,500	25,000	7,600
0,760	1,000	25,000	5,300	1,180	1,500	25,000	7,600
0,770	1,000	25,000	5,300	1,190	1,500	25,000	8,500
0,790	1,000	25,000	5,300	1,200	1,500	25,000	8,500
0,800	1,500	25,000	5,300	1,210	1,500	25,000	8,500
0,810	1,500	25,000	5,300	1,240	1,500	25,000	8,500
0,820	1,500	25,000	5,300	1,250	1,500	25,000	8,500
0,830	1,500	25,000	5,300	1,270	1,500	25,000	8,500
0,840	1,500	25,000	5,300	1,300	1,500	25,000	8,500
0,850	1,500	25,000	5,300	1,310	1,500	25,000	8,500
0,860	1,500	25,000	6,000	1,320	1,500	25,000	8,500
0,870	1,500	25,000	6,000	1,340	1,500	25,000	9,500
0,880	1,500	25,000	6,000	1,350	1,500	25,000	9,500
0,890	1,500	25,000	6,000	1,380	1,500	25,000	9,500
0,900	1,500	25,000	6,000	1,400	1,500	25,000	9,500
0,910	1,500	25,000	6,000	1,410	1,500	25,000	9,500
0,930	1,500	25,000	6,000	1,420	1,500	25,000	9,500
0,940	1,500	25,000	6,000	1,450	1,500	25,000	9,500
0,950	1,500	25,000	6,000	1,500	2,000	30,000	9,500
0,960	1,500	25,000	6,800	1,600	2,000	30,000	10,600
0,970	1,500	25,000	6,800	1,630	2,000	30,000	10,600
0,980	1,500	25,000	6,800	1,700	2,000	30,000	10,600
0,990	1,500	25,000	6,800	1,800	2,000	30,000	11,800
1,000	1,500	25,000	6,800	1,850	2,000	30,000	11,800
1,010	1,500	25,000	6,800	1,900	2,000	30,000	11,800
1,020	1,500	25,000	6,800				
1,030	1,500	25,000	6,800				



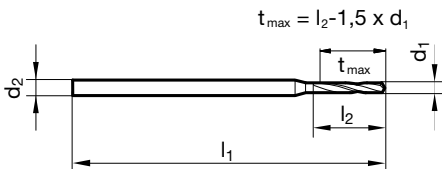
## 无内冷微钻

产品代号 87016

P	M	K	N	S	H
•	•	•	•	○	



双后刀面 • <math>\Phi 0.15\text{ mm}</math> 含钴高速钢 • 增强柄  
 适于加工: 高合金钢

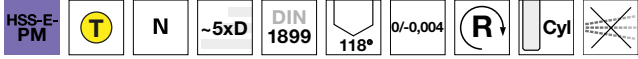


d1 mm	d2 mm	l1 mm	l2 mm	d1 mm	d2 mm	l1 mm	l2 mm
0,160	1,000	25,000	1,100	0,710	1,000	25,000	4,800
0,200	1,000	25,000	1,500	0,740	1,000	25,000	4,800
0,210	1,000	25,000	1,500	0,750	1,000	25,000	4,800
0,220	1,000	25,000	1,500	0,760	1,000	25,000	5,300
0,230	1,000	25,000	1,500	0,780	1,000	25,000	5,300
0,240	1,000	25,000	1,500	0,820	1,500	25,000	5,300
0,280	1,000	25,000	1,900	0,830	1,500	25,000	5,300
0,300	1,000	25,000	1,900	0,840	1,500	25,000	5,300
0,310	1,000	25,000	2,400	0,870	1,500	25,000	6,000
0,330	1,000	25,000	2,400	0,890	1,500	25,000	6,000
0,350	1,000	25,000	2,400	0,900	1,500	25,000	6,000
0,360	1,000	25,000	2,400	0,910	1,500	25,000	6,000
0,370	1,000	25,000	2,400	0,920	1,500	25,000	6,000
0,380	1,000	25,000	2,400	0,930	1,500	25,000	6,000
0,390	1,000	25,000	3,000	0,940	1,500	25,000	6,000
0,400	1,000	25,000	3,000	0,950	1,500	25,000	6,000
0,410	1,000	25,000	3,000	0,970	1,500	25,000	6,800
0,420	1,000	25,000	3,000	0,980	1,500	25,000	6,800
0,440	1,000	25,000	3,000	0,990	1,500	25,000	6,800
0,450	1,000	25,000	3,000	1,000	1,500	25,000	6,800
0,460	1,000	25,000	3,000	1,010	1,500	25,000	6,800
0,470	1,000	25,000	3,000	1,050	1,500	25,000	6,800
0,480	1,000	25,000	3,000	1,080	1,500	25,000	7,600
0,490	1,000	25,000	3,400	1,100	1,500	25,000	7,600
0,500	1,000	25,000	3,400	1,150	1,500	25,000	7,600
0,510	1,000	25,000	3,400	1,250	1,500	25,000	8,500
0,520	1,000	25,000	3,400	1,300	1,500	25,000	8,500
0,540	1,000	25,000	3,900	1,340	1,500	25,000	9,500
0,550	1,000	25,000	3,900	1,350	1,500	25,000	9,500
0,570	1,000	25,000	3,900				
0,600	1,000	25,000	3,900				
0,610	1,000	25,000	4,200				
0,660	1,000	25,000	4,200				
0,670	1,000	25,000	4,200				
0,680	1,000	25,000	4,800				
0,700	1,000	25,000	4,800				

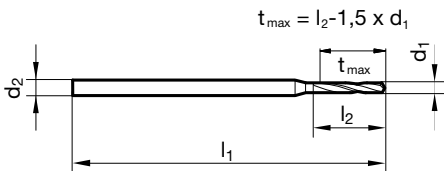
## 无内冷微钻

产品代号 84810

P	M	K	N	S	H
•	•	•	•	○	



双后刀面 • 增强柄 • 耐磨损 高强度  
适于加工：高合金钢



d1 mm	d2 mm	l1 mm	l2 mm	d1 mm	d2 mm	l1 mm	l2 mm
0,200	1,000	25,000	1,500	1,050	1,500	25,000	6,800
0,300	1,000	25,000	1,900	1,100	1,500	25,000	7,600
0,450	1,000	25,000	3,000	1,150	1,500	25,000	7,600
0,490	1,000	25,000	3,400	1,180	1,500	25,000	7,600
0,500	1,000	25,000	3,400	1,200	1,500	25,000	8,500
0,510	1,000	25,000	3,400	1,250	1,500	25,000	8,500
0,520	1,000	25,000	3,400	1,300	1,500	25,000	8,500
0,590	1,000	25,000	3,900	1,400	1,500	25,000	9,500
0,600	1,000	25,000	3,900	1,450	1,500	25,000	9,500
0,700	1,000	25,000	4,800	1,500	2,000	30,000	9,500
0,760	1,000	25,000	5,300				
0,800	1,500	25,000	5,300				
0,880	1,500	25,000	6,000				
0,900	1,500	25,000	6,000				
0,920	1,500	25,000	6,000				
0,950	1,500	25,000	6,000				
0,980	1,500	25,000	6,800				
1,000	1,500	25,000	6,800				

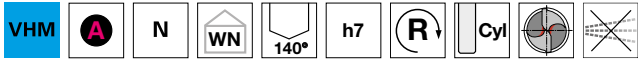


## 无内冷微钻

产品代号 86402

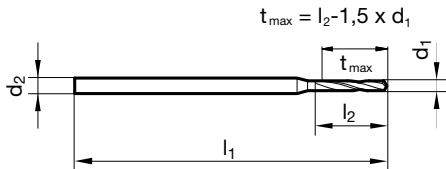


P	M	K	N	S	H
•		•			



芯厚 ≥ Ø 0,800 • 双后刀面 • 统一柄径3mm • 统一长度38mm

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 铸件材料 • 板材加工



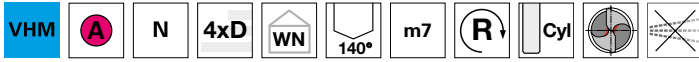
d1	inch	d2 h6	l1	l2	d1	inch	d2 h6	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
0,100		3,000	38,000	1,200	0,980		3,000	38,000	10,000
0,150		3,000	38,000	2,000	0,990		3,000	38,000	10,000
0,200		3,000	38,000	2,500	1,000		3,000	38,000	10,000
0,250		3,000	38,000	3,000	1,100		3,000	38,000	10,000
0,300		3,000	38,000	5,000	1,110		3,000	38,000	10,000
0,310		3,000	38,000	5,000	1,150		3,000	38,000	10,000
0,350		3,000	38,000	6,000	1,200		3,000	38,000	10,000
0,370		3,000	38,000	6,000	1,210		3,000	38,000	10,000
0,400		3,000	38,000	7,000	1,400		3,000	38,000	10,000
0,450		3,000	38,000	7,000	1,450		3,000	38,000	10,000
0,500		3,000	38,000	7,000	1,500		3,000	38,000	10,000
0,550		3,000	38,000	7,000	1,510		3,000	38,000	10,000
0,600		3,000	38,000	7,000	1,520		3,000	38,000	10,000
0,640		3,000	38,000	7,000	1,550		3,000	38,000	10,000
0,650		3,000	38,000	7,000	1,600		3,000	38,000	12,000
0,700		3,000	38,000	8,000	1,650		3,000	38,000	12,000
0,710		3,000	38,000	8,000	1,700		3,000	38,000	12,000
0,720		3,000	38,000	8,000	1,800		3,000	38,000	12,000
0,740		3,000	38,000	8,000	1,810		3,000	38,000	12,000
0,750		3,000	38,000	8,000	1,830		3,000	38,000	12,000
0,760		3,000	38,000	8,000	1,850		3,000	38,000	12,000
0,770		3,000	38,000	8,000	1,900		3,000	38,000	12,000
0,780		3,000	38,000	8,000	1,920		3,000	38,000	12,000
0,790		3,000	38,000	8,000	1,950		3,000	38,000	12,000
0,800		3,000	38,000	10,000	1,980		3,000	38,000	12,000
0,810		3,000	38,000	10,000	2,000		3,000	38,000	12,000
0,820		3,000	38,000	10,000	2,050		3,000	38,000	12,000
0,830		3,000	38,000	10,000	2,100		3,000	38,000	12,000
0,840		3,000	38,000	10,000	2,400		3,000	38,000	12,000
0,850		3,000	38,000	10,000	2,500		3,000	38,000	12,000
0,860		3,000	38,000	10,000	2,600		3,000	38,000	12,000
0,870		3,000	38,000	10,000	2,750		3,000	38,000	12,000
0,880		3,000	38,000	10,000	2,950		3,000	38,000	12,000
0,890		3,000	38,000	10,000	3,000		3,000	38,000	12,000
0,900		3,000	38,000	10,000					
0,910		3,000	38,000	10,000					
0,920		3,000	38,000	10,000					
0,930		3,000	38,000	10,000					
0,940		3,000	38,000	10,000					
0,950		3,000	38,000	10,000					
0,960		3,000	38,000	10,000					
0,970		3,000	38,000	10,000					

## 无内冷微钻

产品代号 86400

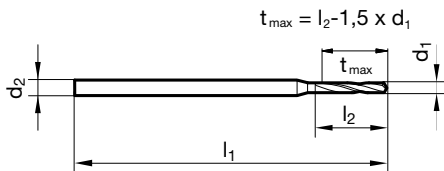


P	M	K	N	S	H
•	•	•	○	○	



芯厚 ≥ Ø 0,500 • 双后刀面 • 精密磨削过的主切削刃 • 精密磨削过的倒棱

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



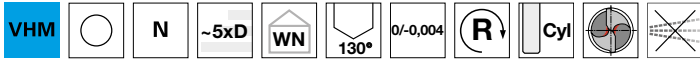
d1	inch	d2 h6	l1	l2	d1	inch	d2 h6	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
0,500		3,000	47,000	3,000	1,950		3,000	52,000	11,700
0,550		3,000	47,000	3,300	1,980		4,000	59,000	12,000
0,600		3,000	47,000	3,600	2,000		4,000	59,000	12,000
0,650		3,000	47,000	3,900	2,050		4,000	59,000	12,300
0,700		3,000	47,000	4,200	2,100		4,000	59,000	12,600
0,750		3,000	47,000	4,500	2,150		4,000	59,000	12,900
0,800		3,000	47,000	4,800	2,200		4,000	59,000	13,200
0,850		3,000	47,000	5,100	2,250		4,000	59,000	13,500
0,900		3,000	47,000	5,400	2,300		4,000	59,000	13,800
0,950		3,000	47,000	5,700	2,350		4,000	59,000	14,100
1,000		3,000	47,000	6,000	2,380		4,000	59,000	14,400
1,050		3,000	47,000	6,300	2,400		4,000	59,000	14,400
1,100		3,000	47,000	6,600	2,450		4,000	59,000	14,700
1,150		3,000	47,000	6,900	2,500		4,000	59,000	15,000
1,200		3,000	47,000	7,200	2,550		4,000	59,000	15,300
1,250		3,000	47,000	7,500	2,600		4,000	59,000	15,600
1,300		3,000	47,000	7,800	2,650		4,000	59,000	15,900
1,350		3,000	47,000	8,100	2,700		4,000	59,000	16,200
1,400		3,000	47,000	8,400	2,750		4,000	59,000	16,500
1,450		3,000	47,000	8,700	2,780		4,000	59,000	16,800
1,500		3,000	47,000	9,000	2,800		4,000	59,000	16,800
1,550		3,000	47,000	9,300	2,850		4,000	59,000	17,100
1,590		3,000	47,000	9,600	2,900		4,000	59,000	17,400
1,600		3,000	47,000	9,600	2,950		4,000	59,000	17,700
1,650		3,000	47,000	9,900	3,000		4,000	59,000	18,000
1,700		3,000	47,000	10,200					
1,750		3,000	47,000	10,500					
1,800		3,000	52,000	10,800					
1,850		3,000	52,000	11,100					
1,900		3,000	52,000	11,400					

## 无内冷微钻

产品代号 89281

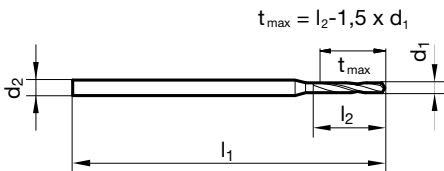


P	M	K	N	S	H
●	○	●	○	○	○



芯厚  $\geq \varnothing 0,800$  • 双后刀面 • 精密磨削过的主切削刃

适合加工: 结构钢和淬硬钢 • 铸件材料 • 青铜、黄铜 • 铝和铝合金 • 镁和镁合金 • 塑料及纤维增强塑料



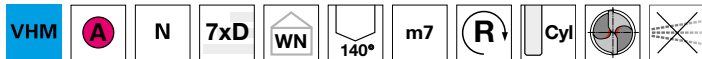
d1 mm	d2 mm	l1 mm	l2 mm	d1 mm	d2 mm	l1 mm	l2 mm
0,200	1,000	25,000	1,500	0,800	1,500	25,000	5,300
0,300	1,000	25,000	1,900	1,000	1,500	25,000	6,800
0,400	1,000	25,000	3,000	1,100	1,500	25,000	7,600
0,500	1,000	25,000	3,400	1,250	1,500	25,000	8,500
0,600	1,000	25,000	3,900	1,300	1,500	25,000	8,500
0,700	1,000	25,000	4,800				

## 无内冷微钻

产品代号 86401

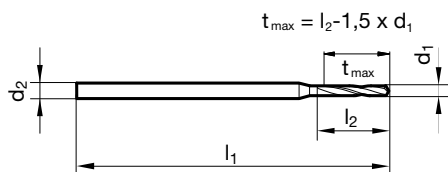


P	M	K	N	S	H
•	•	•	○	○	



芯厚 ≥ Ø 0,500 • 双后刀面 • 精密磨削过的主切削刃 • 精密磨削过的倒棱

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



d1	inch	d2 h6	l1	l2	d1	inch	d2 h6	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
0,500		3,000	47,000	4,000	1,950		3,000	52,000	17,600
0,550		3,000	47,000	4,400	1,980		4,000	63,000	18,000
0,600		3,000	47,000	4,800	2,000		4,000	63,000	18,000
0,650		3,000	47,000	5,200	2,050		4,000	63,000	18,500
0,700		3,000	47,000	5,600	2,100		4,000	63,000	18,900
0,750		3,000	47,000	6,000	2,150		4,000	63,000	19,400
0,800		3,000	47,000	6,400	2,200		4,000	63,000	19,800
0,850		3,000	47,000	6,800	2,250		4,000	63,000	20,300
0,900		3,000	47,000	7,200	2,300		4,000	63,000	20,700
0,950		3,000	47,000	7,600	2,350		4,000	63,000	21,200
1,000		3,000	47,000	8,000	2,380		4,000	63,000	21,600
1,050		3,000	47,000	8,400	2,400		4,000	63,000	21,600
1,100		3,000	47,000	8,800	2,450		4,000	63,000	22,100
1,150		3,000	47,000	9,200	2,500		4,000	63,000	22,500
1,200		3,000	52,000	10,800	2,550		4,000	63,000	23,000
1,250		3,000	52,000	11,300	2,600		4,000	67,000	23,400
1,300		3,000	52,000	11,700	2,650		4,000	67,000	23,900
1,350		3,000	52,000	12,200	2,700		4,000	67,000	24,300
1,400		3,000	52,000	12,600	2,750		4,000	67,000	24,800
1,450		3,000	52,000	13,100	2,780		4,000	67,000	25,200
1,500		3,000	52,000	13,500	2,800		4,000	67,000	25,200
1,550		3,000	52,000	14,000	2,850		4,000	67,000	25,700
1,590		3,000	52,000	14,400	2,900		4,000	67,000	26,100
1,600		3,000	52,000	14,400	2,950		4,000	67,000	26,600
1,650		3,000	52,000	14,900	3,000		4,000	67,000	27,000
1,700		3,000	52,000	15,300					
1,750		3,000	52,000	15,800					
1,800		3,000	52,000	16,200					
1,850		3,000	52,000	16,700					
1,900		3,000	52,000	17,100					

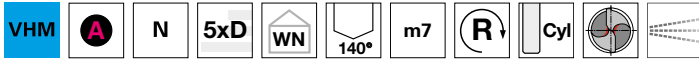


## 带内冷微钻

产品代号 86405

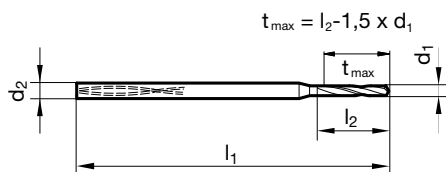


P	M	K	N	S	H
•	•	•	○	○	



芯厚 ≥ Ø 1,400 • 双后刀面 • 精密磨削过的主切削刃 • 精密磨削过的倒棱

适合加工: 结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



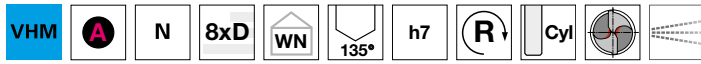
d1	inch	d2 h6	l1	l2	d1	inch	d2 h6	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
1,400		4,000	52,000	11,000	2,450		4,000	62,000	20,000
1,450		4,000	52,000	12,000	2,500		4,000	62,000	20,000
1,500		4,000	52,000	12,000	2,550		4,000	62,000	20,000
1,550		4,000	52,000	12,000	2,600		4,000	66,000	21,000
1,590		4,000	52,000	13,000	2,650		4,000	66,000	21,000
1,600		4,000	52,000	13,000	2,700		4,000	66,000	22,000
1,650		4,000	52,000	13,000	2,750		4,000	66,000	22,000
1,700		4,000	56,000	14,000	2,780		4,000	66,000	22,000
1,750		4,000	56,000	14,000	2,800		4,000	66,000	22,000
1,800		4,000	56,000	14,000	2,850		4,000	66,000	23,000
1,850		4,000	56,000	15,000	2,900		4,000	66,000	23,000
1,900		4,000	56,000	15,000	2,950		4,000	66,000	24,000
1,950		4,000	56,000	16,000	3,000		4,000	66,000	24,000
1,980		4,000	56,000	16,000					
2,000		4,000	56,000	16,000					
2,050		4,000	56,000	16,000					
2,100		4,000	62,000	17,000					
2,150		4,000	62,000	17,000					
2,200		4,000	62,000	18,000					
2,250		4,000	62,000	18,000					
2,300		4,000	62,000	18,000					
2,350		4,000	62,000	19,000					
2,380		4,000	62,000	19,000					
2,400		4,000	62,000	19,000					

## 带内冷微钻

产品代号 86408

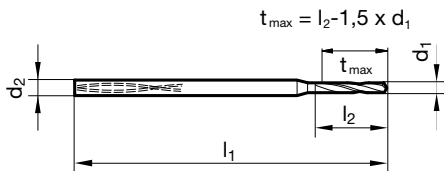


P	M	K	N	S	H
•	•	•	○	○	



芯厚  $\geq \varnothing 1,400$  • 双后刀面 • 精密磨削过的主切削刃 • 精密磨削过的倒棱

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



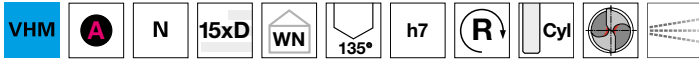
d1 mm	d2 h6 mm	l1 mm	l2 mm	d1 mm	d2 h6 mm	l1 mm	l2 mm
1,400	4,000	52,000	15,000	2,600	4,000	66,000	29,000
1,500	4,000	52,000	17,000	2,700	4,000	66,000	30,000
1,600	4,000	52,000	18,000	2,800	4,000	66,000	31,000
1,700	4,000	56,000	19,000	2,900	4,000	66,000	32,000
1,800	4,000	56,000	20,000	3,000	4,000	66,000	33,000
1,900	4,000	56,000	21,000				
2,000	4,000	56,000	22,000				
2,100	4,000	62,000	23,000				
2,200	4,000	62,000	24,000				
2,300	4,000	62,000	25,000				
2,400	4,000	62,000	26,000				
2,500	4,000	62,000	28,000				

## 带内冷微钻

产品代号 86412

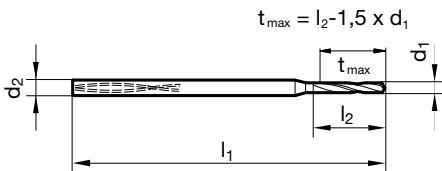


P	M	K	N	S	H
•	•	•	○	○	



芯厚  $\geq \varnothing 1,400$  • 双后刀面 • 精密磨削过的主切削刃 • 精密磨削过的倒棱

适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢 • 不锈钢 • 铸件材料



d1 mm	d2 h6 mm	l1 mm	l2 mm	d1 mm	d2 h6 mm	l1 mm	l2 mm
1,400	4,000	62,000	25,000	2,600	4,000	87,000	47,000
1,500	4,000	62,000	27,000	2,700	4,000	87,000	48,000
1,600	4,000	62,000	29,000	2,800	4,000	87,000	50,000
1,700	4,000	70,000	31,000	2,900	4,000	87,000	52,000
1,800	4,000	70,000	32,000	3,000	4,000	87,000	54,000
1,900	4,000	70,000	34,000				
2,000	4,000	70,000	36,000				
2,100	4,000	78,000	38,000				
2,200	4,000	78,000	40,000				
2,300	4,000	78,000	42,000				
2,400	4,000	78,000	44,000				
2,500	4,000	78,000	45,000				





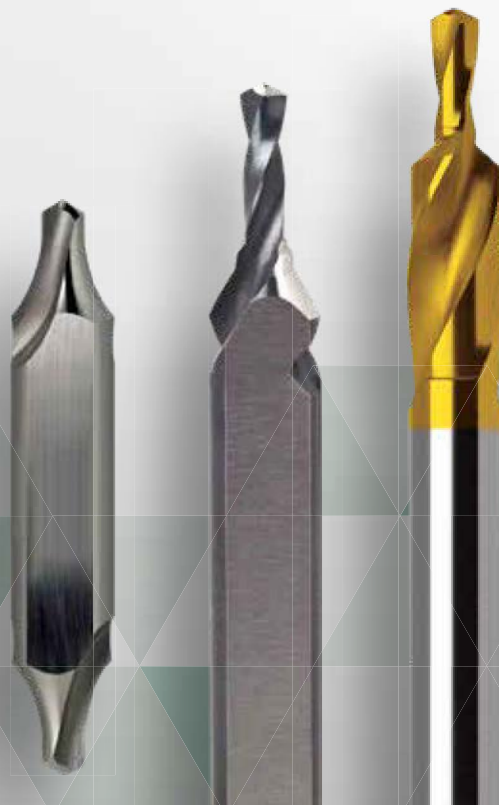
# HARTNER

Precision Cutting Tools

## 阶梯钻 / 中心钻

短阶梯钻 阶梯钻 HSS高速钢和硬质合金材料,  
有直柄和锥柄 中心钻

高速钢HSS 和含钴高速钢HSSE,以及硬质合金  
表面有光亮的,也有带涂层的



阶梯钻  
中心钻

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	哈特纳标准	d1/mm	产品代号	页码
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## 依照DIN332标准的中心阶梯钻

	● ○ ● ● ○	哈特纳标准	N	HSS	○	右手	圆柱形	90	8,000 - 40,000	85910	345
	● ○ ● ● ○	哈特纳标准	N	HSS	○	右手	圆柱形	90	8,000 - 40,000	85911	345
	● ○ ● ● ○	哈特纳标准	N	HSS	○	右手	圆柱形	90	8,000 - 20,000	85912	346
	● ○ ● ● ●	哈特纳标准	N	HSS	○	右手	MK	90	14,000 - 40,000	85914	347

## 直柄短款阶梯钻

	● ○ ● ● ○	哈特纳标准	N	HSS	ⓧ	右手	圆柱形	90	3,400 - 13,500	84445	348
	● ○ ● ● ●	哈特纳标准	N	HSS	○	右手	圆柱形	90	6,000 - 19,000	85916	349
	● ○ ● ● ●	哈特纳标准	N	HSS	○	右手	圆柱形	90	6,600 - 21,500	85917	350
	● ○ ● ● ●	哈特纳标准	N	HSS	○	右手	圆柱形	180	6,000 - 18,000	85918	351
	● ○ ● ● ●	哈特纳标准	N	HSS	○	右手	圆柱形	90	3,400 - 13,500	85920	352
	○ ○ ○ ● ○	哈特纳标准	N	整硬	○	右手	HE	90	5,500 - 9,000	89254	353

## 直柄阶梯钻

	● ○ ● ○ ○	DIN 8374	N	HSS	○	右手	圆柱形	90	6,000 - 19,000	85010	354
	● ○ ● ○ ○	DIN 8374	N	HSS	○	右手	圆柱形	90	7,500 - 19,000	85218	355

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	哈特纳标准	d1/mm	产品代号	页码
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### 直柄阶梯钻

	•	○	•	○		DIN 8376	N	HSS	●	右手	圆柱形	180	6,000 - 18,000	85210	356
	•	○	•	○		DIN 8378	N	HSS	●	右手	圆柱形	90	3,400 - 13,500	85310	357
	•	○	•	○		哈特纳标准	N	HSS	●	右手	圆柱形	90	6,600 - 17,200	85110	358
	•	○	•	○		哈特纳标准	N	HSS	●	右手	圆柱形	180	5,900 - 16,500	85216	359
	○	○	○	○	•		N	整硬	○	右手	圆柱形	180	6,000 - 11,000	89252	360

### 锥柄阶梯钻

	•	○	•	○		DIN 8375	N	HSS	●	右手	MK	90	12,000 - 23,000	85619	361
	•	○	•	○		DIN 8377	N	HSS	●	右手	MK	180	10,000 - 33,000	85610	362
	•	○	•	○		DIN 8379	N	HSS	●	右手	MK	90	9,000 - 22,000	85710	363
	•	○	•	○		哈特纳标准	N	HSS	●	右手	MK	90	11,000 - 26,000	85510	364
	•	○	•	○		哈特纳标准	N	HSS	●	右手	MK	180	9,400 - 33,000	85616	365

### 不带侧平面中心钻

	•	○	•	○		DIN 333	N	HSS	○	右手	圆柱形	A	0,500 - 12,500	83100	366
	•	○	•	○		DIN 333	N	HSS	Ⓧ	右手	圆柱形	A	0,500 - 12,500	84450	366

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	哈特纳标准	d1/mm	产品代号	页码
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## 不带侧平面中心钻

	• ○ • • ○	DIN 333	N	HSS	○	左手	圆柱形	A	0,500 - 4,000	83105	367
	• ○ • • ○	DIN 333	N	HSS	○	右手	圆柱形	R	0,500 - 10,000	83000	368
	• ○ • • ○	DIN 333	N	HSS	Ⓜ	右手	圆柱形	R	0,500 - 10,000	84448	368
	• ○ • • ○	DIN 333	N	HSS	○	右手	圆柱形	A	1,000 - 10,000	83300	369
	• ○ • • ○	DIN 333	N	HSS	○	右手	圆柱形	B	1,000 - 10,000	83200	370
	• ○ • • ○	DIN 333	N	HSS	○	左手	圆柱形	R	1,000 - 4,000	83005	371
	• ○ • • ○	哈特纳标准	N	HSS	○	右手	圆柱形	A	1,000 - 3,150	83110	372
	• • • • ○	DIN 333	N	HSS-E	○	右手	圆柱形	A	1,000 - 4,000	83101	373
	• • • ○ •	DIN 333	N	HSS-E	Ⓜ	右手	圆柱形	A	0,500 - 4,000	83102	374
	○ ○ ○ ○ ○	哈特纳标准	N	整硬	○	右手	圆柱形	A	0,500 - 6,300	83370	375

## 带侧平面中心钻

	• ○ • • ○	DIN 333	N	HSS	○	右手	圆柱形	A	1,600 - 10,000	83600	376
	• ○ • • ○	DIN 333	N	HSS	○	右手	圆柱形	R	1,600 - 10,000	83500	376
	• ○ • • ○	DIN 333	N	HSS	○	右手	圆柱形	B	1,600 - 8,000	83700	377





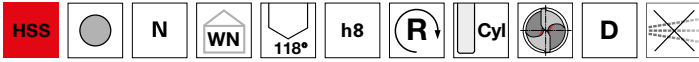
# HARTNER

## 依照DIN332标准的中心阶梯钻

产品代号 85910



P	M	K	N	S	H
●	○	●	●	○	

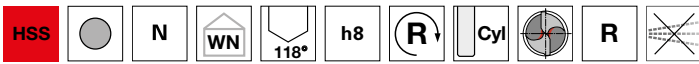


芯厚 ≥ Ø 8,000 • 圆弧后刀面 • 柄部带侧平面 • 60° 阶梯 • DIN 332标准, 表2,D型 • 适用于定点打孔/定长的机床

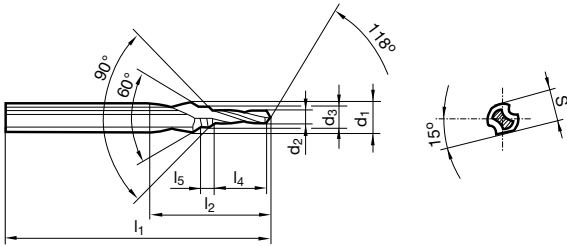
产品代号 85911



P	M	K	N	S	H
●	○	●	●	○	



芯厚 ≥ Ø 8,000 • 圆弧后刀面 • 柄部带侧平面 • 60° 阶梯 • DIN 332标准, 表2,DR型 • 适用于定点打孔/定长的机床



d1 h7 mm	d3 h11 mm	d2 h8 mm	S mm	l1 mm	l2 mm	l4 mm	l5 mm	攻丝
8,000	4,300	3,300	6,750	63,000	23,000	1,600	11,000	M 4
10,000	5,300	4,200	8,450	67,000	27,000	2,150	13,000	M 5
12,500	6,400	5,000	10,450	71,000	33,000	2,900	16,000	M 6
14,000	8,400	6,800	12,500	88,000	41,000	3,500	19,500	M 8
16,000	10,500	8,500	14,850	94,000	47,000	4,700	23,000	M10
20,000	13,000	10,200	18,450	105,000	59,000	6,500	28,000	M12
25,000	17,000	14,000	23,400	132,000	67,000	8,300	33,000	M16
31,500	21,000	17,500	29,350	145,000	76,500	10,350	38,000	M20
40,000	25,000	21,000	36,500	160,000	90,000	12,000	45,000	M24



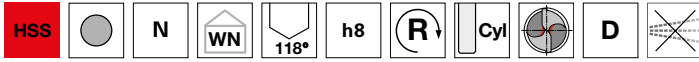
# HARTNER

## 依照DIN332标准的中心阶梯钻

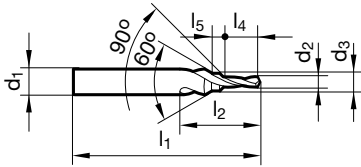
产品代号 85912



P	M	K	N	S	H
•	○	•	•		



芯厚 ≥ Ø 8,000 • 圆弧后刀面 • 60° 阶梯 • DIN 332标准, 表2,D型



d1 h7 mm	d3 h11 mm	d2 h8 mm	l1 mm	l2 mm	l4 mm	l5 mm	攻丝
8,000	4,300	3,300	63,000	23,000	11,000	1,600	M 4
10,000	5,300	4,200	67,000	27,000	13,000	2,150	M 5
12,500	6,400	5,000	71,000	33,000	16,000	2,900	M 6
14,000	8,400	6,800	88,000	41,000	19,500	3,500	M 8
16,000	10,500	8,500	94,000	47,000	23,000	4,700	M10
20,000	13,000	10,200	105,000	59,000	28,000	6,500	M12



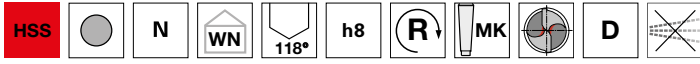
# HARTNER

## 依照DIN332标准的中心阶梯钻

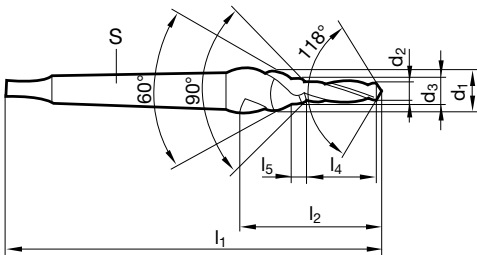
产品代号 85914



P	M	K	N	S	H
•	○	•	•	•	



芯厚 ≥ Ø 14,000 • 圆弧后刀面 • 60° 阶梯 • DIN 332标准, 表2,D型



d1 h7 mm	d3 h11 mm	d2 h8 mm	S	l1 mm	l2 mm	l4 mm	l5 mm	攻丝
14,000	8,400	6,800	MK-1	110,000	41,000	3,500	19,500	M 8
16,000	10,500	8,500	MK-2	131,000	47,000	4,700	23,000	M10
20,000	13,000	10,200	MK-2	145,000	59,000	6,500	28,000	M12
25,000	17,000	14,000	MK-3	172,000	67,000	8,300	33,000	M16
31,500	21,000	17,500	MK-3	184,000	76,500	10,350	38,000	M20
40,000	25,000	21,000	MK-4	222,000	90,000	12,000	45,000	M24



# HARTNER

## 直柄短款阶梯钻

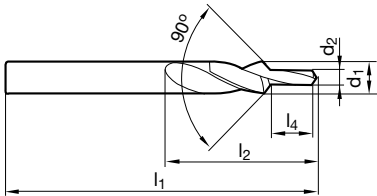
产品代号 84445



P	M	K	N	S	H
•	○	•	•		



芯厚  $\geq \varnothing 3,400$  • 圆弧后刀面 • 具有很高的抗扭稳定性 • 适合在数控机床和加工中心上使用 • 用于DIN336标准的螺纹底孔 • 铈倒角 $90^\circ$   
 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h6 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
3,400	2,500	52,000	20,000	8,800	M 3
6,600	5,000	70,000	31,000	16,500	M 6
9,000	6,800	84,000	40,000	21,000	M 8
11,000	8,500	95,000	47,000	25,500	M10
13,500	10,200	107,000	54,000	30,000	M12



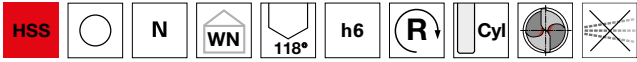
# HARTNER

## 直柄短款阶梯钻

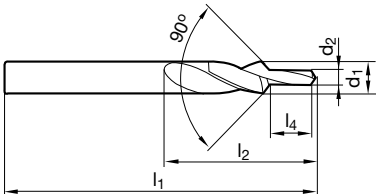
产品代号 85916



P	M	K	N	S	H
•	○	•	•	•	



芯厚  $\geq \varnothing 6,000$  • 圆弧后刀面 • 具有很高的抗扭稳定性 • 适合在数控机床和加工中心上使用 • 根据 DIN EN 20273, 精加工系列 • 加工 90° 螺纹沉孔 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h6 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
6,000	3,200	66,000	28,000	9,000	M 3
8,000	4,300	79,000	37,000	11,000	M 4
10,000	5,300	89,000	43,000	13,000	M 5
11,500	6,400	95,000	47,000	15,000	M 6
15,000	8,400	111,000	56,000	19,000	M 8
19,000	10,500	127,000	64,000	23,000	M10



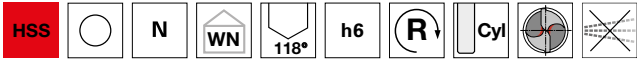
# HARTNER

## 直柄短款阶梯钻

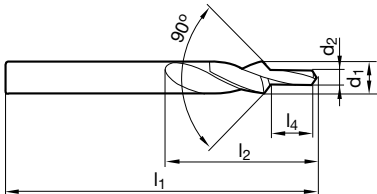
产品代号 85917



P	M	K	N	S	H
•	○	•	•	•	



芯厚  $\geq \varnothing 6,600$  • 圆弧后刀面 • 具有很高的抗扭稳定性 • 适合在数控机床和加工中心上使用 • 用于通孔 DIN EN 20273 系列 中 • 用于 90° 螺钉头沉孔基于 DIN74, formA • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h6 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
6,600	3,400	70,000	31,000	9,000	M 3
9,000	4,500	84,000	40,000	11,000	M 4
11,000	5,500	95,000	47,000	13,000	M 5
13,000	6,600	102,000	51,000	15,000	M 6
17,200	9,000	123,000	62,000	19,000	M 8
21,500	11,000	141,000	70,000	23,000	M10



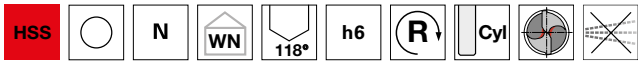
# HARTNER

## 直柄短款阶梯钻

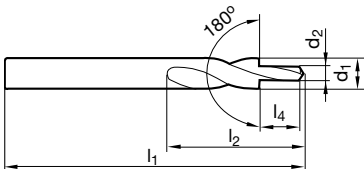
产品代号 85918



P	M	K	N	S	H
•	○	•	•	•	



芯厚  $\geq \varnothing 6,000$  • 圆弧后刀面 • 具有很高的抗扭稳定性 • 适合在数控机床和加工中心上使用 • 用于通孔 DIN EN 20273 系列 中 • 加工 180° 螺纹沉孔 • DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 标准 • 每转进给的选用依据小径 • 切削速度  $V_c$  的选用依据直径



d1 h6 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
6,000	3,400	66,000	28,000	9,000	M 3
8,000	4,500	79,000	37,000	11,000	M 4
10,000	5,500	89,000	43,000	13,000	M 5
11,000	6,600	95,000	47,000	15,000	M 6
15,000	9,000	111,000	56,000	19,000	M 8
18,000	11,000	123,000	62,000	23,000	M10



# HARTNER

## 直柄短款阶梯钻

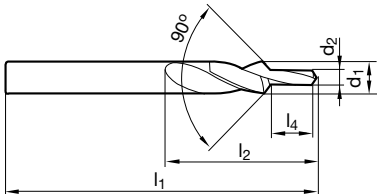
产品代号 85920



P	M	K	N	S	H
•	○	•	•	•	



芯厚  $\geq \varnothing 3,400$  • 圆弧后刀面 • 具有很高的抗扭稳定性 • 适合在数控机床和加工中心上使用 • 用于DIN336标准的螺纹底孔 • 镗倒角 $90^\circ$   
 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h6 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
3,400	2,500	52,000	20,000	8,800	M 3
4,500	3,300	58,000	24,000	11,400	M 4
5,500	4,200	66,000	28,000	13,600	M 5
6,600	5,000	70,000	31,000	16,500	M 6
9,000	6,800	84,000	40,000	21,000	M 8
11,000	8,500	95,000	47,000	25,500	M10
13,500	10,200	107,000	54,000	30,000	M12





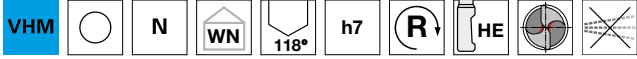
# HARTNER

## 直柄短款阶梯钻

产品代号 89254

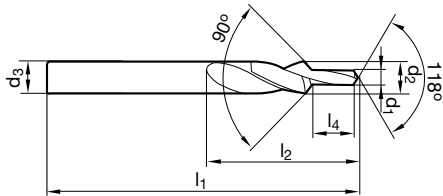


P	M	K	N	S	H
○	○	○	●	○	○



芯厚  $\geq \varnothing 3,400$  • 双后刀面 • 具有很高的抗扭稳定性 • 适合在数控机床和加工中心上使用 • 用于DIN336标准的螺纹底孔 • 铰倒角 $90^\circ$  • 每转进给 $f$ 的选用依据小径 • 切削速度 $V_c$ 的选用依据直径

适于加工: 铸铁, 灰铸铁, 冷硬铸铁 • 硬锰钢, 青铜 • 轻金属和有色金属 • 研磨性材料(如硅铝合金) • 纤维增强塑料 • 加工热固性塑料在切削刃和刃带上易磨损



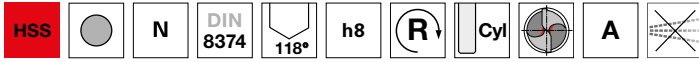
d1 h7 mm	d2 h9 mm	d3 mm	l1 mm	l2 mm	l4 mm	攻丝
5,500	4,200	6,000	66,000	28,000	13,600	M 5
6,600	5,000	8,000	70,000	31,000	16,500	M 6
9,000	6,800	10,000	84,000	40,000	21,000	M 8

## 直柄阶梯钻

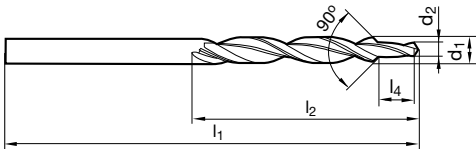
产品代号 85010



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 6,000$  • 圆弧后刀面 • 根据 DIN EN 20273, 精加工系列 • 加工  $90^\circ$  螺纹沉孔 • 每转进给的选用依据小径 • 切削速度  $V_c$  的选用依据直径



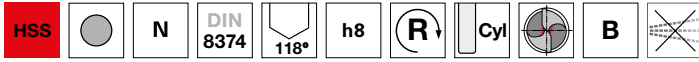
d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
6,000	3,200	93,000	57,000	9,000	M 3
8,000	4,300	117,000	75,000	11,000	M 4
10,000	5,300	133,000	87,000	13,000	M 5
11,500	6,400	142,000	94,000	15,000	M 6
15,000	8,400	169,000	114,000	19,000	M 8
19,000	10,500	198,000	135,000	23,000	M10

## 直柄阶梯钻

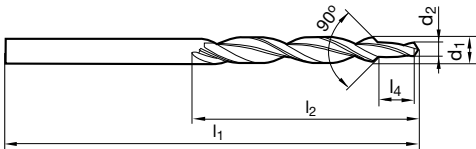
产品代号 85218



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 7,500$  • 圆弧后刀面 • 用于通孔 DIN EN 20273 系列 中 • 用于90°螺栓头沉孔, DIN74 里Form A和F • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



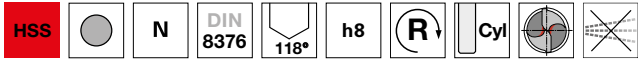
d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
7,500	3,400	109,000	69,000	9,000	M 3
9,700	4,500	133,000	87,000	11,000	M 4
12,000	5,500	151,000	101,000	13,000	M 5
14,500	6,600	169,000	114,000	15,000	M 6
19,000	9,000	198,000	135,000	19,000	M 8

## 直柄阶梯钻

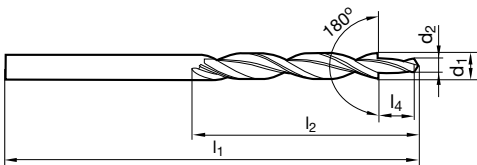
产品代号 85210



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 6,000$  • 圆弧后刀面 • 用于通孔 DIN EN 20273 系列 中 • 加工180°螺纹沉孔 • 根据DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 and DIN 7513, 7516, 7500-1 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
6,000	3,400	93,000	57,000	9,000	M 3
8,000	4,500	117,000	75,000	11,000	M 4
10,000	5,500	133,000	87,000	13,000	M 5
11,000	6,600	142,000	94,000	15,000	M 6
15,000	9,000	169,000	114,000	19,000	M 8
18,000	11,000	191,000	130,000	23,000	M10

## 直柄阶梯钻

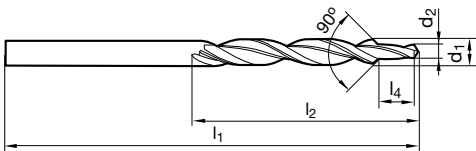
产品代号 85310



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 3,400$  • 圆弧后刀面 • 用于DIN336标准的螺纹底孔 • 铰倒角 $90^\circ$  • 每转进给的选用依据小径 • 切削速度 $V_c$ 的选用依据直径



d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
3,400	2,500	70,000	39,000	8,800	M 3
4,500	3,300	80,000	47,000	11,400	M 4
5,500	4,200	93,000	57,000	13,600	M 5
6,600	5,000	101,000	63,000	16,500	M 6
9,000	6,800	125,000	81,000	21,000	M 8
11,000	8,500	142,000	94,000	25,500	M10
13,500	10,200	160,000	108,000	30,000	M12

## 直柄阶梯钻

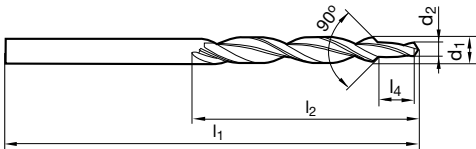
产品代号 85110



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 6,600$  • 圆弧后刀面 • 用于通孔 DIN EN 20273 系列 中 • 用于90°螺柱头沉孔, DIN74 第一节 (版本 12.1980) • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
6,600	3,400	101,000	63,000	9,000	M 3
9,000	4,500	125,000	81,000	11,000	M 4
11,000	5,500	142,000	94,000	13,000	M 5
13,000	6,600	151,000	101,000	15,000	M 6
17,200	9,000	191,000	130,000	19,000	M 8

## 直柄阶梯钻

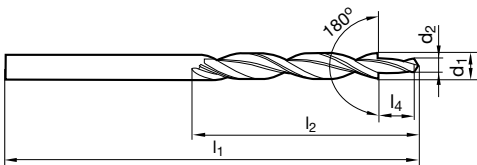
产品代号 85216



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 5,900$  • 圆弧后刀面 • 根据DIN 75第2部分 (1968.04版本) 用于加工通孔的老款形式的扩孔钻 Form H、J、K, 设计款有普通的和精细的 • 加工螺纹底孔 DIN 84, 912, 6712标准 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



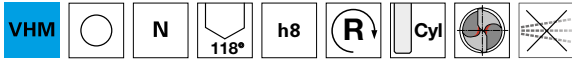
d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
5,900	3,200	93,000	57,000	11,000	M 3
7,400	4,300	109,000	69,000	13,000	M 4
9,400	5,300	125,000	81,000	16,000	M 5
10,000	5,800	133,000	87,000	16,000	M 5
10,400	6,400	133,000	87,000	19,000	M 6
11,000	7,000	142,000	94,000	19,000	M 6
13,500	8,400	160,000	108,000	22,000	M 8
16,500	10,500	184,000	125,000	25,000	M10

## 直柄阶梯钻

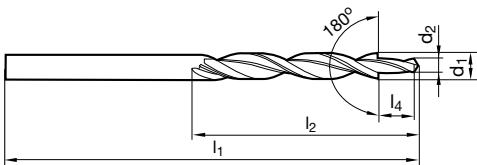
产品代号 89252



P	M	K	N	S	H
○	○	○	○	●	○



芯厚  $\geq \varnothing 8,000$  • 圆弧后刀面 • 用于通孔 DIN EN 20273 系列 中 • 加工180°螺纹沉孔 • 根据DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 and DIN 7513, 7516, 7500-1 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h8 mm	d2 h9 mm	l1 mm	l2 mm	l4 mm	攻丝
6,000	3,400	93,000	57,000	9,000	M 3
10,000	5,500	133,000	87,000	13,000	M 5
11,000	6,600	142,000	94,000	15,000	M 6

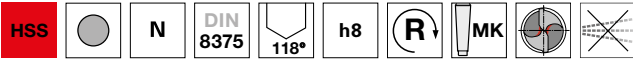


## 锥柄阶梯钻

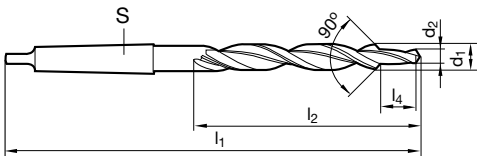
产品代号 85619



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 12,000$  • 圆弧后刀面 • 根据 DIN EN 20273, 精加工系列 • 用于90°螺栓头沉孔, DIN74 里Form A和F • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



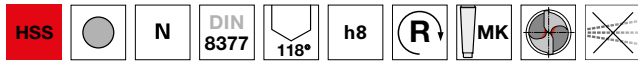
d1 h8 mm	d2 h9 mm	S	l1 mm	l2 mm	l4 mm	攻丝
12,000	5,500	MK-1	182,000	101,000	13,000	M 5
14,500	6,600	MK-2	212,000	114,000	15,000	M 6
19,000	9,000	MK-2	233,000	135,000	19,000	M 8
23,000	11,000	MK-2	253,000	155,000	23,000	M10

## 锥柄阶梯钻

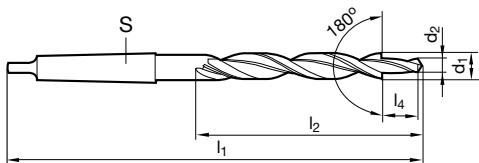
产品代号 85610



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 10,000$  • 圆弧后刀面 • 用于通孔 DIN EN 20273 系列 中 • 加工180°螺纹沉孔 • 根据DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 and DIN 7513, 7516, 7500-1 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h8 mm	d2 h9 mm	S	l1 mm	l2 mm	l4 mm	攻丝
10,000	5,500	MK-1	168,000	87,000	13,000	M 5
11,000	6,600	MK-1	175,000	94,000	15,000	M 6
15,000	9,000	MK-2	212,000	114,000	19,000	M 8
18,000	11,000	MK-2	228,000	130,000	23,000	M10
20,000	13,500	MK-2	238,000	140,000	27,000	M12
24,000	15,500	MK-3	281,000	160,000	31,000	M14
26,000	17,500	MK-3	286,000	165,000	35,000	M16
30,000	20,000	MK-3	296,000	175,000	39,000	M18
33,000	22,000	MK-4	334,000	185,000	43,000	M20

## 锥柄阶梯钻

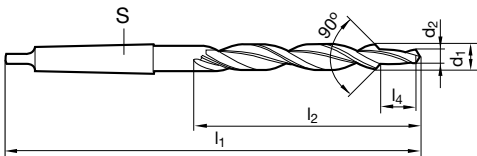
产品代号 85710



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 9,000$  • 圆弧后刀面 • 用于DIN336标准的螺纹底孔 • 铰倒角 $90^\circ$  • 每转进给*f*的选用依据小径 • 切削速度*V<sub>c</sub>*的选用依据直径



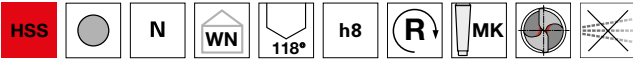
d1 h8 mm	d2 h9 mm	S	l1 mm	l2 mm	l4 mm	攻丝
9,000	6,800	MK-1	162,000	81,000	21,000	M 8
11,000	8,500	MK-1	175,000	94,000	25,500	M10
13,500	10,200	MK-1	189,000	108,000	30,000	M12
15,500	12,000	MK-2	218,000	120,000	34,500	M14
17,500	14,000	MK-2	228,000	130,000	38,500	M16
20,000	15,500	MK-2	238,000	140,000	43,500	M18
22,000	17,500	MK-2	248,000	150,000	47,500	M20

## 锥柄阶梯钻

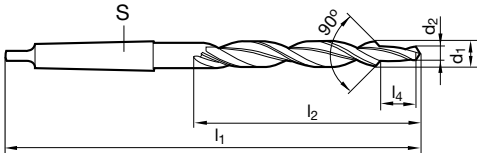
产品代号 85510



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 11,000$  • 圆弧后刀面 • 用于通孔 DIN EN 20273 系列 中 • 用于90°螺栓头沉孔, DIN74 第一节 (版本 12.1980) • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h8 mm	d2 h9 mm	S	l1 mm	l2 mm	l4 mm	攻丝
11,000	5,500	MK-1	175,000	94,000	13,000	M 5
13,000	6,600	MK-1	182,000	101,000	15,000	M 6
17,200	9,000	MK-2	228,000	130,000	19,000	M 8
21,500	11,000	MK-2	248,000	150,000	23,000	M10
26,000	14,000	MK-3	286,000	165,000	27,000	M12

## 锥柄阶梯钻

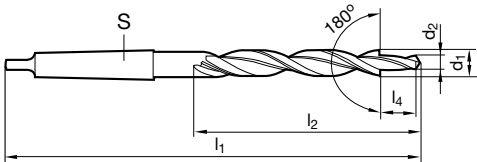
产品代号 85616



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 9,400$  • 圆弧后刀面 • 根据DIN 75第2部分 (1968.04版本) 用于加工通孔的老款形式的扩孔钻 Form H、J、K, 设计款有普通的和精细的 • 加工螺纹底孔 DIN 84, 912, 6712标准 • 每转进给的选用依据小径 • 切削速度Vc的选用依据直径



d1 h8 mm	d2 h9 mm	S	l1 mm	l2 mm	l4 mm	攻丝
9,400	5,300	MK-1	162,000	81,000	16,000	M 5
14,500	9,500	MK-2	212,000	114,000	22,000	M 8
19,000	13,000	MK-2	233,000	135,000	28,000	M12
20,000	14,000	MK-2	238,000	140,000	28,000	M12
23,000	15,000	MK-2	253,000	155,000	30,000	M14
25,000	17,000	MK-3	281,000	160,000	33,000	M16
28,000	19,000	MK-3	291,000	170,000	36,000	M18
29,000	20,000	MK-3	296,000	175,000	36,000	M18
31,000	21,000	MK-3	301,000	180,000	39,000	M20
33,000	23,000	MK-4	334,000	185,000	39,000	M20



# HARTNER

## 不带侧平面中心钻

产品代号 83100



P	M	K	N	S	H
•	○	•	•	○	



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • 无护锥 • DIN 332标准, 表1,A型 • d 1 ≤ 0,8 mm:单头

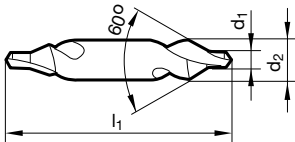
产品代号 84450



P	M	K	N	S	H
•	○	•	•	○	



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • 无护锥 • DIN 332标准, 表1,A型 • d 1 ≤ 0,8 mm:单头 • 耐磨损 高强度



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
0,500	3,150	25,000	10,000	25,000	100,000
0,800	3,150	25,000	12,500	31,500	125,000
1,000	3,150	31,500			
1,250	3,150	31,500			
1,600	4,000	35,500			
2,000	5,000	40,000			
2,500	6,300	45,000			
3,150	8,000	50,000			
4,000	10,000	56,000			
5,000	12,500	63,000			
6,300	16,000	71,000			
8,000	20,000	80,000			



# HARTNER

## 不带侧平面中心钻

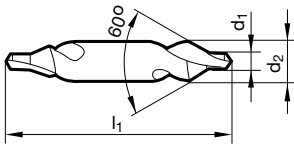
产品代号 83105



P	M	K	N	S	H
•	○	•	•	○	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 无护锥 • DIN 332标准, 表1,A型 •  $d_1 \leq 0,8$  mm:单头



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
0,500	3,150	25,000	2,500	6,300	45,000
0,800	3,150	25,000	3,150	8,000	50,000
1,000	3,150	31,500	4,000	10,000	56,000
1,250	3,150	31,500			
1,600	4,000	35,500			
2,000	5,000	40,000			



# HARTNER

## 不带侧平面中心钻

产品代号 83000



P	M	K	N	S	H
●	○	●	●	○	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 车床对准中心时纠偏 • 根据DIN 332 第一部分 Form R 用于中心孔 •  $d_1 \leq 0,8$  mm:单头

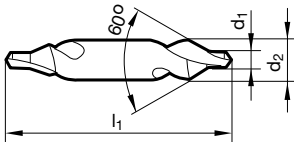
产品代号 84448



P	M	K	N	S	H
●	○	●	●	○	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 车床对准中心时纠偏 • 根据DIN 332 第一部分 Form R 用于中心孔 •  $d_1 \leq 0,8$  mm:单头 • 耐磨损 高强度



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
0,500	3,150	25,000	10,000	25,000	100,000
0,800	3,150	25,000			
1,000	3,150	31,500			
1,250	3,150	31,500			
1,600	4,000	35,500			
2,000	5,000	40,000			
2,500	6,300	45,000			
3,150	8,000	50,000			
4,000	10,000	56,000			
5,000	12,500	63,000			
6,300	16,000	71,000			
8,000	20,000	80,000			





# HARTNER

## 不带侧平面中心钻

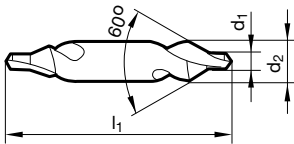
产品代号 83300



P	M	K	N	S	H
•	○	•	•	○	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 加粗部分为了更高的抗断强度 • 无护锥 • 孔与铤交界处开槽为了给冷却润滑液提供额外的空间 • DIN 332标准, 表1,A型



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
1,000	3,150	31,500	4,000	10,000	56,000
1,250	3,150	31,500	5,000	12,500	63,000
1,600	4,000	35,500	6,300	16,000	71,000
2,000	5,000	40,000	8,000	20,000	80,000
2,500	6,300	45,000	10,000	25,000	100,000
3,150	8,000	50,000			



# HARTNER

## 不带侧平面中心钻

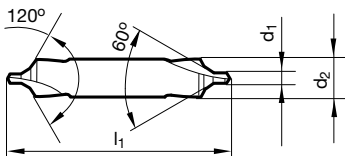
产品代号 83200



P	M	K	N	S	H
•	○	•	•	○	



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • DIN 332标准, 表1,B型 • 120°护锥



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
1,000	4,000	35,500	4,000	14,000	67,000
1,250	5,000	40,000	5,000	18,000	75,000
1,600	6,300	45,000	6,300	20,000	80,000
2,000	8,000	50,000	8,000	25,000	100,000
2,500	10,000	56,000	10,000	31,500	125,000
3,150	11,200	60,000			



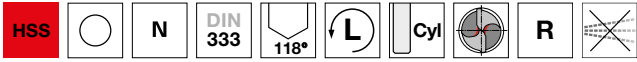
# HARTNER

## 不带侧平面中心钻

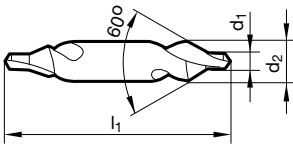
产品代号 83005



P	M	K	N	S	H
•	○	•	•	○	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 车床对准中心时纠偏 • 根据DIN 332 第一部分 Form R 用于中心孔 •  $d_1 \leq 0,8$  mm:单头



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
1,000	3,150	31,500			
1,250	3,150	31,500			
1,600	4,000	35,500			
2,000	5,000	40,000			
3,150	8,000	50,000			
4,000	10,000	56,000			



# HARTNER

## 不带侧平面中心钻

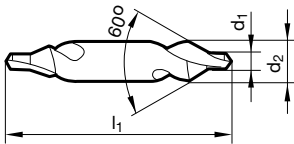
产品代号 83110



P	M	K	N	S	H
•	○	•	•	○	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 超长中心钻 • 无护锥 • 用于中心孔基于DIN332, 表格1, form A • 适合深孔定位



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
1,000	4,000	120,000			
1,600	5,000	120,000			
2,000	6,000	120,000			
2,500	8,000	120,000			
3,150	10,000	120,000			



# HARTNER

## 不带侧平面中心钻

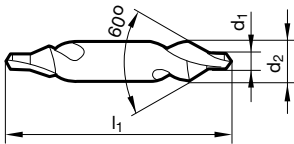
产品代号 83101



P	M	K	N	S	H
•	•	•	•	○	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 无护锥 • 耐磨损 高强度 • DIN 332标准, 表1,A型  
强度超过 $800\text{N}/\text{mm}^2$  的材料 • 不锈钢/耐酸/耐热 CrNi 钢



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
1,000	3,150	31,500			
1,600	4,000	35,500			
2,000	5,000	40,000			
2,500	6,300	45,000			
3,150	8,000	50,000			
4,000	10,000	56,000			



# HARTNER

## 不带侧平面中心钻

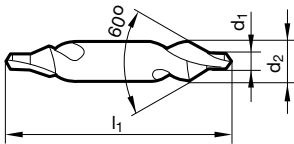
产品代号 83102



P	M	K	N	S	H
•	•	•	○	•	



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 无护锥 • DIN 332标准, 表1,A型 •  $d_1 \leq 0,8$  mm:单头



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
0,500	3,150	25,000	3,150	8,000	50,000
1,000	3,150	31,500	4,000	10,000	56,000
1,250	3,150	31,500			
1,600	4,000	35,500			
2,000	5,000	40,000			
2,500	6,300	45,000			



# HARTNER

## 不带侧平面中心钻

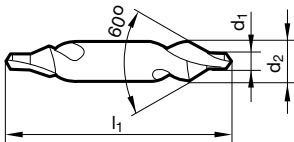
产品代号 83370



P	M	K	N	S	H
○	○	○	○	○	○



芯厚  $\geq \varnothing 2,000$  • 圆弧后刀面 • 无护锥 • DIN 332标准, 表1,A型 •  $d_1 \leq 0,8$  mm:单头  
 万能材料适宜



d1 mm	d2 h8 mm	l1 mm	d1 mm	d2 h8 mm	l1 mm
0,500	3,150	25,000	2,500	6,300	45,000
0,800	3,150	25,000	3,150	8,000	50,000
1,000	3,150	31,500	4,000	10,000	56,000
1,250	3,150	31,500	5,000	12,500	63,000
1,600	4,000	35,500	6,300	16,000	71,000
2,000	5,000	40,000			



# HARTNER

## 带侧平面中心钻

产品代号 83600



P	M	K	N	S	H
●	○	●	●	○	



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • DIN 332标准, 表1,A型 • 无护锥

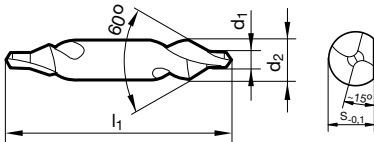
产品代号 83500



P	M	K	N	S	H
●	○	●	●	○	



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • 车床对准中心时纠偏 • 根据DIN 332 第一部分 Form R 用于中心孔



d1 mm	d2 h8 mm	l1 mm	S mm	d1 mm	d2 h8 mm	l1 mm	S mm
1,600	4,000	35,500	3,250	6,300	16,000	71,000	14,000
2,000	5,000	40,000	4,200	8,000	20,000	80,000	17,900
2,500	6,300	45,000	5,350	10,000	25,000	100,000	22,500
3,150	8,000	50,000	6,950				
4,000	10,000	56,000	8,400				
5,000	12,500	63,000	10,950				





# HARTNER

## 带侧平面中心钻

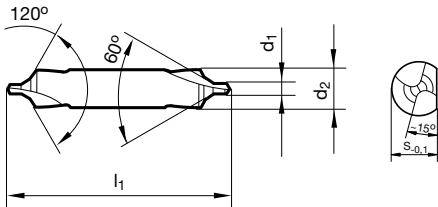
产品代号 83700



P	M	K	N	S	H
•	○	•	•	○	



芯厚 ≥ Ø 2,000 • 圆弧后刀面 • DIN 332标准, 表1,B型 • 120°护锥



d1 mm	d2 h8 mm	l1 mm	S mm	d1 mm	d2 h8 mm	l1 mm	S mm
1,600	6,300	45,000	5,350	6,300	20,000	80,000	17,900
2,000	8,000	50,000	6,950	8,000	25,000	100,000	22,500
2,500	10,000	56,000	8,400				
3,150	11,200	60,000	10,000				
4,000	14,000	67,000	12,650				
5,000	18,000	75,000	16,400				



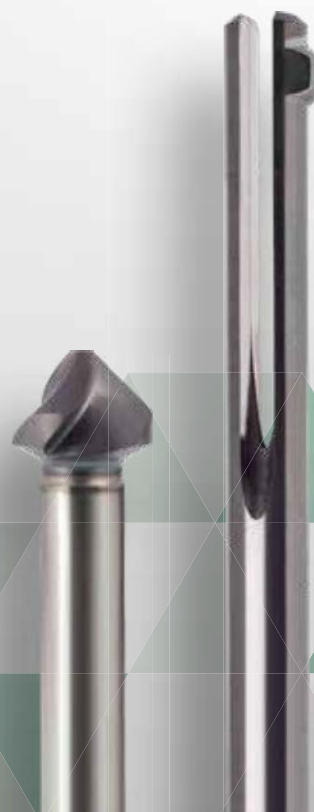


# HARTNER

Precision Cutting Tools

## 镗刀 & 去毛刺刀

HSS, HSS-E, 硬质合金  
抛光处理和涂层



镗刀 &  
去毛刺刀

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	哈特纳标准	d1/mm	产品代号	页码
---	---	---	---	---	---	----	----	------	------	------	------	-------	-------	------	----

### 90° 铰钻



•	○	•	•	○		DIN 335		HSS	○	右手	圆柱形	C	4,300 - 31,000	88200	382
---	---	---	---	---	--	---------	--	-----	---	----	-----	---	----------------	-------	-----

### 90° 螺旋槽铰刀



•	•	•	○	○		DIN 335		HSS-E	Ⓐ	右手	圆柱形	C	6,300 - 31,000	88201	383
---	---	---	---	---	--	---------	--	-------	---	----	-----	---	----------------	-------	-----

### 90° 铰钻



•	○	•	•	○		DIN 335		HSS	○	右手	圆柱形	C		88021	384
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### 90° 螺旋槽铰刀套装



•	•	•	○	○		DIN 335		HSS-E	Ⓐ	右手	圆柱形	C		88022	385
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	柄部形式	哈特纳标准	d1/mm	产品代号	页码
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## 叉形去毛刺刀



•	•	•	○	•	○	哈特纳标准	TS 100 EG	整硬	○	右手	圆柱形			84100	386
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•	•	•	○	•	○	哈特纳标准	TS 100 EG	整硬	○	右手	HA			84101	387
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## 前/后去毛刺 90°



•	•	•	○	•	○	哈特纳标准	TS 100 VR	整硬	Ⓜ	右手	~HA	3,000 - 12,000	80495	388
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# HARTNER

## 90° 铰钻

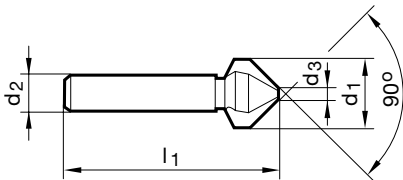
产品代号 88200



P	M	K	N	S	H
●	○	●	●	○	



圆弧后刀面修磨 • 三刃



d1 mm	d2 h9 mm	d3 mm	l1 mm	Z	代号
4,300	4,000	1,300	40,000	3	4,300
5,000	4,000	1,500	40,000	3	5,000
5,300	4,000	1,500	40,000	3	5,300
5,800	5,000	1,500	45,000	3	5,800
6,000	5,000	1,500	45,000	3	6,000
6,300	5,000	1,500	45,000	3	6,300
7,000	6,000	1,800	50,000	3	7,000
7,300	6,000	1,800	50,000	3	7,300
8,000	6,000	2,000	50,000	3	8,000
8,300	6,000	2,000	50,000	3	8,300
9,400	6,000	2,200	50,000	3	9,400
10,000	6,000	2,500	50,000	3	10,000
10,400	6,000	2,500	50,000	3	10,400
11,500	8,000	2,800	56,000	3	11,500
12,400	8,000	2,800	56,000	3	12,400
13,400	8,000	2,900	56,000	3	13,400
15,000	10,000	3,200	60,000	3	15,000
16,500	10,000	3,200	60,000	3	16,500
19,000	10,000	3,500	63,000	3	19,000
20,500	10,000	3,500	63,000	3	20,500
23,000	10,000	3,800	67,000	3	23,000
25,000	10,000	3,800	67,000	3	25,000
26,000	10,000	3,800	67,000	3	26,000
28,000	12,000	4,000	71,000	3	28,000
30,000	12,000	4,200	71,000	3	30,000
31,000	12,000	4,200	71,000	3	31,000

## 90° 铰钻

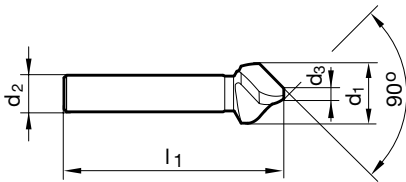
产品代号 88201



P	M	K	N	S	H
•	•	•	○	○	



3个不同的凸型切削刃 • 低震动切削过程 • 提供圆周无震颤铰孔 • 相当低的进给力需求 • 普遍适用



d1 mm	d2 h9 mm	d3 mm	l1 mm	Z	代号
6,300	5,000	1,500	45,000	3	6,300
8,000	6,000	2,000	50,000	3	8,000
8,300	6,000	2,000	50,000	3	8,300
10,000	6,000	2,500	50,000	3	10,000
10,400	6,000	2,500	50,000	3	10,400
11,500	8,000	2,800	56,000	3	11,500
12,400	8,000	2,800	56,000	3	12,400
15,000	10,000	3,200	60,000	3	15,000
16,500	10,000	3,200	60,000	3	16,500
19,000	10,000	3,500	63,000	3	19,000
20,500	10,000	3,500	63,000	3	20,500
23,000	10,000	3,800	67,000	3	23,000
25,000	10,000	3,800	67,000	3	25,000
31,000	12,000	4,200	71,000	3	31,000



# HARTNER

## 90° 铰钻

产品代号 88021

P	M	K	N	S	H
●	○	●	●	○	



套装, 包括no.88200 • 圆弧后刀面修磨 • 三刃

d1 mm	mm	每套钻头数量	代号
6.30-20.50	6.3/8.3/10.4/12.4/16.5/20.5	6	7,000



## 90° 铰钻

产品代号 88022

P	M	K	N	S	H
•	•	•	○	○	



套装, 包括no.88201 • 3个不同的凸型切削刃 • 低震动切削过程 • 提供圆周无震颤铰孔 • 相当低的进给力需求 • 普遍适用

d1 mm	mm	每套钻头数量	代号
6.30-20.50	6.3/8.3/10.4/12.4/16.5/20.5	6	1,000



## 叉形去毛刺刀

产品代号 84100

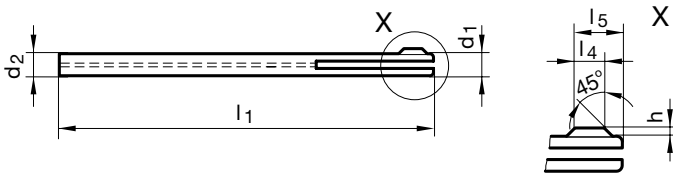


P	M	K	N	S	H
•	•	•	○	•	○



内冷供给 • 适用于弹簧夹套刀柄的普通锥柄

内部-外部去毛刺 • 适合在所有机床上使用，如铣床、车床等等。



Ø-范围	d1 mm	d2 mm	l1 mm	l4 mm	l5 mm	h mm	代号
1.91-2.15	1,900	1,900	80,000	1,000	2,050	0,350	2,000
2.16-2.40	2,100	2,100	80,000	1,500	2,600	0,400	2,250
2.41-2.70	2,400	2,400	80,000	1,500	2,900	0,400	2,500
2.71 -2.90	2,600	2,600	90,000	1,500	2,950	0,450	2,750
2.91-3.25	2,900	2,900	90,000	2,000	3,650	0,450	3,000
3.26-3.60	3,200	3,200	90,000	2,000	3,800	0,600	3,500
3.61-4.25	3,600	3,600	90,000	2,000	4,100	0,700	4,000
4.26-4.75	4,200	4,200	90,000	2,500	4,600	0,700	4,500
4.76-5.30	4,700	4,700	100,000	2,500	4,850	0,750	5,000
5.31-5.80	5,200	5,200	100,000	2,500	4,850	0,750	5,500
5.81-6.20	5,600	5,600	110,000	3,000	5,800	0,800	6,000
6.21-6.70	6,000	6,000	110,000	3,000	5,900	0,900	6,500
6.71-7.10	6,500	6,500	110,000	3,000	5,850	0,850	7,000
7.11-7.60	6,900	6,900	110,000	3,500	6,950	0,950	7,500
7.61-8.05	7,300	7,300	110,000	3,500	7,000	1,000	8,000

## 叉形去毛刺刀

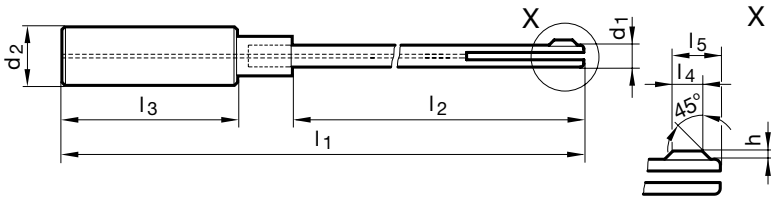
产品代号 84101



P	M	K	N	S	H
•	•	•	○	•	○



适合液压刀柄和热胀刀柄 • 柄, 根据DIN 6535标准 • 内冷供给  
内部-外部去毛刺 • 适合在所有机床上使用, 如铣床、车床等等。



Ø-范围	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	l4 mm	l5 mm	h mm	代号
1,91 -2,15	1,900	6,000	120,000	69,000	36,000	1,000	2,050	0,350	2,000
2,16 -2,40	2,100	6,000	120,000	69,000	36,000	1,500	2,600	0,400	2,250
2,41 -2,70	2,400	6,000	120,000	69,000	36,000	1,500	2,900	0,400	2,500
2,71 -2,90	2,600	6,000	130,000	79,000	36,000	1,500	2,950	0,450	2,750
2,91 -3,25	2,900	6,000	130,000	79,000	36,000	2,000	3,650	0,450	3,000
3,26 -3,60	3,200	10,000	135,000	80,000	40,000	2,000	3,800	0,600	3,500
3,61 -4,25	3,600	10,000	135,000	80,000	40,000	2,000	4,100	0,700	4,000
4,26 -4,75	4,200	10,000	135,000	80,000	40,000	2,500	4,600	0,700	4,500
4,76 -5,30	4,700	10,000	145,000	80,000	40,000	2,500	4,850	0,750	5,000
5,31 -5,80	5,200	10,000	145,000	90,000	40,000	2,500	4,850	0,750	5,500
5,81 -6,20	5,600	10,000	155,000	90,000	40,000	3,000	5,800	0,800	6,000
6,21 -6,70	6,000	16,000	165,000	102,000	48,000	3,000	5,900	0,900	6,500
6,71 -7,10	6,500	16,000	165,000	102,000	48,000	3,000	5,850	0,850	7,000
7,11 -7,60	6,900	16,000	165,000	102,000	48,000	3,500	6,950	0,950	7,500
7,61 -8,05	7,300	16,000	165,000	102,000	48,000	3,500	7,000	1,000	8,000



# HARTNER

## 前/后去毛刺 90°

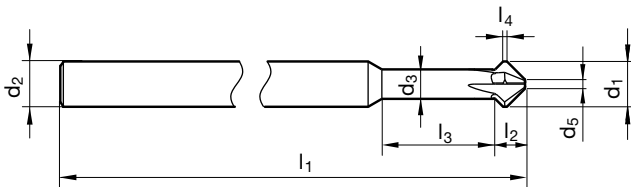
产品代号 80495



P	M	K	N	S	H
•	•	•	○	•	○



柄, 根据DIN 6535标准 • 适合液压刀柄和热胀刀柄  
 内部-外部去毛刺 • 加工孔以及工件的外轮廓去毛刺

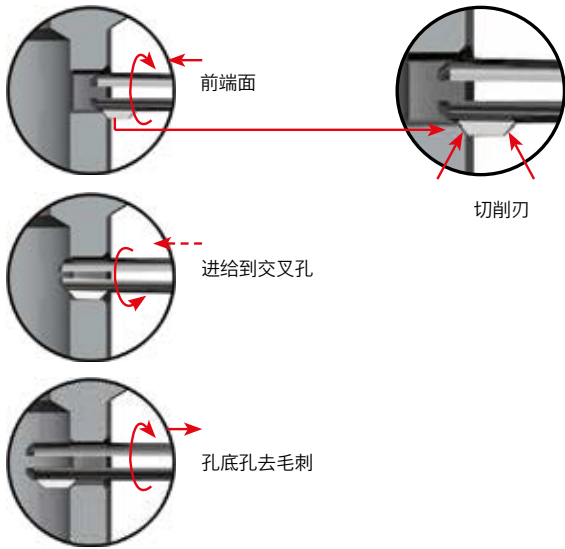


d1 mm	d2 h6 mm	d3 mm	d5 mm	l1 mm	l2 mm	l3 mm	l4 mm	Z	代号
3,000	4,000	2,200	0,600	75,000	2,10	11,400	0,500	4	3,000
4,000	4,000	2,900	0,800	75,000	2,70	15,000	0,500	4	4,000
5,000	5,000	3,900	1,000	75,000	3,00	18,000	0,500	4	5,000
6,000	6,000	3,900	1,200	100,000	3,90	18,200	0,500	4	6,000
8,000	6,000	6,000	1,600	100,000	4,70	55,000	0,500	4	8,000
10,000	6,000	6,000	2,000	100,000	6,50	55,000	0,500	4	10,000
12,000	6,000	6,000	2,400	100,000	8,30	55,500	0,500	4	12,000



## TS 100 EG 整体硬质合金去毛刺刀

### 操作

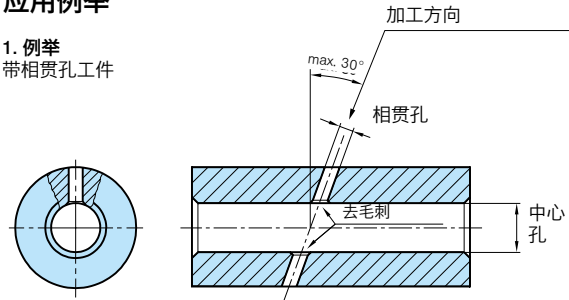


### 应用步骤

硬质合金去毛刺刀可自动对内和外孔口去毛刺。  
TS 100EG是一种使用简便、成本低廉并可使用普通的手动操作的去毛刺工具  
仅一款刀具就可以用于所有的加工步骤。

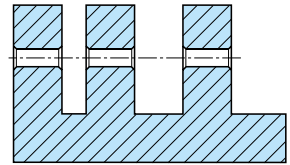
### 应用列举

#### 1. 例举 带相贯孔工件



在加工带交叉孔工件时,请注意  
- 相贯孔孔径为最大中心孔孔径的35%  
- 相贯孔孔径比切削长度(l4)大40%

#### 2. 例举 带多层断续加工工件



### 通用性应用:

新式的ex-stock去毛刺刀不仅可以加工那些带相贯孔的工件,同时也可以加工那些带多层断续加工的工件.并且加工出的表面具有很高的表面质量。

### 重要提示:

请注意推荐的切削参数可以上下调整。

Ø 范围 (mm)	v <sub>c</sub> m/min	f <sub>u</sub> (mm)
< Ø 4	8 - 10	0.1 - 0.2
Ø 4 - < Ø 6	10 - 14	0.1 - 0.2
6 - Ø 8	14 - 20	0.1 - 0.2

## TS 100 VR 前/后去毛刺

### 切削参数 TS 100 VR

材料组	拉伸强度 MPa (N/mm <sup>2</sup> )	v <sub>c</sub> (m/min)	进给代号
钢件	< 850	120 - 200	71
	850-1200	100 - 180	71
	> 1200	80 - 140	71
淬火钢	< 54 HRC	60 - 120	71
	54-60 HRC	40 - 80	71
不锈钢/耐酸钢	< 850	80 - 120	71
镍基合金	< 1300	30 - 60	71
钛合金	< 1300	50 - 100	71
铸件材料	< 240 HB30	120 - 180	72
	> 240 HB30	100 - 160	72
锻铝合金 < 3% Si		150 - 250	72
铸铝合金 > 3% Si		100 - 200	72
锰合金		150 - 250	72
有色金属	< 850	30 - 200	72

### 进给代号 (mm/rev.)

Ø	71	72
≤ 3.00	0.060	0.080
4.00	0.100	0.125
5.00	0.100	0.125
6.30	0.125	0.160
8.00	0.160	0.200
10.00	0.200	0.250
12.50	0.200	0.250

### 重要提示:

请注意推荐的切削参数可以上下调整。





# HARTNER

Precision Cutting Tools

## 复合 复合HPC

麻花钻系统 带可换式刀片和内冷却  
HSS-E, HSS-E-PM及硬质合金涂层可换式刀片



复合  
复合HPC

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	内冷	钻深	d1/mm	产品代号	页码
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## 带直柄复合钻刀杆



哈特纳标准

Ⓝ

右手

with

3xD

86612

399



哈特纳标准

Ⓝ

右手

with

5xD

86622

400



哈特纳标准

Ⓝ

右手

with

7xD

86624

401



哈特纳标准

Ⓝ

右手

with

86628

402

## 带莫氏锥柄复合钻刀杆



哈特纳标准

Ⓝ

右手

with

86630

404



哈特纳标准

Ⓝ

右手

with

86650

405



哈特纳标准

Ⓝ

右手

with

86670

406



哈特纳标准

Ⓝ

右手

with

86680

407



哈特纳标准

Ⓝ

右手

with

86678

408



P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	内冷	钻深	d1/mm	产品代号	页码
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## 可换刀片



●	○	●	○	○		哈特纳标准	HSS-E-PM	T		右手		10,000 - 25,000	86602	411
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○	●	○	●	●		哈特纳标准	HSS-E	T		右手		25,000 - 102,000	86605	412
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●	○	●	○	○		哈特纳标准	HSS-E-PM	F		右手		10,000 - 25,000	86608	413
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●	○	●	○	○		哈特纳标准	HSS-E-PM	A		右手		25,000 - 210,000	86609	414
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●	○	●	○	○		哈特纳标准	HSS-E-PM	A		右手		10,000 - 65,000	86611	415
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●	○	●	○	○		哈特纳标准	整硬	F		右手		10,000 - 35,000	86701	417
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●	○	●	○	○		哈特纳标准	整硬	F		右手		10,000 - 35,000	86702	418
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●	○	●	○	○		哈特纳标准	整硬	T		右手		10,000 - 35,000	86708	419
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●	○	●	○	○		哈特纳标准	整硬	T		右手		9,920 - 35,000	86709	420
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			●			哈特纳标准	整硬	○		右手		10,000 - 65,000	86711	421
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	内冷	钻深	d1/mm	产品代号	页码
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### 内冷接口



哈特纳标准

86690

422

### 冷却剂供给管道



哈特纳标准



82571

423

### 快速释放冷却管单元



哈特纳标准

82578

424

### 梅花螺丝起子



哈特纳标准

86842

425

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	内冷	钻深	d1/mm	产品代号	页码
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## 多用型带内冷刀柄



哈特纳标准

Ⓑ

86691

426



哈特纳标准

Ⓑ

86692

427



哈特纳标准

Ⓑ

86693

428



哈特纳标准

Ⓑ

86694

429

## 用于刀柄出水的夹持直柄的变径套



哈特纳标准

Ⓑ

86699

430

P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	内冷	钻深	d1/mm	产品代号	页码
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## 复合 HPC 刀柄



						哈特纳标准	HPC		Ⓝ	右手	with	1xD	11,000 - 36,005	<b>86681</b>	432
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						哈特纳标准	HPC		Ⓝ	右手	with	1.5xD	11,000 - 39,005	<b>86682</b>	433
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						哈特纳标准	HPC		Ⓝ	右手	with	3xD	11,000 - 39,005	<b>86683</b>	435
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						哈特纳标准	HPC		Ⓝ	右手	with	5xD	11,000 - 39,000	<b>86684</b>	437
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						哈特纳标准	HPC		Ⓝ	右手	with	7xD	11,000 - 31,505	<b>86685</b>	439
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						哈特纳标准	HPC		Ⓝ	右手	with	10xD	11,000 - 31,505	<b>86686</b>	441
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## 复合HPC可换刀片



○	○	○	○	○	○	哈特纳标准	HPC	整硬	Ⓞ	右手			11,000 - 40,000	<b>86721</b>	443
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●	○	○	○	○	○	哈特纳标准	HPC	整硬	Ⓟ	右手			11,000 - 40,000	<b>86722</b>	446
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○	●	○	○	○	○	哈特纳标准	HPC	整硬	Ⓠ	右手			11,000 - 40,000	<b>86723</b>	449
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	内冷	钻深	d1/mm	产品代号	页码
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### 复合HPC可换刀片



			●			哈特纳标准	HPC	整硬	○	右手		11,000 - 40,000	86724	452
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○	●			○		哈特纳标准	HPC	整硬	ⓐ	右手		11,000 - 40,000	86725	455
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●						哈特纳标准		整硬	ⓑ	右手		12,000 - 40,000	86729	458
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### 复合HPC镗刀刀片



○		●				哈特纳标准		整硬	Ⓐ	直向		52,020 - 93,080	86726	459
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			●			哈特纳标准		整硬	○	右手		52,020 - 93,080	86727	459
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●	○	○		○	○	哈特纳标准		整硬	ⓓ	右手		52,020 - 93,080	86728	460
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### 复合HPC刀柄压紧螺钉 1.5-10xD



						哈特纳标准							86843	461
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### 扭力扳手



						哈特纳标准							86844	462
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P	M	K	N	S	H	标准	型号	刀具材料	表面处理	切削方向	内冷	钻深	d1/mm	产品代号	页码
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## Torx扳手头



哈特纳标准

86845

463

## 复合HPC镗刀刀柄压紧螺钉



哈特纳标准

86846

464



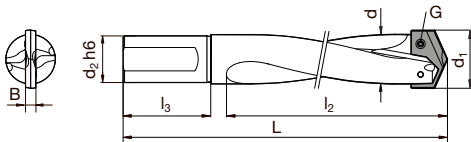
# HARTNER

## 带直柄复合钻刀杆

产品代号 86612



镀镍 • 可换刀片的刀体。圆柱形刀体提供内冷，较宽的排屑槽提供良好的排屑。通过锁紧螺钉可以便捷的更换刀片，不需要调节刀片，用这样的可换刀片的螺旋槽钻头原则上加工非预铸孔，不适合加工预铸孔或者已用引导钻加工过的孔。锁紧螺钉：86807



d1 mm	d mm	d2 h6 mm	L mm	l2 mm	l3 mm	B mm	G	代号
10.00-11.7	9,500	20,000	108,000	50,000	40,000	2,500	86807 2.000	<b>9,500</b>
11.71-13.4	11,500	20,000	109,000	53,000	40,000	2,500	86807 2.000	<b>11,500</b>
13.41-16.4	13,000	20,000	116,000	60,000	40,000	3,500	86807 2.500	<b>13,000</b>
16.41-18.9	16,000	20,000	118,000	65,000	40,000	3,500	86807 2.501	<b>16,000</b>
18.91-22.4	18,500	20,000	124,000	73,000	40,000	4,000	86807 3.000	<b>18,500</b>
22.41-25.4	22,000	20,000	127,000	78,000	40,000	4,000	86807 3.001	<b>22,000</b>
25.41-29.0	24,000	32,000	178,000	105,000	60,000	5,000	86807 3.500	<b>24,000</b>
29.01-35.0	28,000	32,000	178,000	108,000	60,000	5,000	86807 3.500	<b>28,000</b>
35.01-45.0	34,000	32,000	223,000	152,000	60,000	7,000	86807 4.001	<b>34,000</b>
45.01-55.0	44,000	40,000	233,000	152,000	70,000	7,000	86807 4.001	<b>44,000</b>
55.01-65.0	54,000	40,000	233,000	152,000	70,000	7,000	86807 4.001	<b>54,000</b>



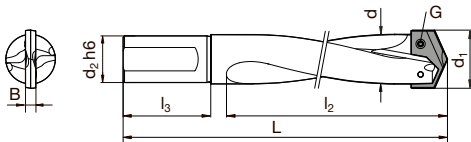
# HARTNER

## 带直柄复合钻刀杆

产品代号 86622



镀镍 • 可换刀片的刀体。圆柱形刀体提供内冷，较宽的排屑槽提供良好的排屑。通过锁紧螺钉可以便捷的更换刀片，不需要调节刀片，用这样的可换刀片的螺旋槽钻头原则上加工非预铸孔，不适合加工预铸孔或者已用引导钻加工过的孔。锁紧螺钉：86807



d1 mm	d mm	d2 h6 mm	L mm	l2 mm	l3 mm	B mm	G	代号
10.00-11.7	9,500	20,000	140,000	83,000	40,000	2,500	86807 2.000	<b>9,500</b>
11.71-13.4	11,500	20,000	150,000	94,000	40,000	2,500	86807 2.000	<b>11,500</b>
13.41-16.4	13,000	20,000	160,000	104,000	40,000	3,500	86807 2.500	<b>13,000</b>
16.41-18.9	16,000	20,000	170,000	117,000	40,000	3,500	86807 2.501	<b>16,000</b>
18.91-22.4	18,500	20,000	180,000	129,000	40,000	4,000	86807 3.000	<b>18,500</b>
22.41-25.4	22,000	20,000	180,000	131,000	40,000	4,000	86807 3.001	<b>22,000</b>
25.41-29.0	24,000	32,000	240,000	166,000	60,000	5,000	86807 3.500	<b>24,000</b>
29.01-35.0	28,000	32,000	240,000	170,000	60,000	5,000	86807 3.500	<b>28,000</b>
35.01-45.0	34,000	32,000	280,000	210,000	60,000	7,000	86807 4.001	<b>34,000</b>
45.01-55.0	44,000	40,000	290,000	210,000	70,000	7,000	86807 4.001	<b>44,000</b>
55.01-65.0	54,000	40,000	290,000	210,000	70,000	7,000	86807 4.001	<b>54,000</b>





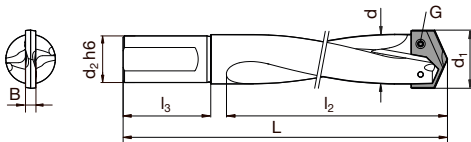
# HARTNER

## 带直柄复合钻刀杆

产品代号 86624



镀镍 • 可换刀片的刀体。圆柱形刀体提供内冷，较宽的排屑槽提供良好的排屑。通过锁紧螺钉可以便捷的更换刀片，不需要调节刀片，用这样的可换刀片的螺旋槽钻头原则上加工非预铸孔，不适合加工预铸孔或者已用引导钻加工过的孔。锁紧螺钉：86807



d1 mm	d mm	d2 h6 mm	L mm	l2 mm	l3 mm	B mm	G	代号
10.00-11.7	9,500	20,000	180,000	123,000	40,000	2,500	86807 2.000	<b>9,500</b>
11.71-13.4	11,500	20,000	190,000	134,000	40,000	2,500	86807 2.000	<b>11,500</b>
13.41-16.4	13,000	20,000	210,000	155,000	40,000	3,500	86807 2.500	<b>13,000</b>
16.41-18.9	16,000	20,000	220,000	168,000	40,000	3,500	86807 2.501	<b>16,000</b>
18.91-22.4	18,500	20,000	250,000	199,000	40,000	4,000	86807 3.000	<b>18,500</b>
22.41-25.4	22,000	20,000	250,000	201,000	40,000	4,000	86807 3.001	<b>22,000</b>
25.41-29.0	24,000	32,000	320,000	246,000	60,000	5,000	86807 3.500	<b>24,000</b>
29.01-35.0	28,000	32,000	320,000	250,000	60,000	5,000	86807 3.500	<b>28,000</b>
35.01-45.0	34,000	32,000	380,000	310,000	60,000	7,000	86807 4.001	<b>34,000</b>
45.01-55.0	44,000	40,000	390,000	310,000	70,000	7,000	86807 4.001	<b>44,000</b>
55.01-65.0	54,000	40,000	390,000	310,000	70,000	7,000	86807 4.001	<b>54,000</b>



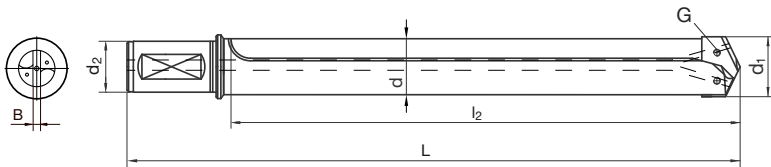
# HARTNER

## 带直柄复合钻刀杆

产品代号 86628



镀镍 • 可换刀片的刀体。特别长的圆柱形刀体提供内冷，较宽的排屑槽提供良好的排屑。通过锁紧螺钉可以便捷的更换刀片，不需要调节刀片，用这样的可换刀片的螺旋槽钻头原则上加工非预铸孔，不适合加工预铸孔或者已用引导钻加工过的孔。锁紧螺钉：86807



d1 mm	d mm	d2 h6 mm	L mm	l2 mm	B mm	G	代号
13.41-16.4	13,000	20,000	198,500	156,500	3,500	86807 2.500	13,157
13.41-16.4	13,000	20,000	238,500	196,500	3,500	86807 2.500	13,197
13.41-16.4	13,000	20,000	318,500	276,500	3,500	86807 2.500	13,277
15.00-16.4	14,500	20,000	95,000	52,000	3,500	86807 2.500	14,052
15.00-16.4	14,500	20,000	125,000	82,000	3,500	86807 2.500	14,082
15.00-16.4	14,500	20,000	178,500	136,500	3,500	86807 2.500	14,137
15.00-16.4	14,500	20,000	198,500	156,500	3,500	86807 2.500	14,157
15.00-16.4	14,500	20,000	238,500	196,500	3,500	86807 2.500	14,197
15.00-16.4	14,500	20,000	268,500	226,500	3,500	86807 2.500	14,227
15.00-16.4	14,500	20,000	398,500	356,500	3,500	86807 2.500	14,357
16.41-18.9	16,000	20,000	260,500	218,500	3,500	86807 2.500	16,219
16.41-18.9	16,000	20,000	295,500	253,500	3,500	86807 2.500	16,254
16.41-18.9	16,000	20,000	410,500	368,500	3,500	86807 2.501	16,369
18.91-22.4	18,500	20,000	304,000	262,000	4,000	86807 3.000	18,262
18.91-22.4	18,500	20,000	344,000	302,000	4,000	86807 3.000	18,302
18.91-22.4	18,500	20,000	464,000	422,000	4,000	86807 3.000	18,422
22.41-25.4	22,000	20,000	285,000	243,000	4,000	86807 3.001	22,243
22.41-25.4	22,000	20,000	345,000	303,000	4,000	86807 3.001	22,303
22.41-25.4	22,000	20,000	385,000	343,000	4,000	86807 3.001	22,343
22.41-25.4	22,000	20,000	535,000	493,000	4,000	86807 3.001	22,493
25.41-29.0	23,000	32,000	138,000	63,000	5,000	86807 3.500	23,063
25.41-29.0	23,000	32,000	173,000	98,000	5,000	86807 3.500	23,098
25.41-29.0	23,000	32,000	225,000	150,000	5,000	86807 3.500	23,150
25.41-29.0	23,000	32,000	273,000	198,000	5,000	86807 3.500	23,198
25.41-29.0	23,000	32,000	343,000	268,000	5,000	86807 3.500	23,268
25.41-29.0	23,000	32,000	433,000	358,000	5,000	86807 3.500	23,358
25.41-29.0	23,000	32,000	503,000	428,000	5,000	86807 3.500	23,428
25.41-29.0	23,000	32,000	683,000	608,000	5,000	86807 3.500	23,608
29.01-35.0	28,000	32,000	393,000	321,500	5,000	86807 3.500	28,322
29.01-35.0	28,000	32,000	473,000	401,500	5,000	86807 3.500	28,402
29.01-35.0	28,000	32,000	553,000	481,500	5,000	86807 3.500	28,482
29.01-35.0	28,000	32,000	763,000	691,500	5,000	86807 3.500	28,692
33.20-36.0	33,000	32,000	148,000	80,500	5,000	86807 3.500	33,081
33.20-36.0	33,000	32,000	173,000	105,500	5,000	86807 3.500	33,106
33.20-36.0	33,000	32,000	223,000	155,500	5,000	86807 3.500	33,156
33.20-36.0	33,000	32,000	273,000	205,500	5,000	86807 3.500	33,206
33.20-36.0	33,000	32,000	393,000	325,500	5,000	86807 3.500	33,326
33.20-36.0	33,000	32,000	503,000	435,500	5,000	86807 3.500	33,436
33.20-36.0	33,000	32,000	603,000	535,500	5,000	86807 3.500	33,536
33.20-36.0	33,000	32,000	823,000	755,500	5,000	86807 3.500	33,756
35.01-45.0	34,000	32,000	457,000	388,000	7,000	86807 4.001	34,388
35.01-45.0	34,000	32,000	607,000	538,000	7,000	86807 4.001	34,538



## 带直柄复合钻刀杆

d1 mm	d mm	d2 h6 mm	L mm	l2 mm	B mm	G	代号
35.01-45.0	34,000	32,000	907,000	838,000	7,000	86807 4.001	34,838
45.01-55.0	44,000	40,000	467,000	394,000	7,000	86807 4.001	44,394
45.01-55.0	44,000	40,000	617,000	544,000	7,000	86807 4.001	44,544
45.01-55.0	44,000	40,000	917,000	844,000	7,000	86807 4.001	44,844
55.01-65.0	54,000	40,000	467,000	393,000	7,000	86807 4.001	54,393
55.01-65.0	54,000	40,000	617,000	543,000	7,000	86807 4.001	54,543
55.01-65.0	54,000	40,000	917,000	843,000	7,000	86807 4.001	54,843
65.01-78.0	63,000	40,000	230,000	155,000	9,000	86807 5.000	63,155
65.01-78.0	63,000	40,000	340,000	265,000	9,000	86807 5.000	63,265
65.01-78.0	63,000	40,000	470,000	395,000	9,000	86807 5.000	63,395
65.01-78.0	63,000	40,000	620,000	545,000	9,000	86807 5.000	63,545
65.01-78.0	63,000	40,000	920,000	845,000	9,000	86807 5.000	63,845
78.01-90.0	77,000	50,000	240,000	155,000	9,000	86807 5.000	77,155
78.01-90.0	77,000	50,000	350,000	265,000	9,000	86807 5.000	77,265
78.01-90.0	77,000	50,000	480,000	395,000	9,000	86807 5.000	77,395
78.01-90.0	77,000	50,000	630,000	545,000	9,000	86807 5.000	77,545
78.01-90.0	77,000	50,000	930,000	845,000	9,000	86807 5.000	77,845
90.01-102.0	89,000	50,000	240,000	155,000	9,000	86807 5.000	89,155
90.01-102.0	89,000	50,000	350,000	265,000	9,000	86807 5.000	89,265
90.01-102.0	89,000	50,000	480,000	395,000	9,000	86807 5.000	89,395
90.01-102.0	89,000	50,000	630,000	545,000	9,000	86807 5.000	89,545
90.01-102.0	89,000	50,000	930,000	845,000	9,000	86807 5.000	89,845



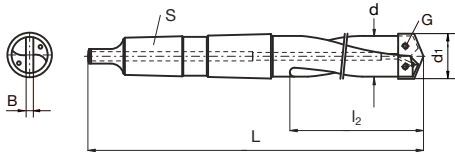
# HARTNER

## 带莫氏锥柄复合钻刀杆

产品代号 86630



镀镍 • 可换刀片的短款刀体。锥柄式的刀体提供内冷，较宽的排屑槽提供良好的排屑。通过锁紧螺钉可以便捷的更换刀片，不需要调节刀片，用这样的可换刀片的螺旋槽钻头原则上加工非预铸孔，不适合加工预铸孔或者已用引导钻加工过的孔。冷却方式：轴向（径向根据需求）锁紧螺钉：86807



d1 mm	d mm	S	L mm	l <sub>2</sub> mm	B mm	G	代号
10.00-11.7	9,500	MK-2	139,000	56,000	2,500	86807 2.000	<b>9,500</b>
11.71-13.4	11,500	MK-2	141,000	58,000	2,500	86807 2.000	<b>11,500</b>
13.41-16.4	13,000	MK-2	148,000	63,000	3,500	86807 2.500	<b>13,000</b>
16.41-18.9	16,000	MK-2	150,000	67,000	3,500	86807 2.501	<b>16,000</b>
18.91-22.4	18,500	MK-3	178,000	76,000	4,000	86807 3.000	<b>18,500</b>
22.41-25.4	22,000	MK-3	181,000	80,000	4,000	86807 3.001	<b>22,000</b>



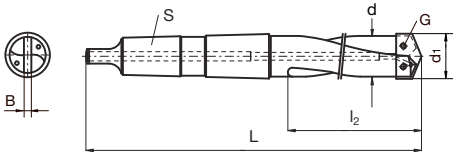
# HARTNER

## 带莫氏锥柄复合钻刀杆

产品代号 86650



镀镍 • 可更换刀片的长款刀柄。锥面刀柄带内冷。宽的排屑槽保证较好的排屑。通过压紧螺钉更换刀片。无需调节刀片。带刀片的麻花钻应加工非预铸孔。这样的刀不适合加工预铸孔或者有引导孔的孔。冷却方式：轴向（径向根据需求）压紧螺钉型号：86807



d1 mm	d mm	S	L mm	l2 mm	B mm	G	代号
10.00-11.7	9,500	MK-2	186,000	103,000	2,500	86807 2.000	<b>9,500</b>
11.71-13.4	11,500	MK-2	191,000	108,000	2,500	86807 2.000	<b>11,500</b>
13.41-16.4	13,000	MK-2	210,000	125,000	3,500	86807 2.500	<b>13,000</b>
16.41-18.9	16,000	MK-2	218,000	135,000	3,500	86807 2.501	<b>16,000</b>
18.91-22.4	18,500	MK-3	258,000	156,000	4,000	86807 3.000	<b>18,500</b>
22.41-25.4	22,000	MK-3	266,000	166,000	4,000	86807 3.001	<b>22,000</b>



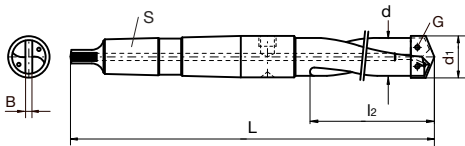
# HARTNER

## 带莫氏锥柄复合钻刀杆

产品代号 86670



≤ Ø 28 mm: 镀镍 Ø 28 mm: 抛光 • 可更换刀片的短款刀柄, 锥面刀柄带内冷。宽的排屑槽保证较好的排屑。通过压紧螺钉更换刀片。无需调节刀片。带刀片的麻花钻应加工非预铸孔。这样的刀不适合加工预铸孔或者有引导孔的孔。冷却方式: 轴向 (径向根据需求) 刀柄从Ø 63.0 mm开始; 直槽; 柄身尺寸MK5; 十字槽; 压紧螺钉型号: 86807



d1 mm	d mm	S	L mm	l2 mm	B mm	G	代号
25.01-29.0	24,000	MK-4	279,000	108,000	5,000	86807 3.500	24,000
29.01-35.0	28,000	MK-4	279,000	108,000	5,000	86807 3.500	28,000
35.01-45.0	34,000	MK-4	324,000	152,000	7,000	86807 4.001	34,000
45.01-55.0	44,000	MK-4	324,000	152,000	7,000	86807 4.001	44,000
55.01-65.0	54,000	MK-4	324,000	152,000	7,000	86807 4.001	54,000
65.01-78.0	63,000	MK-5	436,000	216,000	9,000	86807 5.000	63,000
78.01-90.0	77,000	MK-5	436,000	216,000	9,000	86807 5.000	77,000
90.01-102.0	89,000	MK-5	436,000	216,000	9,000	86807 5.000	89,000



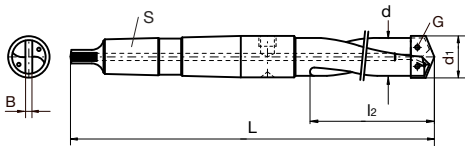
# HARTNER

## 带莫氏锥柄复合钻刀杆

产品代号 86680



≤ Ø 28 mm: 镀镍 Ø 28 mm: 抛光 • 可换刀片的长款设计的环形面提供冷却的刀体。锥形柄的刀体提供内冷，较宽的排屑槽提供良好的排屑。通过锁紧螺钉可以便捷的更换刀片，不需要调节刀片，用这样的可换刀片的螺旋槽钻头原则上加工非预铸孔，不适合加工预铸孔或者已用引导钻加工过的孔。冷却方式：轴向（径向根据需求）刀柄直径Ø 63,0 mm 直槽 柄的型号 莫氏锥柄 5 锁紧螺钉：86807



d1 mm	d mm	S	L mm	l2 mm	B mm	G	代号
25.01-29.0	24,000	MK-4	379,000	208,000	5,000	86807 3.500	24,000
29.01-35.0	28,000	MK-4	379,000	208,000	5,000	86807 3.500	28,000
35.01-45.0	34,000	MK-4	429,000	257,000	7,000	86807 4.001	34,000
45.01-55.0	44,000	MK-4	429,000	257,000	7,000	86807 4.001	44,000
55.01-65.0	54,000	MK-4	429,000	257,000	7,000	86807 4.001	54,000
65.01-78.0	63,000	MK-5	536,000	316,000	9,000	86807 5.000	63,000
78.01-90.0	77,000	MK-5	536,000	316,000	9,000	86807 5.000	77,000
90.01-102.0	89,000	MK-5	536,000	316,000	9,000	86807 5.000	89,000



# HARTNER

## 带莫氏锥柄复合钻刀杆

产品代号 86678



镀镍面总长 ≤ 1000 mm，最大抛光长度为1000 mm • 可换刀片的加长设计的刀体。锥形柄的刀体提供内冷，较宽的排屑槽提供良好的排屑。通过锁紧螺钉可以便捷的更换刀片，不需要调节刀片，用这样的可换刀片的螺旋槽钻头原则上加工非预铸孔，不适合加工预铸孔或者已用引导钻加工过的孔。冷却方式：轴向（径向根据需求）锁紧螺钉：86807



d1 mm	d mm	S	L mm	l2 mm	B mm	G	代号
35.01-45.0	34,000	MK-4	566,000	393,000	7,000	86807 4.001	34,393
35.01-45.0	34,000	MK-4	716,000	543,000	7,000	86807 4.001	34,543
35.01-45.0	34,000	MK-4	1016,000	843,000	7,000	86807 4.001	34,843
45.01-55.0	44,000	MK-4	566,000	394,500	7,000	86807 4.001	44,395
45.01-55.0	44,000	MK-4	716,000	544,500	7,000	86807 4.001	44,545
45.01-55.0	44,000	MK-4	1016,000	844,500	7,000	86807 4.001	44,845
55.01-65.0	54,000	MK-4	560,000	387,000	7,000	86807 4.001	54,387
55.01-65.0	54,000	MK-4	716,000	543,000	7,000	86807 4.001	54,543
55.01-65.0	54,000	MK-4	1016,000	843,000	7,000	86807 4.001	54,843
65.01-78.0	63,000	MK-5	766,000	547,000	9,000	86807 5.000	63,547
65.01-78.0	63,000	MK-5	1066,000	847,000	9,000	86807 5.000	63,847
78.01-90.0	77,000	MK-5	766,000	544,000	9,000	86807 5.000	77,544
78.01-90.0	77,000	MK-5	1066,000	844,000	9,000	86807 5.000	77,844
90.01-102.0	89,000	MK-5	766,000	544,000	9,000	86807 5.000	89,544
90.01-102.0	89,000	MK-5	1066,000	844,000	9,000	86807 5.000	89,844





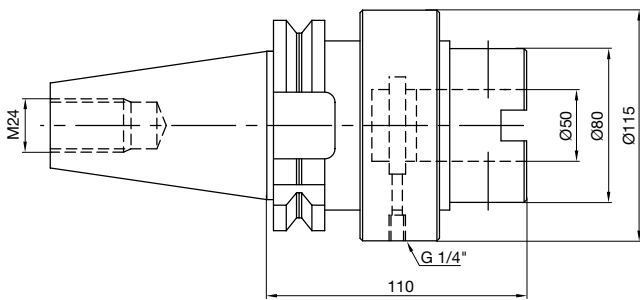
## 非标模块式机夹钻削系统



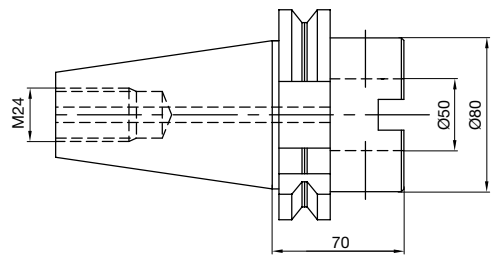
### 主轴刀柄

以下刀柄可按需提供:

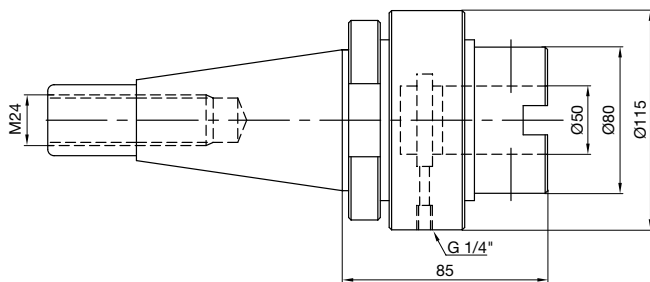
SK50 DIN 69871 带冷却供给接口



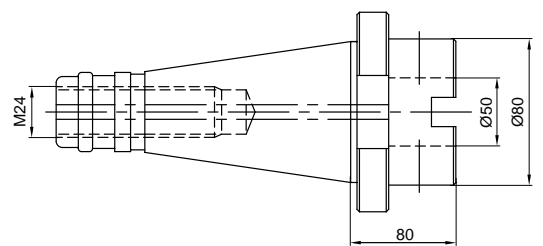
SK50 DIN 69871 无冷却供给接口



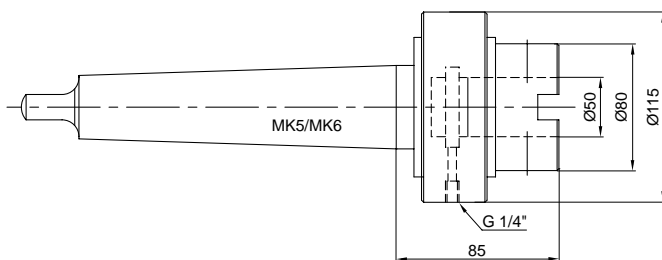
SK50 DIN 2080 带冷却供给接口



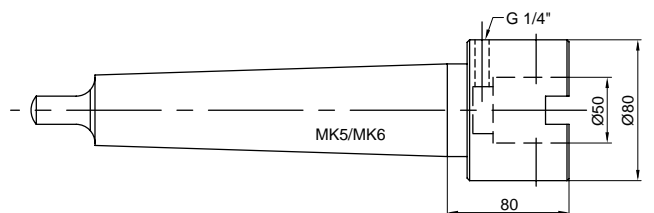
SK50 DIN 2080 无冷却供给接口



MT 5/MT 6 带冷却供给接口



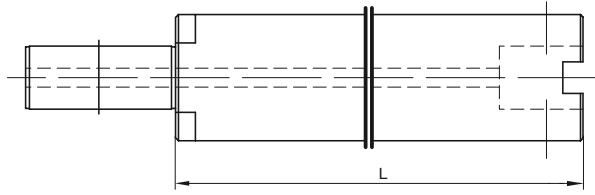
MT 5/MT 6 无冷却供给接口





## 非标模块式机夹钻削系统

### 延长杆



延长杆  
 97 mm 至 130 mm  
 L = 186 mm  
 L = 300 mm

延长杆  
 131 mm 至 165 mm, 164 mm 至 210 mm  
 L = 204 mm  
 L = 300 mm  
 L = 500 mm

### 连接环

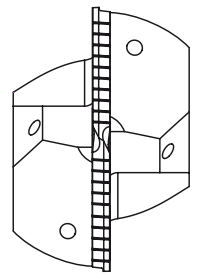
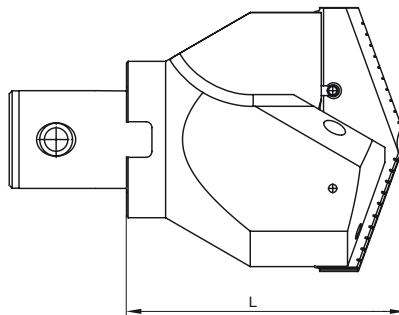


小号, 适用于钻头头部直径  
 97 mm 至 130 mm,  
 宽 14 mm



大号, 适用于钻头头部直径 131 mm 至 165 mm  
 和 164 mm 至 210 mm, 宽 16 mm

### 钻头头部



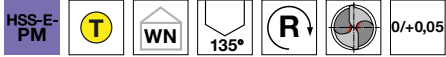
以下规格可按需提供:  
 -  $\varnothing$  97 mm 至  $\varnothing$  130 mm, L = 118.5 mm  
 -  $\varnothing$  131 mm 至  $\varnothing$  165 mm, L = 142.5 mm  
 -  $\varnothing$  164 mm 至  $\varnothing$  210 mm, L = 142.5 mm

## 可换刀片

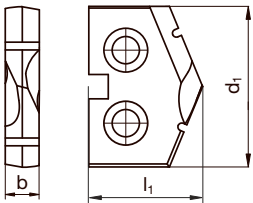
产品代号 86602



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 9,800$  • 带断屑槽的可换式刀片。顶角135度，通用型



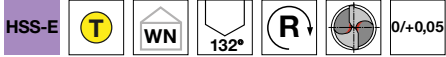
d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
10,000	8,700	2,500	10,000	17,500	11,700	3,500	17,500
10,200	8,700	2,500	10,200	17,750	11,700	3,500	17,750
10,500	8,700	2,500	10,500	18,000	11,700	3,500	18,000
11,000	8,700	2,500	11,000	18,250	11,700	3,500	18,250
11,110	8,700	2,500	11,110	18,500	11,700	3,500	18,500
11,500	8,700	2,500	11,500	18,750	11,700	3,500	18,750
11,750	8,700	2,500	11,750	19,000	13,700	4,000	19,000
12,000	8,700	2,500	12,000	19,500	13,700	4,000	19,500
12,250	8,700	2,500	12,250	19,750	13,700	4,000	19,750
12,400	8,700	2,500	12,400	20,000	13,700	4,000	20,000
12,500	8,700	2,500	12,500	20,250	13,700	4,000	20,250
12,750	8,700	2,500	12,750	20,500	13,700	4,000	20,500
13,000	8,700	2,500	13,000	21,000	13,700	4,000	21,000
13,250	8,700	2,500	13,250	21,250	13,700	4,000	21,250
13,500	11,700	3,500	13,500	21,500	13,700	4,000	21,500
13,750	11,700	3,500	13,750	21,750	13,700	4,000	21,750
14,000	11,700	3,500	14,000	22,000	13,700	4,000	22,000
14,250	11,700	3,500	14,250	22,500	13,700	4,000	22,500
14,500	11,700	3,500	14,500	23,000	13,700	4,000	23,000
14,750	11,700	3,500	14,750	23,500	13,700	4,000	23,500
15,000	11,700	3,500	15,000	24,000	13,700	4,000	24,000
15,250	11,700	3,500	15,250	24,500	13,700	4,000	24,500
15,300	11,700	3,500	15,300	25,000	13,700	4,000	25,000
15,500	11,700	3,500	15,500				
15,750	11,700	3,500	15,750				
16,000	11,700	3,500	16,000				
16,500	11,700	3,500	16,500				
16,750	11,700	3,500	16,750				
17,000	11,700	3,500	17,000				
17,250	11,700	3,500	17,250				

## 可换刀片

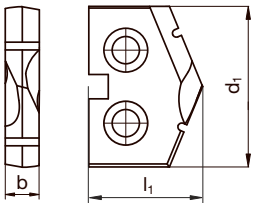
产品代号 86605



P	M	K	N	S	H
○	●	○	●	●	



芯厚 ≥ Ø 25,000



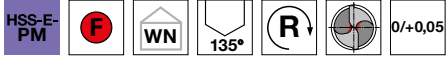
d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
25,000	17,300	5,000	25,000	56,000	24,000	7,000	56,000
25,500	17,300	5,000	25,500	57,000	24,000	7,000	57,000
26,000	17,300	5,000	26,000	58,000	24,000	7,000	58,000
26,500	17,300	5,000	26,500	59,000	24,000	7,000	59,000
27,000	17,300	5,000	27,000	60,000	24,000	7,000	60,000
28,000	17,300	5,000	28,000	62,000	24,000	7,000	62,000
29,000	17,300	5,000	29,000	64,000	24,000	7,000	64,000
29,500	17,300	5,000	29,500	65,000	24,000	7,000	65,000
30,000	17,300	5,000	30,000	66,000	37,000	9,000	66,000
31,000	17,300	5,000	31,000	68,000	37,000	9,000	68,000
32,000	17,300	5,000	32,000	70,000	37,000	9,000	70,000
33,000	17,300	5,000	33,000	74,000	37,000	9,000	74,000
34,000	17,300	5,000	34,000	75,000	37,000	9,000	75,000
35,000	17,300	5,000	35,000	78,000	37,000	9,000	78,000
36,000	24,000	7,000	36,000	80,000	37,000	9,000	80,000
37,000	24,000	7,000	37,000	82,000	37,000	9,000	82,000
37,500	24,000	7,000	37,500	84,000	37,000	9,000	84,000
38,000	24,000	7,000	38,000	85,000	37,000	9,000	85,000
39,000	24,000	7,000	39,000	88,000	37,000	9,000	88,000
40,000	24,000	7,000	40,000	90,000	37,000	9,000	90,000
41,000	24,000	7,000	41,000	94,000	37,000	9,000	94,000
42,000	24,000	7,000	42,000	95,000	37,000	9,000	95,000
43,000	24,000	7,000	43,000	96,000	37,000	9,000	96,000
44,000	24,000	7,000	44,000	98,000	37,000	9,000	98,000
45,000	24,000	7,000	45,000	100,000	37,000	9,000	100,000
46,000	24,000	7,000	46,000	102,000	37,000	9,000	102,000
47,000	24,000	7,000	47,000				
48,000	24,000	7,000	48,000				
49,000	24,000	7,000	49,000				
50,000	24,000	7,000	50,000				
50,500	24,000	7,000	50,500				
51,000	24,000	7,000	51,000				
52,000	24,000	7,000	52,000				
53,000	24,000	7,000	53,000				
54,000	24,000	7,000	54,000				
55,000	24,000	7,000	55,000				

## 可换刀片

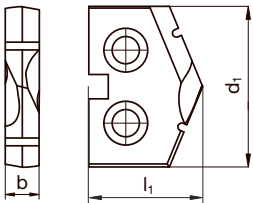
产品代号 86608



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 10,000$  • 带断屑槽的可换式刀片。顶角135度，通用型



d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
10,000	8,700	2,500	10,000	17,500	11,700	3,500	17,500
10,200	8,700	2,500	10,200	17,750	11,700	3,500	17,750
10,500	8,700	2,500	10,500	18,000	11,700	3,500	18,000
11,000	8,700	2,500	11,000	18,250	11,700	3,500	18,250
11,500	8,700	2,500	11,500	18,500	11,700	3,500	18,500
11,750	8,700	2,500	11,750	18,750	11,700	3,500	18,750
12,000	8,700	2,500	12,000	19,000	13,700	4,000	19,000
12,500	8,700	2,500	12,500	19,500	13,700	4,000	19,500
12,750	8,700	2,500	12,750	19,750	13,700	4,000	19,750
13,000	8,700	2,500	13,000	20,000	13,700	4,000	20,000
13,250	8,700	2,500	13,250	20,500	13,700	4,000	20,500
13,500	11,700	3,500	13,500	21,000	13,700	4,000	21,000
13,750	11,700	3,500	13,750	21,500	13,700	4,000	21,500
14,000	11,700	3,500	14,000	21,750	13,700	4,000	21,750
14,250	11,700	3,500	14,250	22,000	13,700	4,000	22,000
14,500	11,700	3,500	14,500	22,500	13,700	4,000	22,500
14,750	11,700	3,500	14,750	23,000	13,700	4,000	23,000
15,000	11,700	3,500	15,000	23,500	13,700	4,000	23,500
15,250	11,700	3,500	15,250	24,000	13,700	4,000	24,000
15,500	11,700	3,500	15,500	24,500	13,700	4,000	24,500
15,750	11,700	3,500	15,750	24,750	13,700	4,000	24,750
16,000	11,700	3,500	16,000	25,000	13,700	4,000	25,000
16,500	11,700	3,500	16,500				
17,000	11,700	3,500	17,000				

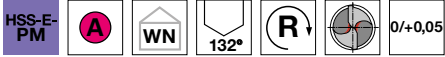


## 可换刀片

产品代号 86609



P	M	K	N	S	H
●	○	●	○		



芯厚 ≥ Ø 25,000 • 带分屑槽刀片。通用型。

顶角:

≥ Ø 25,0 mm = 132°

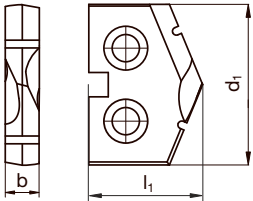
> Ø 66,0 mm = 140°

> Ø 190,0 mm = 150°

切削刃材料:

≤ Ø 66,0 mm HSS-E-PM

> Ø 66,0 mm HSS-E



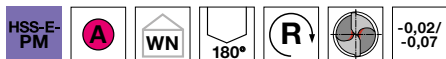
d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
25,000	17,300	5,000	25,000	66,000	37,000	9,000	66,000
25,500	17,300	5,000	25,500	68,000	37,000	9,000	68,000
26,000	17,300	5,000	26,000	70,000	37,000	9,000	70,000
26,500	17,300	5,000	26,500	74,000	37,000	9,000	74,000
27,000	17,300	5,000	27,000	75,000	37,000	9,000	75,000
28,000	17,300	5,000	28,000	78,000	37,000	9,000	78,000
29,000	17,300	5,000	29,000	80,000	37,000	9,000	80,000
29,500	17,300	5,000	29,500	82,000	37,000	9,000	82,000
30,000	17,300	5,000	30,000	84,000	37,000	9,000	84,000
31,000	17,300	5,000	31,000	85,000	37,000	9,000	85,000
32,000	17,300	5,000	32,000	88,000	37,000	9,000	88,000
33,000	17,300	5,000	33,000	90,000	37,000	9,000	90,000
34,000	17,300	5,000	34,000	93,000	37,000	9,000	93,000
35,000	17,300	5,000	35,000	95,000	37,000	9,000	95,000
36,000	24,000	7,000	36,000	96,000	37,000	9,000	96,000
37,000	24,000	7,000	37,000	98,000	37,000	9,000	98,000
38,000	24,000	7,000	38,000	100,000	37,000	9,000	100,000
39,000	24,000	7,000	39,000	102,000	37,000	9,000	102,000
40,000	24,000	7,000	40,000	103,000	37,000	9,000	103,000
41,000	24,000	7,000	41,000	105,000	37,000	9,000	105,000
42,000	24,000	7,000	42,000	110,000	37,000	9,000	110,000
43,000	24,000	7,000	43,000	115,000	37,000	9,000	115,000
44,000	24,000	7,000	44,000	120,000	37,000	9,000	120,000
45,000	24,000	7,000	45,000	125,000	37,000	9,000	125,000
46,000	24,000	7,000	46,000	130,000	37,000	9,000	130,000
47,000	24,000	7,000	47,000	135,000	47,000	9,000	135,000
48,000	24,000	7,000	48,000	140,000	47,000	9,000	140,000
49,000	24,000	7,000	49,000	145,000	47,000	9,000	145,000
50,000	24,000	7,000	50,000	150,000	47,000	9,000	150,000
51,000	24,000	7,000	51,000	155,000	47,000	9,000	155,000
52,000	24,000	7,000	52,000	160,000	47,000	9,000	160,000
53,000	24,000	7,000	53,000	165,000	47,000	9,000	165,000
54,000	24,000	7,000	54,000	170,000	47,000	9,000	170,000
55,000	24,000	7,000	55,000	175,000	47,000	9,000	175,000
56,000	24,000	7,000	56,000	180,000	47,000	9,000	180,000
57,000	24,000	7,000	57,000	185,000	47,000	9,000	185,000
58,000	24,000	7,000	58,000	190,000	47,000	9,000	190,000
59,000	24,000	7,000	59,000	195,000	47,000	9,000	195,000
60,000	24,000	7,000	60,000	200,000	47,000	9,000	200,000
62,000	24,000	7,000	62,000	205,000	47,000	9,000	205,000
64,000	24,000	7,000	64,000	210,000	47,000	9,000	210,000
65,000	24,000	7,000	65,000				

## 可换刀片

产品代号 86611



P	M	K	N	S	H
●	○	●	○		

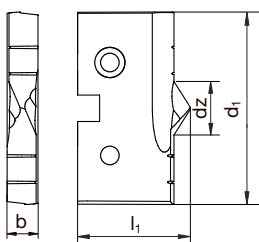


芯厚  $\geq \varnothing 10,000$  • 带断屑槽的刀片。适用于通用应用。

中心点顶角:

$\leq \varnothing 35,0 \text{ mm} = 120^\circ$

$> \varnothing 35,0 \text{ mm} = 140^\circ$



d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
10,000	10,000	2,500	10,000	23,000	15,000	4,000	23,000
10,500	10,000	2,500	10,500	23,500	15,000	4,000	23,500
11,000	10,000	2,500	11,000	24,000	15,000	4,000	24,000
11,500	10,000	2,500	11,500	24,500	15,000	4,000	24,500
11,750	10,000	2,500	11,750	24,750	15,000	4,000	24,750
12,000	10,000	2,500	12,000	25,000	15,000	4,000	25,000
12,500	10,000	2,500	12,500	25,000	18,500	5,000	25,001
12,700	10,000	2,500	12,700	25,400	18,500	5,000	25,400
12,750	10,000	2,500	12,750	25,500	18,500	5,000	25,500
13,000	10,000	2,500	13,000	26,000	18,500	5,000	26,000
13,250	10,000	2,500	13,250	26,500	18,500	5,000	26,500
13,500	13,000	3,500	13,500	27,000	18,500	5,000	27,000
13,750	13,000	3,500	13,750	28,000	18,500	5,000	28,000
14,000	13,000	3,500	14,000	29,000	18,500	5,000	29,000
14,250	13,000	3,500	14,250	29,500	18,500	5,000	29,500
14,500	13,000	3,500	14,500	30,000	18,500	5,000	30,000
14,750	13,000	3,500	14,750	31,000	18,500	5,000	31,000
15,000	13,000	3,500	15,000	32,000	18,500	5,000	32,000
15,250	13,000	3,500	15,250	33,000	18,500	5,000	33,000
15,500	13,000	3,500	15,500	34,000	18,500	5,000	34,000
15,750	13,000	3,500	15,750	35,000	18,500	5,000	35,000
16,000	13,000	3,500	16,000	36,000	25,500	7,000	36,000
16,500	13,000	3,500	16,500	37,000	25,500	7,000	37,000
17,000	13,000	3,500	17,000	38,000	25,500	7,000	38,000
17,500	13,000	3,500	17,500	39,000	25,500	7,000	39,000
17,750	13,000	3,500	17,750	40,000	25,500	7,000	40,000
18,000	13,000	3,500	18,000	41,000	25,500	7,000	41,000
18,250	13,000	3,500	18,250	42,000	25,500	7,000	42,000
18,500	13,000	3,500	18,500	43,000	25,500	7,000	43,000
18,750	13,000	3,500	18,750	44,000	25,500	7,000	44,000
19,000	15,000	4,000	19,000	45,000	25,500	7,000	45,000
19,500	15,000	4,000	19,500	46,000	25,500	7,000	46,000
19,750	15,000	4,000	19,750	47,000	25,500	7,000	47,000
20,000	15,000	4,000	20,000	48,000	25,500	7,000	48,000
20,250	15,000	4,000	20,250	49,000	25,500	7,000	49,000
20,500	15,000	4,000	20,500	50,000	25,500	7,000	50,000
21,000	15,000	4,000	21,000	51,000	25,500	7,000	51,000
21,250	15,000	4,000	21,250	52,000	25,500	7,000	52,000
21,500	15,000	4,000	21,500	53,000	25,500	7,000	53,000
21,750	15,000	4,000	21,750	54,000	25,500	7,000	54,000
22,000	15,000	4,000	22,000	55,000	25,500	7,000	55,000
22,500	15,000	4,000	22,500	56,000	25,500	7,000	56,000

## 可换刀片

d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
57,000	25,500	7,000	<b>57,000</b>	65,000	25,500	7,000	<b>65,000</b>
58,000	25,500	7,000	<b>58,000</b>				
59,000	25,500	7,000	<b>59,000</b>				
60,000	25,500	7,000	<b>60,000</b>				
62,000	25,500	7,000	<b>62,000</b>				
64,000	25,500	7,000	<b>64,000</b>				



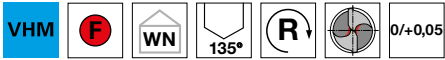


## 可换刀片

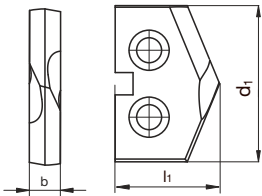
产品代号 86701



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 10,000$  • 没有断屑槽的可更换试刀片，用于抗拉强度最大为600N/mm<sup>2</sup>的材料，可普遍使用  
 顶角  $\leq \varnothing 25.4 \text{ mm} = 135^\circ$ ， $>\varnothing 25.4 \text{ mm} = 132^\circ$   
 没有倒角（见应用推荐/技术类）



d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
10,000	8,700	2,500	10,000	18,000	11,700	3,500	18,000
10,200	8,700	2,500	10,200	18,250	11,700	3,500	18,250
10,500	8,700	2,500	10,500	18,500	11,700	3,500	18,500
11,000	8,700	2,500	11,000	19,000	13,700	4,000	19,000
11,500	8,700	2,500	11,500	19,500	13,700	4,000	19,500
12,000	8,700	2,500	12,000	20,000	13,700	4,000	20,000
12,500	8,700	2,500	12,500	20,500	13,700	4,000	20,500
12,750	8,700	2,500	12,750	21,000	13,700	4,000	21,000
13,000	8,700	2,500	13,000	21,500	13,700	4,000	21,500
13,500	11,700	3,500	13,500	22,000	13,700	4,000	22,000
13,750	11,700	3,500	13,750	23,000	13,700	4,000	23,000
14,000	11,700	3,500	14,000	24,000	13,700	4,000	24,000
14,500	11,700	3,500	14,500	24,500	13,700	4,000	24,500
14,750	11,700	3,500	14,750	25,000	13,700	4,000	25,000
15,000	11,700	3,500	15,000	26,000	17,300	5,000	26,000
15,500	11,700	3,500	15,500	27,000	17,300	5,000	27,000
15,750	11,700	3,500	15,750	28,000	17,300	5,000	28,000
16,000	11,700	3,500	16,000	29,000	17,300	5,000	29,000
16,250	11,700	3,500	16,250	30,000	17,300	5,000	30,000
16,500	11,700	3,500	16,500	31,000	17,300	5,000	31,000
16,750	11,700	3,500	16,750	32,000	17,300	5,000	32,000
17,000	11,700	3,500	17,000	33,000	17,300	5,000	33,000
17,500	11,700	3,500	17,500	34,000	17,300	5,000	34,000
17,750	11,700	3,500	17,750	35,000	17,300	5,000	35,000



## 可换刀片

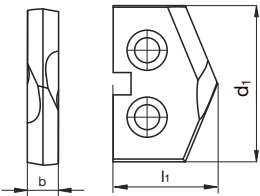
产品代号 86702



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 10,000$  • 没有断屑槽的可更换试刀片，用于抗拉强度最大为600N/mm<sup>2</sup>的材料，可普遍使用  
 顶角  $\leq \varnothing 25.4 \text{ mm} = 135^\circ$ ， $>\varnothing 25.4 \text{ mm} = 132^\circ$   
 (见应用推荐/技术类)



d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
10,000	8,700	2,500	10,000	21,000	13,700	4,000	21,000
10,200	8,700	2,500	10,200	21,500	13,700	4,000	21,500
10,500	8,700	2,500	10,500	22,000	13,700	4,000	22,000
11,000	8,700	2,500	11,000	22,300	13,700	4,000	22,300
12,000	8,700	2,500	12,000	22,750	13,700	4,000	22,750
12,500	8,700	2,500	12,500	23,000	13,700	4,000	23,000
12,750	8,700	2,500	12,750	24,250	13,700	4,000	24,250
13,000	8,700	2,500	13,000	24,500	13,700	4,000	24,500
13,500	11,700	3,500	13,500	25,000	13,700	4,000	25,000
13,750	11,700	3,500	13,750	26,000	17,300	5,000	26,000
14,000	11,700	3,500	14,000	26,500	17,300	5,000	26,500
14,100	11,700	3,500	14,100	27,000	17,300	5,000	27,000
14,500	11,700	3,500	14,500	28,000	17,300	5,000	28,000
14,750	11,700	3,500	14,750	29,000	17,300	5,000	29,000
15,000	11,700	3,500	15,000	29,800	17,300	5,000	29,800
15,500	11,700	3,500	15,500	30,000	17,300	5,000	30,000
16,000	11,700	3,500	16,000	32,000	17,300	5,000	32,000
16,250	11,700	3,500	16,250	33,000	17,300	5,000	33,000
16,500	11,700	3,500	16,500	34,000	17,300	5,000	34,000
17,000	11,700	3,500	17,000	35,000	17,300	5,000	35,000
17,500	11,700	3,500	17,500				
17,750	11,700	3,500	17,750				
18,000	11,700	3,500	18,000				
18,250	11,700	3,500	18,250				
18,500	11,700	3,500	18,500				
19,000	13,700	4,000	19,000				
19,500	13,700	4,000	19,500				
19,750	13,700	4,000	19,750				
20,000	13,700	4,000	20,000				
20,500	13,700	4,000	20,500				

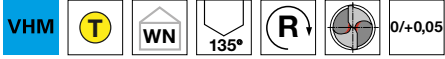


## 可换刀片

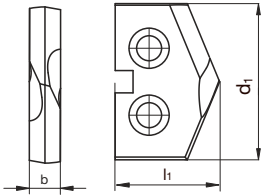
产品代号 86708



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 9,800$  • 没有断屑槽的可更换刀片，用于抗拉强度最大为600N/mm<sup>2</sup>的材料，可普遍使用  
 顶角  $\leq \varnothing 25.4 \text{ mm} = 135^\circ$ ,  $> \varnothing 25.4 \text{ mm} = 132^\circ$   
 (见应用推荐/技术类)



d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
10,000	8,700	2,500	10,000	20,500	13,700	4,000	20,500
10,200	8,700	2,500	10,200	21,000	13,700	4,000	21,000
10,500	8,700	2,500	10,500	21,500	13,700	4,000	21,500
11,000	8,700	2,500	11,000	22,000	13,700	4,000	22,000
11,500	8,700	2,500	11,500	22,500	13,700	4,000	22,500
12,500	8,700	2,500	12,500	22,750	13,700	4,000	22,750
12,750	8,700	2,500	12,750	23,000	13,700	4,000	23,000
13,000	8,700	2,500	13,000	23,500	13,700	4,000	23,500
13,500	11,700	3,500	13,500	24,000	13,700	4,000	24,000
13,750	11,700	3,500	13,750	24,250	13,700	4,000	24,250
14,000	11,700	3,500	14,000	24,500	13,700	4,000	24,500
14,500	11,700	3,500	14,500	25,000	13,700	4,000	25,000
14,750	11,700	3,500	14,750	26,000	17,300	5,000	26,000
15,000	11,700	3,500	15,000	27,000	17,300	5,000	27,000
15,500	11,700	3,500	15,500	28,000	17,300	5,000	28,000
15,750	11,700	3,500	15,750	29,000	17,300	5,000	29,000
16,000	11,700	3,500	16,000	30,000	17,300	5,000	30,000
16,250	11,700	3,500	16,250	31,000	17,300	5,000	31,000
16,500	11,700	3,500	16,500	32,000	17,300	5,000	32,000
16,750	11,700	3,500	16,750	34,000	17,300	5,000	34,000
17,000	11,700	3,500	17,000	35,000	17,300	5,000	35,000
17,500	11,700	3,500	17,500				
17,750	11,700	3,500	17,750				
18,000	11,700	3,500	18,000				
18,250	11,700	3,500	18,250				
18,500	11,700	3,500	18,500				
19,000	13,700	4,000	19,000				
19,500	13,700	4,000	19,500				
19,750	13,700	4,000	19,750				
20,000	13,700	4,000	20,000				



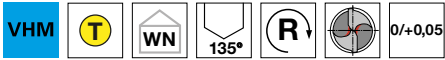
# HARTNER

## 可换刀片

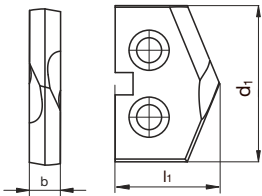
产品代号 86709



P	M	K	N	S	H
●	○	●	○		



芯厚  $\geq \varnothing 9,800$  • 没有断屑槽的可更换刀片，用于抗拉强度最大为600N/mm<sup>2</sup>的材料，可普遍使用  
 顶角  $\leq \varnothing 25.4 \text{ mm} = 135^\circ$ ， $>\varnothing 25.4 \text{ mm} = 132^\circ$   
 没有倒角（见应用推荐/技术类）

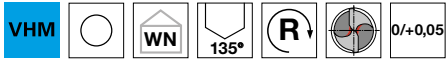


d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
9,920	8,700	2,500	9,920	18,250	11,700	3,500	18,250
10,000	8,700	2,500	10,000	18,500	11,700	3,500	18,500
10,200	8,700	2,500	10,200	19,000	13,700	4,000	19,000
10,500	8,700	2,500	10,500	19,500	13,700	4,000	19,500
11,000	8,700	2,500	11,000	20,000	13,700	4,000	20,000
11,110	8,700	2,500	11,110	20,500	13,700	4,000	20,500
12,000	8,700	2,500	12,000	21,000	13,700	4,000	21,000
12,500	8,700	2,500	12,500	21,500	13,700	4,000	21,500
12,700	8,700	2,500	12,700	22,000	13,700	4,000	22,000
12,750	8,700	2,500	12,750	23,000	13,700	4,000	23,000
13,000	8,700	2,500	13,000	23,250	13,700	4,000	23,250
13,500	11,700	3,500	13,500	24,500	13,700	4,000	24,500
14,000	11,700	3,500	14,000	25,000	13,700	4,000	25,000
14,500	11,700	3,500	14,500	26,000	17,300	5,000	26,000
15,000	11,700	3,500	15,000	27,000	17,300	5,000	27,000
15,880	11,700	3,500	15,880	28,000	17,300	5,000	28,000
16,250	11,700	3,500	16,250	29,000	17,300	5,000	29,000
16,500	11,700	3,500	16,500	30,000	17,300	5,000	30,000
16,670	11,700	3,500	16,670	33,000	17,300	5,000	33,000
16,750	11,700	3,500	16,750	34,000	17,300	5,000	34,000
17,000	11,700	3,500	17,000	35,000	17,300	5,000	35,000
17,500	11,700	3,500	17,500				
17,750	11,700	3,500	17,750				
18,000	11,700	3,500	18,000				

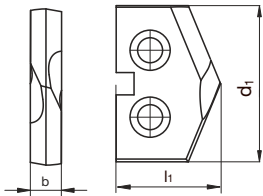


## 可换刀片

产品代号 86711



芯厚  $\geq \varnothing 10,000$  • 带断屑槽的刀片。几何形状适用于  
 铝合金、有色金属和塑料:  
 $\leq \varnothing 25.4 \text{ mm} = 135^\circ$   
 $> \varnothing 25.4 \text{ mm} = 132^\circ$



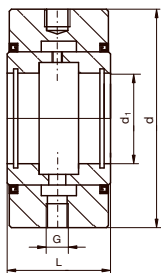
d1 mm	l1 mm	b mm	代号	d1 mm	l1 mm	b mm	代号
10,000	8,700	2,500	10,000	24,000	13,700	4,000	24,000
10,200	8,700	2,500	10,200	24,250	13,700	4,000	24,250
10,500	8,700	2,500	10,500	24,500	13,700	4,000	24,500
11,000	8,700	2,500	11,000	25,000	13,700	4,000	25,000
11,500	8,700	2,500	11,500	25,400	17,300	5,000	25,400
12,000	8,700	2,500	12,000	26,000	17,300	5,000	26,000
12,250	8,700	2,500	12,250	27,000	17,300	5,000	27,000
12,500	8,700	2,500	12,500	28,000	17,300	5,000	28,000
12,700	8,700	2,500	12,700	29,000	17,300	5,000	29,000
12,750	8,700	2,500	12,750	30,000	17,300	5,000	30,000
13,000	8,700	2,500	13,000	31,000	17,300	5,000	31,000
13,500	11,700	3,500	13,500	32,000	17,300	5,000	32,000
13,750	11,700	3,500	13,750	34,000	17,300	5,000	34,000
14,000	11,700	3,500	14,000	35,000	17,300	5,000	35,000
14,250	11,700	3,500	14,250	36,000	24,000	7,000	36,000
14,500	11,700	3,500	14,500	37,000	24,000	7,000	37,000
14,750	11,700	3,500	14,750	38,000	24,000	7,000	38,000
15,000	11,700	3,500	15,000	39,000	24,000	7,000	39,000
15,500	11,700	3,500	15,500	40,000	24,000	7,000	40,000
15,750	11,700	3,500	15,750	41,000	24,000	7,000	41,000
16,000	11,700	3,500	16,000	42,000	24,000	7,000	42,000
16,250	11,700	3,500	16,250	43,000	24,000	7,000	43,000
16,500	11,700	3,500	16,500	44,000	24,000	7,000	44,000
16,750	11,700	3,500	16,750	45,000	24,000	7,000	45,000
17,000	11,700	3,500	17,000	46,000	24,000	7,000	46,000
17,500	11,700	3,500	17,500	47,000	24,000	7,000	47,000
17,750	11,700	3,500	17,750	48,000	24,000	7,000	48,000
18,000	11,700	3,500	18,000	49,000	24,000	7,000	49,000
18,250	11,700	3,500	18,250	50,000	24,000	7,000	50,000
18,500	11,700	3,500	18,500	51,000	24,000	7,000	51,000
19,000	13,700	4,000	19,000	52,000	24,000	7,000	52,000
19,500	13,700	4,000	19,500	53,000	24,000	7,000	53,000
19,750	13,700	4,000	19,750	54,000	24,000	7,000	54,000
20,000	13,700	4,000	20,000	55,000	24,000	7,000	55,000
20,500	13,700	4,000	20,500	56,000	24,000	7,000	56,000
21,000	13,700	4,000	21,000	57,000	24,000	7,000	57,000
21,500	13,700	4,000	21,500	58,000	24,000	7,000	58,000
22,000	13,700	4,000	22,000	59,000	24,000	7,000	59,000
22,500	13,700	4,000	22,500	60,000	24,000	7,000	60,000
22,750	13,700	4,000	22,750	62,000	24,000	7,000	62,000
23,000	13,700	4,000	23,000	64,000	24,000	7,000	64,000
23,500	13,700	4,000	23,500	65,000	24,000	7,000	65,000

## 内冷接口

产品代号 86690



用于夹持莫氏锥柄及带有86670、86680环槽的刀柄的冷却液供给管（不含螺钉）



给	d1 mm	d mm	G	L mm	代号
MK 4	31,750	80,000	G1/4	45,000	31,750
MK 5	63,500	127,000	G1/2	60,000	63,500



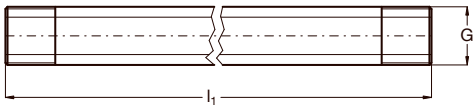
HARTNER

## 冷却剂供给管道

产品代号 82571



用于冷却液供给环（型号86690）的冷却液注水管



G	l1 mm	代号
G1/4	200,000	13,160
G1/2	200,000	20,960



HARTNER

## 快速释放冷却管单元

产品代号 82578



快速更换管接头No.82571

G	d mm	l1 mm	代号
G1/4	9,000	118,000	9,000
G1/2	13,000	118,000	13,000

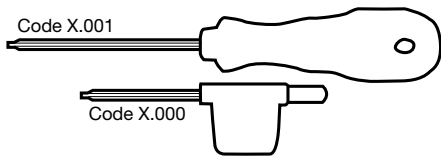


## 梅花螺丝起子

产品代号 86842



梅花螺丝起子



Torx	l1 mm	代号
T5	130,000	5,001
T6	69,000	6,000
T6	150,000	6,001
T7	74,000	7,000
T7	150,000	7,001
T8	150,000	8,001
T9	150,000	9,001
T10	170,000	10,001
T15	80,000	15,000
T15	190,000	15,001
T20	205,000	20,001
T25	207,000	25,001



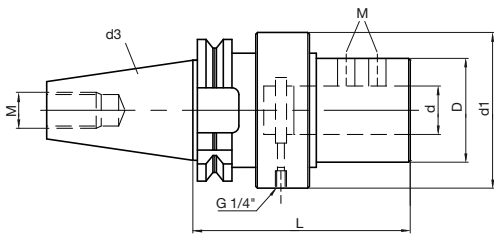
# HARTNER

## 多用型带内冷刀柄

产品代号 86691



带SK（基于 DIN ISO 7388-1）与圆柱孔，小柄径变径套的应用



d3	d mm	D mm	D1 mm	L mm	M	kg	代号
SK 40	32,000	65,000	88,000	130,000	M16	4,000	32,040
SK 50	40,000	65,000	98,000	135,000	M24	5,400	40,050
SK 50	50,000	90,000	123,000	165,000	M24	9,520	50,050



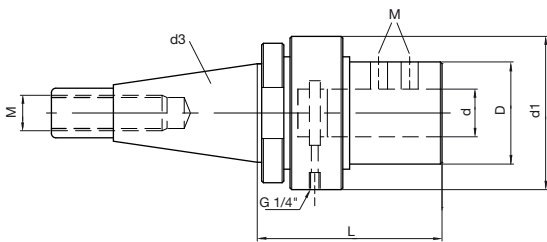
# HARTNER

## 多用型带内冷刀柄

产品代号 86692



带SK（基于 DIN 2080）与圆柱孔，小柄径变径套的应用



d3	d mm	D mm	D1 mm	L mm	M	kg	代号
SK 40	32,000	65,000	88,000	110,000	M16	0,931	32,040
SK 50	40,000	65,000	98,000	120,000	M24	5,825	40,050
SK 50	50,000	90,000	123,000	145,000	M24	9,116	50,050



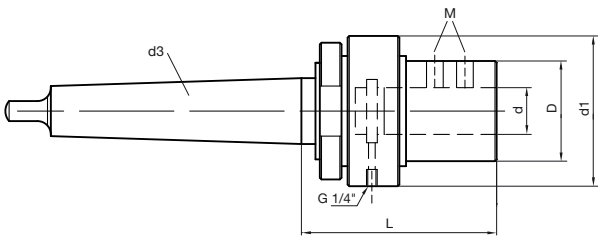
# HARTNER

## 多用型带内冷刀柄

产品代号 86693



带MK（基于 DIN 228 B）与圆柱孔，小柄径变径套的应用



d3	d mm	D mm	D1 mm	L mm	M	kg	代号
MK-4	32,000	65,000	88,000	100,000	M14	3,498	32,400
MK-5	40,000	75,000	98,000	110,000	M16	7,325	40,500
MK-6	40,000	75,000	98,000	120,000	M16	8,000	40,600
MK-5	50,000	90,000	123,000	140,000	M20	7,278	50,500
MK-6	50,000	90,000	123,000	140,000	M20	3,997	50,600



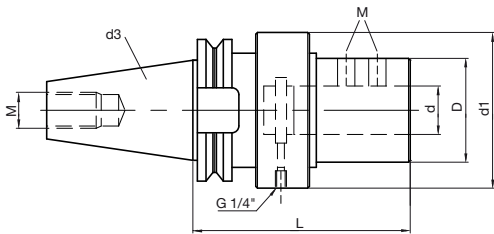
# HARTNER

## 多用型带内冷刀柄

产品代号 86694



带MAS BT（基于 DIN ISO 7388-2）与圆柱孔，小柄径变径套的应用



d3	d mm	D mm	D1 mm	L mm	M	kg	代号
BT 40	32,000	65,000	88,000	125,000	M16	0,872	32,040
BT 50	40,000	65,000	98,000	145,000	M24	6,800	40,050
BT 50	50,000	90,000	123,000	170,000	M24	10,183	50,050

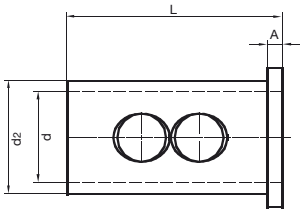


## 用于刀柄出水的夹持直柄的变径套

产品代号 86699



带圆柱定位孔的带内冷刀柄的变径套



d mm	d2 mm	L mm	A mm	代号
20,000	32,000	65,000	5,000	20,032
20,000	40,000	75,000	5,000	20,040
25,000	32,000	65,000	5,000	25,032
25,000	40,000	75,000	5,000	25,040
32,000	40,000	75,000	5,000	32,040



# HARTNER

Precision Cutting Tools



**MULTIPLIX HPC**



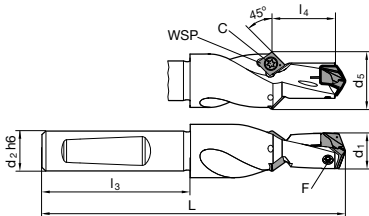
# HARTNER

## 复合 HPC 刀柄

产品代号 86681



出色的耐磨性 • 优化槽型设计 • 优化内冷孔出水 • 压紧螺钉 物料号86843和86846 • 扳手 物料号86842  
预钻和45°镗孔



规格 mm	d1	d2 h6 mm	d5 mm	L mm	l3 mm	l4 mm	F	C	代号
110	11.00-11.99	12,000	17,000	81,000	45,000	12,000	86843 2.200	86846 2.000	11,000
110	11.00-11.99	12,700	17,000	81,000	45,000	12,000	86843 2.200	86846 2.000	11,005
120	12.00-12.99	12,000	18,000	84,000	45,000	13,000	86843 2.201	86846 2.000	12,000
120	12.00-12.99	12,700	18,000	84,000	45,000	13,000	86843 2.201	86846 2.000	12,005
130	13.00-13.99	14,000	18,000	86,000	45,000	14,000	86843 2.500	86846 2.000	13,000
130	13.00-13.99	15,875	18,000	86,000	45,000	14,000	86843 2.500	86846 2.000	13,005
140	14.00-15.99	16,000	18,000	93,000	48,000	16,000	86843 3.000	86846 2.000	14,000
140	14.00-15.99	15,875	18,000	93,000	48,000	16,000	86843 3.000	86846 2.000	14,005
160	16.00-17.99	18,000	20,000	99,000	48,000	18,000	86843 3.500	86846 2.500	16,000
160	16.00-17.99	19,050	20,000	99,000	48,000	18,000	86843 3.500	86846 2.500	16,005
180	18.00-19.99	20,000	22,000	106,000	50,000	20,000	86843 4.000	86846 2.500	18,000
180	18.00-19.99	19,050	22,000	106,000	50,000	20,000	86843 4.000	86846 2.500	18,005
200	20.00-21.99	25,000	25,000	117,000	56,000	22,000	86843 4.500	86846 2.500	20,000
200	20.00-21.99	25,400	25,400	117,000	56,000	22,000	86843 4.500	86846 2.500	20,005
220	22.00-23.99	25,000	26,000	122,000	56,000	24,000	86843 5.000	86846 2.500	22,000
220	22.00-23.99	25,400	26,000	122,000	56,000	24,000	86843 5.000	86846 2.500	22,005
240	24.00-25.99	25,000	28,000	128,000	56,000	26,000	86843 5.001	86846 2.500	24,000
240	24.00-25.99	25,400	28,000	128,000	56,000	26,000	86843 5.001	86846 2.500	24,005
260	26.00-27.99	32,000	32,000	142,000	60,000	28,000	86843 5.003	86846 2.500	26,000
260	26.00-27.99	31,750	32,000	142,000	60,000	28,000	86843 5.003	86846 2.500	26,005
280	28.00-29.99	32,000	34,000	147,000	60,000	30,000	86843 5.003	86846 2.500	28,000
280	28.00-29.99	31,750	34,000	147,000	60,000	30,000	86843 5.003	86846 2.500	28,005
300	30.00-31.99	32,000	38,000	152,000	60,000	32,000	86843 6.000	86846 4.006	30,000
300	30.00-31.99	31,750	38,000	152,000	60,000	32,000	86843 6.000	86846 4.006	30,005
320	32.00-35.99	32,000	42,000	163,000	60,000	36,000	86843 6.001	86846 4.006	32,000
320	32.00-35.99	31,750	42,000	163,000	60,000	36,000	86843 6.001	86846 4.006	32,005
360	36.00-40.00	32,000	46,000	173,000	60,000	40,000	86843 6.002	86846 4.006	36,000
360	36.00-40.00	31,750	46,000	173,000	60,000	40,000	86843 6.002	86846 4.006	36,005





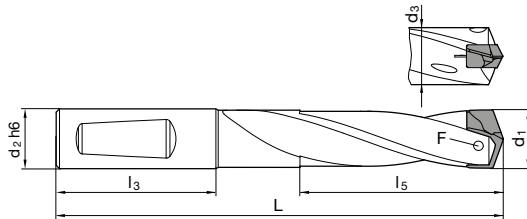
# HARTNER

## 复合 HPC 刀柄

产品代号 86682



出色的耐磨性 • 优化槽型设计 • 优化内冷孔出水 • 扳手 物料号86843 • 扳手 物料号86842



规格 mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	代号
110	11.00-11.49	12,000	10,700	84,000	45,000	19,300	86843 2.200	11,000
110	11.00-11.49	12,700	10,700	84,000	45,000	19,300	86843 2.200	11,005
115	11.50-11.99	12,000	11,200	85,000	45,000	20,100	86843 2.200	11,500
115	11.50-11.99	12,700	11,200	85,000	45,000	20,100	86843 2.200	11,505
120	12.00-12.49	12,000	11,700	87,000	45,000	21,000	86843 2.201	12,000
120	12.00-12.49	12,700	11,700	87,000	45,000	21,000	86843 2.201	12,005
125	12.50-12.99	14,000	12,200	89,000	45,000	21,900	86843 2.201	12,500
125	12.50-12.99	15,875	12,200	89,000	45,000	21,900	86843 2.201	12,505
130	13.00-13.49	14,000	12,700	90,000	45,000	22,600	86843 2.500	13,000
130	13.00-13.49	15,875	12,700	90,000	45,000	22,600	86843 2.500	13,005
135	13.50-13.99	14,000	13,200	92,000	45,000	23,600	86843 2.500	13,500
135	13.50-13.99	15,875	13,200	92,000	45,000	23,600	86843 2.500	13,505
140	14.00-14.49	14,000	13,700	93,000	45,000	24,500	86843 3.000	14,000
140	14.00-14.49	15,875	13,700	93,000	45,000	24,500	86843 3.000	14,005
145	14.50-14.99	16,000	14,200	98,000	48,000	25,300	86843 3.000	14,500
145	14.50-14.99	15,875	14,200	98,000	48,000	25,300	86843 3.000	14,505
150	15.00-15.49	16,000	14,700	100,000	48,000	26,100	86843 3.001	15,000
150	15.00-15.49	15,875	14,700	100,000	48,000	26,100	86843 3.001	15,005
155	15.50-15.99	16,000	15,200	101,000	48,000	27,000	86843 3.001	15,500
155	15.50-15.99	15,875	15,200	101,000	48,000	27,000	86843 3.001	15,505
160	16.00-16.49	16,000	15,700	102,000	48,000	27,800	86843 3.500	16,000
160	16.00-16.49	15,875	15,700	102,000	48,000	27,800	86843 3.500	16,005
165	16.50-16.99	18,000	16,200	105,000	48,000	28,700	86843 3.500	16,500
165	16.50-16.99	19,050	16,200	105,000	48,000	28,700	86843 3.500	16,505
170	17.00-17.49	18,000	16,700	106,000	48,000	29,600	86843 3.500	17,000
170	17.00-17.49	19,050	16,700	106,000	48,000	29,600	86843 3.500	17,005
175	17.50-17.99	18,000	17,200	107,000	48,000	30,400	86843 3.500	17,500
175	17.50-17.99	19,050	17,200	107,000	48,000	30,400	86843 3.500	17,505
180	18.00-18.49	18,000	17,700	109,000	48,000	31,200	86843 4.000	18,000
180	18.00-18.49	19,050	17,700	109,000	48,000	31,200	86843 4.000	18,005
185	18.50-18.99	20,000	18,200	113,000	50,000	32,100	86843 4.000	18,500
185	18.50-18.99	19,050	18,200	113,000	50,000	32,100	86843 4.000	18,505
190	19.00-19.49	20,000	18,700	114,000	50,000	32,900	86843 4.000	19,000
190	19.00-19.49	19,050	18,700	114,000	50,000	32,900	86843 4.000	19,005
195	19.50-19.99	20,000	19,200	116,000	50,000	33,700	86843 4.000	19,500
195	19.50-19.99	19,050	19,200	116,000	50,000	33,700	86843 4.000	19,505
200	20.00-20.49	20,000	19,700	117,000	50,000	34,600	86843 4.500	20,000
200	20.00-20.49	19,050	19,700	117,000	50,000	34,600	86843 4.500	20,005
205	20.50-20.99	25,000	20,200	128,000	56,000	35,500	86843 4.500	20,500
205	20.50-20.99	25,400	20,200	128,000	56,000	35,500	86843 4.500	20,505
210	21.00-21.49	25,000	20,700	129,000	56,000	36,400	86843 4.500	21,000
210	21.00-21.49	25,400	20,700	129,000	56,000	36,400	86843 4.500	21,005



## 复合 HPC 刀柄

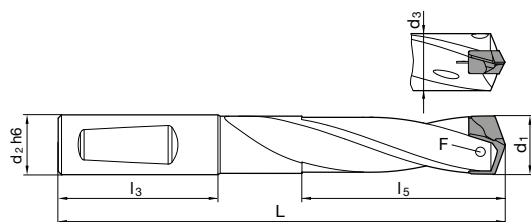
规格 mm	d1	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	F	代号
215	21.50-21.99	25,000	21,200	130,000	56,000	37,200	86843 4.500	21,500
215	21.50-21.99	25,400	21,200	130,000	56,000	37,200	86843 4.500	21,505
220	22.00-22.49	25,000	21,700	131,000	56,000	38,000	86843 5.000	22,000
220	22.00-22.49	25,400	21,700	131,000	56,000	38,000	86843 5.000	22,005
225	22.50-22.99	25,000	22,200	134,000	56,000	38,900	86843 5.000	22,500
225	22.50-22.99	25,400	22,200	134,000	56,000	38,900	86843 5.000	22,505
230	23.00-23.49	25,000	22,700	135,000	56,000	39,800	86843 5.000	23,000
230	23.00-23.49	25,400	22,700	135,000	56,000	39,800	86843 5.000	23,005
235	23.50-23.99	25,000	23,200	137,000	56,000	40,600	86843 5.000	23,500
235	23.50-23.99	25,400	23,200	137,000	56,000	40,600	86843 5.000	23,505
240	24.00-24.49	25,000	23,700	138,000	56,000	41,500	86843 5.001	24,000
240	24.00-24.49	25,400	23,700	138,000	56,000	41,500	86843 5.001	24,005
245	24.50-24.99	25,000	24,200	140,000	56,000	42,300	86843 5.001	24,500
245	24.50-24.99	25,400	24,200	140,000	56,000	42,300	86843 5.001	24,505
250	25.00-25.49	25,000	24,700	142,000	56,000	43,200	86843 5.001	25,000
250	25.00-25.49	25,400	24,700	142,000	56,000	43,200	86843 5.001	25,005
255	25.50-25.99	32,000	25,200	148,000	60,000	44,000	86843 5.001	25,500
255	25.50-25.99	31,750	25,200	148,000	60,000	44,000	86843 5.001	25,505
260	26.00-26.49	32,000	25,700	151,000	60,000	44,300	86843 5.003	26,000
260	26.00-26.49	31,750	25,700	151,000	60,000	44,300	86843 5.003	26,005
265	26.50-26.99	32,000	26,200	153,000	60,000	45,100	86843 5.003	26,500
265	26.50-26.99	31,750	26,200	153,000	60,000	45,100	86843 5.003	26,505
270	27.00-27.49	32,000	26,700	155,000	60,000	46,000	86843 5.003	27,000
270	27.00-27.49	31,750	26,700	155,000	60,000	46,000	86843 5.003	27,005
275	27.50-27.99	32,000	27,200	156,000	60,000	46,800	86843 5.003	27,500
275	27.50-27.99	31,750	27,200	156,000	60,000	46,800	86843 5.003	27,505
280	28.00-28.49	32,000	27,700	157,000	60,000	47,700	86843 5.003	28,000
280	28.00-28.49	31,750	27,700	157,000	60,000	47,700	86843 5.003	28,005
285	28.50-28.99	32,000	28,200	159,000	60,000	48,500	86843 5.003	28,500
285	28.50-28.99	31,750	28,200	159,000	60,000	48,500	86843 5.003	28,505
290	29.00-29.49	32,000	28,700	161,000	60,000	49,400	86843 5.003	29,000
290	29.00-29.49	31,750	28,700	161,000	60,000	49,400	86843 5.003	29,005
295	29.50-29.99	32,000	29,200	162,000	60,000	50,200	86843 5.003	29,500
295	29.50-29.99	31,750	29,200	162,000	60,000	50,200	86843 5.003	29,505
300	30.00-30.49	32,000	29,700	164,000	60,000	50,900	86843 6.000	30,000
300	30.00-30.49	31,750	29,700	164,000	60,000	50,900	86843 6.000	30,005
305	30.50-30.99	32,000	30,200	166,000	60,000	51,700	86843 6.000	30,500
305	30.50-30.99	31,750	30,200	166,000	60,000	51,700	86843 6.000	30,505
310	31.00-31.49	32,000	30,700	167,000	60,000	52,600	86843 6.000	31,000
310	31.00-31.49	31,750	30,700	167,000	60,000	52,600	86843 6.000	31,005
315	31.50-31.99	32,000	31,200	168,000	60,000	53,400	86843 6.000	31,500
315	31.50-31.99	31,750	31,200	168,000	60,000	53,400	86843 6.000	31,505
320	32.00-32.99	32,000	31,700	172,000	60,000	55,100	86843 6.001	32,000
320	32.00-32.99	31,750	31,700	172,000	60,000	55,100	86843 6.001	32,005
330	33.00-33.99	32,000	32,700	175,000	60,000	56,800	86843 6.001	33,000
330	33.00-33.99	31,750	32,700	175,000	60,000	56,800	86843 6.001	33,005
340	34.00-34.99	32,000	33,700	178,000	60,000	58,500	86843 6.001	34,000
340	34.00-34.99	31,750	33,700	178,000	60,000	58,500	86843 6.001	34,005
350	35.00-35.99	32,000	34,700	181,000	60,000	60,200	86843 6.001	35,000
350	35.00-35.99	31,750	34,700	181,000	60,000	60,200	86843 6.001	35,005
360	36.00-36.99	32,000	35,700	184,000	60,000	61,800	86843 6.002	36,000
360	36.00-36.99	31,750	35,700	184,000	60,000	61,800	86843 6.002	36,005
370	37.00-37.99	32,000	36,700	188,000	60,000	63,500	86843 6.002	37,000
370	37.00-37.99	31,750	36,700	188,000	60,000	63,500	86843 6.002	37,005
380	38.00-38.99	32,000	37,700	191,000	60,000	65,200	86843 6.002	38,000
380	38.00-38.99	31,750	37,700	191,000	60,000	65,200	86843 6.002	38,005
390	39.00-40.00	32,000	38,700	194,000	60,000	66,900	86843 6.002	39,000
390	39.00-40.00	31,750	38,700	194,000	60,000	66,900	86843 6.002	39,005

## 复合 HPC 刀柄

产品代号 86683



出色的耐磨性 • 优化槽型设计 • 刚性好 • 扳手 物料号86843 • 扳手 物料号86842



规格 mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	代号
110	11.00-11.49	12,000	10,700	101,000	45,000	36,600	86843 2.200	11,000
110	11.00-11.49	12,700	10,700	101,000	45,000	36,600	86843 2.200	11,005
115	11.50-11.99	12,000	11,200	103,000	45,000	38,100	86843 2.200	11,500
115	11.50-11.99	12,700	11,200	103,000	45,000	38,100	86843 2.200	11,505
120	12.00-12.49	12,000	11,700	106,000	45,000	39,700	86843 2.201	12,000
120	12.00-12.49	12,700	11,700	106,000	45,000	39,700	86843 2.201	12,005
125	12.50-12.99	14,000	12,200	108,000	45,000	41,300	86843 2.201	12,500
125	12.50-12.99	15,875	12,200	108,000	45,000	41,300	86843 2.201	12,505
130	13.00-13.49	14,000	12,700	110,000	45,000	42,900	86843 2.500	13,000
130	13.00-13.49	15,875	12,700	110,000	45,000	42,900	86843 2.500	13,005
135	13.50-13.99	14,000	13,200	113,000	45,000	44,600	86843 2.500	13,500
135	13.50-13.99	15,875	13,200	113,000	45,000	44,600	86843 2.500	13,505
140	14.00-14.49	14,000	13,700	115,000	45,000	46,200	86843 3.000	14,000
140	14.00-14.49	15,875	13,700	115,000	45,000	46,200	86843 3.000	14,005
145	14.50-14.99	16,000	14,200	120,000	48,000	47,800	86843 3.000	14,500
145	14.50-14.99	15,875	14,200	120,000	48,000	47,800	86843 3.000	14,505
150	15.00-15.49	16,000	14,700	123,000	48,000	49,300	86843 3.001	15,000
150	15.00-15.49	15,875	14,700	123,000	48,000	49,300	86843 3.001	15,005
155	15.50-15.99	16,000	15,200	125,000	48,000	50,900	86843 3.001	15,500
155	15.50-15.99	15,875	15,200	125,000	48,000	50,900	86843 3.001	15,505
160	16.00-16.49	16,000	15,700	127,000	48,000	52,900	86843 3.500	16,000
160	16.00-16.49	15,875	15,700	127,000	48,000	52,900	86843 3.500	16,005
165	16.50-16.99	18,000	16,200	130,000	48,000	54,100	86843 3.500	16,500
165	16.50-16.99	19,050	16,200	130,000	48,000	54,100	86843 3.500	16,505
170	17.00-17.49	18,000	16,700	132,000	48,000	55,800	86843 3.500	17,000
170	17.00-17.49	19,050	16,700	132,000	48,000	55,800	86843 3.500	17,005
175	17.50-17.99	18,000	17,200	134,000	48,000	57,400	86843 3.500	17,500
175	17.50-17.99	19,050	17,200	134,000	48,000	57,400	86843 3.500	17,505
180	18.00-18.49	18,000	17,700	137,000	48,000	58,900	86843 4.000	18,000
180	18.00-18.49	19,050	17,700	137,000	48,000	58,900	86843 4.000	18,005
185	18.50-18.99	20,000	18,200	141,000	50,000	60,500	86843 4.000	18,500
185	18.50-18.99	19,050	18,200	141,000	50,000	60,500	86843 4.000	18,505
190	19.00-19.49	20,000	18,700	143,000	50,000	62,100	86843 4.000	19,000
190	19.00-19.49	19,050	18,700	143,000	50,000	62,100	86843 4.000	19,005
195	19.50-19.99	20,000	19,200	146,000	50,000	63,700	86843 4.000	19,500
195	19.50-19.99	19,050	19,200	146,000	50,000	63,700	86843 4.000	19,505
200	20.00-20.49	20,000	19,700	148,000	50,000	65,300	86843 4.500	20,000
200	20.00-20.49	19,050	19,700	148,000	50,000	65,300	86843 4.500	20,005
205	20.50-20.99	25,000	20,200	159,000	56,000	67,000	86843 4.500	20,500
205	20.50-20.99	25,400	20,200	159,000	56,000	67,000	86843 4.500	20,505
210	21.00-21.49	25,000	20,700	161,000	56,000	68,600	86843 4.500	21,000
210	21.00-21.49	25,400	20,700	161,000	56,000	68,600	86843 4.500	21,005



## 复合 HPC 刀柄

规格 mm	d1	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	F	代号
215	21.50-21.99	25,000	21,200	163,000	56,000	70,100	86843 4.500	21,500
215	21.50-21.99	25,400	21,200	163,000	56,000	70,100	86843 4.500	21,505
220	22.00-22.49	25,000	21,700	165,000	56,000	71,700	86843 5.000	22,000
220	22.00-22.49	25,400	21,700	165,000	56,000	71,700	86843 5.000	22,005
225	22.50-22.99	25,000	22,200	168,000	56,000	73,300	86843 5.000	22,500
225	22.50-22.99	25,400	22,200	168,000	56,000	73,300	86843 5.000	22,505
230	23.00-23.49	25,000	22,700	170,000	56,000	74,900	86843 5.000	23,000
230	23.00-23.49	25,400	22,700	170,000	56,000	74,900	86843 5.000	23,005
235	23.50-23.99	25,000	23,200	173,000	56,000	76,500	86843 5.000	23,500
235	23.50-23.99	25,400	23,200	173,000	56,000	76,500	86843 5.000	23,505
240	24.00-24.49	25,000	23,700	175,000	56,000	78,100	86843 5.001	24,000
240	24.00-24.49	25,400	23,700	175,000	56,000	78,100	86843 5.001	24,005
245	24.50-24.99	25,000	24,200	177,000	56,000	79,700	86843 5.001	24,500
245	24.50-24.99	25,400	24,200	177,000	56,000	79,700	86843 5.001	24,505
250	25.00-25.49	25,000	24,700	180,000	56,000	81,300	86843 5.001	25,000
250	25.00-25.49	25,400	24,700	180,000	56,000	81,300	86843 5.001	25,005
255	25.50-25.99	32,000	25,200	187,000	60,000	82,900	86843 5.001	25,500
255	25.50-25.99	31,750	25,200	187,000	60,000	82,900	86843 5.001	25,505
260	26.00-26.49	32,000	25,700	191,000	60,000	84,000	86843 5.003	26,000
260	26.00-26.49	31,750	25,700	191,000	60,000	84,000	86843 5.003	26,005
265	26.50-26.99	32,000	26,200	193,000	60,000	86,100	86843 5.003	26,500
265	26.50-26.99	31,750	26,200	193,000	60,000	86,100	86843 5.003	26,505
270	27.00-27.49	32,000	26,700	196,000	60,000	87,200	86843 5.003	27,000
270	27.00-27.49	31,750	26,700	196,000	60,000	87,200	86843 5.003	27,005
275	27.50-27.99	32,000	27,200	198,000	60,000	88,900	86843 5.003	27,500
275	27.50-27.99	31,750	27,200	198,000	60,000	88,900	86843 5.003	27,505
280	28.00-28.49	32,000	27,700	200,000	60,000	90,400	86843 5.003	28,000
280	28.00-28.49	31,750	27,700	200,000	60,000	90,400	86843 5.003	28,005
285	28.50-28.99	32,000	28,200	202,000	60,000	92,500	86843 5.003	28,500
285	28.50-28.99	31,750	28,200	202,000	60,000	92,500	86843 5.003	28,505
290	29.00-29.49	32,000	28,700	205,000	60,000	94,600	86843 5.003	29,000
290	29.00-29.49	31,750	28,700	205,000	60,000	94,600	86843 5.003	29,005
295	29.50-29.99	32,000	29,200	207,000	60,000	95,100	86843 5.003	29,500
295	29.50-29.99	31,750	29,200	207,000	60,000	95,100	86843 5.003	29,505
300	30.00-30.49	32,000	29,700	210,000	60,000	96,700	86843 6.000	30,000
300	30.00-30.49	31,750	29,700	210,000	60,000	96,700	86843 6.000	30,005
305	30.50-30.99	32,000	30,200	212,000	60,000	98,300	86843 6.000	30,500
305	30.50-30.99	31,750	30,200	212,000	60,000	98,300	86843 6.000	30,505
310	31.00-31.49	32,000	30,700	214,000	60,000	99,800	86843 6.000	31,000
310	31.00-31.49	31,750	30,700	214,000	60,000	99,800	86843 6.000	31,005
315	31.50-31.99	32,000	31,200	216,000	60,000	101,400	86843 6.000	31,500
315	31.50-31.99	31,750	31,200	216,000	60,000	101,400	86843 6.000	31,505
320	32.00-32.99	32,000	31,700	221,000	60,000	104,600	86843 6.001	32,000
320	32.00-32.99	31,750	31,700	221,000	60,000	104,600	86843 6.001	32,005
330	33.00-33.99	32,000	32,700	226,000	60,000	107,800	86843 6.001	33,000
330	33.00-33.99	31,750	32,700	226,000	60,000	107,800	86843 6.001	33,005
340	34.00-34.99	32,000	33,700	230,000	60,000	111,000	86843 6.001	34,000
340	34.00-34.99	31,750	33,700	230,000	60,000	111,000	86843 6.001	34,005
350	35.00-35.99	32,000	34,700	235,000	60,000	114,200	86843 6.001	35,000
350	35.00-35.99	31,750	34,700	235,000	60,000	114,200	86843 6.001	35,005
360	36.00-36.99	32,000	35,700	240,000	60,000	117,300	86843 6.002	36,000
360	36.00-36.99	31,750	35,700	240,000	60,000	117,300	86843 6.002	36,005
370	37.00-37.99	32,000	36,700	245,000	60,000	120,500	86843 6.002	37,000
370	37.00-37.99	31,750	36,700	245,000	60,000	120,500	86843 6.002	37,005
380	38.00-38.99	32,000	37,700	249,000	60,000	123,700	86843 6.002	38,000
380	38.00-38.99	31,750	37,700	249,000	60,000	123,700	86843 6.002	38,005
390	39.00-40.00	32,000	38,700	254,000	60,000	126,900	86843 6.002	39,000
390	39.00-40.00	31,750	38,700	254,000	60,000	126,900	86843 6.002	39,005



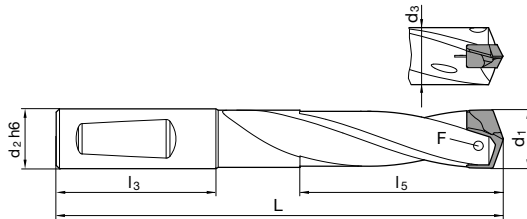
# HARTNER

## 复合 HPC 刀柄

产品代号 86684



出色的耐磨性 • 优化槽型设计 • 刚性好 • 扳手 物料号86843 • 扳手 物料号86842



规格 mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	代号
110	11.00-11.49	12,000	10,700	124,000	45,000	59,600	86843 2.200	11,000
110	11.00-11.49	12,700	10,700	124,000	45,000	59,600	86843 2.200	11,005
115	11.50-11.99	12,000	11,200	127,000	45,000	62,100	86843 2.200	11,500
115	11.50-11.99	12,700	11,200	127,000	45,000	62,100	86843 2.200	11,505
120	12.00-12.49	12,000	11,700	131,000	45,000	64,700	86843 2.201	12,000
120	12.00-12.49	12,700	11,700	131,000	45,000	64,700	86843 2.201	12,005
125	12.50-12.99	14,000	12,200	134,000	45,000	67,300	86843 2.201	12,500
125	12.50-12.99	15,875	12,200	134,000	45,000	67,300	86843 2.201	12,505
130	13.00-13.49	14,000	12,700	137,000	45,000	69,900	86843 2.500	13,000
130	13.00-13.49	15,875	12,700	137,000	45,000	69,900	86843 2.500	13,005
135	13.50-13.99	14,000	13,200	141,000	45,000	72,600	86843 2.500	13,500
135	13.50-13.99	15,875	13,200	141,000	45,000	72,600	86843 2.500	13,505
140	14.00-14.49	14,000	13,700	144,000	45,000	75,200	86843 3.000	14,000
140	14.00-14.49	15,875	13,700	144,000	45,000	75,200	86843 3.000	14,005
145	14.50-14.99	16,000	14,200	150,000	48,000	77,800	86843 3.000	14,500
145	14.50-14.99	15,875	14,200	150,000	48,000	77,800	86843 3.000	14,505
150	15.00-15.49	16,000	14,700	154,000	48,000	80,300	86843 3.001	15,000
150	15.00-15.49	15,875	14,700	154,000	48,000	80,300	86843 3.001	15,005
155	15.50-15.99	16,000	15,200	157,000	48,000	82,900	86843 3.001	15,500
155	15.50-15.99	15,875	15,200	157,000	48,000	82,900	86843 3.001	15,505
160	16.00-16.49	16,000	15,700	160,000	48,000	85,900	86843 3.500	16,000
160	16.00-16.49	15,875	15,700	160,000	48,000	85,900	86843 3.500	16,005
165	16.50-16.99	18,000	16,200	164,000	48,000	88,100	86843 3.500	16,500
165	16.50-16.99	19,050	16,200	164,000	48,000	88,100	86843 3.500	16,505
170	17.00-17.49	18,000	16,700	167,000	48,000	90,800	86843 3.500	17,000
170	17.00-17.49	19,050	16,700	167,000	48,000	90,800	86843 3.500	17,005
175	17.50-17.99	18,000	17,200	170,000	48,000	93,400	86843 3.500	17,500
175	17.50-17.99	19,050	17,200	170,000	48,000	93,400	86843 3.500	17,505
180	18.00-18.49	18,000	17,700	174,000	48,000	95,900	86843 4.000	18,000
180	18.00-18.49	19,050	17,700	174,000	48,000	95,900	86843 4.000	18,005
185	18.50-18.99	20,000	18,200	179,000	50,000	98,500	86843 4.000	18,500
185	18.50-18.99	19,050	18,200	179,000	50,000	98,500	86843 4.000	18,505
190	19.00-19.49	20,000	18,700	182,000	50,000	101,100	86843 4.000	19,000
190	19.00-19.49	19,050	18,700	182,000	50,000	101,100	86843 4.000	19,005
195	19.50-19.99	20,000	19,200	186,000	50,000	103,700	86843 4.000	19,500
195	19.50-19.99	19,050	19,200	186,000	50,000	103,700	86843 4.000	19,505
200	20.00-20.49	20,000	19,700	189,000	50,000	106,300	86843 4.500	20,000
200	20.00-20.49	19,050	19,700	189,000	50,000	106,300	86843 4.500	20,005
205	20.50-20.99	25,000	20,200	201,000	56,000	109,000	86843 4.500	20,500
205	20.50-20.99	25,400	20,200	201,000	56,000	109,000	86843 4.500	20,505
210	21.00-21.49	25,000	20,700	204,000	56,000	111,600	86843 4.500	21,000
210	21.00-21.49	25,400	20,700	204,000	56,000	111,600	86843 4.500	21,005



## 复合 HPC 刀柄

规格 mm	d1	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	F	代号
215	21.50-21.99	25,000	21,200	207,000	56,000	114,100	86843 4.500	21,500
215	21.50-21.99	25,400	21,200	207,000	56,000	114,100	86843 4.500	21,505
220	22.00-22.49	25,000	21,700	210,000	56,000	116,700	86843 5.000	22,000
220	22.00-22.49	25,400	21,700	210,000	56,000	116,700	86843 5.000	22,005
225	22.50-22.99	25,000	22,200	214,000	56,000	119,300	86843 5.000	22,500
225	22.50-22.99	25,400	22,200	214,000	56,000	119,300	86843 5.000	22,505
230	23.00-23.49	25,000	22,700	217,000	56,000	121,900	86843 5.000	23,000
230	23.00-23.49	25,400	22,700	217,000	56,000	121,900	86843 5.000	23,005
235	23.50-23.99	25,000	23,200	221,000	56,000	124,500	86843 5.000	23,500
235	23.50-23.99	25,400	23,200	221,000	56,000	124,500	86843 5.000	23,505
240	24.00-24.49	25,000	23,700	224,000	56,000	127,100	86843 5.001	24,000
240	24.00-24.49	25,400	23,700	224,000	56,000	127,100	86843 5.001	24,005
245	24.50-24.99	25,000	24,200	227,000	56,000	129,700	86843 5.001	24,500
245	24.50-24.99	25,400	24,200	227,000	56,000	129,700	86843 5.001	24,505
250	25.00-25.49	25,000	24,700	231,000	56,000	132,300	86843 5.001	25,000
250	25.00-25.49	25,400	24,700	231,000	56,000	132,300	86843 5.001	25,005
255	25.50-25.99	32,000	25,200	239,000	60,000	134,900	86843 5.001	25,500
255	25.50-25.99	31,750	25,200	239,000	60,000	134,900	86843 5.001	25,505
260	26.00-26.49	32,000	25,700	244,000	60,000	137,000	86843 5.003	26,000
265	26.50-26.99	32,000	26,200	247,000	60,000	140,000	86843 5.003	26,500
270	27.00-27.49	32,000	26,700	251,000	60,000	142,200	86843 5.003	27,000
275	27.50-27.99	32,000	27,200	254,000	60,000	144,800	86843 5.003	27,500
280	28.00-28.49	32,000	27,700	257,000	60,000	147,400	86843 5.003	28,000
285	28.50-28.99	32,000	28,200	260,000	60,000	150,400	86843 5.003	28,500
290	29.00-29.49	32,000	28,700	264,000	60,000	153,500	86843 5.003	29,000
295	29.50-29.99	32,000	29,200	267,000	60,000	155,100	86843 5.003	29,500
300	30.00-30.49	32,000	29,700	271,000	60,000	157,600	86843 6.000	30,000
305	30.50-30.99	32,000	30,200	274,000	60,000	160,200	86843 6.000	30,500
310	31.00-31.49	32,000	30,700	277,000	60,000	162,800	86843 6.000	31,000
315	31.50-31.99	32,000	31,200	280,000	60,000	165,400	86843 6.000	31,500
320	32.00-32.99	32,000	31,700	287,000	60,000	170,600	86843 6.001	32,000
330	33.00-33.99	32,000	32,700	294,000	60,000	175,800	86843 6.001	33,000
340	34.00-34.99	32,000	33,700	300,000	60,000	181,000	86843 6.001	34,000
350	35.00-35.99	32,000	34,700	307,000	60,000	186,200	86843 6.001	35,000
360	36.00-36.99	32,000	35,700	314,000	60,000	191,300	86843 6.002	36,000
370	37.00-37.99	32,000	36,700	321,000	60,000	196,500	86843 6.002	37,000
380	38.00-38.99	32,000	37,700	327,000	60,000	201,700	86843 6.002	38,000
390	39.00-40.00	32,000	38,700	334,000	60,000	206,900	86843 6.002	39,000



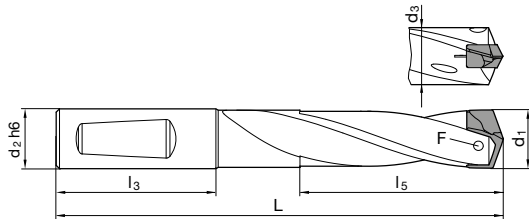
# HARTNER

## 复合 HPC 刀柄

产品代号 86685



出色的耐磨性 • 优化槽型设计 • 刚性好 • 扳手 物料号86843 • 扳手 物料号86842



规格 mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	代号
110	11.00-11.49	12,000	10,700	147,000	45,000	82,600	86843 2.200	11,000
110	11.00-11.49	12,700	10,700	147,000	45,000	82,600	86843 2.200	11,005
115	11.50-11.99	12,000	11,200	151,000	45,000	86,100	86843 2.200	11,500
115	11.50-11.99	12,700	11,200	151,000	45,000	86,100	86843 2.200	11,505
120	12.00-12.49	12,000	11,700	156,000	45,000	89,700	86843 2.201	12,000
120	12.00-12.49	12,700	11,700	156,000	45,000	89,700	86843 2.201	12,005
125	12.50-12.99	14,000	12,200	160,000	45,000	93,300	86843 2.201	12,500
125	12.50-12.99	15,875	12,200	160,000	45,000	93,300	86843 2.201	12,505
130	13.00-13.49	14,000	12,700	164,000	45,000	96,900	86843 2.500	13,000
130	13.00-13.49	15,875	12,700	164,000	45,000	96,900	86843 2.500	13,005
135	13.50-13.99	14,000	13,200	169,000	45,000	100,600	86843 2.500	13,500
135	13.50-13.99	15,875	13,200	169,000	45,000	100,600	86843 2.500	13,505
140	14.00-14.49	14,000	13,700	173,000	45,000	104,200	86843 3.000	14,000
140	14.00-14.49	15,875	13,700	173,000	45,000	104,200	86843 3.000	14,005
145	14.50-14.99	16,000	14,200	180,000	48,000	107,800	86843 3.000	14,500
145	14.50-14.99	15,875	14,200	180,000	48,000	107,800	86843 3.000	14,505
150	15.00-15.49	16,000	14,700	185,000	48,000	111,300	86843 3.001	15,000
150	15.00-15.49	15,875	14,700	185,000	48,000	111,300	86843 3.001	15,005
155	15.50-15.99	16,000	15,200	189,000	48,000	114,900	86843 3.001	15,500
155	15.50-15.99	15,875	15,200	189,000	48,000	114,900	86843 3.001	15,505
160	16.00-16.49	16,000	15,700	193,000	48,000	118,900	86843 3.500	16,000
160	16.00-16.49	15,875	15,700	193,000	48,000	118,900	86843 3.500	16,005
165	16.50-16.99	18,000	16,200	198,000	48,000	122,100	86843 3.500	16,500
165	16.50-16.99	19,050	16,200	198,000	48,000	122,100	86843 3.500	16,505
170	17.00-17.49	18,000	16,700	202,000	48,000	125,800	86843 3.500	17,000
170	17.00-17.49	19,050	16,700	202,000	48,000	125,800	86843 3.500	17,005
175	17.50-17.99	18,000	17,200	206,000	48,000	129,400	86843 3.500	17,500
175	17.50-17.99	19,050	17,200	206,000	48,000	129,400	86843 3.500	17,505
180	18.00-18.49	18,000	17,700	211,000	48,000	132,900	86843 4.000	18,000
180	18.00-18.49	19,050	17,700	211,000	48,000	132,900	86843 4.000	18,005
185	18.50-18.99	20,000	18,200	217,000	50,000	136,500	86843 4.000	18,500
185	18.50-18.99	19,050	18,200	217,000	50,000	136,500	86843 4.000	18,505
190	19.00-19.49	20,000	18,700	221,000	50,000	140,100	86843 4.000	19,000
190	19.00-19.49	19,050	18,700	221,000	50,000	140,100	86843 4.000	19,005
195	19.50-19.99	20,000	19,200	226,000	50,000	143,700	86843 4.000	19,500
195	19.50-19.99	19,050	19,200	226,000	50,000	143,700	86843 4.000	19,505
200	20.00-20.49	20,000	19,700	230,000	50,000	147,300	86843 4.500	20,000
200	20.00-20.49	19,050	19,700	230,000	50,000	147,300	86843 4.500	20,005
205	20.50-20.99	25,000	20,200	243,000	56,000	151,000	86843 4.500	20,500
205	20.50-20.99	25,400	20,200	243,000	56,000	151,000	86843 4.500	20,505
210	21.00-21.49	25,000	20,700	247,000	56,000	154,600	86843 4.500	21,000
210	21.00-21.49	25,400	20,700	247,000	56,000	154,600	86843 4.500	21,005



## 复合 HPC 刀柄

规格 mm	d1	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	F	代号
215	21.50-21.99	25,000	21,200	251,000	56,000	158,100	86843 4.500	21,500
215	21.50-21.99	25,400	21,200	251,000	56,000	158,100	86843 4.500	21,505
220	22.00-22.49	25,000	21,700	255,000	56,000	161,700	86843 5.000	22,000
220	22.00-22.49	25,400	21,700	255,000	56,000	161,700	86843 5.000	22,005
225	22.50-22.99	25,000	22,200	260,000	56,000	165,300	86843 5.000	22,500
225	22.50-22.99	25,400	22,200	260,000	56,000	165,300	86843 5.000	22,505
230	23.00-23.49	25,000	22,700	264,000	56,000	168,900	86843 5.000	23,000
230	23.00-23.49	25,400	22,700	264,000	56,000	168,900	86843 5.000	23,005
235	23.50-23.99	25,000	23,200	269,000	56,000	172,500	86843 5.000	23,500
235	23.50-23.99	25,400	23,200	269,000	56,000	172,500	86843 5.000	23,505
240	24.00-24.49	25,000	23,700	273,000	56,000	176,100	86843 5.001	24,000
240	24.00-24.49	25,400	23,700	273,000	56,000	176,100	86843 5.001	24,005
245	24.50-24.99	25,000	24,200	277,000	56,000	179,700	86843 5.001	24,500
245	24.50-24.99	25,400	24,200	277,000	56,000	179,700	86843 5.001	24,505
250	25.00-25.49	25,000	24,700	282,000	56,000	183,300	86843 5.001	25,000
250	25.00-25.49	25,400	24,700	282,000	56,000	183,300	86843 5.001	25,005
255	25.50-25.99	32,000	25,200	291,000	60,000	186,900	86843 5.001	25,500
255	25.50-25.99	31,750	25,200	291,000	60,000	186,900	86843 5.001	25,505
260	26.00-26.49	32,000	25,700	297,000	60,000	190,000	86843 5.003	26,000
260	26.00-26.49	31,750	25,700	297,000	60,000	190,000	86843 5.003	26,005
265	26.50-26.99	32,000	26,200	301,000	60,000	194,000	86843 5.003	26,500
265	26.50-26.99	31,750	26,200	301,000	60,000	194,000	86843 5.003	26,505
270	27.00-27.49	32,000	26,700	306,000	60,000	197,200	86843 5.003	27,000
270	27.00-27.49	31,750	26,700	306,000	60,000	197,200	86843 5.003	27,005
275	27.50-27.99	32,000	27,200	310,000	60,000	200,800	86843 5.003	27,500
275	27.50-27.99	31,750	27,200	310,000	60,000	200,800	86843 5.003	27,505
280	28.00-28.49	32,000	27,700	314,000	60,000	204,400	86843 5.003	28,000
280	28.00-28.49	31,750	27,700	314,000	60,000	204,400	86843 5.003	28,005
285	28.50-28.99	32,000	28,200	318,000	60,000	208,400	86843 5.003	28,500
285	28.50-28.99	31,750	28,200	318,000	60,000	208,400	86843 5.003	28,505
290	29.00-29.49	32,000	28,700	323,000	60,000	212,500	86843 5.003	29,000
290	29.00-29.49	31,750	28,700	323,000	60,000	212,500	86843 5.003	29,005
295	29.50-29.99	32,000	29,200	327,000	60,000	215,100	86843 5.003	29,500
295	29.50-29.99	31,750	29,200	327,000	60,000	215,100	86843 5.003	29,505
300	30.00-30.49	32,000	29,700	332,000	60,000	218,600	86843 6.000	30,000
300	30.00-30.49	31,750	29,700	332,000	60,000	218,600	86843 6.000	30,005
305	30.50-30.99	32,000	30,200	336,000	60,000	222,200	86843 6.000	30,500
305	30.50-30.99	31,750	30,200	336,000	60,000	222,200	86843 6.000	30,505
310	31.00-31.49	32,000	30,700	340,000	60,000	225,800	86843 6.000	31,000
310	31.00-31.49	31,750	30,700	340,000	60,000	225,800	86843 6.000	31,005
315	31.50-31.99	32,000	31,200	344,000	60,000	229,400	86843 6.000	31,500
315	31.50-31.99	31,750	31,200	344,000	60,000	229,400	86843 6.000	31,505





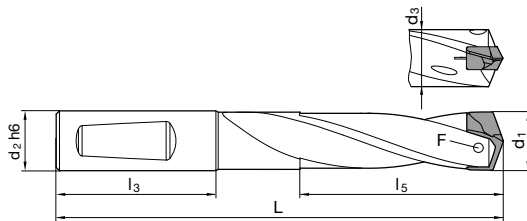
# HARTNER

## 复合 HPC 刀柄

产品代号 86686



出色的耐磨性 • 优化槽型设计 • 刚性好 • 扳手 物料号86843 • 扳手 物料号86842



规格 mm	d1	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	F	代号
110	11.00-11.49	12,000	10,700	182,000	45,000	117,100	86843 2.200	11,000
110	11.00-11.49	12,700	10,700	182,000	45,000	117,100	86843 2.200	11,005
115	11.50-11.99	12,000	11,200	187,000	45,000	122,100	86843 2.200	11,500
115	11.50-11.99	12,700	11,200	187,000	45,000	122,100	86843 2.200	11,505
120	12.00-12.49	12,000	11,700	194,000	45,000	127,200	86843 2.201	12,000
120	12.00-12.49	12,700	11,700	194,000	45,000	127,200	86843 2.201	12,005
125	12.50-12.99	14,000	12,200	199,000	45,000	132,300	86843 2.201	12,500
125	12.50-12.99	15,875	12,200	199,000	45,000	132,300	86843 2.201	12,505
130	13.00-13.49	14,000	12,700	205,000	45,000	137,500	86843 2.500	13,000
130	13.00-13.49	15,875	12,700	205,000	45,000	137,500	86843 2.500	13,005
135	13.50-13.99	14,000	13,200	211,000	45,000	142,500	86843 2.500	13,500
135	13.50-13.99	15,875	13,200	211,000	45,000	142,500	86843 2.500	13,505
140	14.00-14.49	14,000	13,700	217,000	45,000	147,700	86843 3.000	14,000
140	14.00-14.49	15,875	13,700	217,000	45,000	147,700	86843 3.000	14,005
145	14.50-14.99	16,000	14,200	225,000	48,000	152,800	86843 3.000	14,500
145	14.50-14.99	15,875	14,200	225,000	48,000	152,800	86843 3.000	14,505
150	15.00-15.49	16,000	14,700	232,000	48,000	157,800	86843 3.001	15,000
150	15.00-15.49	15,875	14,700	232,000	48,000	157,800	86843 3.001	15,005
155	15.50-15.99	16,000	15,200	237,000	48,000	162,900	86843 3.001	15,500
155	15.50-15.99	15,875	15,200	237,000	48,000	162,900	86843 3.001	15,505
160	16.00-16.49	16,000	15,700	243,000	48,000	168,000	86843 3.500	16,000
160	16.00-16.49	15,875	15,700	243,000	48,000	168,000	86843 3.500	16,005
165	16.50-16.99	18,000	16,200	249,000	48,000	170,000	86843 3.500	16,500
165	16.50-16.99	19,050	16,200	249,000	48,000	170,000	86843 3.500	16,505
170	17.00-17.49	18,000	16,700	255,000	48,000	178,300	86843 3.500	17,000
170	17.00-17.49	19,050	16,700	255,000	48,000	178,300	86843 3.500	17,005
175	17.50-17.99	18,000	17,200	260,000	48,000	183,500	86843 3.500	17,500
175	17.50-17.99	19,050	17,200	260,000	48,000	183,500	86843 3.500	17,505
180	18.00-18.49	18,000	17,700	267,000	48,000	188,400	86843 4.000	18,000
180	18.00-18.49	19,050	17,700	267,000	48,000	188,400	86843 4.000	18,005
185	18.50-18.99	20,000	18,200	274,000	50,000	193,500	86843 4.000	18,500
185	18.50-18.99	19,050	18,200	274,000	50,000	193,500	86843 4.000	18,505
190	19.00-19.49	20,000	18,700	280,000	50,000	198,700	86843 4.000	19,000
190	19.00-19.49	19,050	18,700	280,000	50,000	198,700	86843 4.000	19,005
195	19.50-19.99	20,000	19,200	286,000	50,000	203,700	86843 4.000	19,500
195	19.50-19.99	19,050	19,200	286,000	50,000	203,700	86843 4.000	19,505
200	20.00-20.49	20,000	19,700	292,000	50,000	208,900	86843 4.500	20,000
200	20.00-20.49	19,050	19,700	292,000	50,000	208,900	86843 4.500	20,005
205	20.50-20.99	25,000	20,200	306,000	56,000	214,000	86843 4.500	20,500
205	20.50-20.99	25,400	20,200	306,000	56,000	214,000	86843 4.500	20,505
210	21.00-21.49	25,000	20,700	312,000	56,000	219,100	86843 4.500	21,000
210	21.00-21.49	25,400	20,700	312,000	56,000	219,100	86843 4.500	21,005



## 复合 HPC 刀柄

规格 mm	d1	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	F	代号
215	21.50-21.99	25,000	21,200	317,000	56,000	224,200	86843 4.500	21,500
215	21.50-21.99	25,400	21,200	317,000	56,000	224,200	86843 4.500	21,505
220	22.00-22.49	25,000	21,700	323,000	56,000	229,300	86843 5.000	22,000
220	22.00-22.49	25,400	21,700	323,000	56,000	229,300	86843 5.000	22,005
225	22.50-22.99	25,000	22,200	329,000	56,000	234,400	86843 5.000	22,500
225	22.50-22.99	25,400	22,200	329,000	56,000	234,400	86843 5.000	22,505
230	23.00-23.49	25,000	22,700	335,000	56,000	239,500	86843 5.000	23,000
230	23.00-23.49	25,400	22,700	335,000	56,000	239,500	86843 5.000	23,005
235	23.50-23.99	25,000	23,200	341,000	56,000	244,600	86843 5.000	23,500
235	23.50-23.99	25,400	23,200	341,000	56,000	244,600	86843 5.000	23,505
240	24.00-24.49	25,000	23,700	347,000	56,000	249,700	86843 5.001	24,000
240	24.00-24.49	25,400	23,700	347,000	56,000	249,700	86843 5.001	24,005
245	24.50-24.99	25,000	24,200	352,000	56,000	254,800	86843 5.001	24,500
245	24.50-24.99	25,400	24,200	352,000	56,000	254,800	86843 5.001	24,505
250	25.00-25.49	25,000	24,700	359,000	56,000	259,900	86843 5.001	25,000
250	25.00-25.49	25,400	24,700	359,000	56,000	259,900	86843 5.001	25,005
255	25.50-25.99	32,000	25,200	369,000	60,000	265,000	86843 5.001	25,500
255	25.50-25.99	31,750	25,200	369,000	60,000	265,000	86843 5.001	25,505
260	26.00-26.49	32,000	25,700	377,000	60,000	270,000	86843 5.003	26,000
260	26.00-26.49	31,750	25,700	377,000	60,000	270,000	86843 5.003	26,005
265	26.50-26.99	32,000	26,200	382,000	60,000	275,000	86843 5.003	26,500
265	26.50-26.99	31,750	26,200	382,000	60,000	275,000	86843 5.003	26,505
270	27.00-27.49	32,000	26,700	388,000	60,000	280,100	86843 5.003	27,000
270	27.00-27.49	31,750	26,700	388,000	60,000	280,100	86843 5.003	27,005
275	27.50-27.99	32,000	27,200	394,000	60,000	285,200	86843 5.003	27,500
275	27.50-27.99	31,750	27,200	394,000	60,000	285,200	86843 5.003	27,505
280	28.00-28.49	32,000	27,700	400,000	60,000	290,300	86843 5.003	28,000
280	28.00-28.49	31,750	27,700	400,000	60,000	290,300	86843 5.003	28,005
285	28.50-28.99	32,000	28,200	405,000	60,000	295,400	86843 5.003	28,500
285	28.50-28.99	31,750	28,200	405,000	60,000	295,400	86843 5.003	28,505
290	29.00-29.49	32,000	28,700	412,000	60,000	300,500	86843 5.003	29,000
290	29.00-29.49	31,750	28,700	412,000	60,000	300,500	86843 5.003	29,005
295	29.50-29.99	32,000	29,200	418,000	60,000	305,600	86843 5.003	29,500
295	29.50-29.99	31,750	29,200	418,000	60,000	305,600	86843 5.003	29,505
300	30.00-30.49	32,000	29,700	424,000	60,000	310,600	86843 6.000	30,000
300	30.00-30.49	31,750	29,700	424,000	60,000	310,600	86843 6.000	30,005
305	30.50-30.99	32,000	30,200	429,000	60,000	315,700	86843 6.000	30,500
305	30.50-30.99	31,750	30,200	429,000	60,000	315,700	86843 6.000	30,505
310	31.00-31.49	32,000	30,700	435,000	60,000	320,800	86843 6.000	31,000
310	31.00-31.49	31,750	30,700	435,000	60,000	320,800	86843 6.000	31,005
315	31.50-31.99	32,000	31,200	441,000	60,000	325,900	86843 6.000	31,500
315	31.50-31.99	31,750	31,200	441,000	60,000	325,900	86843 6.000	31,505



# HARTNER

## 复合HPC可换刀片

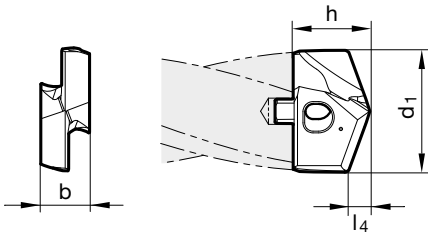
产品代号 86721



P	M	K	N	S	H
○	○	○	○	○	○



芯厚 ≥ Ø 11,000 • 双后刀面 • 直的主切削刃 (带修正) • 扳手 物料号86843  
 所有材料的引导加工



规格	d1 mm	inch	l4 mm	b mm	h mm	代号
110	11,000		1,800	4,500	7,200	11,000
110	11,200		1,800	4,500	7,200	11,200
110	11,500		1,900	4,500	7,200	11,500
110	11,510	29/64	1,900	4,500	7,200	11,510
110	11,700		1,900	4,500	7,200	11,700
110	11,800		1,900	4,500	7,200	11,800
110	11,910	15/32	1,900	4,500	7,200	11,910
120	12,000		1,900	5,000	7,400	12,000
120	12,100		2,000	5,000	7,400	12,100
120	12,200		2,000	5,000	7,400	12,200
120	12,300	31/64	2,000	5,000	7,400	12,300
120	12,500		2,000	5,000	7,400	12,500
120	12,600		2,000	5,000	7,400	12,600
120	12,700	1/2	2,100	5,000	7,400	12,700
120	12,800		2,100	5,000	7,400	12,800
120	12,900		2,100	5,000	7,400	12,900
130	13,000		2,100	5,500	8,200	13,000
130	13,100	33/64	2,100	5,500	8,200	13,100
130	13,490	17/32	2,200	5,500	8,200	13,490
130	13,500		2,200	5,500	8,200	13,500
130	13,600		2,200	5,500	8,200	13,600
130	13,700		2,200	5,500	8,200	13,700
130	13,800		2,200	5,500	8,200	13,800
130	13,890	35/64	2,200	5,500	8,200	13,890
140	14,000		2,300	6,000	9,400	14,000
140	14,100		2,300	6,000	9,400	14,100
140	14,290	9/16	2,300	6,000	9,400	14,290
140	14,400		2,300	6,000	9,400	14,400
140	14,500		2,300	6,000	9,400	14,500
140	14,600		2,400	6,000	9,400	14,600
140	14,680	37/64	2,400	6,000	9,400	14,680
140	14,700		2,400	6,000	9,400	14,700
140	14,800		2,400	6,000	9,400	14,800
140	15,000		2,400	6,000	9,400	15,000
140	15,080	19/32	2,400	6,000	9,400	15,080
140	15,100		2,400	6,000	9,400	15,100
140	15,200		2,400	6,000	9,400	15,200
140	15,300		2,500	6,000	9,400	15,300
140	15,480	39/64	2,500	6,000	9,400	15,480
140	15,500		2,500	6,000	9,400	15,500
140	15,600		2,500	6,000	9,400	15,600
140	15,700		2,500	6,000	9,400	15,700



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
140	15,800		2,500	6,000	9,400	15,800
140	15,870	5/8	2,600	6,000	9,400	15,870
160	16,000		2,600	7,000	10,600	16,000
160	16,270	41/64	2,600	7,000	10,600	16,270
160	16,500		2,700	7,000	10,600	16,500
160	16,670	21/32	2,700	7,000	10,600	16,670
160	17,000		2,700	7,000	10,600	17,000
160	17,070	43/64	2,700	7,000	10,600	17,070
160	17,460	11/16	2,800	7,000	10,600	17,460
160	17,500		2,800	7,000	10,600	17,500
160	17,600		2,800	7,000	10,600	17,600
160	17,860	45/64	2,900	7,000	10,600	17,860
180	18,000		2,900	8,000	12,100	18,000
180	18,260	23/32	2,900	8,000	12,100	18,260
180	18,500		3,000	8,000	12,100	18,500
180	18,650	47/64	3,000	8,000	12,100	18,650
180	19,000		3,000	8,000	12,100	19,000
180	19,050	3/4	3,100	8,000	12,100	19,050
180	19,450	49/64	3,100	8,000	12,100	19,450
180	19,500		3,100	8,000	12,100	19,500
180	19,600		3,100	8,000	12,100	19,600
180	19,840	25/32	3,200	8,000	12,100	19,840
200	20,000		3,200	9,000	13,300	20,000
200	20,240	51/64	3,200	9,000	13,300	20,240
200	20,500		3,300	9,000	13,300	20,500
200	20,640	13/16	3,300	9,000	13,300	20,640
200	21,000		3,400	9,000	13,300	21,000
200	21,030	53/64	3,400	9,000	13,300	21,030
200	21,100		3,400	9,000	13,300	21,100
200	21,430	27/32	3,400	9,000	13,300	21,430
200	21,500		3,400	9,000	13,300	21,500
200	21,830	55/64	3,500	9,000	13,300	21,830
220	22,000		3,500	10,000	14,800	22,000
220	22,220	7/8	3,600	10,000	14,800	22,220
220	22,500		3,600	10,000	14,800	22,500
220	22,620	57/64	3,600	10,000	14,800	22,620
220	23,000		3,700	10,000	14,800	23,000
220	23,020	29/32	3,700	10,000	14,800	23,020
220	23,420	59/64	3,700	10,000	14,800	23,420
220	23,500		3,800	10,000	14,800	23,500
220	23,810	15/16	3,800	10,000	14,800	23,810
240	24,000		3,800	11,000	15,300	24,000
240	24,100		3,800	11,000	15,300	24,100
240	24,210	61/64	3,900	11,000	15,300	24,210
240	24,500		3,900	11,000	15,300	24,500
240	24,610	31/32	3,900	11,000	15,300	24,610
240	25,000	63/64	4,000	11,000	15,300	25,000
240	25,400	1	4,100	11,000	15,300	25,400
240	25,500		4,100	11,000	15,300	25,500
240	25,700		4,100	11,000	15,300	25,700
260	26,000		4,100	12,000	19,400	26,000
260	26,190	1 1/32	4,200	12,000	19,400	26,190
260	26,500		4,200	12,000	19,400	26,500
260	26,590	1 3/64	4,200	12,000	19,400	26,590
260	27,000		4,300	12,000	19,400	27,000
260	27,500		4,400	12,000	19,400	27,500
260	27,700		4,400	12,000	19,400	27,700
260	27,780	1 3/32	4,400	12,000	19,400	27,780
280	28,000		4,500	13,000	20,100	28,000
280	28,180	1 7/64	4,500	13,000	20,100	28,180
280	28,500		4,500	13,000	20,100	28,500
280	28,580		4,600	13,000	20,100	28,580
280	29,000		4,600	13,000	20,100	29,000
280	29,370	1 5/32	4,700	13,000	20,100	29,370
280	29,500		4,700	13,000	20,100	29,500
300	30,000		4,800	14,000	21,700	30,000
300	30,160	1 3/16	4,800	14,000	21,700	30,160
300	30,500		4,900	14,000	21,700	30,500
300	30,960	1 7/32	4,900	14,000	21,700	30,960
300	31,000		4,900	14,000	21,700	31,000
300	31,500		5,000	14,000	21,700	31,500
300	31,750	1 1/4	5,100	14,000	21,700	31,750



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
320	32,000		5,100	15,000	22,400	32,000
320	32,500		5,200	15,000	22,400	32,500
320	32,540	1 9/32	5,200	15,000	22,400	32,540
320	33,000		5,300	15,000	22,400	33,000
320	33,340	1 5/16	5,300	15,000	22,400	33,340
320	33,500		5,300	15,000	22,400	33,500
320	34,000		5,400	15,000	22,400	34,000
320	34,130	1 11/32	5,400	15,000	22,400	34,130
320	34,500		5,500	15,000	22,400	34,500
320	34,930		5,600	15,000	22,400	34,930
320	35,000		5,600	15,000	22,400	35,000
320	35,500		5,600	15,000	22,400	35,500
320	35,720	1 13/32	5,700	15,000	22,400	35,720
360	36,000		5,700	16,000	23,200	36,000
360	36,500		5,800	16,000	23,200	36,500
360	36,510	1 7/16	5,800	16,000	23,200	36,510
360	37,000		5,900	16,000	23,200	37,000
360	37,310	1 15/32	5,900	16,000	23,200	37,310
360	37,500		6,000	16,000	23,200	37,500
360	38,000		6,000	16,000	23,200	38,000
360	38,100	1 1/2	6,100	16,000	23,200	38,100
360	38,500	1 33/64	6,100	16,000	23,200	38,500
360	39,000		6,200	16,000	23,200	39,000
360	39,500		6,300	16,000	23,200	39,500
360	40,000		6,400	16,000	23,200	40,000



# HARTNER

## 复合HPC可换刀片

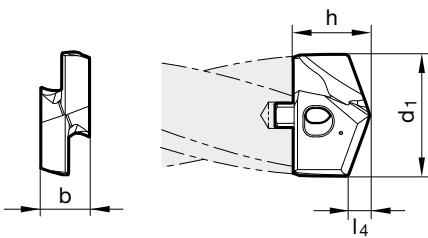
产品代号 86722



P	M	K	N	S	H
●	○	○			



芯厚 ≥ Ø 11,000 • 双后刀面 • 直的主切削刃（带修正） • 扳手 物料号86843  
 适合加工：结构钢和淬硬钢 • 易切削钢和热处理钢 • 强度小于1200N/mm<sup>2</sup>的合金钢



规格	d1 mm	inch	l4 mm	b mm	h mm	代号
110	11,000		2,100	4,500	7,500	11,000
110	11,200		2,100	4,500	7,500	11,200
115	11,500		2,100	4,500	7,500	11,500
115	11,510	29/64	2,100	4,500	7,500	11,510
115	11,700		2,200	4,500	7,500	11,700
115	11,800		2,200	4,500	7,500	11,800
115	11,910	15/32	2,200	4,500	7,500	11,910
120	12,000		2,200	5,000	7,700	12,000
120	12,100		2,300	5,000	7,700	12,100
120	12,200		2,300	5,000	7,700	12,200
120	12,300	31/64	2,300	5,000	7,700	12,300
125	12,500		2,300	5,000	7,700	12,500
125	12,600		2,300	5,000	7,700	12,600
125	12,700	1/2	2,400	5,000	7,700	12,700
125	12,800		2,400	5,000	7,700	12,800
125	12,900		2,400	5,000	7,700	12,900
130	13,000		2,400	5,500	8,500	13,000
130	13,100	33/64	2,400	5,500	8,500	13,100
130	13,490	17/32	2,500	5,500	8,500	13,490
135	13,500		2,500	5,500	8,500	13,500
135	13,600		2,500	5,500	8,500	13,600
135	13,700		2,500	5,500	8,500	13,700
135	13,800		2,600	5,500	8,500	13,800
135	13,890	35/64	2,600	5,500	8,500	13,890
140	14,000		2,600	6,000	9,600	14,000
140	14,100		2,600	6,000	9,600	14,100
140	14,290	9/16	2,700	6,000	9,600	14,290
140	14,400		2,700	6,000	9,600	14,400
145	14,500		2,700	6,000	9,600	14,500
145	14,600		2,700	6,000	9,600	14,600
145	14,680	37/64	2,700	6,000	9,600	14,680
145	14,700		2,700	6,000	9,600	14,700
145	14,800		2,700	6,000	9,600	14,800
150	15,000		2,800	6,000	9,800	15,000
150	15,080	19/32	2,800	6,000	9,800	15,080
150	15,100		2,800	6,000	9,800	15,100
150	15,200		2,800	6,000	9,800	15,200
150	15,300		2,800	6,000	9,800	15,300
150	15,480	39/64	2,900	6,000	9,800	15,480
155	15,500		2,900	6,000	9,800	15,500
155	15,600		2,900	6,000	9,800	15,600
155	15,700		2,900	6,000	9,800	15,700



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
155	15,800		2,900	6,000	9,800	15,800
155	15,870	5/8	2,900	6,000	9,800	15,870
160	16,000		3,000	7,000	11,000	16,000
160	16,270	41/64	3,000	7,000	11,000	16,270
165	16,500		3,100	7,000	11,000	16,500
165	16,670	21/32	3,100	7,000	11,000	16,670
170	17,000		3,100	7,000	11,000	17,000
170	17,070	43/64	3,200	7,000	11,000	17,070
170	17,460	11/16	3,200	7,000	11,000	17,460
175	17,500		3,200	7,000	11,000	17,500
175	17,600		3,300	7,000	11,000	17,600
175	17,860	45/64	3,300	7,000	11,000	17,860
180	18,000		3,300	8,000	12,600	18,000
180	18,260	23/32	3,400	8,000	12,600	18,260
185	18,500		3,400	8,000	12,600	18,500
185	18,650	47/64	3,400	8,000	12,600	18,650
185	18,900		3,500	8,000	12,600	18,900
190	19,000		3,500	8,000	12,600	19,000
190	19,050	3/4	3,500	8,000	12,600	19,050
190	19,250		3,600	8,000	12,600	19,250
190	19,450	49/64	3,600	8,000	12,600	19,450
195	19,500		3,600	8,000	12,600	19,500
195	19,600		3,600	8,000	12,600	19,600
195	19,840	25/32	3,700	8,000	12,600	19,840
200	20,000		3,700	9,000	13,900	20,000
200	20,240	51/64	3,700	9,000	13,900	20,240
205	20,500		3,800	9,000	13,900	20,500
205	20,640	13/16	3,800	9,000	13,900	20,640
210	21,000		3,900	9,000	13,900	21,000
210	21,030	53/64	3,900	9,000	13,900	21,030
210	21,100		3,900	9,000	13,900	21,100
210	21,430	27/32	3,900	9,000	13,900	21,430
215	21,500		4,000	9,000	13,900	21,500
215	21,830	55/64	4,000	9,000	13,900	21,830
220	22,000		4,100	10,000	15,300	22,000
220	22,220	7/8	4,100	10,000	15,300	22,220
225	22,500		4,100	10,000	15,300	22,500
225	22,620	57/64	4,200	10,000	15,300	22,620
230	23,000		4,200	10,000	15,300	23,000
230	23,020	29/32	4,200	10,000	15,300	23,020
230	23,420	59/64	4,300	10,000	15,300	23,420
235	23,500		4,300	10,000	15,300	23,500
235	23,810	15/16	4,400	10,000	15,300	23,810
240	24,000		4,400	11,000	15,800	24,000
240	24,100		4,400	11,000	15,800	24,100
240	24,210	61/64	4,500	11,000	15,800	24,210
245	24,500		4,500	11,000	15,800	24,500
245	24,610	31/32	4,500	11,000	15,800	24,610
250	25,000	63/64	4,600	11,000	15,800	25,000
250	25,400	1	4,700	11,000	15,800	25,400
255	25,500		4,700	11,000	15,800	25,500
255	25,670		4,700	11,000	15,800	25,670
255	25,700		4,700	11,000	15,800	25,700
255	25,810		4,700	11,000	15,800	25,810
260	26,000		4,800	12,000	20,000	26,000
260	26,190	1 1/32	4,800	12,000	20,000	26,190
265	26,500		4,900	12,000	20,000	26,500
265	26,590	1 3/64	4,900	12,000	20,000	26,590
270	27,000		5,000	12,000	20,000	27,000
275	27,500		5,100	12,000	20,000	27,500
275	27,700		5,100	12,000	20,000	27,700
275	27,780	1 3/32	5,100	12,000	20,000	27,780
280	28,000		5,100	13,000	20,700	28,000
280	28,180	1 7/64	5,200	13,000	20,700	28,180
285	28,500		5,200	13,000	20,700	28,500
285	28,580		5,300	13,000	20,700	28,580
290	29,000		5,300	13,000	20,700	29,000
290	29,370	1 5/32	5,400	13,000	20,700	29,370
295	29,500		5,400	13,000	20,700	29,500
295	29,770	1 11/64	5,500	13,000	20,700	29,770
300	30,000		5,500	14,000	22,300	30,000
300	30,160	1 3/16	5,500	14,000	22,300	30,160



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
305	30,500		5,600	14,000	22,300	30,500
305	30,960	1 7/32	5,700	14,000	22,300	30,960
310	31,000		5,700	14,000	22,300	31,000
315	31,500		5,800	14,000	22,300	31,500
315	31,750	1 1/4	5,800	14,000	22,300	31,750
320	32,000		5,900	15,000	23,100	32,000
320	32,500		6,000	15,000	23,100	32,500
320	32,540	1 9/32	6,000	15,000	23,100	32,540
320	32,940	1 19/64	6,000	15,000	23,100	32,940
330	33,000		6,100	15,000	23,100	33,000
330	33,340	1 5/16	6,100	15,000	23,100	33,340
330	33,500		6,100	15,000	23,100	33,500
340	34,000		6,200	15,000	23,100	34,000
340	34,130	1 11/32	6,300	15,000	23,100	34,130
340	34,500		6,300	15,000	23,100	34,500
340	34,930		6,400	15,000	23,100	34,930
350	35,000		6,400	15,000	23,100	35,000
350	35,500		6,500	15,000	23,100	35,500
350	35,720	1 13/32	6,600	15,000	23,100	35,720
360	36,000		6,600	16,000	23,900	36,000
360	36,500		6,700	16,000	23,900	36,500
360	36,510	1 7/16	6,700	16,000	23,900	36,510
370	37,000		6,800	16,000	23,900	37,000
370	37,310	1 15/32	6,800	16,000	23,900	37,310
370	37,500		6,900	16,000	23,900	37,500
380	38,000		7,000	16,000	23,900	38,000
380	38,100	1 1/2	7,000	16,000	23,900	38,100
380	38,500	1 33/64	7,100	16,000	23,900	38,500
390	39,000		7,100	16,000	23,900	39,000
390	39,500		7,200	16,000	23,900	39,500
400	40,000		7,300	16,000	23,900	40,000





# HARTNER

## 复合HPC可换刀片

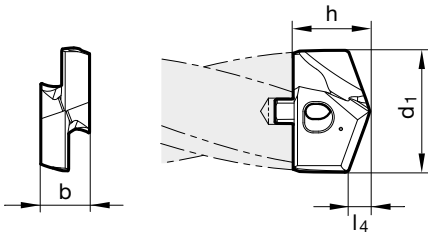
产品代号 86723



P	M	K	N	S	H
○		●			



芯厚 ≥ Ø 11,000 • 双后刀面 • 直的主切削刃 (带修正) • 扳手 物料号86843  
 蠕墨铸铁GGV • 灰铸铁,可锻铸铁和球墨铸铁



规格	d1 mm	inch	l4 mm	b mm	h mm	代号
110	11,000		2,600	4,500	7,500	11,000
110	11,200		2,600	4,500	7,500	11,200
115	11,500		2,700	4,500	7,500	11,500
115	11,510	29/64	2,700	4,500	7,500	11,510
115	11,700		2,700	4,500	7,500	11,700
115	11,800		2,700	4,500	7,500	11,800
115	11,910	15/32	2,700	4,500	7,500	11,910
120	12,000		2,900	5,000	7,700	12,000
120	12,100		2,900	5,000	7,700	12,100
120	12,200		2,900	5,000	7,700	12,200
120	12,300	31/64	2,900	5,000	7,700	12,300
125	12,500		3,000	5,000	7,700	12,500
125	12,600		3,000	5,000	7,700	12,600
125	12,700	1/2	3,000	5,000	7,700	12,700
125	12,800		3,000	5,000	7,700	12,800
125	12,900		3,000	5,000	7,700	12,900
130	13,000		3,100	5,500	8,500	13,000
130	13,100	33/64	3,100	5,500	8,500	13,100
130	13,490	17/32	3,100	5,500	8,500	13,490
135	13,500		3,300	5,500	8,500	13,500
135	13,600		3,300	5,500	8,500	13,600
135	13,700		3,300	5,500	8,500	13,700
135	13,800		3,300	5,500	8,500	13,800
135	13,890	35/64	3,300	5,500	8,500	13,890
140	14,000		3,400	6,000	9,600	14,000
140	14,100		3,400	6,000	9,600	14,100
140	14,290	9/16	3,400	6,000	9,600	14,290
140	14,400		3,400	6,000	9,600	14,400
145	14,500		3,500	6,000	9,600	14,500
145	14,600		3,500	6,000	9,600	14,600
145	14,680	37/64	3,500	6,000	9,600	14,680
145	14,700		3,500	6,000	9,600	14,700
145	14,800		3,500	6,000	9,600	14,800
150	15,000		3,600	6,000	9,800	15,000
150	15,080	19/32	3,600	6,000	9,800	15,080
150	15,100		3,600	6,000	9,800	15,100
150	15,200		3,600	6,000	9,800	15,200
150	15,300		3,600	6,000	9,800	15,300
150	15,480	39/64	3,600	6,000	9,800	15,480
155	15,500		3,800	6,000	9,800	15,500
155	15,600		3,800	6,000	9,800	15,600
155	15,700		3,800	6,000	9,800	15,700



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
155	15,800		3,800	6,000	9,800	15,800
155	15,870	5/8	3,800	6,000	9,800	15,870
160	16,000		3,800	7,000	11,000	16,000
160	16,270	41/64	3,800	7,000	11,000	16,270
165	16,500		4,000	7,000	11,000	16,500
165	16,670	21/32	4,000	7,000	11,000	16,670
170	17,000		4,100	7,000	11,000	17,000
170	17,070	43/64	4,100	7,000	11,000	17,070
170	17,460	11/16	4,100	7,000	11,000	17,460
175	17,500		4,200	7,000	11,000	17,500
175	17,600		4,200	7,000	11,000	17,600
175	17,860	45/64	4,200	7,000	11,000	17,860
180	18,000		4,300	8,000	12,600	18,000
180	18,260	23/32	4,300	8,000	12,600	18,260
185	18,500		4,400	8,000	12,600	18,500
185	18,650	47/64	4,400	8,000	12,600	18,650
190	19,000		4,600	8,000	12,600	19,000
190	19,050	3/4	4,600	8,000	12,600	19,050
190	19,250		4,600	8,000	12,600	19,250
190	19,450	49/64	4,600	8,000	12,600	19,450
195	19,500		4,700	8,000	12,600	19,500
195	19,600		4,700	8,000	12,600	19,600
195	19,840	25/32	4,700	8,000	12,600	19,840
200	20,000		4,800	9,000	13,900	20,000
200	20,240	51/64	4,800	9,000	13,900	20,240
205	20,500		5,000	9,000	13,900	20,500
205	20,640	13/16	5,000	9,000	13,900	20,640
210	21,000		5,100	9,000	13,900	21,000
210	21,030	53/64	5,100	9,000	13,900	21,030
210	21,100		5,100	9,000	13,900	21,100
210	21,430	27/32	5,100	9,000	13,900	21,430
215	21,500		5,200	9,000	13,900	21,500
215	21,830	55/64	5,200	9,000	13,900	21,830
220	22,000		5,300	10,000	15,300	22,000
220	22,220	7/8	5,300	10,000	15,300	22,220
225	22,500		5,400	10,000	15,300	22,500
225	22,620	57/64	5,400	10,000	15,300	22,620
230	23,000		5,600	10,000	15,300	23,000
230	23,020	29/32	5,600	10,000	15,300	23,020
230	23,420	59/64	5,600	10,000	15,300	23,420
235	23,500		5,700	10,000	15,300	23,500
235	23,810	15/16	5,700	10,000	15,300	23,810
240	24,000		5,800	11,000	15,800	24,000
240	24,100		5,800	11,000	15,800	24,100
240	24,210	61/64	5,800	11,000	15,800	24,210
245	24,500		6,000	11,000	15,800	24,500
245	24,610	31/32	6,000	11,000	15,800	24,610
250	25,000	63/64	6,100	11,000	15,800	25,000
250	25,400	1	6,100	11,000	15,800	25,400
255	25,500		6,200	11,000	15,800	25,500
255	25,670		6,200	11,000	15,800	25,670
255	25,700		6,200	11,000	15,800	25,700
255	25,810		6,200	11,000	15,800	25,810
260	26,000		6,000	12,000	20,000	26,000
260	26,190	1 1/32	6,000	12,000	20,000	26,190
265	26,500		6,100	12,000	20,000	26,500
265	26,590	1 3/64	6,100	12,000	20,000	26,590
270	27,000		6,300	12,000	20,000	27,000
275	27,500		6,400	12,000	20,000	27,500
275	27,700		6,400	12,000	20,000	27,700
275	27,780	1 3/32	6,400	12,000	20,000	27,780
280	28,000		6,600	13,000	20,700	28,000
280	28,180	1 7/64	6,600	13,000	20,700	28,180
285	28,500		6,700	13,000	20,700	28,500
285	28,580		6,700	13,000	20,700	28,580
290	29,000		6,900	13,000	20,700	29,000
290	29,370	1 5/32	6,900	13,000	20,700	29,370
295	29,500		7,000	13,000	20,700	29,500
295	29,770	1 11/64	7,000	13,000	20,700	29,770
300	30,000		6,900	14,000	22,300	30,000
300	30,160	1 3/16	6,900	14,000	22,300	30,160
305	30,500		7,000	14,000	22,300	30,500



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
305	30,960	1 7/32	7,000	14,000	22,300	30,960
310	31,000		7,200	14,000	22,300	31,000
315	31,500		7,300	14,000	22,300	31,500
315	31,750	1 1/4	7,300	14,000	22,300	31,750
320	32,000		7,500	15,000	23,100	32,000
320	32,500		7,600	15,000	23,100	32,500
320	32,540	1 9/32	7,600	15,000	23,100	32,540
320	32,940	1 19/64	7,600	15,000	23,100	32,940
330	33,000		7,800	15,000	23,100	33,000
330	33,340	1 5/16	7,800	15,000	23,100	33,340
330	33,500		7,900	15,000	23,100	33,500
340	34,000		8,100	15,000	23,100	34,000
340	34,130	1 11/32	8,100	15,000	23,100	34,130
340	34,500		8,200	15,000	23,100	34,500
340	34,930		8,200	15,000	23,100	34,930
350	35,000		8,300	15,000	23,100	35,000
350	35,500		8,400	15,000	23,100	35,500
350	35,720	1 13/32	8,400	15,000	23,100	35,720
360	36,000		8,500	16,000	23,900	36,000
360	36,500		8,600	16,000	23,900	36,500
360	36,510	1 7/16	8,600	16,000	23,900	36,510
370	37,000		8,800	16,000	23,900	37,000
370	37,310	1 15/32	8,800	16,000	23,900	37,310
370	37,500		8,900	16,000	23,900	37,500
380	38,000		9,000	16,000	23,900	38,000
380	38,100	1 1/2	9,000	16,000	23,900	38,100
380	38,500	1 33/64	9,100	16,000	23,900	38,500
390	39,000		9,300	16,000	23,900	39,000
390	39,500		9,400	16,000	23,900	39,500
400	40,000		9,400	16,000	23,900	40,000



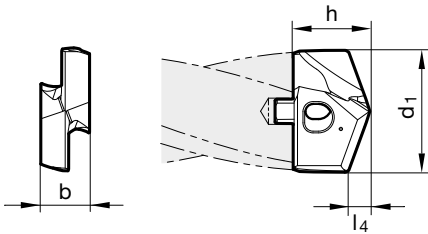
# HARTNER

## 复合HPC可换刀片

产品代号 86724



芯厚 ≥ Ø 11,000 • 圆弧后刀面 • 扳手 物料号86843 • 凹形主切屑刃形状  
铝和铝合金 • 有色金属



规格	d1 mm	inch	l4 mm	b mm	h mm	代号
110	11,000		2,100	4,500	7,500	11,000
110	11,200		2,100	4,500	7,500	11,200
115	11,500		2,100	4,500	7,500	11,500
115	11,510	29/64	2,100	4,500	7,500	11,510
115	11,700		2,200	4,500	7,500	11,700
115	11,800		2,200	4,500	7,500	11,800
115	11,910	15/32	2,200	4,500	7,500	11,910
120	12,000		2,200	5,000	7,700	12,000
120	12,100		2,300	5,000	7,700	12,100
120	12,200		2,300	5,000	7,700	12,200
120	12,300	31/64	2,300	5,000	7,700	12,300
125	12,500		2,300	5,000	7,700	12,500
125	12,600		2,300	5,000	7,700	12,600
125	12,700	1/2	2,400	5,000	7,700	12,700
125	12,800		2,400	5,000	7,700	12,800
125	12,900		2,400	5,000	7,700	12,900
130	13,000		2,400	5,500	8,500	13,000
130	13,100	33/64	2,400	5,500	8,500	13,100
130	13,490	17/32	2,500	5,500	8,500	13,490
135	13,500		2,500	5,500	8,500	13,500
135	13,600		2,500	5,500	8,500	13,600
135	13,700		2,500	5,500	8,500	13,700
135	13,800		2,600	5,500	8,500	13,800
135	13,890	35/64	2,600	5,500	8,500	13,890
140	14,000		2,600	6,000	9,600	14,000
140	14,100		2,600	6,000	9,600	14,100
140	14,290	9/16	2,700	6,000	9,600	14,290
140	14,400		2,700	6,000	9,600	14,400
145	14,500		2,700	6,000	9,600	14,500
145	14,600		2,700	6,000	9,600	14,600
145	14,680	37/64	2,700	6,000	9,600	14,680
145	14,700		2,700	6,000	9,600	14,700
145	14,800		2,700	6,000	9,600	14,800
150	15,000		2,800	6,000	9,800	15,000
150	15,080	19/32	2,800	6,000	9,800	15,080
150	15,100		2,800	6,000	9,800	15,100
150	15,200		2,800	6,000	9,800	15,200
150	15,300		2,800	6,000	9,800	15,300
150	15,480	39/64	2,900	6,000	9,800	15,480
155	15,500		2,900	6,000	9,800	15,500
155	15,600		2,900	6,000	9,800	15,600
155	15,700		2,900	6,000	9,800	15,700



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
155	15,800		2,900	6,000	9,800	15,800
155	15,870	5/8	2,900	6,000	9,800	15,870
160	16,000		3,000	7,000	11,000	16,000
160	16,270	41/64	3,000	7,000	11,000	16,270
165	16,500		3,100	7,000	11,000	16,500
165	16,670	21/32	3,100	7,000	11,000	16,670
170	17,000		3,100	7,000	11,000	17,000
170	17,070	43/64	3,200	7,000	11,000	17,070
170	17,460	11/16	3,200	7,000	11,000	17,460
175	17,500		3,200	7,000	11,000	17,500
175	17,600		3,300	7,000	11,000	17,600
175	17,860	45/64	3,300	7,000	11,000	17,860
180	18,000		3,300	8,000	12,600	18,000
180	18,260	23/32	3,400	8,000	12,600	18,260
185	18,500		3,400	8,000	12,600	18,500
185	18,650	47/64	3,400	8,000	12,600	18,650
190	19,000		3,500	8,000	12,600	19,000
190	19,050	3/4	3,500	8,000	12,600	19,050
190	19,250		3,600	8,000	12,600	19,250
190	19,450	49/64	3,600	8,000	12,600	19,450
195	19,500		3,600	8,000	12,600	19,500
195	19,600		3,600	8,000	12,600	19,600
195	19,840	25/32	3,700	8,000	12,600	19,840
200	20,000		3,700	9,000	13,900	20,000
200	20,240	51/64	3,700	9,000	13,900	20,240
205	20,500		3,800	9,000	13,900	20,500
205	20,640	13/16	3,800	9,000	13,900	20,640
210	21,000		3,900	9,000	13,900	21,000
210	21,030	53/64	3,900	9,000	13,900	21,030
210	21,100		3,900	9,000	13,900	21,100
210	21,430	27/32	3,900	9,000	13,900	21,430
215	21,500		4,000	9,000	13,900	21,500
215	21,830	55/64	4,000	9,000	13,900	21,830
220	22,000		4,100	10,000	15,300	22,000
220	22,220	7/8	4,100	10,000	15,300	22,220
225	22,500		4,100	10,000	15,300	22,500
225	22,620	57/64	4,200	10,000	15,300	22,620
230	23,000		4,200	10,000	15,300	23,000
230	23,020	29/32	4,200	10,000	15,300	23,020
230	23,420	59/64	4,300	10,000	15,300	23,420
235	23,500		4,300	10,000	15,300	23,500
235	23,810	15/16	4,400	10,000	15,300	23,810
240	24,000		4,400	11,000	15,800	24,000
240	24,100		4,400	11,000	15,800	24,100
240	24,210	61/64	4,500	11,000	15,800	24,210
245	24,500		4,500	11,000	15,800	24,500
245	24,610	31/32	4,500	11,000	15,800	24,610
250	25,000	63/64	4,600	11,000	15,800	25,000
250	25,400	1	4,700	11,000	15,800	25,400
255	25,500		4,700	11,000	15,800	25,500
255	25,670		4,700	11,000	15,800	25,670
255	25,700		4,700	11,000	15,800	25,700
255	25,810		4,700	11,000	15,800	25,810
260	26,000		4,800	12,000	20,000	26,000
260	26,190	1 1/32	4,800	12,000	20,000	26,190
265	26,500		4,900	12,000	20,000	26,500
265	26,590	1 3/64	4,900	12,000	20,000	26,590
270	27,000		5,000	12,000	20,000	27,000
275	27,500		5,100	12,000	20,000	27,500
275	27,700		5,100	12,000	20,000	27,700
275	27,780	1 3/32	5,100	12,000	20,000	27,780
280	28,000		5,100	13,000	20,700	28,000
280	28,180	1 7/64	5,200	13,000	20,700	28,180
285	28,500		5,200	13,000	20,700	28,500
285	28,580		5,300	13,000	20,700	28,580
290	29,000		5,300	13,000	20,700	29,000
290	29,370	1 5/32	5,400	13,000	20,700	29,370
295	29,500		5,400	13,000	20,700	29,500
295	29,770	1 11/64	5,500	13,000	20,700	29,770
300	30,000		5,500	14,000	22,300	30,000
300	30,160	1 3/16	5,500	14,000	22,300	30,160
305	30,500		5,600	14,000	22,300	30,500



HARTNER

复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
305	30,960	1 7/32	5,700	14,000	22,300	30,960
310	31,000		5,700	14,000	22,300	31,000
315	31,500		5,800	14,000	22,300	31,500
315	31,750	1 1/4	5,800	14,000	22,300	31,750
320	32,000		5,900	15,000	23,100	32,000
320	32,500		6,000	15,000	23,100	32,500
320	32,540	1 9/32	6,000	15,000	23,100	32,540
320	32,940	1 19/64	6,000	15,000	23,100	32,940
330	33,000		6,100	15,000	23,100	33,000
330	33,340	1 5/16	6,100	15,000	23,100	33,340
330	33,500		6,100	15,000	23,100	33,500
340	34,000		6,200	15,000	23,100	34,000
340	34,130	1 11/32	6,300	15,000	23,100	34,130
340	34,500		6,300	15,000	23,100	34,500
340	34,930		6,400	15,000	23,100	34,930
350	35,000		6,400	15,000	23,100	35,000
350	35,500		6,500	15,000	23,100	35,500
350	35,720	1 13/32	6,600	15,000	23,100	35,720
360	36,000		6,600	16,000	23,900	36,000
360	36,500		6,700	16,000	23,900	36,500
360	36,510	1 7/16	6,700	16,000	23,900	36,510
370	37,000		6,800	16,000	23,900	37,000
370	37,310	1 15/32	6,800	16,000	23,900	37,310
370	37,500		6,900	16,000	23,900	37,500
380	38,000		7,000	16,000	23,900	38,000
380	38,100	1 1/2	7,000	16,000	23,900	38,100
380	38,500	1 33/64	7,100	16,000	23,900	38,500
390	39,000		7,100	16,000	23,900	39,000
390	39,500		7,200	16,000	23,900	39,500
400	40,000		7,300	16,000	23,900	40,000



# HARTNER

## 复合HPC可换刀片

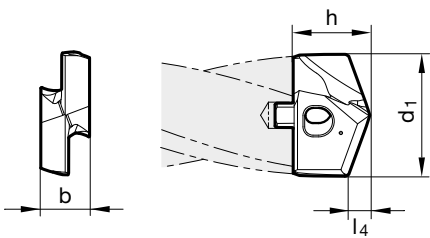
产品代号 86725



P	M	K	N	S	H
○	●	■	□	○	○



芯厚 ≥ Ø 11,000 • 圆弧后刀面 • 直的主切削刃 (带修正) • 扳手 物料号86843  
 不锈钢



规格	d1 mm	inch	l4 mm	b mm	h mm	代号
110	11,000		2,100	4,500	7,500	11,000
110	11,200		2,100	4,500	7,500	11,200
115	11,500		2,100	4,500	7,500	11,500
115	11,510	29/64	2,100	4,500	7,500	11,510
115	11,700		2,200	4,500	7,500	11,700
115	11,800		2,200	4,500	7,500	11,800
115	11,910	15/32	2,200	4,500	7,500	11,910
120	12,000		2,200	5,000	7,700	12,000
120	12,100		2,300	5,000	7,700	12,100
120	12,200		2,300	5,000	7,700	12,200
120	12,300	31/64	2,300	5,000	7,700	12,300
125	12,500		2,300	5,000	7,700	12,500
125	12,600		2,300	5,000	7,700	12,600
125	12,700	1/2	2,400	5,000	7,700	12,700
125	12,800		2,400	5,000	7,700	12,800
125	12,900		2,400	5,000	7,700	12,900
130	13,000		2,400	5,500	8,500	13,000
130	13,100	33/64	2,400	5,500	8,500	13,100
130	13,490	17/32	2,500	5,500	8,500	13,490
135	13,500		2,500	5,500	8,500	13,500
135	13,600		2,500	5,500	8,500	13,600
135	13,700		2,500	5,500	8,500	13,700
135	13,800		2,600	5,500	8,500	13,800
135	13,890	35/64	2,600	5,500	8,500	13,890
140	14,000		2,600	6,000	9,600	14,000
140	14,100		2,600	6,000	9,600	14,100
140	14,290	9/16	2,700	6,000	9,600	14,290
140	14,400		2,700	6,000	9,600	14,400
145	14,500		2,700	6,000	9,600	14,500
145	14,600		2,700	6,000	9,600	14,600
145	14,700		2,700	6,000	9,600	14,700
145	14,800		2,700	6,000	9,600	14,800
150	15,000		2,800	6,000	9,800	15,000
150	15,080	19/32	2,800	6,000	9,800	15,080
150	15,100		2,800	6,000	9,800	15,100
150	15,200		2,800	6,000	9,800	15,200
150	15,300		2,800	6,000	9,800	15,300
155	15,500		2,900	6,000	9,800	15,500
155	15,600		2,900	6,000	9,800	15,600
155	15,700		2,900	6,000	9,800	15,700
155	15,800		2,900	6,000	9,800	15,800
155	15,870	5/8	2,900	6,000	9,800	15,870



## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
160	16,000		3,000	7,000	11,000	16,000
160	16,270	41/64	3,000	7,000	11,000	16,270
165	16,500		3,100	7,000	11,000	16,500
165	16,670	21/32	3,100	7,000	11,000	16,670
170	17,000		3,100	7,000	11,000	17,000
170	17,070	43/64	3,200	7,000	11,000	17,070
170	17,460	11/16	3,200	7,000	11,000	17,460
175	17,500		3,200	7,000	11,000	17,500
175	17,600		3,300	7,000	11,000	17,600
175	17,860	45/64	3,300	7,000	11,000	17,860
180	18,000		3,300	8,000	12,600	18,000
180	18,260	23/32	3,400	8,000	12,600	18,260
185	18,500		3,400	8,000	12,600	18,500
185	18,650	47/64	3,400	8,000	12,600	18,650
190	19,000		3,500	8,000	12,600	19,000
190	19,050	3/4	3,500	8,000	12,600	19,050
190	19,450	49/64	3,600	8,000	12,600	19,450
195	19,500		3,600	8,000	12,600	19,500
195	19,600		3,600	8,000	12,600	19,600
195	19,840	25/32	3,700	8,000	12,600	19,840
200	20,000		3,700	9,000	13,900	20,000
200	20,240	51/64	3,700	9,000	13,900	20,240
205	20,500		3,800	9,000	13,900	20,500
205	20,640	13/16	3,800	9,000	13,900	20,640
210	21,000		3,900	9,000	13,900	21,000
210	21,030	53/64	3,900	9,000	13,900	21,030
210	21,100		3,900	9,000	13,900	21,100
210	21,430	27/32	3,900	9,000	13,900	21,430
215	21,500		4,000	9,000	13,900	21,500
215	21,830	55/64	4,000	9,000	13,900	21,830
220	22,000		4,100	10,000	15,300	22,000
220	22,220	7/8	4,100	10,000	15,300	22,220
225	22,500		4,100	10,000	15,300	22,500
225	22,620	57/64	4,200	10,000	15,300	22,620
230	23,000		4,200	10,000	15,300	23,000
230	23,020	29/32	4,200	10,000	15,300	23,020
230	23,420	59/64	4,300	10,000	15,300	23,420
235	23,500		4,300	10,000	15,300	23,500
235	23,810	15/16	4,400	10,000	15,300	23,810
240	24,000		4,400	11,000	15,800	24,000
240	24,100		4,400	11,000	15,800	24,100
240	24,210	61/64	4,500	11,000	15,800	24,210
245	24,500		4,500	11,000	15,800	24,500
245	24,610	31/32	4,500	11,000	15,800	24,610
250	25,000	63/64	4,600	11,000	15,800	25,000
250	25,400	1	4,700	11,000	15,800	25,400
255	25,500		4,700	11,000	15,800	25,500
255	25,670		4,700	11,000	15,800	25,670
255	25,700		4,700	11,000	15,800	25,700
260	26,000		4,800	12,000	20,000	26,000
260	26,190	1 1/32	4,800	12,000	20,000	26,190
265	26,500		4,900	12,000	20,000	26,500
265	26,590	1 3/64	4,900	12,000	20,000	26,590
270	27,000		5,000	12,000	20,000	27,000
275	27,500		5,100	12,000	20,000	27,500
275	27,700		5,100	12,000	20,000	27,700
275	27,780	1 3/32	5,100	12,000	20,000	27,780
280	28,000		5,100	13,000	20,700	28,000
280	28,180	1 7/64	5,200	13,000	20,700	28,180
285	28,500		5,200	13,000	20,700	28,500
285	28,580		5,300	13,000	20,700	28,580
290	29,000		5,300	13,000	20,700	29,000
290	29,370	1 5/32	5,400	13,000	20,700	29,370
295	29,500		5,400	13,000	20,700	29,500
295	29,600		5,400	13,000	20,700	29,600
295	29,770	1 11/64	5,500	13,000	20,700	29,770
300	30,000		5,500	14,000	22,300	30,000
300	30,160	1 3/16	5,500	14,000	22,300	30,160
305	30,500		5,600	14,000	22,300	30,500
305	30,960	1 7/32	5,700	14,000	22,300	30,960
310	31,000		5,700	14,000	22,300	31,000
315	31,500		5,800	14,000	22,300	31,500





## 复合HPC可换刀片

规格	d1 mm	inch	l4 mm	b mm	h mm	代号
315	31,750	1 1/4	5,800	14,000	22,300	31,750
320	32,000		5,900	15,000	23,100	32,000
320	32,500		6,000	15,000	23,100	32,500
320	32,540	1 9/32	6,000	15,000	23,100	32,540
320	32,940	1 19/64	6,000	15,000	23,100	32,940
330	33,000		6,100	15,000	23,100	33,000
330	33,340	1 5/16	6,100	15,000	23,100	33,340
330	33,500		6,100	15,000	23,100	33,500
340	34,000		6,200	15,000	23,100	34,000
340	34,130	1 11/32	6,300	15,000	23,100	34,130
340	34,500		6,300	15,000	23,100	34,500
340	34,930		6,400	15,000	23,100	34,930
350	35,000		6,400	15,000	23,100	35,000
350	35,500		6,500	15,000	23,100	35,500
350	35,720	1 13/32	6,600	15,000	23,100	35,720
360	36,000		6,600	16,000	23,900	36,000
360	36,500		6,700	16,000	23,900	36,500
360	36,510	1 7/16	6,700	16,000	23,900	36,510
370	37,000		6,800	16,000	23,900	37,000
370	37,310	1 15/32	6,800	16,000	23,900	37,310
370	37,500		6,900	16,000	23,900	37,500
380	38,000		7,000	16,000	23,900	38,000
380	38,100	1 1/2	7,000	16,000	23,900	38,100
380	38,500	1 33/64	7,100	16,000	23,900	38,500
390	39,000		7,100	16,000	23,900	39,000
390	39,500		7,200	16,000	23,900	39,500
400	40,000		7,300	16,000	23,900	40,000



# HARTNER

## 复合HPC可换刀片

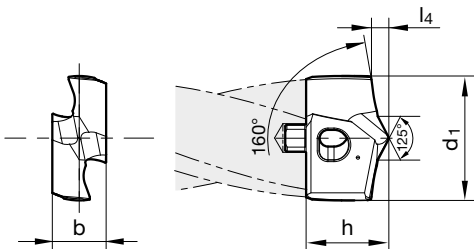
产品代号 86729



P	M	K	N	S	H
•					



双后刀面 • 凹形主切屑刃形状 • 特殊的双顶角设计:中间顶角125°, 第二顶角160°。 • 扳手 物料号86843



规格	d1 mm	inch	l4 mm	b mm	h mm	代号
120	12,000		1,700	5,000	7,500	12,000
140	14,000		2,000	6,000	9,500	14,000
160	16,000		2,300	7,000	10,800	16,000
180	18,000		2,600	8,000	12,300	18,000
200	20,000		2,900	9,000	13,600	20,000
210	21,000		3,000	9,000	13,600	21,000
220	22,000		3,200	10,000	14,900	22,000
240	24,000		3,500	11,000	15,500	24,000
250	25,000	63/64	3,600	11,000	15,500	25,000
260	26,000		3,800	12,000	18,500	26,000
270	27,000		3,900	12,000	18,600	27,000
280	28,000		4,100	13,000	18,600	28,000
290	29,000		4,200	13,000	18,600	29,000
300	30,000		4,400	14,000	19,900	30,000
320	32,000		4,600	15,000	21,300	32,000
330	33,000		4,800	15,000	21,700	33,000
340	34,000		4,900	15,000	22,200	34,000
360	36,000		5,200	16,000	22,500	36,000
380	38,000		5,500	16,000	23,000	38,000
400	40,000		5,800	16,000	23,100	40,000



# HARTNER

## 复合HPC镗刀刀片

产品代号 86726



P	M	K	N	S	H
○		●			



灰铸铁,可锻铸铁和球墨铸铁

ISO	刀柄规格	代号
CPGW050202F N-K	110-140	52,020
CPGW050204F N-K	110-140	52,040
CPGW060202F N-K	160-280	62,020
CPGW060204F N-K	160-280	62,040
CPGW09T308F N-K	300-360	93,080

产品代号 86727



P	M	K	N	S	H
			●		



铝和铝合金 • 有色金属

ISO	刀柄规格	代号
CPGT050202F R-AL	110-140	52,020
CPGT050204F R-AL	110-140	52,040
CPGT060202F R-AL	160-280	62,020
CPGT060204F R-AL	160-280	62,040
CPGT09T308F R-AL	300-360	93,080



# HARTNER

## 复合HPC镗刀刀片

产品代号 86728



P	M	K	N	S	H
•	○	○		○	○



适于加工：合金/非合金钢和铸钢

ISO	刀柄规格	代号
CPGT050202F R-P	110-140	52,020
CPGT050204F R-P	110-140	52,040
CPGT060202F R-P	160-280	62,020
CPGT060204F R-P	160-280	62,040
CPGT09T308F R-P	300-360	93,080



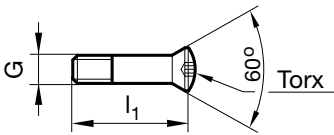
# HARTNER

## 复合HPC刀柄压紧螺钉 1.5-10xD

产品代号 86843



匹配紧固螺钉与刀柄, "Multiplex HPC -技术及优势"



G	l1 mm	Torx	代号
M 2.2	9,500	T7	2,200
M 2.2	10,500	T7	2,201
M 2.5	11,400	T8	2,500
M 3	12,100	T9	3,000
M 3	13,100	T9	3,001
M 3.5	14,250	T10	3,500
M 4	16,000	T15	4,000
M 4.5	18,000	T15	4,500
M 5	19,750	T20	5,000
M 5	21,750	T20	5,001
M 5	23,400	T20	5,003
M 6	27,000	T25	6,000
M 6	28,500	T25	6,001
M 6	32,500	T25	6,002

扭力扳手

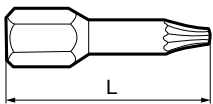
产品代号 86844



驱动头	扭矩 Nm	L mm	型号	代号
1/4"	0,4-1	100,000	A	1,001
1/4"	0,8-2	160,000	A	2,000
1/4"	0,8-5	160,000	A	5,001
1/4"	2-8	200,000	A	8,000
1/4"	5-14	200,000	E	14,000

Torx扳手头

产品代号 86845



驱动头		Torx	L mm	代号
1/4	六角形	T5	25,000	5,000
1/4	六角形	T7	25,000	7,000
1/4	六角形	T8	25,000	8,000
1/4	六角形	T9	25,000	9,000
1/4	六角形	T10	25,000	10,000
1/4	六角形	T15	25,000	15,000
1/4	六角形	T20	25,000	20,000
1/4	六角形	T25	25,000	25,001



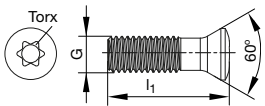
HARTNER

### 复合HPC铍刀刀柄压紧螺钉

产品代号 86846



匹配紧固螺钉与刀柄, "Multiplex HPC -技术及优势"



G	l1 mm	Torx	代号
M 2	5,500	T6	2,000
M2,5	5,300	T7	2,500
M4	9,500	T15	4,006





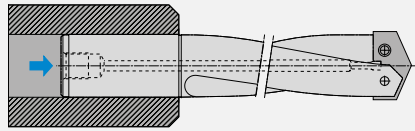
## 复合钻 - 冷却液的要求

每一个复合钻刀把都配有一个内部冷却系统,它保证了冷却剂的最佳输送。

冷却液通过内冷孔直接到达工作中的切削刃,它可以有效改进刀具寿命。此外,冷却液确保削屑从孔中顺利冲走。冷却液输送方式取决于夹持刀柄的设计。

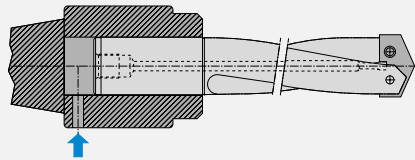
### 采用内冷刀柄的冷却液输送方式

对于静态和旋转状态下的刀具:  
冷却液输送通过内冷刀柄直接输送。  
直柄刀杆直径 $\varnothing 10$ 到 $\varnothing 102$ 毫米。  
适合我司产品编号为86612 / 86622 / 86624 / 86730 / 86740 / 86750  
和超长刀杆



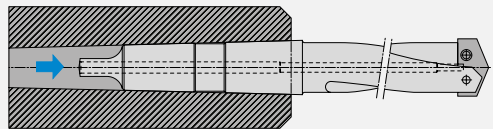
### 采用油路刀柄的冷却液输送方式

对于旋转状态的刀具:  
径向冷却液通过冷却孔输送。  
支持夹持直径 $\varnothing 10$ mm到 $\varnothing 102$ mm。  
适合我司编号为86612 / 86622 / 86624 / 86730 / 86740 / 86750  
和额外长度的刀杆  
适用于SK40 / 50和莫式 MT4 / 5 / 6等刀柄



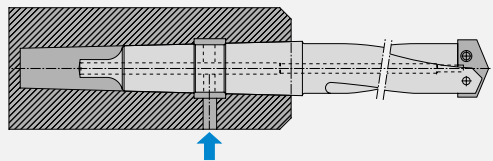
### 采用内冷锥柄刀柄的冷却液输送方式

对于静态和旋转状态下的刀具:  
轴向冷却液输送通过内冷锥度刀柄直接输送。  
适于夹持莫式柄直径 $\varnothing 10$ mm到 $\varnothing 25$ mm的刀把。  
适合我司产品编号86630 / 86650的刀把



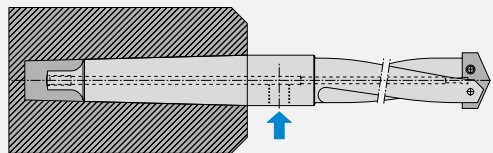
### 采用侧冷却的锥度刀柄的冷却液输送方式

对于静止状态下的刀具:  
冷却液通过刀柄的径向冷却孔输送。  
适于夹持莫式柄直径 $\varnothing 10$ mm到 $\varnothing 25$ mm的刀把。  
这种刀把按客户的需求来非标定制



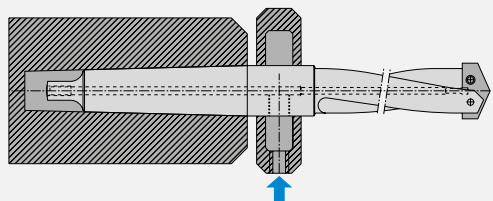
### 采用直接通过刀把的横向冷却孔来输送冷却液的方式

对于旋转状态的刀具:  
可以通过软管/管道连接来进行的冷却液输送  
支持螺纹R1 / 4"和R1 / 2"。  
通常莫氏锥度刀柄支持 $\varnothing 10$ mm到 $\varnothing 25$ mm的刀把  
适用于我司产品编号86670 / 86680和额外长度的刀把



### 通过油路环和刀把的横向冷却孔来液输送冷却液的方式

对于旋转状态的刀具:  
冷却液通过油路环来进行冷却液的输送。  
支持莫氏锥度直径 $\varnothing$ 超过25mm的刀把  
适用于我司产品编号86670 / 86680和额外长度的刀把

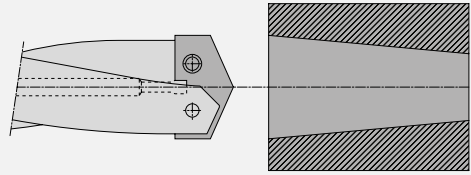




## 复合钻 - 常见问题和使用技巧

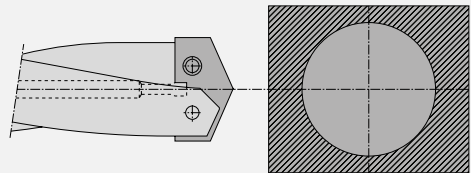
### 用来钻预钻孔

由于复合钻主要设计用来钻深孔,它的前端刃部较宽,它不适合预铸孔或者预钻孔。然而,如果复合钻被应用在上述情况,切削参数应该降低。



### 断续切削

复合钻不适合断续切削(即通过大于钻头直径的横向孔)。



### 定心

复合钻的切削刀片是相当薄的,因此,如果可以,请选择更大的钻头。如果因为技术原因中心钻是必须的,那么中心点的角度要求必须大于或等于复合钻的刀片的角度。

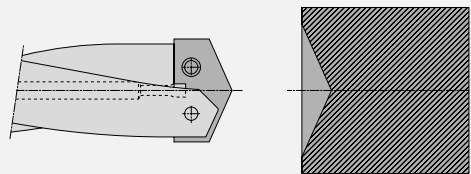
下面是应用建议:

直径最大到25.4mm= 135°

直径最大到 66mm= 132°

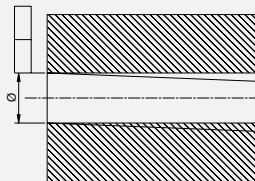
直径大于 66mm = 140°

建议用,短刀把(3xD)用于定心。



### 钻后的孔直线度超公差要求

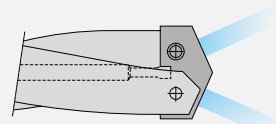
一个钻后的孔的直线度受多个因素的影响。通常对于一个深度在7xd的孔来说,0.1mm-0.16mm的偏差是可以接受的。在满足孔深要求的前提下,最短的刀杆有最佳的刚性,因为,应该选择尽可能短的刀杆。



### 冷却液压力

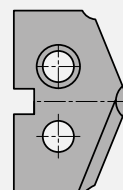
复合钻的冷却液是非常重要的,它可以冲走切屑,带走热量。我司的刀把适用于最小5bar的压力。通常,冷却液压力越大,流量越多,越好。

通过使用油路环或者内冷刀柄,可以与现有的贵司冷却液连通,我司的复合钻还可以应用于较旧的机器上。如果您有特殊的应用方式,请联系我们,我们的技术工程师会很乐意为您服务。



### 重型切削导致切削刃磨损

如果切削产生的热量已经侵蚀了切削刃,导致切削刃磨损,通常是因为切削速度太高。我们必须降低切削速度。通过测量未受影响的切削刃的直径和根据这个新的直径来计算切削速度。从得到的速度中减去10%,并将其输入到机床设备中。





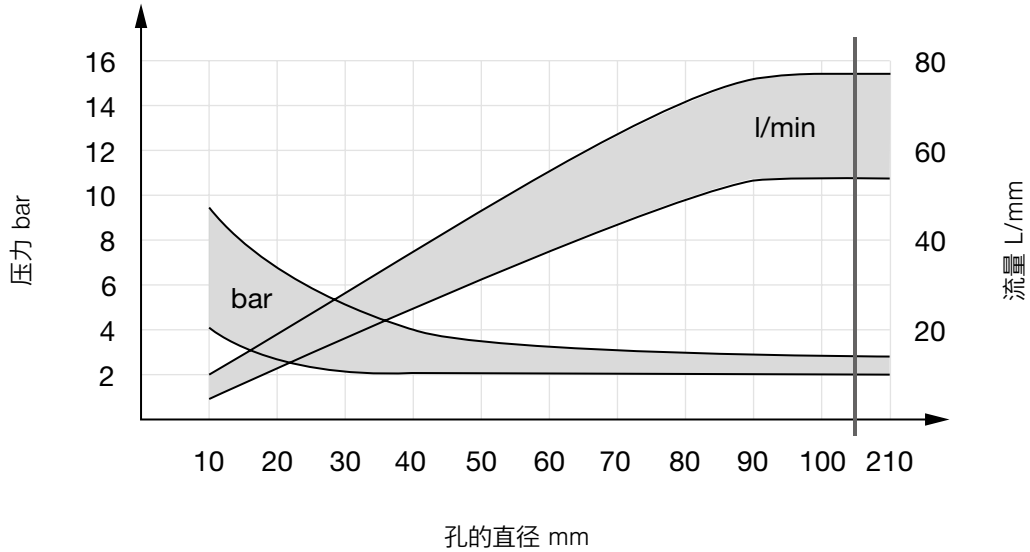
## 复合钻 - 冷却液的要求

有效的冷却液是非常重要的。冷却液压力不足或流量不够,可能会导致孔的表面光洁度变差,或者刀具的意外损坏。如果可能的话,冷却液中固体颗粒的大小不应超过50 $\mu\text{m}$ 。

对于应用高速钢或硬质合金刀片的复合钻,我们建议使用可溶性油作为冷却液来使用。

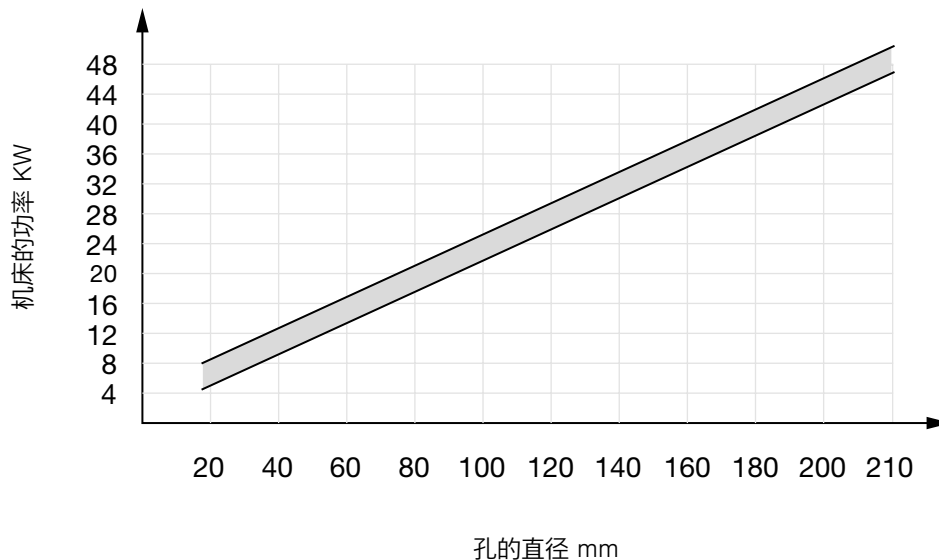
标准的混合比例: 1:20

冷却液的压力和流量比可溶性油的成分更重要。所以使用复合钻有,一个重要的先决条件,足够的冷却和润滑。



## 机床和工件

一个刚性好的机床和主轴,以及良好夹持的刀具、工件,才能获得一个良好的应用。在孔加工中,刚性不足容易导致钻头在孔加工过程中,刀具容易振动,容易磨损,从而导致切削刃寿命缩短或者意外破损。





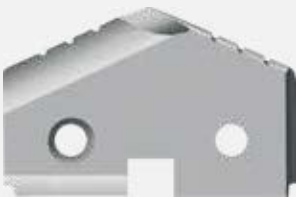
## 复合钻 - 特殊的几何形状



**按照客户图纸要求的刀片**  
(材质:HSS-E/PM HSS-E ,或 硬质合金)



**NC 90°或120°中心钻用刀片(材质:HEE-E/PM HSS-E 或 硬质合金) (上面的图片是基于90°)**



**带圆弧R角的刀片**  
(材质:HSS-E/PM HSS-E ,或 硬质合金)



**带圆弧R角的刀片**  
(材质:HEE-E/PM HSS-E 或 硬质合金)



**黄铜用非标刀片**  
(材质:硬质合金)



**不带中心点的盲孔用刀片(HSS-E/PM HSS-E)**



**纤维、塑料用非标刀片**  
(材质:硬质合金)



**圆弧刀片(材质:HEE-E/PM HSS-E, 硬质合金)**

**\* 请注意,当贵司使用盲孔用非标刀片时:**

- 仅适用于较短的刀杆。
- 请先用标准刀杆做预加工孔(标准刀片的直径 ≤ 盲孔用刀片直径)
- 在整体材料下使用需要推荐下特殊加工参数。
- 请向我们提供工件图纸,确认孔的几何角度。如果可能,请联系我们的技术人员。

我司可以根据贵司的需求提供非标的刀片,以及特殊的涂层。  
请联系我们。非标品的交期为3周左右。



## 复合钻 - 技术特点

哈特纳新设计的 可换刀尖的复合钻 HPC 系列, 为我们的客户带来了可高性能和高的性价比的新产品。它适用的孔的直径范围从 11mm到40mm, 它具有以下优点:

**• 刀具寿命更长**

可替换的刀片经过了精密磨削过, 它的表面有很高的光洁度, 并且有复合涂层, 使得此刀尖非常耐磨。  
刀杆也有很高的耐磨性, 它的材料经过特别的处理, 表面镀镍。  
刀杆直径从 11mm到31.99mm, 它间隔0.5mm; 刀杆直径从 32mm开始, 他间隔1mm. 这使得刀杆在使用中, 受到更少的磨损

**• 优化的切屑流动**

最优的螺旋槽设计, 复合钻 HPC 系列确保切屑能顺畅的流出, 甚至加工比较深的孔的时候。

**• 完美冷却润滑**

特殊设计的刀杆的内冷管, 可以给予一个完美的冷却润滑。它确保切屑从螺旋槽中顺利流出, 并带走切削产生的热量。

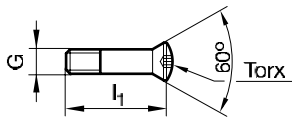
**• 高精度和高刚性的刀片**

更换可换式的刀片, 只需要简单的几步, 外加一个标准的梅花扳手, 就可以准确的将切削刀片杆相互配合。复合钻HPC的刀杆材料经过了最佳的优化, 可以支撑更频繁的更换切削刃, 而不会带来刀杆的磨损。  
使用螺钉锁紧, 使得切削刃和刀杆成为一个整体, 即使加工时, 机床有较大的振动, 也可以保持切削的稳定。

**• 高刚性的刀杆**

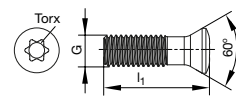
刀杆的直径和刀片的直径类似, 它有效减少了磨损。在孔内的导向性更好。它增强了 复合钻 HPC 系统的刚性, 使得刀具的寿命延长, 改善了孔的表面质量。

### 刀片固定在刀杆 螺钉 1.5 - 10x D 868433



刀杆尺寸	螺丝刀	螺钉型号
110/115	T7	2,200
120/125	T7	2,201
130/135	T8	2,500
140/145	T9	3,000
150/155	T9	3,001
160 - 175	T10	3,500
180 - 195	T15	4,000
200 - 215	T15	4,500

### 倒角刀片固定于刀杆上 螺钉 86846



刀杆尺寸	螺丝刀	螺钉型号
220 - 235	T20	5,000
240 - 255	T20	5,001
260 - 295	T20	5,003
300 - 315	T25	6,000
320 - 350	T25	6,001
360 - 390	T25	6,002

刀杆尺寸	螺丝刀	螺钉型号
110 - 140	T6	2,000
160 - 280	T7	2,500
300 - 360	T15	4,006

我们建议更换刀片时也更换夹紧螺钉  
每个刀杆都随配一个螺钉, 型号No.86643, 以及一个螺丝刀, 型号No.86642. 每个刀片都随配一个螺钉, 型号No.86643

### 拧紧螺钉所需的力矩

直径范围	11,0 - 12,99	13,0 - 13,99	14,0 - 15,99	16,0 - 17,99	18,0 - 19,99	20,0 - 21,99	22,0 - 29,99	30,0 - 40,00
螺纹	M2,2	M2,5	M3	M3,5	M4	M4,5	M5	M6
螺丝刀	T7	T8	T9	T10	T15	T15	T20	T25
力矩 [Nm]	0,8	1,0	1,7	2,7	4,0	6,0	8,0	14,0



ip x

7



# HARTNER

Precision Cutting Tools

## 技术章节

定义及应用推荐



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# HARTNER

## 尺寸 直柄麻花钻

直径 to (包括)	DIN 338		DIN 339		DIN 340		DIN 1897		DIN 1869 加长麻花钻					
	半 径	半 径	半 径	半 径	半 径	半 径	半 径	半 径	系列1		系列2		系列3	
									半 径	半 径	半 径	半 径	半 径	半 径
mm	mm		mm		mm		mm		mm		mm		mm	
≤ .24	19	2.5					19	1.5						
.30	19	3					19	1.5						
.38	19	4					19	2						
.48	20	5			30*	10*	19	2.5						
.53	22	6			32*	12*	20	3						
.60	24	7	32*	15*	35*	15*	21	3.5						
.67	26	8	36*	18*	38*	18*	22	4						
.75	28	9	39*	20*	42*	21*	23	4.5						
.85	30	10	42*	22*	46*	25*	24	5						
.95	32	11	45*	24*	51*	29*	25	5.5						
1.06	34	12	48	26	56	33	26	6						
1.18	36	14	50	28	60	37	28	7						
1.32	38	16	52	30	65	41	30	8						
1.50	40	18	55	33	70	45	32	9						
1.70	43	20	58	35	76	50	34	10	115*	75*				
1.90	46	22	62	38	80	53	36	11	120*	80*				
2.12	49	24	66	41	85	56	38	12	125	85	160*	110*	205*	135*
2.36	53	27	70	44	90	59	40	13	135	90	170*	115*	215*	145*
2.65	57	30	74	47	95	62	43	14	140	95	180*	120*	225*	150*
3.00	61	33	79	51	100	66	46	16	150	100	190	130	240*	160*
3.35	65	36	84	55	106	69	49	18	155	105	200	135	250*	170*
3.75	70	39	91	60	112	73	52	20	165	115	210	145	265	180
4.25	75	43	96	64	119	78	55	22	175	120	220	150	280	190
4.75	80	47	102	69	126	82	58	24	185	125	235	160	295	200
5.30	86	52	108	74	132	87	62	26	195	135	245	170	315	210
6.00	93	57	116	80	139	91	66	28	205	140	260	180	330	225
6.70	101	63	124	86	148	97	70	31	215	150	275	190	350	235
7.50	109	69	133	93	156	102	74	34	225	155	290	200	370	250
8.50	117	75	142	100	165	109	79	37	240	165	305	210	390	265
9.50	125	81	151	107	175	115	84	40	250	175	320	220	410	280
10.60	133	87	162	116	184	121	89	43	265	185	340	235	430	295
11.80	142	94	173	125	195	128	95	47	280*	195*	365*	250*	455*	310*
13.20	151	101	184	134	205	134	102	51	295*	205*	375*	260*	480*	330*
14.00	160	108	194	142	214	140	107	54						
15.00	169	114	202	147	220	144	111	56						
16.00	178	120	211	153	227	149	115	58						
17.00	184	125	218	159	235	154	119	60						
18.00	191	130	226	165	241	158	123	62						
19.00	198	135	234	171	247	162	127	64						
20.00	205	140	242	177	254	166	131	66						
21.20					261	171	136	68						
22.40					268	176	141	70						
23.60					275	180	146	72						
25.00					282	185	151	75						
26.50					290	190	156	78						
28.00					298	195	162	81						
30.00					307	201	168	84						
31.50					316	207	174	87						
33.50							180	90						
35.50							186	93						
37.50							193	96						
40.00							200	100						
42.50							207	104						
45.00							214	108						
47.50							221	112						
50.00							228	116						

哈特纳标准钻头总长≤1000mm。  
哈特纳no.81740, 81750, 81760

\* 钻领标准



# HARTNER

## 尺寸 莫氏锥柄麻花钻

直径 to (包括) mm	DIN 345			DIN 346			DIN 341			钻套 带 特大号锥柄*			V/IS-钻头* 加工 难加工材料			DIN 1870 加长麻花钻					
																系列1			系列2		
	总长	槽长	莫氏锥柄	总长	槽长	莫氏锥柄	总长	槽长	莫氏锥柄	总长	槽长	莫氏锥柄	总长	槽长	莫氏锥柄	总长	槽长	莫氏锥柄	总长	槽长	莫氏锥柄
mm	mm			mm			mm			mm			mm			mm					
2.65	111*	30*	1*																		
3.00	114	33	1																		
3.35	117	36	1																		
3.75	120	39	1																		
4.25	124	43	1																		
4.75	128	47	1																		
5.30	133	52	1																		
6.00	138	57	1																		
6.70	144	63	1																		
7.50	150	69	1																		
8.50	156	75	1									130	49	1	265	165	1	330	210	1	
9.50	162	81	1									134	53	1	275	175	1	345	220	1	
10.60	168	87	1	185*	87*	2*	197	116	1	214	116	2	138	57	1	285	185	1	360	235	1
11.80	175	94	1	192*	94*	2*	206	125	1	223	125	2	142	61	1	300	195	1	375	250	1
13.20	182	101	1	199	101	2	215	134	1	232	134	2	147	66	1	310	205	1	395	260	1
14.00	189	108	1	206	108	2	223	142	1	240	142	2	168	70	2	325	220	1	410	275	1
15.00	212	114	2	235*	114*	3*	245	147	2	268	147	3	172	74	2	340	220	2	425	275	2
16.00	218	120	2	241*	120*	3*	251	153	2	274	153	3	176	78	2	355	230	2	445	295	2
17.00	223	125	2	246*	125*	3*	257	159	2	280	159	3	179	81	2	355	230	2	445	295	2
18.00	228	130	2	251*	130*	3*	263	165	2	286	165	3	183	85	2	370	245	2	465	310	2
19.00	233	135	2	256	135	3	269	171	2	292	171	3	186	88	2	370	245	2	465	310	2
20.00	238	140	2	261	140	3	275	177	2	298	177	3	212	91	3	385	260	2	490	325	2
21.20	243	145	2	266	145	3	282	184	2	305	184	3	216	95	3	385	260	3	490	325	3
22.40	248	150	2	271	150	3	289	191	2	312	191	3	219	98	3	405	270	3	515	345	3
23.02	253	155	2	276	155	3	296	198	2	319	198	3	222	101	3	405	270	3	515	345	3
23.60	276	155	3	304*	155*	4*	319	198	3	347	198	4	222	101	3	425	270	3	535	345	3
25.00	281	160	3	309*	160*	4*	327	206	3	355	206	4	225	104	3	440	290	3	555	365	3
26.50	286	165	3	314*	165*	4*	335	214	3	363	214	4	256	107	4	440	290	3	555	365	3
28.00	291	170	3	319	170	4	343	222	3	371	222	4	259	110	4	460	305	3	580	385	3
30.00	296	175	3	324	175	4	351	230	3	379	230	4	263	114	4	460	305	3	580	385	3
31.50	301	180	3	329	180	4	360	239	3	388	239	4	266	117	4	480	320	3	610	410	3
31.75	306	185	3	334	185	4	369	248	3	397	248	4	269	120	4	480	320	3	610	410	3
33.50	334	185	4	372*	185*	5*	397	248	4	435	248	5	269	120	4	505	320	4	635	410	4
35.50	339	190	4	377*	190*	5*	406	257	4				272	123	4	530	340	4	665	430	4
37.50	344	195	4	382*	195*	5*	416	267	4				276	127	4	530	340	4	665	430	4
40.00	349	200	4	387*	200*	5*	426	277	4				317	130	5	555	360	4	695	460	4
42.50	354	205	4	392	205	5	436	287	4				320	133	5	555	360	4	695	460	4
45.00	359	210	4	397	210	5	447	298	4				323	136	5	585	385	4	735	490	4
47.50	364	215	4	402	215	5	459	310	4							585	385	4	735	490	4
50.00	369	220	4	407	220	5	470	321	4							605	405	4	765	510	4
50.80	374	225	4	412	225	5	475*	326*	4*												
53.00	412	225	5	479*	225*	6*	513*	326*	5*												
56.00	417	230	5	484*	230*	6*	518*	331*	5*												
60.00	422	235	5	489*	235*	6*	523*	336*	5*												
63.00	427	240	5	494*	240*	6*															
67.00	432	245	5	499	245	6															
71.00	437	250	5	504	250	6															
75.00	442	255	5	509	255	6															
76.50	447	260	5	514	260	6															
80.00	514	260	6																		
85.00	519	265	6																		
90.00	524	270	6																		
95.00	529	275	6																		
100.00	534	280	6																		
106.00	539*	285*	6*																		

哈特纳标准钻头总长≤1000mm, 钻  
领 82467, 82468, 82469, 82466

\* 钻领标准



# HARTNER

## 高速钢 Hartner刀具

我们的HSS刀具均用优质的刀具材料制成。对合金元素的系统选择确保刀具针对不同的应用都具有优化的特征。

钨, 钼: 提高耐回火性和耐磨性。  
钒: 提高精加工刀具的耐磨性。  
钴: 能承受更高的淬火温度并改善耐热性。

纳特纳种类	类型	应用范围
<b>HSS</b>	传统的高速钢	最普遍应用的标准刀具材料
<b>HSS-E</b>	含钴高速钢	需求增加的高热硬度的刀具材料, 特别适用于较高的加工温度或不利的冷却条件下使用。
<b>M42</b>	含8%的钴高速钢	工具材料具有较高的耐热性和硬度, 适用于加工难加工材料。
<b>HSS-E-PM</b>	粉末冶金含钴高速钢	工具材料具有高的致密性, 且结构均匀; 具有高的硬度和耐热性。刀具切削刃具有高耐磨性和稳定性。



## 哈特纳硬质合金牌号介绍

下表列出了哈特纳主要的硬质合金牌号及应用信息, 如想进一步了解更多哈特纳硬质合金牌号的信息,。

使用硬质合金的客户超过80%以上都知道哈特纳的硬质合金。经证明DK460UF硬质合金加上其它的涂层, 其性能比其它的硬质合金加上涂层都具有优越性。我们的棒料都备有库存并简化了选择的过程。欲了解更多关于其它硬质合金材质等级的应用信息, 请联系我们的技术工程师。

钴钨种类	钴含量 [M-%]	碳化钨颗粒大小 [μm]	硬度 [HV]	ISO 分类 [ISO 513 ]	特性
DK460UF K40UF	10	0,6	1620	K20-K40	可能是使用最广泛的硬质合金。大多数是带涂层的, 用于加工钢, 软铝合金, 铸铁还有“超合金”, 如Inconel 718。该牌号的硬质合金是我们的主导产品。
DK500UF K44UF	12	0,5	1690	K20-K30	该牌号的硬质合金尤其适用于硬切削加工。与DK460UF相比, 该牌号的硬质合金拥有较高的硬度和抗变形性能。由于所含钴比例大, 强烈推荐这种材质的刀具加涂层后使用。
DK255F	8	0,7	1720	K20	该牌号的硬质合金推荐用在硬切削加工上, 加工高拉伸强度的灰铸铁和硬硅铝合金。也可用于干切削加工。优先考虑加涂层后使用。
DK120	6	1,3	1620	K15-K20	该牌号的硬质合金尤其适合加金刚石涂层使用。
DK120UF	7	0,7	1850	K05-K10	超细颗粒的硬质合金, 极高的耐磨性, 适合用在刚性机床, 优先用作铰刀。
K55SF	9	0,2-0,4	1920	K05-K10	可应用于加工耐磨材料, 不锈钢, 复合材料如Kevlar and GRP, 高速切削和干切削状况下使用
DK400N	10	0,7	1580	K20-K40	该牌号的硬质合金韧性极好, 适用于加工高耐热金属
DK256EH	10	0,6	1750	K20	尤其适用于加工镍基合金。
K6UF	6	0,6	1870	K05-K10	超细颗粒度, 具有很高的耐磨性。特别适合加工高耐磨性的材料、复合材料、碳纤维和凯夫拉尔。
K5UF	5	0,5	2010	K05-K10	新开发高硬度等级材料, 适合钻孔和扩孔类刀具。特别适用于加工复合材料及碳纤维。



### 抛光处理



特别是在加工锻铝和铸铝时,没有涂层的钻头具有很好的加工性能。由于这些刀在钻尖、排屑槽和后刀面上有很高的表面光洁度,防止了积屑瘤的形成,使得他们在该领域上的广泛应用。

### 蒸汽和氮化表面处理



由于蒸汽处理后刀具表面有3-10 $\mu$ m的氧化层,使得蒸汽处理后的刀具具有较高的耐腐蚀性和较低的摩擦系数。因为氮化处理后的刀具表面具有较高的硬度,提高了刀具的耐磨型,比较适合加工耐磨性高材料。但是用超硬涂层或者软涂层都能达到该效果,这样的表面处理方式越来越不重要了。

### TiN-涂层



最大应用温度:<600 $^{\circ}$ C  
颜色: 金黄色  
结构: 单层  
硬度: 2300 HV0.05

根据哈特纳刀具在1980年代初的介绍,TiN涂层在高速钢和硬质合金刀具的应用上,是最经济的通用型涂层。

### FIRE/nanoFIRE-涂层



最大应用温度: <800 $^{\circ}$ C  
颜色: 紫色  
结构: 多层  
硬度: 3300 HV0.05

FIRE和nanoFIRE 涂层含有铝,钛和氮元素。这两个涂层是在1990年代末被推出的,是TiN涂层的进一步发展。由于其硬度的增加和良好的导热性能,他们都适用于高速钢和硬质合金刀具。



# HARTNER

## 涂层 / 表面处理

### TiAlZrN涂层



最大应用温度: < 800°C  
颜色: 淡金色  
结构: 多层  
硬度: 3300 HV0.05

当加工钢件时,由TiN/TiAlN多层结构组成的TiAlZrN是刀具具有良好性能的关键部分。基于其基体有锆元素的缘故,其可以在钢件加工中得到更进一步的扩展应用(如铁素体,奥氏体和双相钢件)。

### TiAlN-涂层



最大应用温度: < 800°C  
颜色: 紫色  
结构: 单层  
硬度: 3300 HV0.05

TiAlN涂层的特性和Fire、NanoFire特性相似,由于其只有单层 结果,一般用于微型钻头。

### AlTiN nano-涂层



最大应用温度: < 900°C  
颜色: 蓝紫色  
结构: 多层, 纳米结构  
硬度: 3300 HV0.05

Nano A 的基体是TiAlN,其可以应用于不锈钢加工,也适合加工铸铁,镍基合金和钴铬合金。由于其结构是纳米结构,所以涂层脱落情况延迟。此外它还比别的涂层(例如TiAlN)具有较高的耐热性。

### AlTiZrN-涂层



最大应用温度: < 900°C  
颜色: 淡金色  
结构: 多层, 纳米结果  
硬度: 3400 HV0.05

AlTiZrN基于AlTiN,特别适合加工不锈钢。由于它是纳米结构,所以具有良好的硬度和韧性。这个有锆的涂层在加工时很大程度上消除了与被加工材料的 化学反应,因此使刀具具有较好的排屑能力。



# HARTNER

## 涂层 / 表面处理

### TiAlSiN涂层



最大应用温度: < 800°C  
颜色: 棕红色  
结构: 多层, 纳米结构  
硬度: 5500 HV0.05

TiAlSiN涂层属于纳米级材料。这个微观结构是精细的TiAlN纳米结构转成玻璃状, 耐高温的硅氮化物为基体。这样的结构使得TiAlSiN具有较高的硬度, 是加工硬化钢和铸铁的首选涂层。

### TiSiN涂层



最大应用温度: < 800°C  
颜色: 铜色  
结构: 多层, 纳米结构  
硬度: 4000 HV0.05

TiSiN涂层是另一个纳米级涂层, 它是为碳钢, 易切削钢和锰合金钢的加工而特殊设计的。

### ZrN涂层



最大应用温度: < 700°C  
颜色: 淡金色  
结构: 多层, 纳米结构  
硬度: 2500 HV0.05

这个纳米级涂层是专门为钛合金加工设计的。其特殊的组合结构有助于摩擦系数的降低, 这使得它变得更加特殊。当加工中硅含量的铸铝时, 其也具有良好的效果。

### CrN涂层



最大应用温度: < 1000°C  
涂层: 银灰色  
结构: 多层  
硬度: 3500 HV0.05

基于钛, 铝, 铬的Ice涂层特别适合于加工有色金属, 如铜合金, 青铜和黄铜。



# HARTNER

## 涂层 / 表面处理

### DLC涂层



最大应用温度: < 500°C

颜色: 灰黑色

结构: 单层

硬度: 5000 HV0.05

DLC涂层是DLC涂层类的一部分(DLC-金刚石类),这些carbon涂层具有类金刚石的特性。由于其由100%的碳和碳化钨组成,DLC涂层具有极高的硬度。在加工有色金属,如铸铝(含硅量小于12%),铜,青铜和黄铜方面,它具有优秀的性能。它也适合加工塑料和木材。

### Cristall涂层



最大应用温度: < 600°C

颜色: 灰黑色

结构: 单层

硬度: 8000 HV0.05

Cristall涂层是一种纯金刚石涂层,特性上不弱于天然金刚石。它具有很多的物理特性,但最让人印象深刻的是它的硬度。因此这种微型Cristall涂层特别适合于加工高耐磨性材料,如纤维增强塑料、陶瓷、石墨、高硅含量铸铝合金(> 12%)。这种涂层只能应用于特殊的硬质合金刀具技术工艺中。





## 哈特纳涂层的应用推荐

	孔钻		
	硬质合金		高速钢
	常规的	MQL	
碳钢 易切削钢, 锰钢	TiSiN	TiSiN	Fire
	TiAlZrN	TiAlZrN	-
	Fire	Fire	-
低合金钢	Fire	Fire	Fire
	TiSiN	TiSiN	TiN
	TiAlZrN	TiAlZrN	
合金钢	Fire	Fire	Fire
	TiAlSiN	TiAlSiN	TiN
	AlTiN nano	AlTiN nano	
硬化钢	TiAlSiN	TiAlSiN	-
	Fire	Fire	-
	TiAlN	TiAlN	-
硬化钢	TiAlSiN	TiAlSiN	-
	Fire	Fire	-
	TiAlN	TiAlN	-
不锈钢 耐腐蚀钢	AlTiN nano	AlTiN nano	AlTiZrN
	AlTiZrN	AlTiZrN	Fire
	TiSiN	TiSiN	TiN
铸铁	TiAlSiN	TiAlSiN	Fire
	Fire	Fire	-
	AlTiN nano	AlTiN nano	-
锻铝合金	bright	bright	bright
	DLC	DLC	DLC
	Diamant	Diamant	-
铸铝合金 (<12% Si)	bright	bright	bright
	ZrN	ZrN	ZrN
	DLC	DLC	DLC
铸铝合金 (≥12% Si)	Diamant	Diamant	-
	-	-	-
	-	-	-
镍基合金 (因科镍合金)	AlTiN nano	AlTiN nano	Fire
	TiAlSiN	TiAlSiN	-
	Fire	Fire	-
钛/钛合金	ZrN	ZrN	Fire
	AlTiN nano	AlTiN nano	-
铜/黄铜/青铜	CrN	CrN	TiN
	DLC	DLC	-
铬钴合金	AlTiN nano	AlTiN nano	-
	TiAlSiN	TiAlSiN	-
	Fire	Fire	-
贵金属	AlTiN nano	AlTiN nano	-
陶瓷	Diamant	Diamant	-
非增强塑料	DLC	-	-
纤维强化的塑料	Diamant	Diamant	-
	TiAlSiN	TiAlSiN	-

### 提示

表格展示的是一般加工所用的哈特纳涂层推荐。涂层的选择建议由上往下。



# HARTNER

## 哈特纳涂层应用推荐

		钻削			铣削		
		硬质合金		高速钢	硬质合金		高速钢
		常规	MQL		常规	MQL	
碳钢, 易切削钢, 锰钢		TiSiN TiAlZrN Fire	TiSiN TiAlZrN Fire	Fire - -	TiSiN Fire TiAlZrN	Fire TiSiN TiAlZrN	Fire - -
低合金钢		Fire TiSiN TiAlZrN	Fire TiSiN TiAlZrN	Fire TiN -	Fire TiAlSiN AlTiN nano	Fire TiAlSiN AlTiN nano	Fire TiCN -
合金钢		Fire TiAlSiN AlTiN nano	Fire TiAlSiN AlTiN nano	Fire TiN -	Fire AlTiN nano TiAlSiN	Fire AlTiN nano TiAlSiN	Fire TiCN -
硬化钢, <55 HRC		TiAlSiN Fire TiAlN	TiAlSiN Fire TiAlN	- - -	TiAlSiN AlTiN nano TiAlN	TiAlSiN AlTiN nano TiAlN	- - -
硬化钢, 55-65 HRC		TiAlSiN Fire TiAlN	TiAlSiN Fire TiAlN	- - -	TiAlSiN SuperA AlTiN nano	TiAlSiN SuperA AlTiN nano	- - -
不锈钢和耐酸钢		AlTiN nano AlTiZrN TiSiN	AlTiN nano AlTiZrN TiSiN	AlTiZrN Fire TiN	AlTiN nano AlTiZrN Fire	AlTiN nano AlTiZrN Fire	Fire - -
铸铁		TiAlSiN Fire AlTiN nano	TiAlSiN Fire AlTiN nano	Fire - -	TiAlSiN Fire AlTiN nano	TiAlSiN Fire AlTiN nano	Fire TiCN -
镍基合金 (例如铬镍铁合金)		AlTiN nano TiAlSiN Fire	AlTiN nano TiAlSiN Fire	Fire - -	AlTiN nano TiAlSiN ZrN	AlTiN nano TiAlSiN -	Fire - -
钛及钛合金		ZrN AlTiN nano	ZrN AlTiN nano	Fire -	ZrN SuperA	ZrN SuperA	Fire -
钴铬合金		AlTiN nano TiAlSiN Fire	AlTiN nano TiAlSiN Fire	- - -	AlTiN nano TiAlSiN Fire	AlTiN nano TiAlSiN Fire	- - -
贵金属		AlTiN nano	AlTiN nano	-	AlTiN nano	AlTiN nano	-
铝合金		光亮处理 DLC 钻石	光亮处理 DLC 钻石	光亮处理 DLC -	光亮处理 DLC ZrN	光亮处理 DLC ZrN	光亮处理 DLC -
铸铝合金 (<12% 硅)		光亮处理 ZrN DLC	光亮处理 ZrN DLC	光亮处理 ZrN DLC	ZrN DLC 钻石	ZrN DLC 钻石	光亮处理 DLC -
铸铝合金 (≥12% 硅)		钻石 - -	钻石 - -	- - -	钻石 - -	钻石 - -	- - -
铜/青铜/ 黄铜		CrN DLC	CrN DLC	TiN -	CrN DLC	CrN DLC	TiN -
陶瓷		钻石	钻石	-	钻石	钻石	-
塑料, 未增强		DLC	-	-	DLC	-	-
塑料, 纤维增强		钻石 TiAlSiN	钻石 TiAlSiN	- -	钻石 TiAlSiN	钻石 TiAlSiN	- -
石墨		-	钻石	-	-	钻石	-

注释: 概述了硬质涂层的一般应用建议。优先级从上到下。



# HARTNER

## 哈特纳涂层应用推荐

切削丝锥			螺纹铣削		挤压丝锥			铰孔		
硬质合金		高速钢	硬质合金		硬质合金		高速钢	硬质合金		高速钢
常规	MQL		常规	MQL	常规	MQL		常规	MQL	
-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiSiN	TiSiN	TiN
-	-	TiAlN	-	-	TiN	TiN	-	AlTiN nano	AlTiN nano	-
-	-	TiN	-	-	-	-	-	-	-	-
-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	AlTiN nano	AlTiN nano	TiN
-	-	TiAlN	-	-	TiN	TiN	-	TiSiN	TiSiN	-
-	-	TiN	-	-	-	-	AlCrN	-	-	-
-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	AlTiN nano	-	TiN
-	-	TiAlN	-	-	TiN	TiN	TiN	TiSiN	-	-
-	-	TiN	-	-	-	-	AlCrN	-	-	-
-	-	TiCN	TiAlN	TiAlN	-	-	-	AlTiN nano	AlTiN nano	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
TiCN	-	-	TiAlN	TiAlN	-	-	-	TiAlSiN	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	AlTiZrN <sup>1</sup> /TiAlN <sup>2</sup>	TiCN	TiCN	TiCN	TiCN	TiCN	AlTiN nano	AlTiN nano	TiN
-	-	TiN	-	-	TiN	TiN	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
TiAlN	TiAlN	TiAlN	TiCN	TiCN	TiCN	TiCN	TiCN	TiAlSiN	TiAlSiN	TiN
TiCN	-	TiCN	-	-	TiN	TiN	TiN	-	-	-
-	-	TiN	-	-	-	-	-	-	-	-
-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	AlTiN nano	-	TiN
-	-	TiAlN	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	ZrN	-	TiN
-	-	TiAlN	-	-	-	-	-	AlTiN nano	-	-
-	-	-	-	-	-	-	-	-	-	-
光亮处理	-	光亮处理	TiCN	TiCN	-	-	-	AlTiN nano	-	TiN
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	AlTiN nano	AlTiN nano	TiN
光亮处理	光亮处理	光亮处理	光亮处理	光亮处理	DLC	DLC	DLC	DLC	-	-
DLC	DLC	DLC	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	DLC	DLC	-
DLC	DLC	DLC	光亮处理	光亮处理	DLC	DLC	DLC	-	-	-
-	-	-	-	-	-	-	-	-	-	-
TiCN	TiCN	TiCN	TiCN	TiCN	-	-	-	-	-	-
钻石	-	-	钻石	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
光亮处理	光亮处理	光亮处理	光亮处理	-	DLC	DLC	DLC	光亮处理	-	-
DLC	DLC	DLC	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
光亮处理	-	光亮处理	光亮处理	光亮处理	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
TiCN	TiCN	-	TiCN	TiCN	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

1 对于通孔, 2 对于盲孔

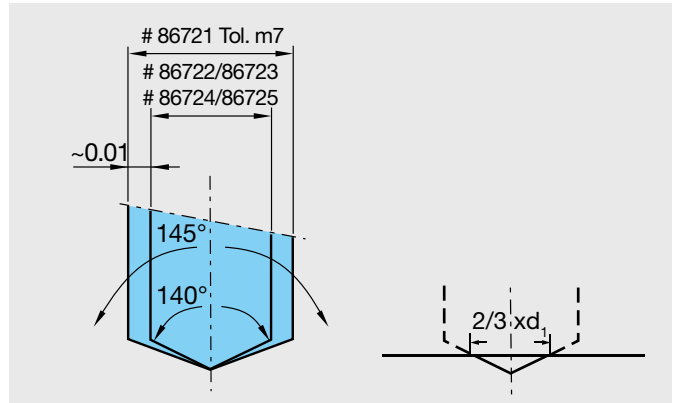


### HT800的中心钻和引导钻

当HT800钻深 $5xD$ 以上,一般我们建议使用中心钻或引导钻。

当使用中心钻定心时,中心钻钻孔直径一般是后续钻头直径的 $2/3$ 。

当使用引导钻时,我们推荐钻深 $1xD$ 。此外引导钻的顶角和直径需大于深孔钻的直径。为了保证该要求,我们推荐选择一个适当的引导钻,比如右图中的标准品No.86721,顶角 $145^\circ$ 和直径公差 $m7$ ,配合使用标准品No.86681的刀杆。



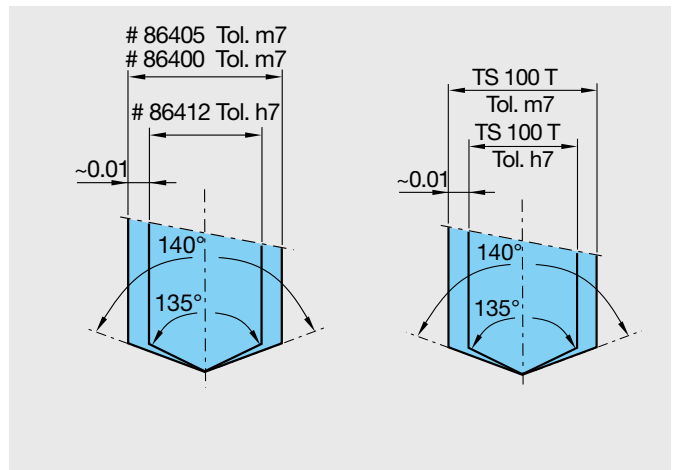
### 整体硬质合金中心钻和引导钻

当采用硬质合金钻头钻深 $7xD$ 到 $12xD$ 之间的孔时,我们建议中心钻或引导钻钻深是 $1xD$ 到 $2xD$ 。

当钻深超过 $12xD$ 时,引导孔孔深必须保证在 $1xD$ 到 $2xD$ 之间。

当专用的 $15xD$ 微钻(标准品No.86412)需要引导钻时,我们推荐使用专用的 $4xD$ 不带内冷微钻(标准品No.86400)或者使用 $5xD$ 带内冷微钻(标准品No.86405),因为他们有最适合的顶角角度和直径公差。

当深孔钻加工需要引导钻时,如TS100T,一个标准类型 $3xD$ 内冷钻头TS100U(标准品No.86410)可以被选用,因为它具有最适合的顶角和直径公差。



### 高速钢钻头的中心钻和引导钻

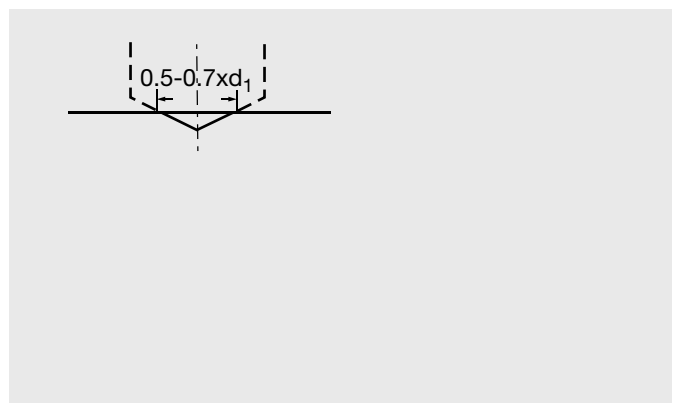
#### DIN340长系列钻头的定心

当我们用高速钢或者含钴高速钢的长系列钻头(DIN340)时,我们建议采用 $0.5xD$ 到 $0.7xD$ 直径的中心钻。高速钢NC点钻是最佳选择。详细信息可以在NC点钻章节中看到。

#### 长系列钻头DIN1869的引导钻

当选用DIN1869超长的高速钢或者含钴高速钢钻头时,我们推荐引导孔的孔深为 $1xD$ 到 $2xD$ 。

DIN1897系列的V短钻头是最适合的引导钻。

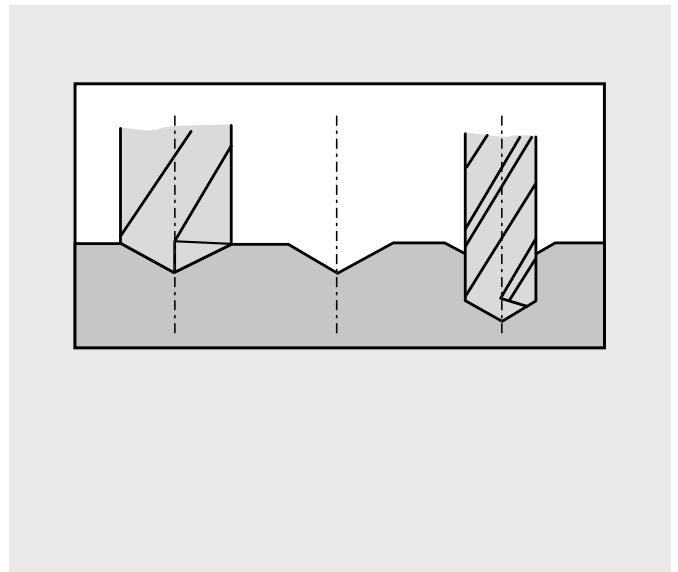




### NC 点钻

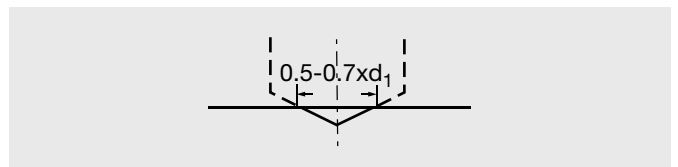
当加工的孔公差紧,深孔或者一般的形状公差(圆度,不粗糙等)要求高时,建议使用一个NC点钻。这可以保证后面的深孔钻定心好,防止孔偏。

点钻也可以用于加工孔口倒角(比加工底孔直径大),集定心于一体。



### NC点钻的选择

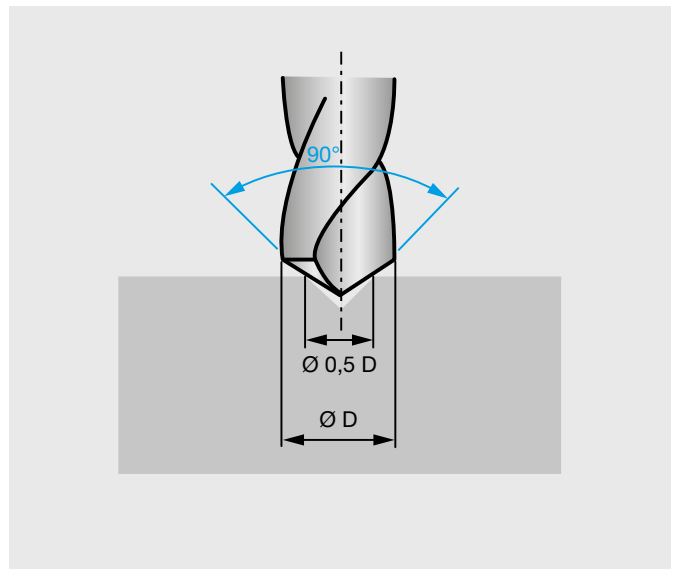
理想情况下,定心孔直径应该选择在0.5 到0.7\*D范围内。



### 90°-NC点钻

如果在后面使用的是有很大横刃的高速钢钻头,NC 点钻是非常合适的。这可以保证后面的高速钢钻头的切削刃先接触工件,通过切削刃的固定顶角,起到导向作用。

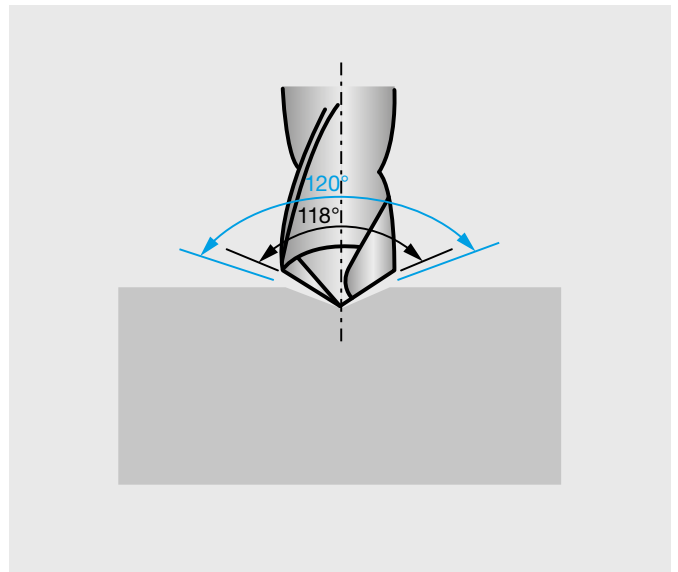
另外,如果定心孔比底孔直径大的话,NC 点钻也可以倒角和定心在一起加工。





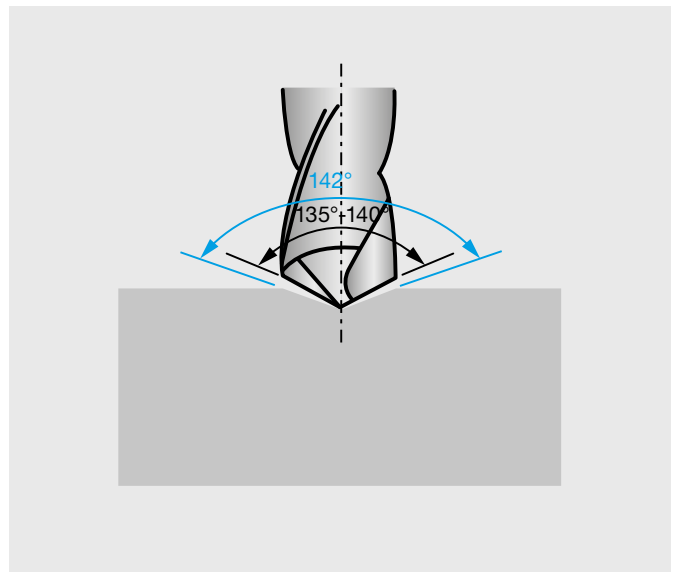
### 120°-NC点钻

带有小层 120°的NC点钻特别适用于后面用带有118°的HSS/HSS-E钻头打孔的工件。这可以保证为HSS/HSS-E钻头起到很好的导向作用。



### 142°-NC点钻

带有142°的NC点钻特别适用于后面用135°-140°的整硬钻头的工件定心。这可以保证随后的整硬钻头顶角先接触工件,起到导向作用。如果刀尖倒角在顶角接触工件之前先接触工件的话,有崩刃的风险。



### NC-点钻

90°



120°



142°





# HARTNER

## 换算表:英寸-毫米 从1/64到11 63/64

尺寸 (英寸)	mm	英寸部分 (十进制)	尺寸 (英寸)	mm	英寸部分 (十进制)	尺寸 (英寸)	mm	英寸部分 (十进制)	尺寸 (英寸)	mm	英寸部分 (十进制)
-	0.10	0.0039	51	1.70	0.0670	4	5.31	0.2090	-	14.00	0.5512
97	0.15	0.0059		1.75	0.0689	3	5.41	0.213	9/16	14.29	0.5625
96	0.16	0.0063	50	1.78	0.0700		5.50	0.2165		14.50	0.5709
95	0.17	0.0067		1.80	0.0709	7/32	5.56	0.2188	37/64	14.68	0.5781
94	0.18	0.0071	49	1.85	0.0730	2	5.61	0.221	-	15.00	0.5906
93	0.19	0.0075		1.90	0.0748	1	5.79	0.228	19/32	15.08	0.5938
92	0.20	0.0079	48	1.93	0.0760	A	5.94	0.234	39/64	15.48	0.6094
91	0.21	0.0083		1.95	0.0768	15/64	5.95	0.2344		15.50	0.6102
90	0.22	0.0087	5/64	1.98	0.0781	-	6.00	0.2362	5/8	15.88	0.625
89	0.23	0.0091	47	1.99	0.0785	B	6.05	0.238	-	16.00	0.6299
88	0.24	0.0095	-	2.00	0.0787	C	6.15	0.242	41/64	16.27	0.6406
-	0.25	0.0098		2.05	0.0807	D	6.25	0.246		16.50	0.6496
87	0.25	0.0100	46	2.06	0.0810	1/4	6.35	0.25	21/32	16.67	0.6562
	0.26	0.0102	45	2.08	0.0820	E	6.35	0.25	-	17.00	0.6693
86	0.27	0.0105		2.15	0.0846		6.50	0.2559	43/64	17.07	0.6719
	0.27	0.0106	44	2.18	0.0860	F	6.53	0.257	11/16	17.46	0.6875
85	0.28	0.0110	43	2.26	0.0890	G	6.63	0.261		17.50	0.689
	0.29	0.0114	42	2.37	0.0935	17/64	6.75	0.2656	45/64	17.86	0.7031
84	0.29	0.0115	3/32	2.38	0.0938		6.75	0.2657	-	18.00	0.7087
-	0.30	0.0118	41	2.44	0.0960	H	6.76	0.266	23/32	18.26	0.7188
83	0.30	0.0120	40	2.50	0.0980	I	6.91	0.272		18.50	0.7283
82	0.32	0.0125	39	2.53	0.0995	-	7.00	0.2756	47/64	18.65	0.7344
	0.32	0.0126	38	2.58	0.1015	J	7.04	0.2772	-	19.00	0.748
81	0.33	0.0130	37	2.64	0.1040	K	7.14	0.281	3/4	19.05	0.75
80	0.34	0.0135	36	2.71	0.1065	9/32	7.14	0.2812	49/64	19.45	0.7656
79	0.37	0.0145	7/64	2.78	0.1094	L	7.37	0.29		19.50	0.7677
1/64	0.40	0.0156	35	2.79	0.11	M	7.49	0.2949	25/32	19.84	0.7812
78	0.41	0.0160	34	2.82	0.111		7.50	0.2953	-	20.00	0.7874
77	0.46	0.0180	33	2.87	0.113	19/64	7.54	0.2969	51/64	20.24	0.7969
-	0.50	0.0197		2.90	0.1142	N	7.67	0.3020		20.50	0.8071
76	0.51	0.0200	32	2.95	0.116		7.75	0.3051	13/16	20.64	0.8125
75	0.53	0.0210	-	3.00	0.1181	5/16	7.94	0.3125	-	21.00	0.8268
74	0.57	0.0225	31	3.05	0.12	-	8.00	0.315	53/64	21.03	0.8281
-	0.60	0.0236	1/8	3.18	0.125	O	8.03	0.316	27/32	21.43	0.8438
73	0.61	0.0240	30	3.26	0.1285	P	8.20	0.323		21.50	0.8465
72	0.64	0.0250		3.30	0.1299	21/64	8.33	0.3281	55/64	21.84	0.8594
71	0.66	0.0260	29	3.45	0.136	Q	8.43	0.332	-	22.00	0.8661
-	0.70	0.0276		3.50	0.1378		8.50	0.3346	7/8	22.23	0.875
70	0.71	0.0280	28	3.57	0.1405	R	8.61	0.339		22.50	0.8858
69	0.74	0.0292	9/64	3.57	0.1406	11/32	8.73	0.3438	57/64	22.62	0.8906
-	0.75	0.0295	27	3.66	0.144		8.75	0.3445	-	23.00	0.9055
68	0.79	0.0310	26	3.73	0.147	S	8.84	0.348	29/32	23.02	0.9062
1/32	0.79	0.0313		3.75	0.1476	-	9.00	0.3543	59/64	23.42	0.9219
-	0.80	0.0315	25	3.80	0.1495	T	9.09	0.358		23.50	0.9252
67	0.81	0.0320	24	3.86	0.152	23/64	9.13	0.3594	15/16	23.81	0.9375
66	0.84	0.0330	23	3.91	0.154	U	9.35	0.368	-	24.00	0.9449
65	0.89	0.0350	5/32	3.97	0.1562		9.50	0.374	61/64	24.21	0.9531
-	0.90	0.0354	22	3.99	0.157	3/8	9.53	0.375		24.50	0.9646
64	0.91	0.0360	-	4.00	0.1575	V	9.56	0.377	31/32	24.61	0.9688
63	0.94	0.0370	21	4.04	0.159	W	9.80	0.386	-	25.00	0.9843
62	0.97	0.0380	20	4.09	0.161	25/64	9.92	0.3906	63/64	25.00	0.9844
61	0.99	0.0390		4.20	0.1654	-	10.00	0.3937	1	25.40	1.00
-	1.00	0.0394	19	4.22	0.166	X	10.08	0.397			
60	1.02	0.0400	18	4.31	0.1695	Y	10.26	0.4040			
59	1.04	0.0410	11/64	4.37	0.1719	13/32	10.32	0.4062			
58	1.07	0.0420	17	4.39	0.173	Z	10.49	0.413			
57	1.09	0.0430	16	4.50	0.177		10.50	0.4134			
56	1.18	0.0465	15	4.57	0.18	27/64	10.72	0.4219			
3/64	1.19	0.0469	14	4.62	0.182	-	11.00	0.4331			
	1.20	0.0472	13	4.70	0.185	7/16	11.11	0.4375			
	1.25	0.0492	3/16	4.76	0.1875		11.50	0.4528			
	1.30	0.0512	12	4.80	0.189	29/64	11.51	0.4531			
55	1.32	0.0520	11	4.85	0.191	15/32	11.91	0.4688			
54	1.40	0.0550	10	4.91	0.1935	-	12.00	0.4724			
	1.45	0.0571	9	4.98	0.196	31/64	12.30	0.4844			
	1.50	0.0591	-	5.00	0.1968		12.50	0.4921			
53	1.51	0.0595	8	5.05	0.199	1/2	12.70	0.50			
	1.55	0.0610	7	5.11	0.2010	-	13.00	0.5118			
1/16	1.59	0.0625	13/64	5.16	0.2031	33/64	13.10	0.5156			
	1.60	0.0630	6	5.18	0.2040	17/32	13.49	0.5312			
52	1.61	0.0635	5	5.22	0.2055		13.50	0.5315			
	1.65	0.0650		5.25	0.2067	35/64	13.89	0.5469			

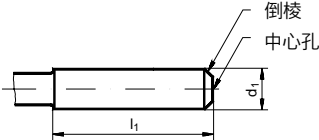
1英寸=25.400 0 mm, 参考DIN4890标准(版本2/75)



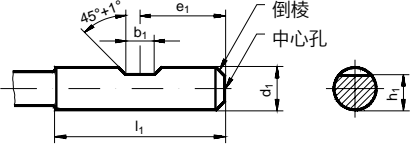
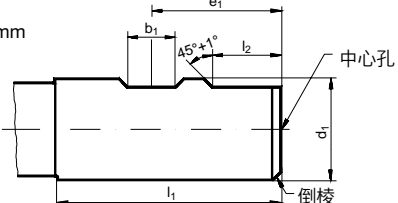
# HARTNER

## 高速钢直柄柄部设计 根据DIN 1835(摘录)

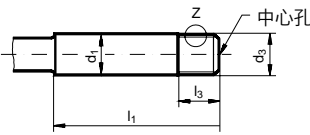
### A型, 圆柱柄

尺寸 单位mm	d <sub>1</sub> h8	l <sub>1</sub> +2 0	d <sub>1</sub> h8	l <sub>1</sub> +2 0	d <sub>1</sub> h8	l <sub>1</sub> +2 0
	3	28	10	40	32	60
	4	28	12	45	40	70
	5	28	16	48	50	80
	6	36	20	50	63	90
	8	36	25	56		

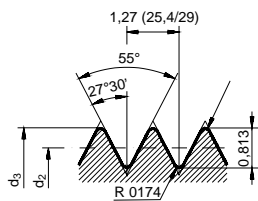
### B型, 带驱动侧面

尺寸 单位mm	d <sub>1</sub> h6	b <sub>1</sub> +0.05 0	e <sub>1</sub> 0 -1	h <sub>1</sub> h13	l <sub>1</sub> +2 0	l <sub>2</sub> +1 0	中心孔 R型 DIN 332 1
带一个驱动平面 对于d <sub>1</sub> =6...20mm	6	4.2	18	4.8	36	-	1.6x2.5
	8	5.5	18	6.6	36	-	1.6x3.35
	10	7	20	8.4	40	-	1.6x3.35
	12	8	22.5	10.4	45	-	1.6x3.35
	16	10	24	14.2	48	-	2.0x4.25
	20	11	25	18.2	50	-	2.5x5.3
带两个驱动平面 对于d <sub>1</sub> =25...63mm	25	12	32	23	56	17	2.5x5.3
	32	14	36	30	60	19	3.15x6.7
	40	14	40	38	70	19	3.15x6.7
	50	18	45	47.8	80	23	3.15x6.7
	63	18	50	60.8	90	23	3.15x6.7

### D型, 螺纹柄

尺寸 单位mm	d <sub>1</sub> h8	d <sub>3</sub> tol. zone	d <sub>2</sub> tol. zone	l <sub>1</sub> +2 0	l <sub>3</sub> +2 0	中心孔 R型 DIN 332 1
	6	5.9 0 -0.1	5.087 0 -0.1	36	10	1.6 x 2.5
	10	9.9 0 -0.1	9.087 0 -0.1	40	10	1.6 x 3.35
	12	11.9 0 -0.1	11.087 0 -0.1	45	10	1.6 x 3.35
	16	15.9 0 -0.1	15.087 0 -0.1	48	10	2.0 x 4.25
	20	19.9 0 -0.15	19.087 0 -0.15	50	15	2.5 x 5.3
	25	24.9 0 -0.15	24.087 0 -0.15	56	15	2.5 x 5.3
	32	31.9 0 -0.15	31.087 0 -0.15	60	15	3.15 x 6.7

Z局部图  
(截面)  
螺纹外形  
依据DIN 228 1



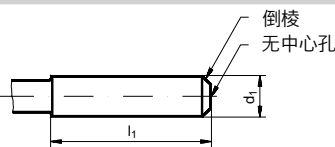




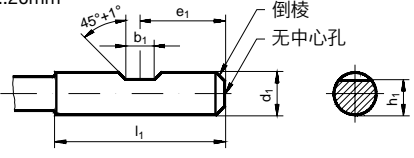
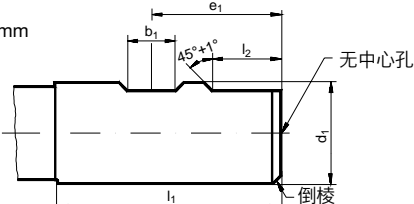
# HARTNER

## 硬质合金直柄柄部设计 依据DIN 6535(摘录)

### HA型, 圆柱柄

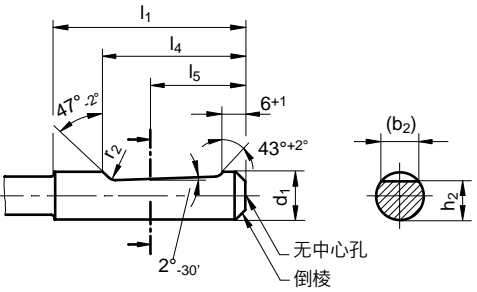
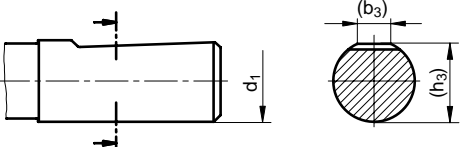
尺寸 单位mm	d1 h6	l1 +2 0	d1 h6	l1 +2 0	d1 h6	l1 +2 0
	2	28	8	36	18	48
	3	28	10	40	20	50
	4	28	12	45	25	56
	5	28	14	45	32	60
	6	36	16	48		

### HB型, 带驱动侧面

尺寸 单位mm	d1 h6	b1 +0.05 0	e1 0 -1	h1 h11	l1 +2 0	l2 +1 0
带一个驱动平面 对于d1=6...20mm	6	4.2	18	5.1	36	-
	8	5.5	18	6.9	36	-
	10	7	20	8.5	40	-
	12	8	22.5	10.4	45	-
	14	8	22.5	12.7	45	-
	16	10	24	14.2	48	-
	18	10	24	16.2	48	-
	20	11	25	18.2	50	-
有两个驱动平面 对于d1=25和32mm	25	12	32	23	56	17
	32	14	36	30	60	19

### HE型, 不带冷却槽, 侧固式\*

\* 设计: 根据DIN6335标准的直柄, 可以带或不带内冷。各种刀具, 尺寸规格和不同冷却形式在标准品范围内均有描述和应用。

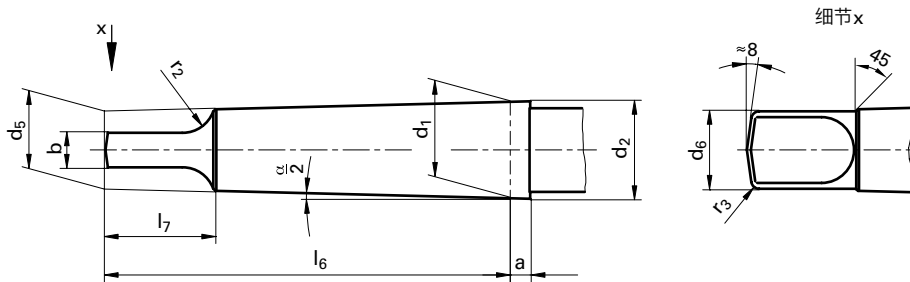
尺寸 单位mm	d1 h6	(b2) ≈	(b3)	h2 h13	(h3)	l1 +2 0	l4 0 -1	l5 nom. size	r2 min.
对于d1=6...20mm	6	4.3	-	5.1	-	36	25	18	1.2
	8	5.5	-	6.9	-	36	25	18	1.2
	10	7.1	-	8.5	-	40	28	20	1.2
	12	8.2	-	10.4	-	45	33	22.5	1.2
	14	8.1	-	12.7	-	45	33	22.5	1.2
	16	10.1	-	14.2	-	48	36	24	1.6
	18	10.8	-	16.2	-	48	36	24	1.6
	20	11.4	-	18.2	-	50	38	25	1.6
对于d1=25和32mm	25	13.6	9.3	23.0	24.1	56	44	32	1.6
	32	15.5	9.9	30.0	31.2	60	48	35	1.6



HARTNER

莫氏锥柄根据 DIN 228 章节 1(节选)

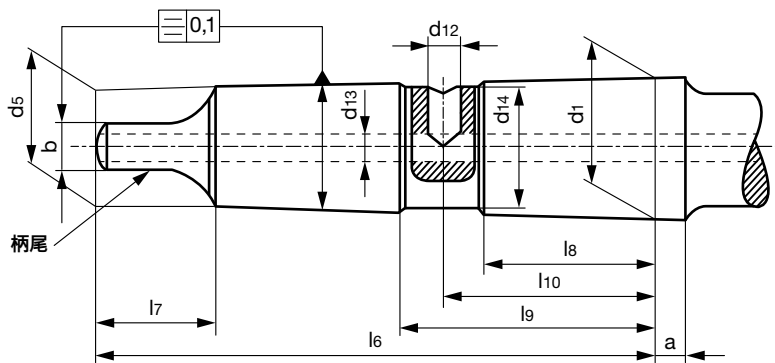
Form B, 莫氏锥柄带柄齿



尺寸单位(mm)

柄 根据 DIN 228 标准 form B	a	限值	b h13	d <sub>1</sub>	d <sub>2</sub> ≈	d <sub>5</sub> ≈	d <sub>6</sub> 最大值	l <sub>6</sub> 0 -1	l <sub>7</sub> 最大值	r <sub>2</sub> 最大值	r <sub>3</sub> ≈	$\frac{\alpha}{2}$
<b>MK 1</b>	3.5	+1.4 0	5.2	12.065	12.2	9.0	8.7	62	13.5	5	1.2	1°25'43"
<b>MK 2</b>	5.0	+1.4 0	6.3	17.780	18.0	14.0	13.5	75	16	6	1.6	1°25'50"
<b>MK 3</b>	5.0	+1.7 0	7.9	23.825	24.1	19.1	18.5	94	20	7	2	1°26'16"
<b>MK 4</b>	6.5	+1.9 0	11.9	31.267	31.6	25.2	24.5	117.5	24	8	2.5	1°29'15"
<b>MK 5</b>	6.5	+1.9 0	15.9	44.399	44.7	36.5	35.7	149.5	29	10	3	1°30'26"

BK型带内冷转换的莫氏锥柄



尺寸单位(mm)

柄 根据 DIN 228 标准 form BK 规格	a	限值	b h13	d <sub>1</sub>	d <sub>5</sub> ≈	d <sub>12</sub>	d <sub>13</sub>	d <sub>14</sub> 0 -0.01	l <sub>6</sub> 0 -1	l <sub>7</sub> 最大值	l <sub>8</sub>	l <sub>9</sub>	l <sub>10</sub>
<b>MT 1</b>	3.5	+1.4 0	5.2	12.065	9.0	-	-	-	62	13.5	-	-	-
<b>MT 2</b>	5	+1.4 0	6.3	17.780	14.0	4.2	4.2	15.0	75	16	20	34	27
<b>MT 3</b>	5	+1.7 0	7.9	23.825	19.1	5.0	5.0	21.0	94	20	29	43	36
<b>MT 4</b>	6.5	+1.9 0	11.9	31.267	25.2	6.8	6.8	28.0	117.5	24	39	55	47
<b>MT 5</b>	6.5	+1.9 0	15.9	44.399	36.5	8.5	8.5	40.0	149.5	29	51	69	60

## 切削螺纹的底孔

ISO公制螺纹 DIN 13					ISO公制细牙 DIN 13								UNC 螺距 ASME B1.1						
公称直径 Ø	螺距 P	底孔直径Ø DIN 336	中径尺寸 (内螺纹6H*)		公称直径 x Ø	螺距 P	底孔直径Ø DIN 336	中径尺寸 (内螺纹6H*)		公称直径 x Ø	螺距 P	底孔直径Ø DIN 336	中径尺寸 (内螺纹6H*)		公称直径 Ø	螺距 每英寸	底孔直径Ø DIN 336	中径尺寸 (内螺纹2B)	
			最小值 mm	最大值 mm				最小值 mm	最大值 mm				最小值 mm	最大值 mm				最小值 mm	最大值 mm
M 1	0.25	<b>0.75</b>	0.729	0.785	M 2.5 x	0.35	<b>2.15</b>	2.121	2.221	M 22 x	1.00	<b>21.00</b>	20.917	21.153	Nr. 1 -	64	<b>1.55</b>	1.425	1.580
M 1.1	0.25	<b>0.85</b>	0.829	0.885	M 3.0 x	0.35	<b>2.65</b>	2.621	2.721	M 22 x	1.50	<b>20.50</b>	20.376	20.676	Nr. 2 -	56	<b>1.85</b>	1.694	1.872
M 1.2	0.25	<b>0.95</b>	0.929	0.985	M 3.5 x	0.35	<b>3.15</b>	3.121	3.221	M 22 x	2.00	<b>20.00</b>	19.835	20.210	Nr. 3 -	48	<b>2.10</b>	1.941	2.146
M 1.4	0.30	<b>1.10</b>	1.075	1.142	M 4.0 x	0.50	<b>3.50</b>	3.459	3.599	M 24 x	1.00	<b>23.00</b>	22.917	23.153	Nr. 4 -	40	<b>2.35</b>	2.157	2.385
M 1.6	0.35	<b>1.25</b>	1.221	1.321	M 4.5 x	0.50	<b>4.00</b>	3.959	4.099	M 24 x	1.50	<b>22.50</b>	22.376	22.676	Nr. 5 -	40	<b>2.65</b>	2.487	2.698
M 1.8	0.35	<b>1.45</b>	1.421	1.521	M 5.0 x	0.50	<b>4.50</b>	4.459	4.599	M 24 x	2.00	<b>22.00</b>	21.835	22.210	Nr. 6 -	32	<b>2.85</b>	2.642	2.896
M 2	0.40	<b>1.60</b>	1.567	1.679	M 5.5 x	0.50	<b>5.00</b>	4.959	5.099	M 25 x	1.00	<b>24.00</b>	23.917	24.153	Nr. 8 -	32	<b>3.50</b>	3.302	3.531
M 2.2	0.45	<b>1.75</b>	1.713	1.838	M 6.0 x	0.75	<b>5.20</b>	5.188	5.378	M 25 x	1.50	<b>23.50</b>	23.376	23.676	Nr. 10 -	24	<b>3.90</b>	3.683	3.937
M 2.5	0.45	<b>2.05</b>	2.013	2.138	M 7.0 x	0.75	<b>6.20</b>	6.188	6.378	M 25 x	2.00	<b>23.00</b>	22.835	23.210	Nr. 12 -	24	<b>4.50</b>	4.343	4.597
M 3	0.50	<b>2.50</b>	2.459	2.599	M 8.0 x	0.50	<b>7.50</b>	7.459	7.599	M 27 x	1.00	<b>26.00</b>	25.917	26.153	1/4 -	20	<b>5.10</b>	4.978	5.258
M 3.5	0.60	<b>2.90</b>	2.850	3.010	M 8.0 x	0.75	<b>7.20</b>	7.188	7.378	M 27 x	1.50	<b>25.50</b>	25.376	25.676	5/16 -	18	<b>6.60</b>	6.401	6.731
M 4	0.70	<b>3.30</b>	3.242	3.422	M 8.0 x	1.00	<b>7.00</b>	6.917	7.153	M 27 x	2.00	<b>25.00</b>	24.835	25.210	3/8 -	16	<b>8.00</b>	7.798	8.153
M 4.5	0.75	<b>3.70</b>	3.688	3.878	M 9.0 x	0.75	<b>8.20</b>	8.188	8.378	M 28 x	1.00	<b>27.00</b>	26.917	27.153	7/16 -	14	<b>9.40</b>	9.144	9.550
M 5	0.80	<b>4.20</b>	4.134	4.334	M 9.0 x	1.00	<b>8.00</b>	7.917	8.153	M 28 x	1.50	<b>26.50</b>	26.376	26.676	1/2 -	13	<b>10.80</b>	10.592	11.024
M 6	1.00	<b>5.00</b>	4.917	5.153	M 10 x	0.75	<b>9.20</b>	9.188	9.378	M 28 x	2.00	<b>26.00</b>	25.835	26.210	9/16 -	12	<b>12.20</b>	11.989	12.446
M 7	1.00	<b>6.00</b>	5.917	6.153	M 10 x	1.00	<b>9.00</b>	8.917	9.153	M 30 x	1.00	<b>29.00</b>	28.917	29.153	5/8 -	11	<b>13.50</b>	13.386	13.868
M 8	1.25	<b>6.80</b>	6.647	6.912	M 10 x	1.25	<b>8.80</b>	8.647	8.912	M 30 x	1.50	<b>28.50</b>	28.376	28.676	3/4 -	10	<b>16.50</b>	16.307	16.840
M 9	1.25	<b>7.80</b>	7.647	7.912	M 11 x	0.75	<b>10.20</b>	10.188	10.378	M 30 x	2.00	<b>28.00</b>	27.835	28.210	7/8 -	9	<b>19.50</b>	19.177	19.761
M 10	1.50	<b>8.50</b>	8.376	8.676	M 11 x	1.00	<b>10.00</b>	9.917	10.153	M 30 x	3.00	<b>27.00</b>	26.752	27.252	1 -	8	<b>22.25</b>	21.971	22.606
M 11	1.50	<b>9.50</b>	9.376	9.676	M 12 x	1.00	<b>11.00</b>	10.917	11.153	M 32 x	1.50	<b>30.50</b>	30.376	30.676	1 1/8 -	7	<b>25.00</b>	24.638	25.349
M 12	1.75	<b>10.20</b>	10.106	10.441	M 12 x	1.25	<b>10.80</b>	10.647	10.912	M 32 x	2.00	<b>30.00</b>	29.835	30.210	1 1/4 -	7	<b>28.00</b>	27.813	28.524
M 14	2.00	<b>12.00</b>	11.835	12.210	M 12 x	1.50	<b>10.50</b>	10.376	10.676	M 33 x	1.50	<b>31.50</b>	31.376	31.676	1 3/8 -	6	<b>30.75</b>	30.353	31.115
M 16	2.00	<b>14.00</b>	13.835	14.210	M 14 x	1.00	<b>13.00</b>	12.917	13.153	M 33 x	2.00	<b>31.00</b>	30.835	31.210	1 1/2 -	6	<b>34.00</b>	33.528	34.290
M 18	2.50	<b>15.50</b>	15.294	15.744	M 14 x	1.25	<b>12.80</b>	12.647	12.912	M 33 x	3.00	<b>30.00</b>	29.752	30.252	1 3/4 -	5	<b>39.50</b>	38.938	39.802
M 20	2.50	<b>17.50</b>	17.294	17.744	M 14 x	1.50	<b>12.50</b>	12.376	12.676	M 35 x	1.50	<b>33.50</b>	33.376	33.676	2 -	4.5	<b>45.00</b>	44.679	45.593
M 22	2.50	<b>19.50</b>	19.294	19.744	M 15 x	1.00	<b>14.00</b>	13.917	14.153	M 36 x	1.50	<b>34.50</b>	34.376	34.676					
M 24	3.00	<b>21.00</b>	20.752	21.252	M 15 x	1.50	<b>13.50</b>	13.376	13.676										
M 27	3.00	<b>24.00</b>	23.752	24.252	M 16 x	1.00	<b>15.00</b>	14.917	15.153										
M 30	3.50	<b>26.50</b>	26.211	26.771	M 16 x	1.25	<b>14.80</b>	14.647	14.912										
M 33	3.50	<b>29.50</b>	29.211	29.771	M 16 x	1.50	<b>14.50</b>	14.376	14.676										
M 36	4.00	<b>32.00</b>	31.670	32.270	M 17 x	1.00	<b>16.00</b>	15.917	16.153										
M 39	4.00	<b>35.00</b>	34.670	35.270	M 17 x	1.50	<b>15.50</b>	15.376	15.676										
M 42	4.50	<b>37.50</b>	37.129	37.799	M 18 x	1.00	<b>17.00</b>	16.917	17.153										
M 45	4.50	<b>40.50</b>	40.129	40.799	M 18 x	1.50	<b>16.50</b>	16.376	16.676										
M 48	5.00	<b>43.00</b>	42.587	43.297	M 20 x	1.00	<b>19.00</b>	18.917	19.153										
M 52	5.00	<b>47.00</b>	46.587	47.297	M 20 x	1.50	<b>18.50</b>	18.376	18.676										
M 56	5.50	<b>50.50</b>	50.046	50.796	M 20 x	2.00	<b>18.00</b>	17.835	18.210										

\* MJ3X0.50~MJ5X0.80,内螺纹公差为6H

MJ 螺距 DIN ISO 5855					UNJC 螺距 ISO 3161					UNJF 螺距 ISO 3161									
公称直径 Ø	螺距 P	底孔直径Ø DIN 336	扩孔刀Ø (内螺纹5H*)		公称直径 Ø	螺距 每英寸	底孔直径Ø DIN 336	扩孔刀Ø (内螺纹3B)		公称直径 Ø	螺距 每英寸	底孔直径Ø DIN 336	扩孔刀Ø (内螺纹3B)						
			最小值 mm	最大值 mm				最小值 mm	最大值 mm				最小值 mm	最大值 mm					
MJ 3 x	0.50	<b>2.60</b>	2.513	2.653	Nr. 6 -	32	<b>2.85</b>	2.733	2.939	Nr. 6 -	40	<b>3.00</b>	2.888	3.053					
MJ 4 x	0.70	<b>3.40</b>	3.318	3.498	Nr. 8 -	32	<b>3.55</b>	3.393	3.599	Nr. 8 -	36	<b>3.60</b>	3.480	3.663					
MJ 5 x	0.80	<b>4.30</b>	4.221	4.421	Nr. 10 -	24	<b>4.00</b>	3.795	4.064	Nr. 10 -	32	<b>4.20</b>	4.054	4.255					
MJ 6 x	0.50	<b>5.55</b>	5.513	5.625	Nr. 12 -	24	<b>4.60</b>	4.455	4.704	Nr. 12 -	28	<b>4.75</b>	4.602	4.816					
MJ 6 x	0.75	<b>5.35</b>	5.269	5.419	1/4 -	20	<b>5.30</b>	5.113	5.387	1/4 -	28	<b>5.60</b>	5.466	5.662					
MJ 6 x	1.00	<b>5.10</b>	5.026	5.216	5/16 -	18	<b>6.75</b>	6.563	6.833	5/16 -	24	<b>7.00</b>	6.906	7.109					
MJ 8 x	0.50	<b>7.55</b>	7.513	7.625	3/8 -	16	<b>8.20</b>	7.978	8.255	3/8 -	24	<b>8.60</b>	8.494	8.679					
MJ 8 x	0.75	<b>7.35</b>	7.269	7.419	7/16 -	14	<b>9.60</b>	9.346	9.639	7/16 -	20	<b>10.00</b>	9.876	10.084					
MJ 8 x	1.00	<b>7.10</b>	7.026	7.216	1/2 -	13	<b>11.00</b>	10.798	11.095	1/2 -	20	<b>11.60</b>	11.463	11.661					
MJ 8 x	1.25	<b>6.90</b>	6.782	6.994	9/16 -	12	<b>12.40</b>	12.228	12.482	9/16 -	18	<b>13.00</b>	12.913	13.122					
MJ 10 x	1.00	<b>9.10</b>	9.026	9.216	5/8 -	11	<b>13.80</b>	13.627	13.904	5/8 -	18	<b>14.60</b>	14.501	14.702					
MJ 10 x	1.25	<b>8.90</b>	8.782	8.994															
MJ 10 x	1.50	<b>8.60</b>	8.539	8.775															
MJ 12 x	1.75	<b>10.40</b>	10.295	10.560															
MJ 16 x	2.00	<b>14.20</b>	14.051	14.351															

\* MJ 3x0.50 至 MJ 5x0.80 芯径 螺距螺纹 6H



## 切削螺纹的底孔

UNF 螺距 ASME B1.1					BSW (惠氏) 螺距 BS84					(惠氏) 螺距 (DIN-ISO 228-1)					钢导线管螺纹 DIN 40430				
公称直径 Ø	螺距	底孔直径Ø DIN 336	中径尺寸 (内螺纹2B)		公称直径 Ø	螺距	底孔直径Ø DIN 336	中径尺寸 (内螺纹2B)		公称直径 Ø	螺距	底孔直径Ø DIN 336	中径尺寸 (内螺纹)		公称直径 Ø	螺距	底孔直径Ø	中径尺寸 (内螺纹)	
	每 英寸	mm	最小值 mm	最大值 mm		每 英寸	mm	最小值 mm	最大值 mm		每 英寸	mm	最小值 mm	最大值 mm		每 英寸	mm	最小值 mm	最大值 mm
Nr. 1 - 72	1.55	1.473	1.610		W 1/16	60	1.20	1.045	1.230	G 1/16	28	6.80	6.561	6.843	Pg 7	20	11.40	11.280	11.430
Nr. 2 - 64	1.85	1.755	1.910		W 3/32	48	1.80	1.704	1.912	G 1/8	28	8.80	8.566	8.848	Pg 9	18	14.00	13.860	14.010
Nr. 3 - 56	2.15	2.024	2.197		W 1/8	40	2.50	2.362	2.591	G 1/4	19	11.80	11.445	11.890	Pg 11	18	17.30	17.260	17.410
Nr. 4 - 48	2.40	2.271	2.459		W 5/32	32	3.20	2.952	3.214	G 3/8	19	15.25	14.950	15.395	Pg 13.5	18	19.00	19.060	19.210
Nr. 5 - 44	2.70	2.550	2.741		W 3/16	24	3.60	3.407	3.745	G 1/2	14	19.00	18.631	19.172	Pg 16	18	21.30	21.160	21.310
Nr. 6 - 40	2.95	2.819	3.023		W 7/32	24	4.50	4.201	4.539	G 5/8	14	21.00	20.587	21.128	Pg 21	16	26.90	26.780	27.030
Nr. 8 - 36	3.50	3.404	3.607		W 1/4	20	5.10	4.724	5.156	G 3/4	14	24.50	24.117	24.658	Pg 29	16	35.50	35.480	35.730
Nr. 10 - 32	4.10	3.962	4.166		W 5/16	18	6.50	6.130	6.590	G 7/8	14	28.25	27.877	28.418	Pg 36	16	45.50	45.480	45.730
Nr. 12 - 28	4.60	4.496	4.724		W 3/8	16	7.90	7.492	7.987	G 1	11	30.75	30.291	30.931	Pg 42	16	52.50	52.480	52.730
1/4 - 28	5.50	5.359	5.588		W 7/16	14	9.20	8.789	9.330	G 1 1/8	11	35.50	34.939	35.579	Pg 48	16	57.80	57.780	58.030
5/16 - 24	6.90	6.782	7.036		W 1/2	12	10.50	9.989	10.591	G 1 1/4	11	39.50	38.952	39.592					
3/8 - 24	8.50	8.382	8.636		W 9/16	12	12.00	11.577	12.179	G 1 1/2	11	45.25	44.845	45.485					
7/16 - 20	9.90	9.728	10.033		W 5/8	11	13.50	12.918	13.558	G 1 3/4	11	51.00	50.788	51.428					
1/2 - 20	11.50	11.328	11.608		W 3/4	10	16.25	15.797	16.483	G 2	11	57.00	56.656	57.296					
9/16 - 18	12.90	12.751	13.081		W 7/8	9	19.25	18.611	19.353										
5/8 - 18	14.50	14.351	14.681		W 1	8	22.00	21.334	22.147										
3/4 - 16	17.50	17.323	17.678		W 1 1/8	7	24.50	23.928	24.832										
7/8 - 14	20.40	20.269	20.650		W 1 1/4	7	27.75	27.103	28.007										
1 - 12	23.25	23.114	23.571		W 1 3/8	6	30.50	29.504	30.528										
1 1/8 - 12	26.50	26.289	26.746		W 1 1/2	6	33.50	32.679	33.703										
1 1/4 - 12	29.50	29.464	29.921		W 1 5/8	5	35.50	34.769	35.963										
1 3/8 - 12	32.75	32.639	33.096		W 1 3/4	5	39.00	37.944	39.138										
1 1/2 - 12	36.00	35.814	36.271		W 2	4.5	44.50	43.571	44.877										

### NPT ANSI B 2.1 美制锥管螺纹 1:16

A型 (如果可能尽量不选)		B型		公称直径 Ø	螺距 每 英寸	底孔直径Ø 圆柱 (A) d <sub>1</sub>	底孔直径Ø 圆锥 (B) D <sub>1</sub>	有效钻深 ET mm	有效钻深 BT (最小值) mm
				1/16	27	6.15	6.39	9.29	10.7
				1/8	27	8.40	8.74	9.32	10.8
				1/4	18	11.10	11.36	13.52	15.6
				3/8	18	14.30	14.80	13.83	16.0
				1/2	14	17.90	18.32	18.07	20.8
				3/4	14	23.30	23.67	18.55	21.3
				1	11.5	29.00	29.69	22.29	25.6
				1 1/4	11.5	37.70	38.45	22.80	26.1
				1 1/2	11.5	43.70	44.52	22.80	26.1
				2	11.5	55.60	56.56	23.20	26.5
				2 1/2	8	66.30	67.62	31.75	36.3
				3	8	82.30	83.52	33.74	38.5

EG-螺距粗牙/细牙 (EG M 14 x 1,25) DIN 8140 丝套					UNC (UNC-STI) EG-螺距 ASME B18.29.1 丝套					UNF (UNF-STI) EG-螺距 ASME B18.29.1 丝套				
公称直径 Ø	螺距 P	底孔直径Ø DIN 336	扩孔刀Ø 内螺纹的尺寸		公称直径 Ø	螺距	底孔直径Ø DIN 336	扩孔刀Ø 内螺纹的尺寸		公称直径 Ø	螺距	底孔直径Ø	扩孔刀Ø 内螺纹的尺寸	
	mm	mm	最小值 mm	最大值 mm		每 英寸	mm	最小值 mm	最大值 mm		每 英寸	mm	最小值 mm	最大值 mm
EG M 4 x 0.70	4.20	4.152	4.292		EG Nr. 6 - 32	3.80	3.678	3.879		EG Nr. 6 - 40	3.70	3.644	3.818	
EG M 5 x 0.80	5.25	5.174	5.334		EG Nr. 8 - 32	4.40	4.338	4.524		EG Nr. 8 - 36	4.40	4.321	4.498	
EG M 6 x 1.00	6.30	6.217	6.407		EG Nr. 10 - 24	5.20	5.055	5.283		EG Nr. 10 - 32	5.10	4.999	5.184	
EG M 8 x 1.25	8.40	8.271	8.483		EG Nr. 12 - 24	5.80	5.715	5.944		EG Nr. 12 - 28	5.70	5.682	5.809	
EG M10 x 1.50	10.50	10.324	10.560		EG 1/4 - 20	6.70	6.624	6.868		EG 1/4 - 28	6.60	6.546	6.721	
EG M12 x 1.75	12.50	12.379	12.644		EG 5/16 - 18	8.40	8.242	8.489		EG 5/16 - 24	8.25	8.166	8.352	
EG M14 x 1.25	14.40	14.271	14.483		EG 3/8 - 16	10.00	9.868	10.127		EG 3/8 - 24	9.80	9.754	9.931	
EG M16 x 2.00	16.50	16.433	16.733		EG 7/16 - 14	11.60	11.506	11.783		EG 7/16 - 20	11.50	11.389	11.585	
					EG 1/2 - 13	13.30	13.122	13.393		EG 1/2 - 20	13.10	12.974	13.172	
					EG 9/16 - 12	14.90	14.747	15.032		EG 9/16 - 18	14.70	14.592	14.798	
					EG 5/8 - 11	16.50	16.375	16.673		EG 5/8 - 18	16.25	16.180	16.386	



HARTNER

推荐的挤压丝锥的螺纹底孔

ISO公制螺纹 DIN 13 and ISO公制细牙 DIN 13 tables. Columns include: 公称直径, 螺距, 底孔直径, 底孔直径, 中径尺寸 (内螺纹7H\*). Rows list various thread sizes from M2 to M42.

\* M2~M2.5,内螺纹公差为6H

\* M2.5x0.35~M4x0.35,内螺纹公差为6H

挤压螺纹底孔的直径公差 (根据DIN13,50节)

由于材料强度的改变,挤压螺纹底孔直径公差就不必一定要达到6H, 7H 就可以满足有效牙型面 不小于0.32 x P的要求 另外,挤压螺纹和切削螺纹 相比具有更高的强度,这主要归咎于 挤压过程中的冷作硬化和晶相纤维的连续性。

UNC 螺距 ASME B1.1, UNF 螺距 ASME B1.1, and (惠氏)螺距 (根据DIN-ISO228 标准) tables. Columns include: 公称直径, 螺距, 底孔直径, 底孔直径, 中径尺寸 (内螺纹2B). Rows list various thread sizes like Nr. 1 to 12, 1/4, 3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8, 1.



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## 材料国际牌号对照

Mat. no.	Germany	Great Britain		Japan	USA
	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.0711	9 S 20	220 M 07	-	SUM 21	1212
1.0715	9 SMn 28	230 M 07	-	SUM 22	1213
1.0718	9 SMnPb 28	-	-	SUM 22 L	12 L 13
1.0721	10 S 20	210 M 15	-	-	1108
1.0722	10 SPb 20	-	-	-	11 L 08
1.0723	15 S 20	210 A 15	-	SUM 32	-
1.0736	9 SMn 36	240 M 07	1B	-	1215
1.0737	9 SMnPb 36	-	-	-	12 L 14
1.0726	35 S 20	212 M 36	8M	-	1140
1.0727	45 S 20	212 M 44	-	-	1146
1.0728	60 S 20	-	-	-	-
1.0037	St 37-2	-	-	STKM 12 C	-
1.0044	St 44-2	4360-43 B	-	SM 41 B	A 570 Gr. 40
1.0116	St 37-3	4360-40 C	-	-	A 573 Gr. 58
1.0144	St 44-3	4360-43 C	-	SM 41 C	A 573 Gr. 70
1.0050	St 50-2	4360-50 B	-	SS 50	A 570 Gr. 50
1.0570	St 52-3	4360-50 B	-	SM 50 YA	-
1.0060	St 60-2	4360-SSE; SS	-	SM 58	-
1.5415	15 Mo 3	1501-240	-	-	A 204 Gr. A
1.5423	16 Mo 5	1503-245-420	-	-	4520
1.5622	14 Ni 6	-	-	-	A 350-LF 5
1.5680	12 Ni 19	-	-	-	2515
1.7335	13 CrMo 4 4	1501-620 Gr.	-	-	A 182-F11; F12
1.7337	16 CrMo 4 4	1501-620 Gr.	-	-	A 387 Gr. 12 C
1.7380	10 CrMo 9 10	1501-622 Gr.	-	-	A 182-F22
1.7709	21 CrMoV 5 7	-	-	-	-
1.7715	14 MoV 6 3	1503-660-440	-	-	-
1.7735	14 CrMoV 6 9	-	-	-	-
1.0904	55 Si 7	250 A 53	45	-	9255
1.0961	60 SiCr 7	-	-	SUP 7	9262
1.1231	CK 67	060 A 67	-	-	1070
1.1248	CK 75	060 A 78	-	-	1078; 1080
1.1274	CK 101	060 A 96	-	SUP 4	1095
1.7103	67 SiCr 5	-	-	-	-
1.7176	55 Cr 3	527 A 60	48	SUP 9 (A)	5155
1.8159	50 CrV 4	735 A 50	47	SUP 10	6150
1.0301	C 10	045 M 10	-	S 10 C	1010
1.0401	C 15	080 M 15	-	-	1015
1.1121	CK 10	045 M 10	-	S 10 C; S 9 CK	1010
1.1141	CK 15	080 M 15	32C	S 15 C; S 15 CK	1015
1.7012	13 Cr 2	-	-	-	-
1.7015	15 Cr 3	523 M 15	-	SCR 415 (H)	5015
1.5732	14 NiCr 10	-	-	SNC 415 (H)	3415
1.5752	14 NiCr 14	655 M 13	36A	SNC 815 (H)	3310; 9314
1.5860	14 NiCr 18	-	-	-	-
1.5919	15 CrNi 6	S 107	-	-	-
1.5920	18 NiCr 8	-	-	-	-
1.6523	21 NiCrMo 2	805 M 20	362	SNCM 220 (H)	8620
1.6587	17 CrNiMo 6	820 A 16	-	-	-
1.7131	16 MnCr 5	527 M 17	-	SCR 415	5115
1.7139	16 MnCrS 5	-	-	-	-
1.7147	20 MnCr 5	-	-	SMnC 420 (H)	5120
1.7149	20 MnCrS 5	-	-	-	-
1.7262	15 CrMo 5	-	-	SCM 415 (H)	-
1.7264	20 CrMo 5	-	-	SCM 421	-
1.7271	23 CrMoB 3 3	-	-	-	-
1.7311	20 CrMo 2	-	-	-	-
1.7321	20 MoCr 4	-	-	-	-
1.7323	20 MoCrS 4	-	-	-	-
1.7325	25 MoCr 4	-	-	-	-
1.7326	25 MoCrS 4	-	-	-	-
1.8504	34 CrAl 6	-	-	-	-
1.8506	34 CrAlS 5	-	-	-	-
1.8507	34 CrAlMo 5	905 M 31	-	-	A 355 Cl. D
1.0038	RSt37-2	4360 40C	1A	STKM 12A;C	A570.36



# HARTNER

## 材料国际牌号对照

Mat. no.	Germany	Great Britain		Japan	USA
	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.0402	C22	050 A 20	2C	-	1020
1.5026	55 Si 7	250 A 53	-	-	9255
1.8509	41 CrAlMo 7	905 M 39	41B	SACM 645	A 355 Cl. A
1.8515	31 CrMo 12	722 M 24	-	-	-
1.8519	31 CrMoV 9	-	-	-	-
1.8521	15 CrMoV 5 9	-	-	-	-
1.8523	39 CrMoV 13 9	897 M 39	40C	-	-
1.8550	34 CrAlNi 7	-	-	-	-
1.0402	C 22	050 A 20	2D	-	1020
1.0406	C 25	070 M 26	-	-	1025
1.0501	C 35	060 A 35	-	-	1035
1.0503	C 45	080 M 46	-	-	1045
1.0511	C 40	-	-	-	1040
1.0528	C 30	-	-	-	-
1.1151	Ck 22	050 A 20	-	S 20 C; S 20 CK	1023
1.1158	Ck 25	070 M 26	-	S 25 C	1025
1.1178	Ck 30	-	-	-	-
1.1181	Ck 35	080 M 36	-	S 35 C	1035
1.1186	Ck 40	080 M 40	-	S 40 C	1040
1.1191	Ck 45	080 M 46	-	S 45 C	1045
1.0535	C 55	070 M 55	-	-	1055
1.0540	C 50	-	-	-	-
1.0601	C 60	080 A 62	43D	-	1060
1.1203	Ck 55	070 M 55	-	S 55 C	1055
1.1206	Ck 50	080 M 50	-	-	1050
1.1221	Ck 60	080 A 62	43D	S 58 C	1060
1.1133	20 Mn 5	120 M 19	-	-	1022; 1518
1.3505	100 Cr 6	534 A 99	31	SUJ 2	52100
1.5120	38 MnSi 4	-	-	-	-
1.5121	46 MnSi 4	-	-	-	-
1.5141	53 MnSi 4	-	-	-	-
1.5710	36 NiCr 6	640 A 35	111A	SNC 236	3135
1.6546	40 NiCrMo	311-Type7	-	SNCM 240	8740
1.6565	40 NiCrMo	311-Type6	-	SNCM 439	4340
1.7003	38 Cr 2	-	-	-	-
1.7006	46 Cr 2	-	-	-	5045
1.7020	32 Cr 2	-	-	-	-
1.7030	28 Cr 4	530 A 30	-	-	5130
1.7033	34 Cr 4	530 A 32	18B	SCr 430 (H)	5132
1.7218	25 CrMo 4	1717 CDS 110	-	SCM 420; SCM	4130
1.7220	34 CrMo 4	708 A 37	19B	SCM 432; SCCrM	4135; 4137
1.7223	41 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7225	42 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7228	50 CrMo 4	708 A 47	-	SCM 445 (H)	4150
1.1157	40 Mn 4	150 M 36	15	-	1039
1.1165	30 Mn 5	120 M 36	-	SMn 433 H; SCMn	1330
1.1167	36 Mn 5	150 M 36	-	SMn 438 H; SCMn	1335
1.1170	28 Mn 5	150 M 28	14A	SCMn 1	1330
1.3561	44 Cr 2	-	-	-	-
1.3563	43 CrMo 4	-	-	-	-
1.3565	48 CrMo 4	817 M 40	-	SNC 836	-
1.5120	38 MnSi 4	-	-	-	-
1.5121	46 MnSi 4	-	-	-	-
1.5122	37 MnSi 4	-	-	-	-
1.5131	50 MnSi4	-	-	-	-
1.5141	53 MnSi 4	-	-	-	-
1.5223	42 MnV 7	-	-	-	-
1.5710	36 NiCr 6	640 A 35	111A	SNC 236	3135
1.5736	36 NiCr 10	-	-	SNC 631 (H)	3435
1.5755	31 NiCr 14	653 M 31	-	SNC 836	-
1.6511	36 CrNiMo	816 M 40	110	SNC 836	9840
1.6513	28 NiCrMo	-	-	-	-
1.7003	38 Cr 2	-	-	-	-
1.7006	46 Cr 2	-	-	-	5045
1.7030	28 Cr 4	530 A 30	-	-	5130



# HARTNER

## 材料国际牌号对照

Mat. no.	Germany	Great Britain		Japan	USA
	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.7033	34 Cr 4	530 A 32	18B	SCr 430 (H)	5132
1.7034	37 Cr 4	530 A 36	-	SCr 435 (H)	5135
1.7035	41 Cr 4	530 M 40	18	SCr 440 (H)	5140
1.7218	25 CrMo 4	1717 CDS 110	-	SCM 420; SCM 430	4130
1.7220	34 CrMo 4	708 A 37	19B	SCM 432; SCCrM 3	4135; 4137
1.7223	41 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7225	42 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7228	50 CrMo 4	708 A 47	-	SCM 445 (H)	4150
1.7561	42 CrV 6	-	-	-	-
1.7735	14 CrMoV 6 9	-	-	-	-
1.8159	50 CrV 4	735 A 50	47	SUP 10	6150
1.3563	43 CrMo 4	-	-	-	-
1.3565	48 CrMo 4	817 M 40	-	SNC 836	-
1.5120	38 MnSi 4	-	-	-	-
1.5121	46 MnSi 4	-	-	-	-
1.5122	37 MnSi 4	-	-	-	-
1.5223	42 MnV 7	-	-	-	-
1.5710	36 NiCr 6	640 A 35	111A	SNC 236	3135
1.5736	36 NiCr 10	-	-	SNC 631 (H)	3435
1.5864	35 NiCr 18	-	-	-	-
1.6511	36 CrNiMo 4	816 M 40	110	SNC 836	9840
1.6580	30 CrNiMo 8	823 M 30	-	SNM 431	-
1.6582	34 CrNiMo 6	817 M 40	24	SNM 447	4340
1.7033	34 Cr 4	530 A 32	18B	SCr 430 (H)	5132
1.7034	37 Cr 4	530 A 36	-	SCr 435 (H)	5135
1.7035	41 Cr 4	530 M 40	18	-	5140
1.7045	42 Cr 4	530 A 40	-	2245	5140
1.7218	25 CrMo 4	1717 CDS 110	-	2225	4130
1.7220	34 CrMo 4	708 A 37	19B	2234	4135; 4137
1.7223	41 CrMo 4	708 M 40	19A	2244	4142; 4140
1.7225	42 CrMo 4	708 M 40	19A	2244	4142; 4140
1.7228	50 CrMo 4	708 A 47	-	-	4150
1.7361	32 CrMo 12	722 M 24	40B	2240	-
1.7561	42 CrV 6	-	-	-	-
1.7707	30 CrMoV 9	-	-	-	-
1.7735	14 CrMoV 6 9	-	-	-	-
1.8159	50 CrV 4	735 A 50	47	2230	6150
1.8161	58 CrV 4	-	-	-	-
1.1520	C 70 W1	-	-	-	-
1.1525	C 80 W1	-	-	-	W 108
1.1545	C 105 W1	-	-	-	W 110
1.1620	C 70 W2	-	-	-	-
1.1625	C 80 W2	BW 1B	-	-	W 1
1.1645	C105 W2	-	-	-	-
1.1654	C 110 W	-	-	-	-
1.1663	C 125 W	-	-	-	W 112
1.1673	C 135 W	-	-	-	-
1.1730	C 45 W	-	-	-	-
1.1740	C 60 W	-	-	-	-
1.1744	C 67 W	-	-	-	-
1.1750	C 75 W	BW 1A	-	-	W 1
1.1820	C 55 W	-	-	-	-
1.1830	C 85 W	-	-	-	-
1.2067	100 Cr 6	BL 3	-	-	L 3
1.2101	62 SiMnCr 4	-	-	-	-
1.2103	58 SiCr 8	-	-	-	-
1.2108	90 CrSi 5	-	-	-	-
1.2162	21 MnCr 5	-	-	-	-
1.2210	115 CRV 3	-	-	-	L 2
1.2330	35 CrMo 4	708 A 37	-	2234	4135
1.2332	47 CrMo 4	709 M 40	-	2244	4142
1.2419	105 WCr 6	-	-	-	-
1.2510	100 MnCrW 4	BO 1	-	2140	O 1
1.2516	120 W 4	BF 1	-	-	-
1.2542	45 WCrV 7	BS 1	-	2710	S 1





# HARTNER

## 材料国际牌号对照

Mat. no.	Germany	Great Britain		Japan	USA
	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.2550	60 WCrV 7	-	-	-	-
1.2721	50 NiCr 13	-	-	-	-
1.2735	15 NiCr 14	-	-	SNC 22	-
1.2762	75 CrMoNiW 6 7	-	-	-	-
1.2826	60 MnSiCr 4	-	-	-	-
1.2833	100 V 1	BW 2	-	SKS 43	W 210
1.2842	90 MnCrV 8	BO 2	-	-	O 2
1.2080	X 210 Cr 12	BD 3	-	SKD 1	D 3
1.2341	X 6 CrMo 4	-	-	-	-
1.2363	X 100 CrMoV 5 1	BA 2	-	SKD 12	A 2
1.2379	X 155 CrVMo12 1	BD 2	-	SKD 11	D 2
1.2436	X 210 CrW 12	-	-	SKD 2	-
1.2601	X 165 CrMoV 12	-	-	-	-
1.2311	40 CrMnMo 7	-	-	-	-
1.2312	40 CrMnMoS 8 6	-	-	-	-
1.2711	54 NiCrMoV 6	-	-	-	-
1.2713	55 NiCrMoV 6	-	-	SKT 4	L 6
1.2738	40 CrMnNiMo 8	-	-	-	-
1.2744	57 NiCrMoV 77	-	-	-	-
1.2764	X 19 NiCrMo 4	-	-	-	-
1.2767	X 45 NiCrMo 4	-	-	-	-
1.2083	X 42 Cr 13	-	-	SUS 420 J 2	-
1.2343	X 38 CrMoV 5 1	BH 11	-	SKD 6	H 11
1.2344	X 40 CrMoV 5 1	BH 13	-	SKD 61	H 13
1.2365	X 32 CrMoV 3 3	BH 10	-	SKD 7	H 10
1.2567	X 30 WCrV 5 3	-	-	SKD 4	-
1.2581	X 30 WCrV 9 3	BH 21	-	SKD 5	H 21
1.2885	X 32 CrMoV 3 3 3	-	-	-	-
1.2316	X 36 CrMo 17	-	-	-	-
1.0420	GS-38	-	-	-	-
1.1118	GS-24 Mn 6	-	-	-	-
1.1120	GS-20 Mn 5	-	-	-	-
1.5419	GS-22 Mo 4	-	-	-	-
1.5633	GS-24 Ni 8	-	-	-	-
1.5681	GS-10 Ni 19	-	-	-	-
1.6309	GS-20 Mn MoNi 5 5	-	-	-	-
1.6582	GS-34 CrNiMo 6	-	24	-	-
1.6748	GS-40 NiCrMo 6 5 6	-	-	-	-
1.4311	X 2 CrNiN 18 10	304 S 62	-	SUS 304 LN	304 LN
1.4401	X 5 CrNiMo 18 10	316 S 16	58J	SUS 316	316
1.4404	X 2 CrNiMo 17 13 2	316 S 11	-	SUS 316 L	316 L
1.4406	X 2 CrNiMoN 17 12 2	316 S 61	58C	SUS 316 LN	316 LN
1.4429	X 2 CrNiMoN 17 13 3	316 S 62	-	SUS 316 LN	316 LN
1.4435	X 2 CrNiMo 18 14 3	317 S 12	-	SCS 16; SUS 316	316 L
1.4436	X 5 CrNiMo 17 13 3	316 S 16	-	SUS 316	316
1.4438	X 2 CrNiMo 18 16 4	317 S 12	-	SUS 317 L	317 L
1.4460	X 8 CrNiMo 27 5	-	-	SUS 329 J 1	329
1.4462	X 2 CrNiMoN 22 5	-	-	-	-
1.4541	X 6 CrNiTi 18 10	321 S 12	58B	SUS 321	321
1.4542	X 5 CrNiCuNb 17 14	-	-	SCS 124; SUS 630	630
1.4546	X 5 CrNiNb 18 10	347 S 18	-	-	348
1.4550	X 6 CrNiNb 18 10	347 S 17	58F	SUS 347	347
1.4571	X 6 CrNiMoTi 17 12 2	320 S 31	58J	-	316 Ti
1.4580	X 6 CrNiMoNb 17 12 2	318 S 17	-	-	316 Cb
1.4301	X 5 CrNi 18 9	304 S 15	58E	SUS 304	304; 304 H
1.4303	X 5 CrNi 18 12	305 S 19	-	SUS 305	308; 305
1.4305	X 10 CrNiS 18 9	303 S 21	58M	SUS 303	303
1.4306	X 2 CrNi 19 11	304 S 12	-	SCS 19	304 L
1.4310	X 12 CrNi 17 7	301 S 21	-	SUS 301	301
1.4350	X 5 CrNi18 9	304 S 31	58E	SUS 302	304
1.4573	X 10 CrNiMoTi 18 12	320 S 33	-	-	316 Ti
1.4583	X 10 CrNiMoNb 18 12	-	-	-	318
1.4000	X 6 Cr 13	403 S 17	-	SUS 403	403
1.4002	X 6 CrAl 13	405 S 17	-	SUS 405	405
1.4016	X 6 Cr 17	430 S 15	960	SUS 430	430



# HARTNER

## 材料国际牌号对照

Mat. no.	Germany	Great Britain		Japan	USA
	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.4113	X 6 CrMo 17	434 S 17	-	SUS 434	434
1.4313	X 5 CrNi 13 4	425 C 11	-	SCS 5	CA 6-NM
1.4510	X 6 CrTi 17	-	-	SUS 430 LX	XM 8; 430 Ti
1.4512	X 5 CrTi 12	409 S 19	-	SUH 409	409
1.4005	X 12 CrS 13	416 S 21	-	SUS 416	416
1.4006	X 10 Cr 13	410 S 21	56A	SUS 410	410; CA-15
1.4021	X 20 Cr 13	420 S 37	-	SUS 420 J 1	420
1.4028	X 30 Cr 13	420 S 45	-	SUS 420 J 2	-
1.4031	X 38 Cr 13	-	-	SUS 420 J 2	-
1.4034	X 46Cr 13	420 S 45	56D	SUS 420 J 2	-
1.4057	X 20 CrNi 17 2	431 S 29	57	SUS 431	431
1.4104	X 12 CrMoS 17	-	-	SUS 430 F	430 F
1.4125	X 105 CrMo 17	-	-	SUS 440 C	440 C
1.4742	X 10 CrAl 18	430 S 15	60	SUS 430; SUH	430
1.4747	X 80 CrNiSi 20	443 S 65	59	SUH 4	HNV 6
1.4762	X 10 CrAl 24	-	-	-	446
1.4876	X 10 NiCrAlTi 33	NA 15 (H)	-	NCF 800	B 163
0.6010	GG-10	-	-	FC 10	A48-20 B
0.6015	GG-15	Grade 150	-	FC 15	A48-25 B
0.6020	GG-20	Grade 220	-	FC 20	A48-30 B
0.6025	GG-25	Grade 260	-	FC 25	A48-40 B
0.6030	GG-30	Grade 300	-	FC 30	A48-45 B
0.6035	GG-35	Grade 350	-	FC 35	A48-50 B
0.6040	GG-40	Grade 400	-	-	A48-60 B
0.6655	GGL-NiCuCr 15 6	L-NUC 15 6 2	-	-	A-436 Type 1
0.7040	GGG-40	SNG 420/12	-	FCD 40	60-40-18
0.7050	GGG-50	SNG 500/7	-	FCD 50	65-45-12
0.7060	GGG-60	SNG 600/3	-	FCD 60	80-55-06
0.7070	GGG-70	SNG 700/2	-	FCD 70	100-70-03
0.7080	GGG-80	SNG 800/2	-	-	120-90-02
0.7660	GGG-NiCr 20 2	S-NiCr 20 2	-	-	A 439 Type D-2
0.7661	GGG-NiCr 20 3	S-NiCr 20 3	-	-	A 439 Type D-2B
0.7670	GGG-Ni 22	S-Ni 22	-	-	A 439 Type D-2C
0.7673	GGG-NiMn 23 4	S-NiMn 23 4	-	-	A 439 Type D-2M
0.7676	GGG-NiCr 30 3	S-NiCr 30 3	-	-	A 439 Type D-3
0.7677	GGG-NiCr 30 1	S-NiCr 30 1	-	-	A 439 Type D-3A
0.7680	GGG-NiSiCr 30 5	S-NiSiCr 30 5 5	-	-	A 439 Type D-4
0.7683	GGG-Ni 35	S-Ni 35	-	-	A 439 Type D-5
0.7685	GGG-NiCr 35 3	S-NiCr 35 3	-	-	A 439 Type D-5B
0.8135	GTS-35	B340/12	-	-	32510
0.8145	GTS-45	P440/7	-	-	40010
0.8155	GTS-55	P510/4	-	-	50005
0.8165	GTS-65	P570/3	-	-	70003
0.8170	GTS-70	P690/2	-	-	90001
0.8035	GTW-35	W340/3	-	-	-
3.0225	Al99.5	1B	-	A1x1	-
3.0305	Al99.9	-	-	-	-
3.0505	AlMn0.5Mg0.5	N31	-	-	-
3.0515	AlMn1	N3	-	144054	-
3.0525	AlMn1Mg0.5	-	-	-	-
3.3315	AlMg1	N41	-	A2x8	-
3.3535	AlMg3	N5	-	-	-
3.1325	AlCuMg1	H14	-	-	-
3.1355	AlCuMg2	2L97	-	A3x4	-
3.2315	AlMgSi1	H30	-	-	-
3.3206	AlMgSi0.5	H9	-	A2x5	-
3.3211	AlMg1SiCu	-	-	-	-
3.4345	AlZnMgCu0.5	L86	-	-	7050
3.4365	AlZnMgCu1.5	L87	-	-	7175
-	Al1Mg1SiCrTi	-	-	-	6011
-	Al0.3Cu1Mg0.6SiCr	-	-	-	6061
-	Al1Cu1.1Mg1.4Si0.8Mn	-	-	-	6066
3.2134	G-AlSi5Cu1Mg	-	-	-	-
3.3241	G-AlMg3Si	-	-	-	-
3.3292	GD-AlMg9	-	-	-	-





## 硬度比较

拉伸强度 (N/mm <sup>2</sup> )	HRC	HB30	HV10	拉伸强度 (N/mm <sup>2</sup> )	HRC	HB30	HV10
240		71	75	1110	35	328	345
255		76	80	1140	36	337	355
270		81	85	1170	37	346	364
285		86	90	1200	38	354	373
305		90	95	1230	39	363	382
320		95	100	1260	40	372	392
335		100	105	1300	41	383	403
350		105	110	1330	42	393	413
370		109	115	1360	43	402	423
385		114	120	1400	44	413	434
400		119	125	1440	45	424	446
415		124	130	1480	46	435	458
430		128	135	1530	47	449	473
450		133	140	1570	48	460	484
465		138	145	1620	49	472	497
480		143	150	1680	50	488	514
495		147	155	1730	51	501	527
510		152	160	1790	52	517	544
530		157	165	1845	53	532	560
545		162	170	1910	54	549	578
560		166	175	1980	55	567	596
575		171	180	2050	56	584	615
595		176	185	2140	57	607	639
610		181	190	2180	58	622	655
625		185	195		59		675
640		190	200		60		698
660		195	205		61		720
675		199	210		62		745
690		204	215		63		773
705		209	220		64		800
720		214	225		65		829
740		219	230		66		864
755		223	235		67		900
770		228	240		68		940
785		233	245				
800	22	238	250				
820	23	242	255				
835	24	247	260				
860	25	255	268				
870	26	258	272				
900	27	266	280				
920	28	273	287				
940	29	278	293				
970	30	287	302				
995	31	295	310				
1020	32	301	317				
1050	33	311	327				
1080	34	319	336				



# HARTNER

## 尺寸公差

### ISO-公差

麻花钻标准公差依据DIN 1414生产,跟h8标准公差表相一致  
对要求更小直径公差根据h7,h6,h5公差表。

直径 范围 mm	数值 mm(通过前刀面,外周角测量)				
	h8	h7	h6	h5	m7
从 1.0	0	0	0		
到 3.0	-0.014	-0.010	-0.006	-0.004	
从 3.0	0	0	0	0	+0.016
到 6.0	-0.018	-0.012	-0.008	-0.005	+0.004
从 6.0	0	0	0	0	+0.021
到 10.0	-0.022	-0.015	-0.009	-0.006	+0.006
从 10.0	0	0	0	0	+0.025
到 18.0	-0.027	-0.018	-0.011	-0.008	+0.007
从 18.0	0	0	0	0	+0.029
到 30.0	-0.033	-0.021	-0.013	-0.009	+0.008
从 30.0	0	0	0	0	
到 50.0	-0.039	-0.025	-0.016	-0.011	
从 50.0	0	0	0	0	
到 80.0	-0.046	-0.030	-0.019	-0.013	
从 80.0	0	0	0	0	
到 100.0	-0.054	-0.035	-0.022	-0.015	

### 微型钻公差 依据DIN 1899

微型钻最大生产直径到1.5mm  
微型钻公差 依据DIN 1899

刀体直径公差 = 0 /- 0.004 mm  
柄部直径公差h8 = 0 /- 0.014 mm

### 允许尺寸变动,无公差,根据DIN-ISO 2768 长度数值(单位:mm)

精度等级	名义尺寸范围							
	0.5~3	3~6	6~30	30~120	120~400	400~1000	1000~2000	2000~4000
精细	± 0.05	± 0.05	± 0.1	± 0.15	± 0.2	± 0.3	± 0.5	-
中等	± 0.1	± 0.1	± 0.2	± 0.3	± 0.5	± 0.8	± 1.2	± 2
粗	± 0.15	± 0.2	± 0.5	± 0.8	± 1.2	± 2	± 3	± 4
极粗	-	± 0.5	± 1	± 1.5	± 2.5	± 4	± 6	± 8

### 角度数值(单位:度,分)

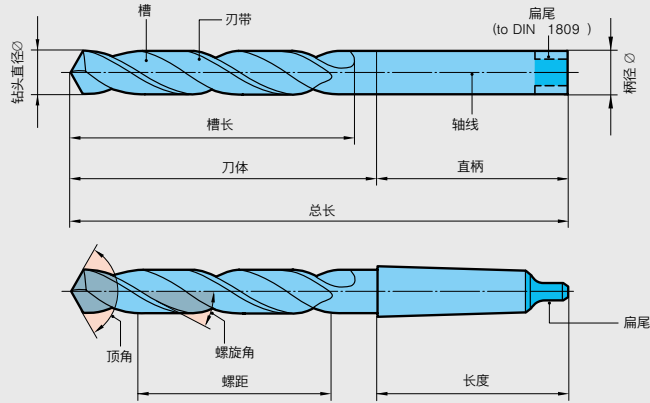
精度等级	名义尺寸范围				
	~10	10~50	50~120	120~400	400~
精细,中等	± 1°	± 0° 30'	± 0° 20'	± 0° 10'	± 0° 5'
粗	± 1°30'	± 1°	± 0° 30'	± 0° 15'	± 0° 10'
极粗	± 3°	± 2°	± 1°	± 0° 30'	± 0° 20'



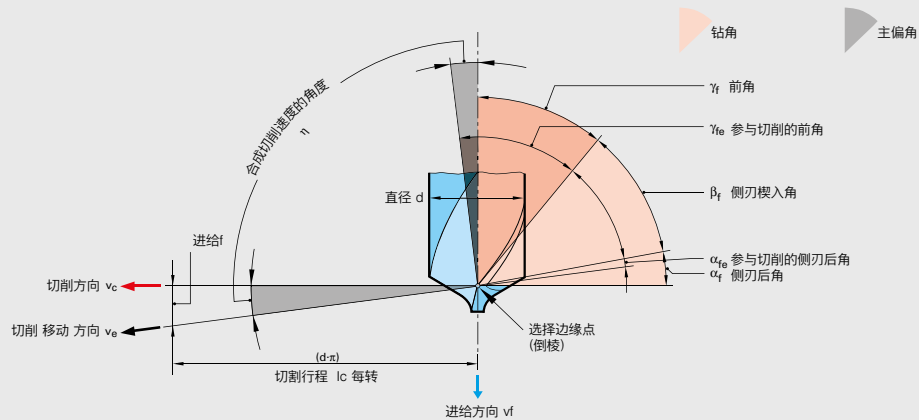
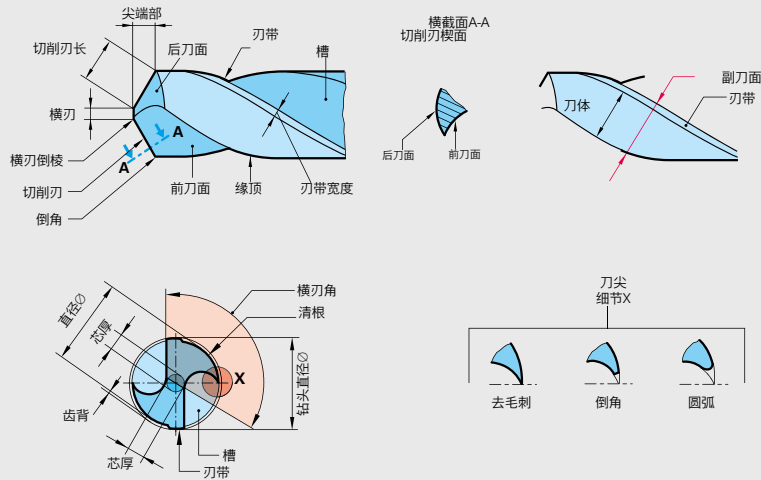
# HARTNER

## 定义, 尺寸和角度根据 DIN ISO 5419 标准 (节选, 版本 06 / 98)

### 直柄/锥柄麻花钻



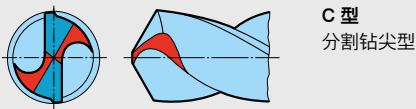
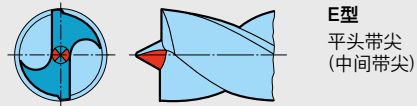
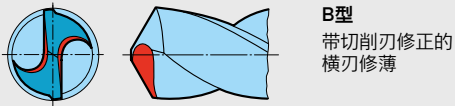
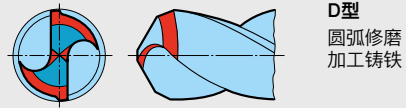
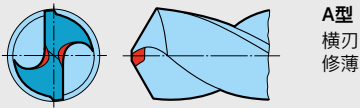
### 切削部分





## 特殊钻尖形式 和制造公差

### 特殊钻尖根据 DIN 1412 (节选, 版本03 / 01)



### 钻头公差 根据 DIN ISO 286, 章节 2

直径 (公称直径) ≤ mm	公差范围 mm	
	h 8	h 7
.38 ... .60	10	7
.95	12	8
3.00	14	10
6.00	18	12
10.00	22	15
18.00	27	18
30.00	33	21
50.00	39	25
80.00	46	30
120.00	54	35

### 参考其他相关标准

DIN 228 章节 1 机用锥柄; 莫氏锥柄和公制锥柄, 锥柄

DIN 1414-1 高速钢麻花钻的设计和使用的指南

DIN 6580 金属切削定义  
切削和几何参数

DIN 6581 金属切削定义  
切削部分参考系统和角度

以上所述标准为德国标准协会 (Deutsches Institut für Normung) 提供的。Beuth-Verlag GmbH, D-10787 Berlin 的 DIN A 4 中有最近编辑的标准可供使用。

\* 假如你需要 ISO h 8 以外的公差, 请告知我们。对于接近上述直径的公差所需要支付的附加费, 请参考“钻头”章节的最后一页。



## 后角角度/切屑排出频率

### 后角角度: HSS, HSS-E麻花钻

直径范围	N型, H型Ø 台阶钻 中心钻		W型, FN型 FW型, S型, IS型		V型	
	后角 $\alpha_x$	顶角	后角 $\alpha_x$	顶角	后角 $\alpha_x$	顶角
0.14 - 0.24	28°	118°	28°	130°	28°	130°
0.24 - 0.48	25°	118°	25°	130°	25°	130°
0.48 - 0.95	23°	118°	23°	130°	23°	130°
0.95 - 2.36	20°	118°	20°	130°	20°	130°
2.36 - 6.00	15°	118°	15°	130°	15°	130°
6.00 - 15.00	13°	118°	13°	130°	13°	130°
15.00 - 37.50	10°	118°	10°	130°	10°	130°
37.50 - 100.00	8°	118°	8°	130°	8°	130°

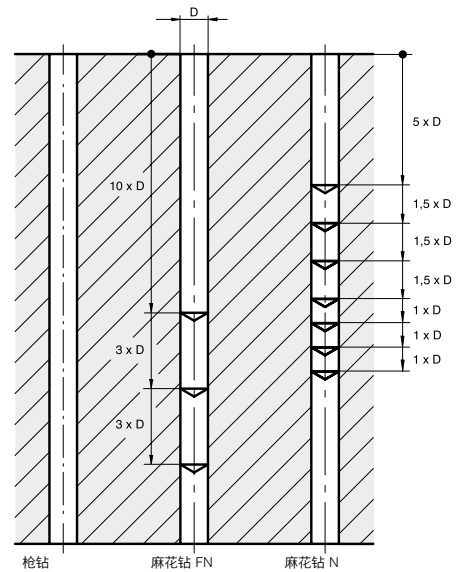
### 沉孔后角角度: 台阶钻, 中心钻

直径范围	N型, S型沉孔角度 20 - 160°      161 - 180°		W型, H型 沉孔角度 20-160° 161-180°		中心钻 后角角度-通过柄径 ØD测量	
	后角 $\alpha_x$	后角 $\alpha_x$	后角 $\alpha_x$	后角 $\alpha_x$		
0.48 - 0.95	-	-	-	-	7°	
0.95 - 2.36	14.0°	8°	16°	9°	7°	
2.36 - 3.75	13.0°	7°	15°	8°	6°	
3.75 - 6.00	12.5°	6.5°	14°	7°	5°	
6.00 - 9.50	11.0°	6°	13°	7°	4°	
9.50 - 15.00	10.0°	5°	12°	6°	4°	
15.00 - 23.60	9.5°	5°	11°	6°	-	
23.60 - 37.50	9.0°	4.5°	11°	5°	-	
37.50 - 60.00	8.0°	4°	10°	5°	-	

### 深孔钻削加工的切屑排出频率

当深孔钻削加工时, 需要特别注意至钻尖也要具有足够的冷却。钻尖需要通过一次或多次切屑的排出而被充分冷却。频繁切屑排出主要取决于工件材料、钻深及钻头类型等因素。当在使用带直槽部分(FN)型深孔钻时, 切屑的排出频率具有明显的减少。对有些材料, 切屑的形态可以通过顶角的变化而影响。正确的切屑形态通过切屑排出和冷却进给同时得以改善。对些极端的深孔, 推荐使用带内冷供给的钻头或卧式加工方式。

所列数据可以作为您的应用指导及代表平均值。



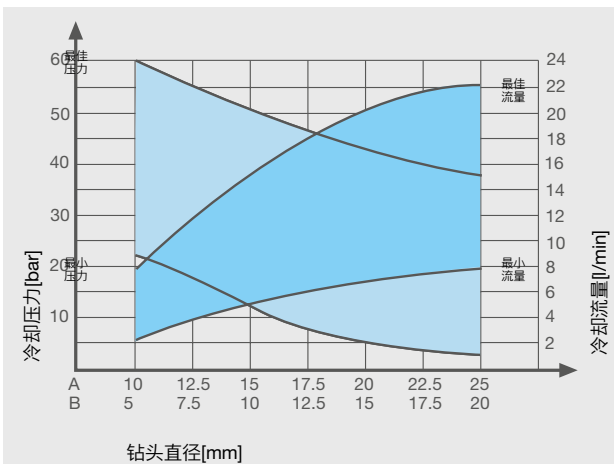




# HARTNER

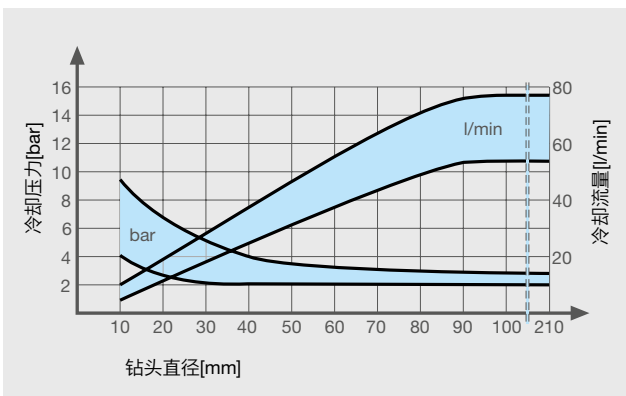
## 冷却图表 冷却压力和冷却流量

### 带内冷硬质合金麻花钻



A = 带中心冷却孔的刀具直径范围  
 B = 非常态内冷供给刀具直径范围

### 对带内冷复合钻



当使用HSS-Co和硬质合金材质的刀片式钻头加工时,也可以使用钻削乳化液作为冷却液使用。通常使用的稀释比为1:20。当你使用高性能的冷却液时,这也是绝对必须要遵循

的。如果没有足够的冷却压力和流量,钻孔的表面质量也许会比较差,甚至刀具有可能损坏。如有可能,冷却剂里实体分子的尺寸不应超过50µm。

# 麻花钻应用推荐

- 订单号 
- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - ⊙ 乳化液

- 切削方向:
- Ⓜ 右切削
  - Ⓛ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# HARTNER

≤3xD

81110	81120	81130	81140
81115			81145
1897	1897	1897	1897
<b>HSS</b>			
<b>N</b>	<b>H</b>	<b>W</b>	<b>FN</b>
24/26	28	29	30/31

84400
1897
<b>HSS</b>
<b>N</b>
33

84501
1897
<b>HSS</b>
<b>N</b>
33

81171	82971	81173	82972
1897	Std.	1897	Std.
<b>HSS-E</b>			
<b>V</b>	<b>V</b>	<b>IS</b>	<b>IS</b>
37	181	39	182



V <sub>c</sub> m/min	进给代号				V <sub>c</sub> m/min	进给代号				V <sub>c</sub> m/min	进给代号				V <sub>c</sub> m/min	进给代号			
27	6			6	30	6			6	32	7			7	35	5	5	5	5
22	5			5	24	5			5	26	6			6	30	5	5	5	5
30	6			6	33	6			6	36	7			7	40	5	5	5	5
30	5			5	33	5			5	36	6			6	40	5	5	5	5
25	5			5	28	5			5	31	6			6	40	5	5	5	5
25	5			5	28	5			5	31	6			6	40	5	5		
					25	4			4	28	5			5	35	4	4		
					22	4			4	24	5			5	20	4	4		
															16	3	3		
30	6			6	33	6			6	36	7			7	36	6	6	6	6
					20	4			4	22	5			5	20	4	4		
					14	4			4	16	5			5	15	3	3		
16	4			4	18	4			4	20	5			5	16	4	4		
															12	3	3		
															15	4	4		
															12	3	3		
															15	3	3		
															8	2	2		
															4	1	1		
															18	4	4	4	4
															14	3	3	3	3
															16	3	3	3	3
30	6			6	33	6			6	36	7			7	35	6	6		
30	6			6	33	6			6	36	7			7	30	6	6		
25	6			6	28	6			6	31	7			7	30	6	6		
20	6			6	22	6			6	24	7			7	25	6	6		
															10	3	3		
70				7	80	6			6	90	6			6	70				
70				7	65	5			5	85	8			8	70				
50	7			7	75	5			5	85	8			8	90				
50	6			6	45	5			5	60	8			8	90				
70	6	6		6	33	4			4	60	7			7	80				
60	5			5	27	4			4	30	5			5	70				
70		6		6	16	4			4	18	5			5	70				
40	5			5	15	4			4	18	5			5	40				
30	4	4		4	22	4			4	29	5			5	35	4	4	4	4
25	4			4	36	5			5	47	6			6	30	4	4	4	4
15	4			4											20	4	4	4	4
															15	4	4	4	4
18	4	4		4											20	4	4		
28	5	5		5											30			4	4

# 麻花钻应用推荐

- 订单号 
- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:  
 气冷  
 纯油  
 乳化液
- 切削方向:  
 右切削  
 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		<input type="radio"/>
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		<input type="radio"/>
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		<input type="radio"/>
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		<input type="radio"/>
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		<input type="radio"/>
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		<input type="radio"/>
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		<input type="radio"/>
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		<input type="radio"/>
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		<input type="radio"/>
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		<input type="radio"/>
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		<input checked="" type="radio"/>
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		<input checked="" type="radio"/>
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		<input type="radio"/>
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		<input checked="" type="radio"/>
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		<input type="radio"/>
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		<input checked="" type="radio"/>
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		<input checked="" type="radio"/>
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
硬化钢	-		≤48 HRC	<input checked="" type="radio"/>
			≤66 HRC	<input checked="" type="radio"/>
不锈钢,硫化 奥氏体	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		<input checked="" type="radio"/>
	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		<input checked="" type="radio"/>
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		<input checked="" type="radio"/>
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	<input type="radio"/>
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	<input type="radio"/>
球墨铸铁和 可锻铸铁	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	<input type="radio"/>
	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	<input type="radio"/>
冷激铸铁	-		≤350 HB	<input type="radio"/>
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	<input type="radio"/>
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	<input type="radio"/>
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		<input type="radio"/>
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		<input type="radio"/>
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		<input checked="" type="radio"/>
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		<input checked="" type="radio"/>
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		<input type="radio"/>
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		<input type="radio"/>
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		<input type="radio"/>
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input type="radio"/>
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		<input type="radio"/>
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		<input type="radio"/>
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		<input type="radio"/>
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		<input type="radio"/>
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		<input type="radio"/>
	<b>2.0790</b> CuNi18Zn19Pb	≤850		<input checked="" type="radio"/>
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		<input checked="" type="radio"/>
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		<input checked="" type="radio"/>
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		<input type="radio"/>
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		<input type="radio"/>
Kevlar 合成纤维	Kevlar	≤1000		<input type="radio"/>
玻璃/碳纤维	GFK/CFK	≤1000		<input type="radio"/>



# HARTNER

≤3xD

81112
1897
<b>M42</b>
○
<b>N</b>
<b>35</b>

81000
Std.
<b>M42</b>
Ⓩ
<b>104</b>

81178
1897
<b>HSS-E</b>
Ⓢ
<b>IS</b>
<b>44</b>

84803
1897
<b>HSS-E</b>
Ⓣ
<b>V</b>
<b>40</b>

84503
1897
<b>HSS-E</b>
Ⓡ
<b>V</b>
<b>40</b>

89253
6539
<b>Solid carbide</b>
Ⓡ
<b>N</b>
<b>50</b>



V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号
35	5	42	6	38	6	38	5	42	6	104	5
30	5	36	5	33	5	33	4	36	5	91	5
40	5	48	6	44	6	44	5	48	6	104	6
40	5	42	5	42	5	38	5	42	6	91	5
40	5	44	6	44	5	44	5	48	6	104	5
40	5	44	5	44	5	44	5	48	6	91	5
35	4	42	4	44	5	38	4	42	5	78	5
20	4	25	4			27	4	30	5	78	5
16	3	20	3			22	3	24	4		
36	6	40	6	40	6	44	4	48	5	104	6
20	3	20	2			22	4	24	5	78	5
15	3	15	2			18	3	20	4	65	5
16		17	2			22	4	24	5	65	4
12	3	12	2			18	3	20	4		
15	3	19	3			19	4	21	5	32	3
12	3	14	2			14	3	16	4	26	4
15	3	15	2			14	3	17	4		
8	2	11	2			9	2	11	3		
4	1	6	1			4	1	5	2		
18	3	18	4	20	4	20	4	22	5	32	2
14	3	14	3	15	3	15	3	17	4	20	1
16	3	16	3	18	3	18	3	20	4	32	2
35	5	45	6	30	6	40	6	45	7	117	5
30	5	40	6	30	6	35	6	40	7	104	5
30	5	36	6			33	6	36	7	91	5
25	5	29	6			27	6	29	7	104	5
10	3	14	3			12	3	14	4		
8	1	7	1	8	1	6	2	7	2	20	2
10	2	9	2	12	2	11	2	12	3	15	1
6	2	7	2	8	2	7	2	8	3	15	1
90	7			90	7					260	8
90	7			90	7					260	8
80	7	80	7	80	7					195	7
70	6	70	6	70	6					156	7
70	6	80	6	70	6					234	6
40	5	70	5	70	5					104	6
60	5	60	5	60	5					234	6
40	5	40	5	40	5					234	6
35	4	35	4	35	4	45	5	50	6	156	6
30	4	33	4	33	4	40	4	45	5	156	6
20	4	20	4	20	4	23	4	26	5	91	5
15	4	15	4	15	4	17	4	20	5	65	4
20		29	4							65	5
30	4	36	5	30	4					52	4
										104	4

## 麻花钻应用推荐

- 订单号 
- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - ⊙ 乳化液

- 切削方向:
- Ⓜ 右切削
  - Ⓜ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# 麻花钻应用推荐

- 订单号 
- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - ⊙ 乳化液
- 切削方向:
- Ⓜ 右切削
  - Ⓛ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○





# 麻花钻应用推荐

- 订单号 
- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:  
 气冷  
 纯油  
 乳化液
- 切削方向:  
 右切削  
 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		<input type="radio"/>
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		<input type="radio"/>
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		<input type="radio"/>
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		<input type="radio"/>
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		<input type="radio"/>
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		<input type="radio"/>
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		<input type="radio"/>
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		<input type="radio"/>
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		<input type="radio"/>
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		<input type="radio"/>
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		<input checked="" type="radio"/>
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		<input checked="" type="radio"/>
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		<input type="radio"/>
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		<input checked="" type="radio"/>
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		<input type="radio"/>
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		<input checked="" type="radio"/>
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		<input checked="" type="radio"/>
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
硬化钢	-		≤48 HRC	<input checked="" type="radio"/>
			≤66 HRC	<input checked="" type="radio"/>
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		<input checked="" type="radio"/>
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		<input checked="" type="radio"/>
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		<input checked="" type="radio"/>
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	<input type="radio"/>
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	<input type="radio"/>
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	<input type="radio"/>
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	<input type="radio"/>
冷激铸铁	-		≤350 HB	<input type="radio"/>
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	<input type="radio"/>
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	<input type="radio"/>
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		<input type="radio"/>
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		<input type="radio"/>
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		<input checked="" type="radio"/>
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		<input checked="" type="radio"/>
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		<input type="radio"/>
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		<input type="radio"/>
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		<input type="radio"/>
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input type="radio"/>
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		<input type="radio"/>
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		<input type="radio"/>
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		<input type="radio"/>
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		<input type="radio"/>
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		<input type="radio"/>
	<b>2.0790</b> CuNi18Zn19Pb	≤850		<input checked="" type="radio"/>
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		<input checked="" type="radio"/>
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		<input checked="" type="radio"/>
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		<input type="radio"/>
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		<input type="radio"/>
Kevlar 合成纤维	Kevlar	≤1000		<input type="radio"/>
玻璃/碳纤维	GFK/CFK	≤1000		<input type="radio"/>



# HARTNER

## ≤5xD

81011	82011	81041	81061	81013	82012	81012
338	345	338	338	338	345	338
HSS-E						M42
N	N	FN	S	IS	IS	N
83	177	87	89	85	178	77

84800	84859	84807
338		338
HSS-E		
FN	N	S
91	180	95

84504	84505
338	338
HSS-E	
FN	S
91	95



V <sub>c</sub> m/min	进给代号					
35	5	5	5	5	5	5
30	5	5	5	5	5	5
40	5	5	5	5	5	5
40	5	5	5	5	5	5
40	5	5	5	5	5	5
40	5	5	5	5	5	5
35	4	4	4	4	4	4
20	4	4	4	4	4	4
16	3	3	3	3	3	3
36	6	6	6	6	6	6
20	4	4	4	4	4	4
15	3	3	3	3	3	3
16	4	4	4	4	4	4
12	3	3	3	3	3	3
15	4	4	4	4	4	4
12	3	3	3	3	3	3
15	3	3	3	3	3	3
8	2	2	2	2	2	2
4						1
18	4	4	4	4	4	3
14	3	3	2	3	3	3
16	3	3	3	3	3	3
35	6	6	6	6	6	5
30	6	6	6	6	6	5
30	6	6	6	6	6	5
28	6	6	6	6	6	5
10	3	3	3	3	3	3
8			1			1
10			2	2	2	2
6			2	2	2	2
90			7	7	7	7
90			7	7	7	7
80		7	7	7	7	7
70		6	6	6	6	6
70			6	6	6	6
40	5	5	5	5	5	5
60			5	5	5	5
40	5	5	4	5	5	5
35	4	4		4	4	4
33	4	4		4	4	4
20	4	4	4	4	4	4
15	4	4	4	1	1	4
20	4	4	4			

V <sub>c</sub> m/min	进给代号		
38	6	6	
33	5	5	
44	5	5	
38	5	5	
44	5	5	
38	4	4	
27	4	4	
22	3	3	3
44	4	4	
22	4	4	
18	3	3	
22	4	4	
18	3	3	
19	4	4	
14	3	3	
14	3	3	3
9		2	2
20	4	4	4
15		3	3
18	3		3
40	6	6	
35	6	6	
33	6	6	
27	6	6	
12			3
6			2
11			2
7			2
88	5	5	
40		4	
22	4	4	
17	4	4	4
22	4	4	

V <sub>c</sub> m/min	进给代号	
42	6	
36	5	
48	6	
42	6	
48	6	
42	5	
30	5	
34	4	4
48	6	
24	5	
20	4	
24	5	
20	4	
21	5	
16	4	
17	4	4
11	3	2
6		1
22	5	5
17	4	3
20	4	4
45	7	
40	7	
36	7	
29	7	
14	4	3
7		2
12		2
8		2
85	8	
72	7	
96	6	
25	5	
20	5	4
24	5	

## 麻花钻应用推荐

- 订单号 
- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - 乳化液

- 切削方向:
- Ⓡ 右切削
  - Ⓢ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# HARTNER

≤5xD

81018	81019	81078	84804	84802	84801	84660
338	338	338	338	338	Std.	345
M42	M42	HSS-E	HSS-E	HSS-E	HSS-E-PM	HSS-E
N	N	IS	FU 500 DZ	FU 500 DZ	FU 500	FN
79	81	97	93	93	107	176



V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号
35	6	32	7	38	6	35	6	45	6	45	6	42	5
30	5	26	6	33	5	30	5	35	5	35	5		
40	6	36	7	44	6	40	6	50	6	50	6		
40	5	36	6	42	5	30	6	40	6	40	5		
40	5	31	6	44	5	32	6	44	6	44	6		
40	5	31	6	44	5	28	6	44	6	44	6		
35	4	28	5			20	5	40	5	40	5		
20	4	24	5			15	4	27	4	27	4		
16	3					13	3	22	3	22	3		
36	6	36	7	40	6	30	6	44	6	44	6		
20	3	22	5			16	4	22	4	22	4		
15	3					12	3	18	3	18	3		
16	4	16	5			15	4	22	4	22	4		
12	3					10	3	16	3	16	3		
15	3	20	5			15	4	20	4	20	4		
12	3					10	3	15	3	15	3		
15	3					10	3	13	3	13	3		
8	2							9	2	9	2		
4	1												
18	3			20	4	14	4	20	4	20	4		
14	3			15	3	10	4	16	4	16	4		
16	3			18	3	12	4	18	4	18	4		
35	6	36	7	30	6	36	6	45	6	45	6	45	7
30	6	36	7	30	6	30	6	40	6	40	6	40	7
30	6	31	7			30	6	40	6	40	6	36	7
28	6	24	7			22	6	30	6	30	6	29	7
10	3												
8	1			8	1								
10	2			12	2								
6	2			8	2								
90	7	85	8	90	7	50	7	70	7	70	7		
90	7	85	8	90	7	50	7	70	7	70	7		
80	7	60	8	80	7	65	7	85	7	85	7		
70	6	60	8	70	6	60	6	70	6	70	6		
70	6	90	7	70	6	60	6	80	6	80	6	85	
70	5	70	6	70	5	70	5	80	5	88	5	96	
60	5	80	6	60	5	45	5	77	5	77	5		
40	5	50	6	40	5	30	5	44	5	44	5		
35	4	36	5	35	4	36	4	50	4	50	4		
33	4	33	5	33	4	30	4	40	4	40	4	25	5
20	4	18	5	20	4	30	4	32	4	32	4	20	5
15	4	18	5	15	4	25	4	28	4	28	4		
20	4	29	5			20	4	25	4	25	4	24	5
30	5			30	4	15	4	27	4	27	4		

# 麻花钻应用推荐





















- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 冷却
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
-  气冷
  -  纯油
  -  乳化液

- 切削方向:
-  右切削
  -  左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	
硬化钢	-		≤48 HRC	
			≤66 HRC	
不锈钢,硫化 奥氏体	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		
	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	
球墨铸铁和 可锻铸铁	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	
	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	
冷激铸铁	-		≤350 HB	
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		
铸铝 ≤ 10 % Si ≤ 24 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		
	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		
	<b>2.0790</b> CuNi18Zn19Pb	≤850		
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		
Kevlar 合成纤维	Kevlar	≤1000		
玻璃/碳纤维	GFK/CFK	≤1000		



# HARTNER

≤5xD

84811
338
<b>HSS-E-PM</b>
<b>T</b>
FN 500 DZ
99

84507
Std.
<b>HSS-E-PM</b>
<b>F</b>
FN 500
107

82761
Std.
<b>HSS-E</b>
○
FN
轴向
120

84461
Std.
<b>HSS-E</b>
<b>T</b>
FN
轴向
120

89244
Std.
<b>Solid carbide</b>
○
N
100

89261
Std.
<b>Solid carbide</b>
<b>F</b>
N
102



V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号
40	6	42	6	48	7	60	7	80	4	100	5
32	5	37	5	38	6	48	6	70	4	90	5
45	6	47	6	48	7	60	7	80	5	100	6
40	5	44	6	38	6	48	6	70	4	90	4
42	6	47	6	48	6	60	6	80	4	100	5
40	5	47	6	48	6	60	6	70	4	90	5
28	4	44	5	45	5	50	5	60	4	80	5
25	4	30	4	30	5	33	5	60	4	80	5
20	3	25	3	28	4	31	4	80	5	100	6
40	4	47	3	50	7	55	7	60	4	80	5
22	4	25	4	25	5	31	5	60	4	80	5
18	3	20	3	25	4	31	4	50	4	65	5
20	4	25	4	25	5	30	5	50	4	65	5
15	3	18	4	20	4	24	4	50	3	65	3
25	4	22	5	24	5	30	5	50	3	65	3
15	3	17	4	17	4	20	4				
15	3	14	4	14	4	18	4				
10	2	12	2	12	3	15	3	25	2	30	3
				4	3	5	3	20	2	20	2
15	4	22	4	20	5	25	5	25	2	30	2
10	3	18	3	14	4	18	4	15	1	20	1
12	3	20	3	16	4	20	4	25	2	30	2
50	6	50	7	48	7	60	7	90	4	115	5
40	6	40	7	38	7	48	7	80	4	100	5
45	6	44	7	42	7	52	7	70	4	90	5
32	6	33	7	35	7	40	7	80	4	80	5
8	3	16	4	12	4	15	4				
5	2	6	2	10	2	12	2	15	2	20	3
				14	3	18	3	15	1	15	1
				10	3	12	3	15	1	15	1
								200	7	260	8
								200	7	260	8
				95	7	120	7	150	6	195	7
				75	8	95	8	120	6	155	7
								180	5	235	6
50	5	50	5	90	6	100	6	80	5	100	6
								180	5	235	6
60	5	60	5	50	6	55	6	180	5	235	6
50	5	50	5					120	5	155	6
45	4	44	5	48	5	60	5	120	5	155	6
40	4	33	5	45	5	55	5	70	4	90	5
32	4	28	5	38	5	45	5	50	3	65	4
25	4	25	4					50	4	50	5
				38	6	48	6	40	3	65	4
								80	3	100	4

## 麻花钻应用推荐

- 订单号 
- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - ◐ 乳化液

- 切削方向:
- Ⓢ 右切削
  - Ⓣ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化 奥氏体	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和 可锻铸铁	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○





# HARTNER

## ≤10xD

81210	81317	81310	82210	81320	81330	81350	81340	84814	84812	84418	84423	84506
339	340	340	341	340	340	340	340	340	340	340	340	340
HSS								HSS-E	HSS-E	HSS		HSS
N	N	N	N	H	W	FW	FN	FU500DZ	FU500DZ	N	FN	FN
122	127	124	184	128	129	133	131	143	143	135	136	95



V <sub>c</sub> m/min	进给代号								V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号		V <sub>c</sub> m/min	进给代号	
24	6	6	6	6					6	29	5	32	5	28	6	6	30	7
20	5	5	5	5					5	22	4	25	4	22	5	5	24	6
27	6	6	6	6					6	32	5	35	5	30	6	6	33	7
27	5	5	5	5					5	25	5	28	5	30	5	5	33	6
22	5	5	5	5					5	25	5	28	5	25	5	5	28	6
22	5	5	5	5					5	22	5	25	5	25	5	5	28	6
										13	4	15	4	22	4	4	24	5
										12	3	13	3	18	4	4	23	5
										11	2	12	2					
27	6	6	6	6					6	25	5	28	5	30	6	6	33	7
										12	3	14	3	14	4	4	18	5
										11	2	12	2					
										12	3	13	3	12	4	4	15	5
14	4	4	4	4					4	7	2	8	2					
										12	3	13	9	16	4	4	19	5
										9	2	10	2	10	3	3	13	4
										9	2	10	2					
										12	3	13	3					
										7	3	8	3					
										11	3	12	3					
27	6	6	6	6					6	29	6	32	6	30	6	6	33	7
27	6	6	6	6					6	23	6	26	6	30	6	6	33	7
22	6	6	6	6					6	25	6	28	6	24	6	6	26	7
18	6	6	6	6					6	18	6	20	6	20	6	6	22	7
65										45	7	50	7					
65										45	7	50	7					
45	7	7	7	7					7	54	7	60	7	50	7	7	55	8
45	6	6	6	6					6	45	6	50	6	50	6	6	55	7
63	6	6	6	6	6				6	45	6	50	6	70	6	6		
54	5	5	5	5					5	60	5	70	5	60	5	5	65	6
63										40	5	50	5					
36	5	5	5	5					5	25	5	28	5	40	5	5	44	6
28	4	4	4	4	4				4	31	4	35	4	30	4			
22	4	4	4	4	4				4	22	4	25	4	25	4			
22	4	4	4	4	4				4	22	4	24	4	14	4	4	16	5
										18	4	20	4	12	4	4	14	5
14	4	4	4	4	4				4	16	4	18	4	18	4	4	23	5
22	5	5	5	5	5				5	11	4	12	4	32	5			

# 麻花钻应用推荐

- 订单号 
- 标准/DIN
- 刀具材质
- 表面处理
- 类型
- 冷却
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - 乳化液
- 切削方向:
- Ⓢ 右切削
  - Ⓣ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		●
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		●
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		●
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		●
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		●
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		●
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		●
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		●
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		●
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		●
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		●
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		●
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化 奥氏体	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	●○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	●○
球墨铸铁和 可锻铸铁	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	●○
	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	●○
冷激铸铁	-		≤350 HB	●○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	●○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	●○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		●○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		●○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		●
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		●
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		●
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		●
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		●
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		●
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		●
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		●
	<b>2.0790</b> CuNi18Zn19Pb	≤850		●
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		●
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		●
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# HARTNER

## ≤10xD

81311	82211	81341	81361
340	341	340	340
HSS-E			
N	N	FN	S
138	185	139	141

81362
340
HSS-E
S
141

84508
340
HSS-E
FN
145



V <sub>c</sub> m/min	进给代号			
33	5	5	5	
27	5	5	5	
36	5	5	5	
32	5	5	5	
36	5	5	5	
36	5	5	5	
22	4	4	4	
18	4	4	4	
14	3	3	3	3
32	5	5	5	
18	4	4	4	
13	3	3	3	
14	4	4	4	
10	3	3	3	
13	4	4	4	
10	3	3	3	
12	3	3	3	
6	2	2	2	
4			1	
12	4	4	4	4
8	3	3	2	3
10	3	3	3	3
32	6	6	6	
27	6	6	6	
26	6	6	6	
24	6	6	6	
6	3	3	3	3
5	1	1		1
8				2
5				2
70			7	
60			6	
60				5
36	5	5	5	
54			5	
36	5	5	5	
30	4	4	5	
24	4	4	5	
18	4	4	4	
13	4	4	4	4
16	4	4	4	
26				4

V <sub>c</sub> m/min	进给代号
15	3
13	3
10	3
10	3
10	3
10	3
8	2
15	4
10	3
13	3
6	3
6	1
10	2
6	2
25	4

V <sub>c</sub> m/min	进给代号
36	5
30	4
40	5
36	5
40	5
40	5
26	4
18	4
15	3
32	5
20	4
18	3
18	4
12	3
15	4
12	3
14	3
9	3
5	1
14	4
10	3
12	3
35	6
30	6
30	6
26	6
12	3
77	7
66	6
40	6
40	6
21	5
15	5
30	5

## 麻花钻应用推荐

订单号   
 标准/DIN  
 刀具材质  
 表面处理  
 类型  
 冷却  
 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

冷却方式:  
 ○ 气冷  
 ● 纯油  
 ● 乳化液  
 切削方向:  
 ⊙ 右切削  
 ⊙ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		●
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		●
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		●
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		●
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		●
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		●
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		●
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		●
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		●
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		●
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		●
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		●
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化 奥氏体	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	●○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	●○
球墨铸铁和 可锻铸铁	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	●○
	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	●○
冷激铸铁	-		≤350 HB	●○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	●○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	●○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		●○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		●○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		●
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		●
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		●
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		●
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		●
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		●
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		●
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		●
	<b>2.0790</b> CuNi18Zn19Pb	≤850		●
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		●
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		●
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



## ≤10xD

89286
Std.
Solid carbide
○
N
146

82710	82521	82535
Std.	Std.	Std.
HSS		
○	●	●
FN	N	FN
轴向	轴向	轴向
121	195	196

82525
Std.
HSS-E
●
FN
轴向
197

82515
Std.
HSS-E
●
FN
轴向
198



V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号			V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号
		26	6	6	6	35	6	30	5
		22	5	5	5	30	5	25	4
		30	6	6	6	30	6	30	5
		30	5	5	5	30	5	25	4
		24	5	5	5	35	5	30	4
		24	5	5	5	29	5	25	4
		22	4	4	4	22	4	18	3
		20	4	4	4	18	4	16	3
		14	3	3	3	14	3	12	2
		30	6	6	6	35	6	30	5
		17	4	4	4	18	4	16	3
		12	3	3	3	14	3	12	2
		14	4	4	4	14	4	12	3
		10	3	3	3	12	3	10	2
		15	4	4	4	15	4	13	3
		10	3	3	3	11	3	9	2
		10	3	3	3	11	3	9	2
		7	2	2	2	8	2	6	2
						4	2	4	1
						14	4	12	3
						10	3	8	2
						12	3	12	2
		30	6	6	6	30	6	28	5
		30	6	6	6	24	6	22	5
		24	6	6	6	24	6	22	5
		20	6	6	6	20	6	18	5
		7	3	3	3	8	3	6	2
						8	1	6	1
						10	2	8	2
						8	2	6	2
		80	6						
		50	7	7	7	60	7	55	6
		50	6	6	6	50	6	44	5
		60	5	5	5	38	5	35	4
						55	5	50	4
		40	5	5	5	36	5	33	4
		24	4	4	4	24	4	22	4
		24	4	4	4	20	4	18	4
		22	4	4	4	14	4	12	4
50	4								
40	3	24	5	5	5	25	5	25	4
80	3								

# 麻花钻应用推荐

订单号

标准/DIN  
刀具材质  
表面处理  
类型  
页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

冷却方式:  
○ 气冷  
● 纯油  
● 乳化液

切削方向:  
Ⓢ 右切削  
Ⓣ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		○
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		○
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		○
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		○
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	○
硬化钢	-		≤48 HRC	○
			≤66 HRC	○
不锈钢,硫化 奥氏体	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		○
	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		○
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和 可锻铸铁	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		○
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		○
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		○
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○





## 微型钻 应用推荐

- ④ 订单号
- ④ 订单号
- 标准/DIN
- 刀具材质
- 硬质合金等级
- 表面处理
- Typ
- 冷却
- 页码

Drill Ø mm	进给代号								
	101	102	103	104	105	106	107	108	109
	f (mm/rev.)								
0.10	0.002	0.003	0.003	0.004	0.006	0.007	0.010	0.013	0.016
0.16	0.002	0.003	0.004	0.005	0.007	0.009	0.012	0.016	0.022
0.25	0.003	0.004	0.005	0.007	0.009	0.011	0.014	0.019	0.024
0.30	0.004	0.005	0.007	0.009	0.011	0.015	0.019	0.025	0.033
0.50	0.005	0.007	0.008	0.011	0.014	0.019	0.024	0.031	0.041
0.63	0.007	0.009	0.012	0.015	0.020	0.026	0.034	0.044	0.057
0.80	0.010	0.013	0.016	0.020	0.024	0.031	0.038	0.048	0.060
1.00	0.020	0.024	0.029	0.035	0.041	0.050	0.060	0.072	0.086
1.50	0.030	0.035	0.040	0.046	0.052	0.060	0.069	0.080	0.092
2.00	0.040	0.046	0.053	0.061	0.070	0.080	0.093	0.106	0.122

Drill Ø mm	进给代号 order no. 6400/6401/6408/6412												
	56	57	58	59	60	61	62	63	64	65	66	67	68
	f (mm/rev.)												
0.80	0.008	0.016	0.024	0.032	0.04	0.05	0.06	0.07	0.08	0.08	0.08	0.09	0.09
1.00	0.012	0.022	0.032	0.042	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.11	0.12
1.50	0.021	0.036	0.051	0.066	0.09	0.10	0.12	0.13	0.15	0.15	0.16	0.17	0.18
2.00	0.032	0.052	0.072	0.092	0.12	0.14	0.16	0.18	0.20	0.21	0.22	0.23	0.24
2.50	0.045	0.070	0.095	0.120	0.15	0.17	0.20	0.22	0.25	0.26	0.27	0.28	0.30
3.00	0.060	0.090	0.120	0.150	0.18	0.21	0.24	0.27	0.30	0.31	0.33	0.34	0.36

- 冷却方式:
- 气冷
  - 纯油
  - 乳化液

- 切削方向:
- ④ 右切削
  - ④ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		●
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		●
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		●
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		●
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		●
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		●
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		●
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		●
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		●
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		●
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		●
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		●
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	●○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	●○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	●○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	●○
冷激铸铁	-		≤350 HB	●○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	●○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	●○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		●○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		●○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		●
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		●
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		●
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		●
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		●
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		●
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		●
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		●
	<b>2.0790</b> CuNi18Zn19Pb	≤850		●
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		●
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		●
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		●○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



≤4xD ≤7xD

≤5xD ≤8xD ≤15xD

87011 87016 1899 HSS-E-PM	84810 1899 HSS-E-PM	89281 Std. Solid carb. K10/K20	86402 Std. Solid carb. K/P	86400 Std. Solid carb.	86401 Std. Solid carb.	86405 Std. Solid carb.	86408 Std. Solid carb.	86412 Std. Solid carb.
N	N	N	N	N	N	N	N	N
轴向	轴向	轴向	轴向	轴向	轴向	轴向	轴向	轴向
329/331	332	335	333	334	336	337	338	339



V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号	V <sub>c</sub> m/min	进给代号
21	106	27	106	50	105	100	62	100	64 62	105	62 58 58				
18	105	23	105	35	104	100	62	100	64 62	100	62 58 58				
18	106	23	106	50	105	100	62	100	64 62	105	62 59 59				
16	105	21	105	45	104	90	61	90	63 61	90	61 59 59				
20	105	26	105	45	104	90	62	90	64 62	95	62 58 58				
18	105	23	105	35	104	90	62	90	64 62	95	62 58 58				
14	104	18	104	30	103	90	61	90	63 61	90	61 58 58				
14	104	18	104	30	103	90	61	90	63 61	90	61 58 58				
12	103	16	103	70	60	70	60	70	62 60	70	60 58 58				
18	106	23	106	50	103	100	61	100	63 61	100	61 57 57				
14	104	18	104	40	103	85	61	85	63 61	85	61 58 58				
12	103	16	103	70	60	70	60	70	62 60	70	60 58 58				
14	104	18	104	25	103	70	60	70	62 60	70	60 57 57				
12	103	16	103	60	60	60	60	60	62 60	60	60 57 57				
16	104	20	104	25	103	50	60	50	62 60	50	60 58 58				
14	103	18	103	60	60	60	60	60	62 60	50	60 58 58				
14	103	18	103	60	60	60	60	60	57 57	50	57 57 57				
8	102	10	102	20	102	60	57	60	57 57	50	57 57 57				
				15	104										
18	104	20	104	25	103			30	57 57	70	57 57 57				
14	103	16	103	25	102			15	56 56	60	56 56 56				
16	103	18	103	25	102			30	57 57	70	57 57 57				
26	106	33	106	80	105	130	66	130	68 66	150	60 60 60				
22	106	28	106	60	105	130	66	130	68 66	140	60 60 60				
18	106	23	106	60	105	130	66	130	68 66	140	60 60 60				
22	106	28	106	50	105	120	65	120	67 65	130	60 60 60				
				15	103			10	56 56	25	56 56 56				
				45	104			15	56 56	35	56 56 56				
				25	104			15	56 56	35	56 56 56				
				160	107			70	68 68	70	68 68 68				
				150	106			70	68 68	70	68 68 68				
26	107			100	106			135	59 59	135	59 59 59				
18	106			60	106			135	59 59	135	59 59 59				
75	106	80	106	150	105										
42	105	53	105	50	105										
				67	106										
22	105	28	105	44	104										
22	104	28	104	68	103										
18	104	23	104	49	103										
13	104	16	104	53	103										
		14	104	36	103										
16	104	20	104	50	103										
18	104	23	104	36	103										
				60	104										

# TS-Drills 应用推荐

- 订单号
- 标准/DIN
- 刀具材质
- 硬质合金等级
- 表面处理
- 类型
- 柄部形式
- 冷却
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - 乳化液
- 切削方向:
- 右切削
  - 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	
硬化钢	-		≤48 HRC	
			≤66 HRC	
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	
冷激铸铁	-		≤350 HB	
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		
	<b>2.0790</b> CuNi18Zn19Pb	≤850		
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		
Kevlar 合成纤维	Kevlar	≤1000		
玻璃/碳纤维	GFK/CFK	≤1000		



# HARTNER

### ≤3xD

89306 6538K 整体硬质合金	89264 6537K 整体硬质合金	89237 6539 整体硬质合金	89422 6537K 整体硬质合金	89413 6537K 整体硬质合金	89402 6537K 整体硬质合金	89401 6539 整体硬质合金	89450 6537K 整体硬质合金	89550 6537K 整体硬质合金	89266 6537K 整体硬质合金
T	K/P T	K/P T	Y	K/P F	K/P F	K/P F	K/P a	K/P a	K/P T
TS80U HE	TS100U HE	TS100U DZ	TS100H HA	TS100U HA	TS100U HE	TS100U DZ	TS100 INOX HA	TS100 INOX HE	TS100U HE
axial	axial	axial	axial	axial	axial	axial	axial	axial	axial
221	210	216	214	212	212	216	227	227	222



Vc m/min	进给率代号	Vc m/min	进给率代号	Vc m/min	进给率代号	Vc m/min	进给率代号			Vc m/min	进给率代号	Vc m/min	进给率代号	
95	6	100	6	130	7	130	7	7	7		110	6		
80	5	85	5	110	6	110	6	6	6		90	5		
95	7	110	7	145	8	145	8	8	8		130	7		
75	6	85	6	110	7	110	7	7	7		110	7		
80	6	90	6	120	7	120	7	7	7		100	7		
75	6	85	6	110	7	110	7	7	7		95	6		
70	6	80	6	105	7	105	7	7	7		90	6		
75	6	80	6	105	7	105	7	7	7		90	6		
60	5	75	5	100	6	100	6	6	6		80	6		
90	7	100	7	130	8	130	8	8	8		110	7		
75	6	90	6	120	7	120	7	7	7		90	6		
60	5	65	4	85	5	85	5	5	5		65	4		
75	6	75	5	100	6	100	6	6	6		85	6		
60	5	70	4	90	5	90	5	5	5		80	5		
45	5	50	5	65	6	65	6	6	6		60	5		
35	5	40	4	55	5	55	5	5	5		50	4		
40	4			55	4						45	3		
		35	2	45	3	45	3	3	3		45	2		
		35	1	40	1	40	1	1	1		40	2		
		20	1	20	1	20	1	1	1		20	1		
40	2	40	2	40	2	40	2	2	2	80	5	45	4	
35	2	15	1	15	1	15	1	1	1	60	2-3	40	2	
35	2	35	2	35	2	35	2	2	2	80	5	35	4	
150	7	160	7			210	8	8	8		160	8		
110	7	120	7			155	8	8	8		120	8		
110	7	120	6			155	7	7	7		100	8		
90	6	95	6			125	7	7	7		95	7		
		25	2			35	3	3	3		30	2		
		20	3	25	4	25	4	4	4	30	4	4	25	3
		15	1	15	1	15	1	1	1	45	4	4	35	3
		15	1	15	1	15	1	1	1	40	3	3	30	2
200	8	200	8			260	9	9	9		240	8		
200	8	200	8			260	9	9	9		240	8		
170	8	170	8			220	8	8	8		200	8		
140	7	140	7			180	8	8	8		170	8		
		200	7			260	8	8	8		230	7		
		80	6			105	7	7	7		95	6		
		210	7			270	8	8	8		250	7		
		140	6			180	7	7	7		170	6		
		80	5			105	6	6	6		95	6		
		65	5			85	6	6	6		80	5		
		60	4			80	5	5	5		70	5		
		45	4			60	5	5	5		60	5		

## TS-Drills 应用推荐

- 订单号 
- 标准/DIN
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- 表面处理
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- 冷却
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - 乳化液

- 切削方向:
- Ⓢ 右切削
  - Ⓣ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○





## TS-Drills 应用推荐

- 订单号
- 标准/DIN
- 刀具材质
- 硬质合金等级
- 表面处理
- 类型
- 柄部形式
- 冷却
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - ◐ 乳化液

- 切削方向:
- Ⓜ 右切削
  - Ⓛ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# HARTNER

≤5xD

89275
WN
整体硬质合
K/P
TS100U
DZ
220

89414	89417
6537L	6537L
整体硬质合	整体硬质合
K/P	K/P
TS100U	TS100U
HA	HE
218	218

89272
6537L
整体硬质合
K/P
TS100U
HE
axial
231

89411	89408
6537L	6537L
整体硬质合	整体硬质合
K/P	K/P
TS100U	TS100U
HA	HE
axial	axial
232	232

89425	89426
6537L	6537L
整体硬质合	整体硬质合
TS100H	TS100H
HA	HE
axial	axial
236	236



Vc m/min	进给率代号
100	6
85	5
110	7
85	6
90	6
85	6
80	6
80	6
75	5
100	7
90	6
65	4
75	5
70	4
50	5
40	4
35	2
35	1
20	1
40	2
15	1
35	2
160	7
120	7
120	6
95	6
25	2
20	3
15	1
15	1
200	8
200	8
170	8
140	7
200	7
80	6
210	7
140	6
80	5
65	5
60	4
45	4

Vc m/min	进给率代号	
130	7	7
110	6	6
145	8	8
110	7	7
120	7	7
110	7	7
105	7	7
105	7	7
100	6	6
130	8	8
120	7	7
85	5	5
100	6	6
90	5	5
65	6	6
55	5	5
45	3	3
35	1	1
20	1	1
40	2	2
15	1	1
35	2	2
210	8	8
155	8	8
145	7	7
125	7	7
35	3	3
25	4	4
15	1	1
15	1	1
260	9	9
260	9	9
235	9	9
170	8	8
260	8	8
105	7	7
270	8	8
180	7	7
105	6	6
85	6	6
80	5	5
60	5	5

Vc m/min	进给率代号
110	6
90	5
130	7
110	7
100	7
95	6
90	6
90	6
80	6
110	7
90	6
65	4
85	6
80	5
60	5
50	4
45	4
45	2
40	2
25	1
45	4
40	2
35	4
160	8
120	8
100	8
95	7
30	2
25	3
35	3
30	2
240	8
240	8
200	8
170	8
230	7
95	6
250	7
170	6
95	6
80	5
70	5
60	5

Vc m/min	进给率代号	
145	7	7
120	6	6
170	8	8
145	8	8
130	8	8
125	7	7
120	7	7
120	7	7
105	7	7
145	8	8
120	7	7
105	7	7
145	8	8
120	7	7
85	5	5
105	7	7
100	5	5
70	6	6
55	5	5
60	5	5
60	3	3
55	2	2
35	2	2
60	5	5
55	5	5
45	5	5
195	9	9
160	9	9
140	9	9
130	8	8
40	3	3
35	4	4
45	4	4
40	3	3
310	9	9
310	9	9
260	9	9
220	9	9
280	8	8
125	7	7
325	8	8
220	7	7
125	7	7
105	6	6
90	6	6
80	6	6

Vc m/min	进给率代号	
145	7	7
120	6	6
170	8	8
145	8	8
130	8	8
125	7	7
120	7	7
120	7	7
105	7	7
145	8	8
120	7	7
85	5	5
110	7	7
105	5	5
80	6	6
65	5	5
60	4	4
60	3	3
55	3	3
35	2	2
35	4	4
45	4	4
40	3	3

## TS-Drills 应用推荐

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- 标准/DIN
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- 表面处理
- 类型
- 柄部形式
- 冷却
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - ⊙ 乳化液

- 切削方向:
- Ⓜ 右切削
  - Ⓝ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○





# HARTNER

## ≤5xD

89560
6537L
整体硬质合金
K
○
TS 100 ALU
HA
240

89460
6537L
VHM
K/P
Ⓡ
TS 100 HPC
HA
axial
242

89239	89247
6539	6537L
整体硬质合金	
K	K
○	○
TS 3 G	TS 3 G
DZ	HA
263	262

## ≤7xD

89308
6538L
整体硬质合金
P
Ⓢ
TS 80 U
HE
244

89294
WN
整体硬质合金
K
○
TS 150 GG
HA
axial
245

89421
WN
整体硬质合金
K/P
Ⓡ
TS 100 R
HA
axial
248



V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	
		200	8			95	4					
		200	7			75	3					
		200	8			90	5					
		200	8			75	4					
		180	8			80	4					
		160	8			75	4					
		130	8			60	4					
		120	8			75	4					
		120	7			60	3					
		180	8			90	5					
		120	8			75	4					
		110	7			55	3					
		110	7			75	4					
		100	5			55	3					
		90	7			40	3					
		65	6			35	3					
		60	5			40	2					
		60	5									
		55	3									
		80	5			35	1					
		60	5			33	1					
		180	9	100	6	6	150	5	120	6	210	8
		160	9	80	6	6	110	5	100	6	160	8
		140	9	80	6	6	110	5	90	6	160	8
		140	8	70	6	6	90	4	80	6	130	7
									40	2		
		140	8								130	7
		140	8								100	7
		80	7								80	7
		80	7								60	7
		30	4									
		40	4									
		35	3									
350	9			180	7	7	180	6	410	8		
350	9			160	7	7	180	6	410	8		
320	8			150	7	7	160	6	380	8		
280	7			120	6	6	130	5	330	8		
320	7			180	6	6						
190	7											
160	6			180	6	6			280	7		
160	6											
160	6								110	6		
160	6								80	5		
150	6											
150	6											
100	3											
100	3											
100	2											



## TS-Drills 应用推荐

- 订单号
- 标准/DIN
- 刀具材质
- 硬质合金等级
- 表面处理
- 类型
- 柄部形式
- 冷却
- 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>0.50</b>	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
<b>1.00</b>	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
<b>2.00</b>	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
<b>2.50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3.15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5.00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6.30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8.00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10.00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12.50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16.00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
<b>20.00</b>	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
<b>25.00</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
<b>31.50</b>	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
<b>40.00</b>	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
<b>50.00</b>	0.250	0.310	0.400	0.500	0.630	0.800	1.000	1.250	1.250
<b>63.00</b>	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
<b>80.00</b>	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

- 冷却方式:
- 气冷
  - 纯油
  - 乳化液

- 切削方向:
- Ⓜ 右切削
  - Ⓛ 左切削

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# TS-Drills 应用推荐

订单号
标准/DIN
刀具材质
硬质合金等级
表面处理
类型
冷却
页码

### 步骤:

- 初始化铣削加工表面, 加工表面必须加工至同轴孔加工进入角相垂直.
- 用普通钻头加工一轴向引导孔(最小孔深L=1xD, 公差F9)
- 进入导引孔, 一般n=300rev./min, F=500mm/min.
- 设置好冷却压力和切削参数.
- 按照正常的切削参数一次性加工到要求深度.
- 对带斜出口的通孔, 应降低VF至40%以免刀具折断.
- 加工到要求深度后, 停止机床主轴和关闭冷却液, 并将刀具退回至初始位置.

进给代号为粗体的刀具是首选项

钻头直径Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
<b>2,50</b>	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
<b>3,15</b>	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
<b>4,00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
<b>5,00</b>	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250
<b>6,30</b>	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
<b>8,00</b>	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
<b>10,00</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
<b>12,50</b>	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
<b>16,00</b>	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630

冷却方式:

- 气冷
- 纯油
- 乳化液

切削方向:

- Ⓜ 右切削
- Ⓛ 左切削

材料组	材料例举, 最新牌号 (括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185 (St33), <b>1.0486</b> P275N (StE285), <b>1.0345</b> P235GH (H1), <b>1.0425</b> P265GH (H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		●
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢, 硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜, 短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜, 短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜, 长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# HARTNER

## ≤15xD

86509
Hartner 标准
整体硬质合金
K/P
TS 100 T
<b>A</b>
40 bar 传统冷却方式
257



## ≤20xD

86511
Hartner 标准
整体硬质合金
K/P
TS 100 T
<b>A</b>
40 bar 传统冷却方式
258



## ≤25xD

86512
Hartner 标准
整体硬质合金
K/P
TS 100 T
<b>A</b>
40 bar 传统冷却方式
259



## ≤30xD

86513
Hartner 标准
整体硬质合金
K/P
TS 100 T
<b>A</b>
40 bar 传统冷却方式
260



## ≤40xD

86514
Hartner 标准
整体硬质合金
K/P
TS 100 T
<b>A</b>
40 bar
261



Vc m/min	进给率 代号	Vc m/min	进给率 代号	Vc m/min	进给率 代号	Vc m/min	进给率 代号	Vc m/min	进给率 代号	Vc m/min	进给率 代号	Vc m/min	进给率 代号	Vc m/min	进给率 代号		
110	8			110	8			100	8			80	7		80	7	
110	8			110	8			100	8			80	7		80	7	
120	8			120	8			120	8			100	8		100	8	
120	8			120	8			100	8			100	8		100	8	
110	6			110	6			110	6			110	6		110	6	
110	8			110	8			100	8			80	7		80	7	
100	7			100	7			100	7			80	7		80	7	
110	7	80	7	110	7	80	7	100	7	70	7	80	7	60	7	80	6-7
110	6	80	7	110	6	80	7	100	6	70	7	80	6	60	7	80	6
110	8			110	8			100	8			80	7		80	7	
110	7	80	6-7	110	7	80	6-7	100	7	70	6-7	80	6	60	6-7	80	6
110	6	80	6-7	110	6	80	6-7	100	6	70	6-7	80	6	60	6-7	80	6
100	5			100	5			80	5			80	5		80	5	
80	5			80	5			60	5			60	5		60	5	
100	6-7			100	6			90	6			80	6		80	6-7	
80	5			80	5			70	4			70	4		70	4	
50	5			50	5			50	4			50	4		50	4	
50	5			50	5			50	4			50	4		50	4	
50	4			50	4			50	4			50	4		50	4	
100	5			100	5			100	5			80	5		80	5	
70	2-3			60	3			60	3			60	3		70	2-3	
100	5			100	5			100	5			80	5		80	5	
140	8			140	8			130	8			120	8		120	8	
100	8			100	8			90	8			80	8		80	8	
140	8			140	8			130	8			120	8		120	8	
100	8			100	8			90	8			80	8	65	8	80	8
100	6			100	6			90	6			80	6		80	6	
100	6			100	6			90	6			80	6		80	6	
90	8	90	8	90	8	90	8	80	8	80	8	70	8	70	8	70	8
30	2			30	2			30	2			30	2		30	2	
120	1			120	1			120	1			120	1		120	1	
120	8			120	8			110	8			100	8		100	8	

## 枪钻应用推荐

### 枪钻加工深孔的步骤

- 用普通钻头加工引导孔(孔深L=1,5xD, 公差H8)
- 枪钻低转速进入到引导孔内,一般 n=200rev./min, F=500mm/min. 孔深>40xD时,左旋方式进入到引导孔。
- 打开冷却液同时提高切削速度至正常值。
- 继续一次性加工到预定深度. 当长径比加大时,我们建议降低切削参数(降为正常的75%)加工到深度约 25mm后再按正常切削参数加工。
- 加工到要求的深度后关闭冷却液。
- 停转并快速退出枪钻至孔口。

钻头直径 Ø mm	进给代号									
	20	19	18	17	16	15	14	13	12	11
	f (mm/rev.)									
1.0	0.050	0.030	0.022	0.015	0.010	0.006	0.004	0.003	0.002	0.001
1.5	0.075	0.050	0.045	0.032	0.020	0.012	0.008	0.006	0.004	0.002
2.0	0.100	0.060	0.055	0.046	0.028	0.016	0.010	0.007	0.005	0.003
2.5	0.125	0.075	0.070	0.054	0.030	0.018	0.012	0.008	0.006	0.004
4.0	0.240	0.120	0.085	0.065	0.043	0.025	0.016	0.010	0.007	0.005
6.0	0.360	0.180	0.120	0.085	0.061	0.035	0.024	0.013	0.009	0.007
8.0	0.480	0.240	0.150	0.100	0.068	0.045	0.032	0.022	0.014	0.010
10.0	0.600	0.300	0.160	0.120	0.075	0.055	0.040	0.028	0.016	0.012
14.0	0.700	0.350	0.180	0.130	0.085	0.065	0.050	0.035	0.025	0.020
20.0	0.800	0.400	0.250	0.180	0.110	0.080	0.060	0.045	0.035	0.026
24.0	0.900	0.450	0.300	0.185	0.130	0.085	0.065	0.047	0.036	0.027
30.0	1.050	0.500	0.400	0.200	0.150	0.100	0.070	0.050	0.040	0.030
35.0	1.100	0.600	0.450	0.250	0.180	0.120	0.075	0.055	0.045	0.035
40.0	1.200	0.700	0.500	0.300	0.200	0.150	0.080	0.060	0.050	0.040
52.0	1.300	0.800	0.550	0.350	0.230	0.180	0.100	0.070	0.060	0.050

冷却方式:  
 ○ 气冷  
 ● 纯油  
 ● 乳化液

### E100

单刃枪钻  
整体硬质合金  
0.9 ... 16.0

页码

271



\*有时进给率会涉及到相应的刀具涂层. 因为带与不带涂层的切削性能差别很大。

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm <sup>2</sup> )	硬度	冷却方式	recom. coating*	<=35xD		>35xD	
						Vc m/min	进给率代号	Vc m/min	进给率代号
普通结构钢	<b>1.0035</b> S185, <b>1.0486</b> P275N, <b>1.0345</b> P235GH, <b>1.0425</b> <b>1.0050</b> E295), <b>1.0070</b> E360, <b>1.8937</b> P500NH	≤500		●	○	100	15	100	15
易切削钢	<b>1.0718</b> 11SMnPb30, <b>1.0736</b> 11SMn37	≤850		●	○	85	15	85	15
非合金热处理钢	<b>1.0727</b> 46S20, <b>1.0728</b> 60S20, <b>1.0757</b> 46SPb20	≤1000		●	○	90	15	90	15
合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E	≤700		●	○	80	14	80	14
合金表面硬化钢	<b>1.0503</b> C45, <b>1.1191</b> C45E	≤850		●	○	75	14	75	14
非合金表面硬化钢	<b>1.0601</b> C60, <b>1.1221</b> C60E	≤1000		●	○	75	14	75	14
合金表面硬化钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		●	○	65	14	65	14
合金表面硬化钢	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		●	○	80	15	80	15
氮化钢	<b>1.0301</b> , <b>1.1121</b> C10E	≤850		●	○	75	14	75	14
工具钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●	○	65	14	65	14
工具钢	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●	○	75	14	75	14
工具钢	<b>1.8504</b> 34CrAl6	≤1000		●	○	65	14	65	14
工具钢	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●	○	75	13	75	13
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		●	○	65	13	65	13
高速钢	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> , <b>1.2767</b>	≤1400		●	○	55	12	55	12
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●	○	65	13	65	13
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4	≤350 HB		●	○	30	13	30	13
硬化钢	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b>	≤48 HRC		●	○	25	10	25	14
硬化钢	<b>1.4301</b> X5CrNi18-10, <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b>	≤66 HRC		●	○	40	14	40	14
不锈钢,硫化	<b>1.4057</b> X20CrNi172, <b>1.4122</b> X39CrMo17-1, <b>1.4521</b>	≤900		●	○	35	14	35	14
奥氏体	-	≤1100		●	○	35	14	35	14
马氏体	-	≤1500		●	○	85	16	85	16
铸铁	Nimonic, Inconel, Monel, Hastelloy	≤240 HB		○	○	80	16	85	16
球墨铸铁和可锻铸铁	<b>0.6010</b> EN-GJL-100, <b>0.6020</b> EN-GJL-200	≤350 HB		○	○	80	15	80	15
球墨铸铁和可锻铸铁	<b>0.6025</b> EN-GJL-250, <b>0.6035</b> EN-GJL-350	≤240 HB		○	○	70	15	70	15
冷激铸铁	<b>0.7050</b> EN-GJS-500-7, <b>0.8035</b> EN-GJMW-350-4	≤350 HB		○	○	55	14	55	14
蠕墨铸铁 GGV	<b>0.7070</b> EN-GJS-700-2, <b>0.8170</b> EN-GJMB-700-2	≤350 HB		○	○	220	17	220	17
蠕墨铸铁 ADI	-	≤220 HB		○	○	150	17	150	17
蠕墨铸铁 ADI	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤300 HB		○	○	120	19	120	19
特殊合金	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b>	≤1000		○	○	120	20	120	20
钛及钛合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤1400		○	○	130	18	130	18
钛及钛合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> , <b>3.4365</b>	≤2000		○	○	110	17	110	17
铝及铝合金	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤850		○	○	75	15	75	15
铝及铝合金	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤1400		○	○	120	18	120	18
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b>	≤400		○	○	120	18	120	18
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤650		○	○	75	15	75	15
铜合金	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b>	≤600		○	○	120	18	120	18
铜合金	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○	○	110	17	110	17
黄铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b>	≤400		○	○	90	18	90	18
黄铜,短屑	<b>2.0790</b> CuNi18Zn19Pb	≤500		○	○	95	17	95	17
青铜,短屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤600		○	○	70	17	70	17
青铜,短屑	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤600		○	○	60	17	60	17
青铜,长屑	环氧树脂, Resopal, Pertinax, Moltopren	≤600		○	○	75	15	75	15
青铜,长屑	Plexiglass, Hostalen, Novodur, Makralon	≤850		○	○	70	17	70	17
热固塑料	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)	≤850		○	○	70	17	70	17
热固塑料	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6	≤1000		○	○	60	14	60	14
热固塑料	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤150		○	○	75	15	75	15
热固塑料	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤100		○	○	70	15	70	15
热固塑料	Kevlar	≤1000		○	○	60	14	60	14
玻璃/碳纤维	GFK/CFK	≤1000		○	○	50	14	50	14



## 铈钻应用推荐

订单号 

标准/DIN

刀具材质

表面处理

锥角

柄部形式

页码

进给代号为粗体的刀具是首选项







































钻头直径 Ø mm	进给代号					
	<b>81</b>	<b>82</b>	<b>83</b>	<b>84</b>	<b>85</b>	<b>86</b>
	f (mm/rev.)					
<b>2,00</b>	0,03	0,04	0,06	0,08	0,10	0,13
<b>2,50</b>	0,03	0,05	0,07	0,10	0,13	0,16
<b>3,15</b>	0,03	0,05	0,08	0,11	0,15	0,20
<b>4,00</b>	0,04	0,06	0,09	0,13	0,17	0,22
<b>5,00</b>	0,04	0,07	0,10	0,14	0,18	0,23
<b>6,30</b>	0,04	0,07	0,12	0,15	0,19	0,24
<b>8,00</b>	0,05	0,08	0,13	0,16	0,20	0,25
<b>10,00</b>	0,06	0,09	0,14	0,17	0,22	0,26
<b>12,50</b>	0,06	0,10	0,15	0,19	0,23	0,28
<b>16,00</b>	0,07	0,11	0,17	0,21	0,26	0,31
<b>20,00</b>	0,08	0,13	0,18	0,23	0,28	0,33
<b>25,00</b>	0,09	0,15	0,21	0,26	0,30	0,38
<b>31,50</b>	0,12	0,17	0,24	0,30	0,36	0,42
<b>40,00</b>	0,14	0,21	0,28	0,34	0,40	0,46

### 有关螺旋锥孔的重要说明:

最小沉头孔直径,适用于螺旋锥孔沉头的锥面铈钻。

d1	最小沉头孔直径	用于 ISO 2009,2010 、7046,7047 沉头螺栓	用于符合 DIN 7991 的沉 头螺栓
6.30	2.00	-	M3
8.00	2.50	M4	-
8.30	2.50	-	M4
10.00	3.00	M5	-
10.40	3.00	-	M5
11.50	3.30	M6	-
12.40	3.30	-	M6
15.00	3.70	M8	-
16.50	3.70	-	M8
19.00	4.50	M10	-
20.50	4.50	-	M10
23.00	4.80	M12	-
25.00	4.80	-	M12
31.00	5.20	-	M16

冷却方式:  
 气冷  
 纯油  
 乳化液

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度_ MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		
易切削钢	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		
非合金热处理钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		
合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		
合金表面硬化钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	
硬化钢	-		≤48 HRC	
			≤66 HRC	
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	
冷激铸铁	-		≤350 HB	
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		
钛及钛合金	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2	≤850		
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		
铝及铝合金	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤600		
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		
	<b>2.0790</b> CuNi18Zn19Pb	≤850		
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		
Kevlar 合成纤维	Kevlar	≤1000		
玻璃/碳纤维	GFK/CFK	≤1000		





88200	88021
335	335
<b>HSS</b>	<b>HSS</b>
○	○
90°	90°
圆柱柄	圆柱柄
382	384

88201	88022
335	335
<b>HSS-E</b>	<b>HSS-E</b>
Ⓐ	Ⓐ
90°	90°
圆柱柄	圆柱柄
383	385



V <sub>e</sub> m/min	进给代号	
32	85	85
30	85	85
32	85	85
30	85	85
32	85	85
30	85	85
20	84	84
15	84	84
12	84	84
25	85	85
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10	85	85
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70	86	86
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80	85	85
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26	86	86
24	86	86
20	86	86
30	84	84
40	85	85
70	84	84

V <sub>e</sub> m/min	进给代号	
41	83	83
39	82	82
41	83	83
39	82	82
41	83	83
39	83	83
25	82	82
19	83	83
15	82	82
32	83	83
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15	81	81
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28	83	83
18	83	83
10	81	81
19	82	82
13	81	81
114	84	84
89	84	84
51	83	83
39	83	83
127	84	84
76	84	84
101	84	84
64	84	84
39	84	84
33	84	84
31	84	84
25	84	84
39	84	84
51	84	84

# Multiplex 应用推荐

订单号  
Ø范围  
刀具材质  
表面处理  
页码


进给代号为粗体的刀具是首选项


钻头直径 Ø mm	进给代号					
	1	2	3	4	5	6
	f (mm/rev.)					
10,00	0,08	0,09	0,11	0,14	0,19	0,24
12,50	0,09	0,11	0,13	0,17	0,22	0,28
16,00	0,11	0,13	0,16	0,21	0,27	0,34
20,00	0,13	0,15	0,19	0,25	0,32	0,40
25,00	0,16	0,18	0,23	0,29	0,38	0,48
31,50	0,19	0,22	0,27	0,35	0,45	0,57
40,00	0,23	0,26	0,33	0,42	0,54	0,69
50,00	0,27	0,31	0,39	0,50	0,64	0,82
63,00	0,32	0,38	0,47	0,60	0,77	0,98
102,00	0,40	0,48	0,59	0,74	0,85	1,20
150,00	0,59	0,70	0,87	1,09	1,25	1,76
100,00	0,78	0,93	1,16	1,45	1,67	2,35


冷却方式:  
○ 气冷  
● 纯油  
● 乳化液


切削方向:  
Ⓜ 右切削  
Ⓛ 左切削


材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.7050</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.6025</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○

86602
10...25
HSS-E-PM

411

86608
10...25
HSS-E-PM

413

86605
25...102
HSS-E

412

86609
10...102
HSS-E-PM

414

86611
10...65
HSS-E-PM

415



V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号
40	4	48	4	40	4	48	4	25	3
35	4	42	4	35	4	42	4	25	3
50	5	60	5	50	5	60	5	30	3
40	5	50	5	40	5	50	5	25	3
40	4	45	4	40	4	45	4	22	3
35	4	40	4	35	4	40	4	20	3
30	4	35	4	30	4	35	4	20	3
25	3	28	3	25	3	28	3	15	2
22	2	25	2	22	2	25	2	15	2
35	3	40	3	35	3	40	3	20	2
25	3	28	3	25	3	28	3	15	2
22	2	25	2	22	2	25	2	15	2
22	3	25	3	22	3	25	3	15	2
15	2	18	2	15	2	18	2	12	1
26	3	28	3	26	3	28	3	15	2
22	2	25	2	22	2	25	2	15	2
12	2	18	2	12	2	18	2	10	1
10	2	13	2	10	2	13	2	8	1
20	2	23	2	20	2	23	2	10	1
15	2	17	2	15	2	17	2	10	1
15	2	20	2	15	2	20	2	10	1
35	4	40	4	35	4	40	4	20	3
35	4	40	4	35	4	40	4	20	3
35	4	40	4	35	4	40	4	20	3
28	4	33	4	28	4	33	4	20	3
60	5	65	5	60	5	65	5	32	4
80	5	85	5	80	5	85	5	42	4
85	5	85	5	85	5	85	5	42	4
70	5	70	5	70	5	70	5	35	4
45	4	50	4	45	4	50	4	25	3
45	4	50	4	45	4	50	4	25	3
60	5	65	5	60	5	65	5	32	4
45	4	50	4	45	4	50	4	25	3
32	5	35	5	32	5	35	5	20	4
40	3	45	3	40	3	45	3	22	2
36	3	40	3	36	3	40	3	20	2
28	3	32	3	28	3	32	3	15	2
22	3	27	3	22	3	27	3	15	2

## Multiplex 应用推荐

订单号  
 Ø范围  
 刀具材质  
 硬质合金  
 硬质合金等级  
 表面处理  
 页码

进给代号为粗体的刀具是首选项

钻头直径 Ø mm	进给代号					
	1	2	3	4	5	6
	f (mm/rev.)					
10,00	0,08	0,09	0,11	0,14	0,19	0,24
12,50	0,09	0,11	0,13	0,17	0,22	0,28
16,00	0,11	0,13	0,16	0,21	0,27	0,34
20,00	0,13	0,15	0,19	0,25	0,32	0,40
25,00	0,16	0,18	0,23	0,29	0,38	0,48
31,50	0,19	0,22	0,27	0,35	0,45	0,57
40,00	0,23	0,26	0,33	0,42	0,54	0,69
50,00	0,27	0,31	0,39	0,50	0,64	0,82
63,00	0,32	0,38	0,47	0,60	0,77	0,98
102,00	0,40	0,48	0,59	0,74	0,85	1,20
150,00	0,59	0,70	0,87	1,09	1,25	1,76
100,00	0,78	0,93	1,16	1,45	1,67	2,35

冷却方式:  
 ○ 气冷  
 ● 纯油  
 ● 乳化液

切削方向:  
 Ⓜ 右切削  
 Ⓛ 左切削

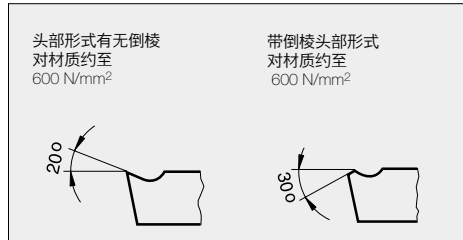
材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2) <b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤500 ≤1000		○ ○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36) <b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤850 ≤1000		○ ○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30) <b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45) <b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤700 ≤850 ≤1000		○ ○ ○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4 <b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1000 ≤1400		○ ○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6 <b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1000 ≤1400		● ●
氮化钢	<b>1.8504</b> 34CrAl6 <b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1000 ≤1400		○ ●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9 <b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤850 ≤1400		○ ○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC ≤66 HRC	● ●
不锈钢,硫化 奥氏体 马氏体	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.4105</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9 <b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A) <b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤900 ≤1100 ≤1500		● ● ●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20) <b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○ ○
球墨铸铁和 可锻铸铁 冷激铸铁	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMw-350-4 (GTW35) <b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB ≤350 HB	○ ○ ○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35) <b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤220 HB ≤300 HB	○ ○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000) <b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1000 ≤1400		○ ○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2 <b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		● ●
铝及铝合金	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		○
铸铝 ≤ 10 % Si ≤ 24 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9 <b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○ ○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑 长屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2 <b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600 ≤600		○ ○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn <b>2.0790</b> CuNi18Zn19Pb	≤600 ≤850		○ ●
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10 <b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤850 ≤1000		● ●
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



86708	86709
10...35	10...35
整体硬质合金	整体硬质合金
H22	H22
K20/K40	K20/K40
419	420

86701	86702
10...35	10...35
整体硬质合金	整体硬质合金
H22	H22
K20/K40	K20/K40
417	418

86711
10...65
整体硬质合金
H22
K20/K40
421



V <sub>c</sub> m/min	进给率代号
60	5
55	4
100	4
95	4
80	4
80	4
75	3
70	4
60	3
85	4
70	4
55	3
60	3
50	2
40	3
35	2
40	2
35	2
25	1
40	2
25	2
100	5
90	4
80	4
65	3
25	1
180	5
160	5
140	5
130	5
150	5
70	4
160	5
110	4
80	5
65	4
45	4
35	4
70	3
70	3
70	3
70	3

V <sub>c</sub> m/min	进给率代号
70	5
65	4
115	4
105	4
90	4
90	4
85	3
80	4
70	3
95	4
80	4
65	3
65	3
55	2
45	3
40	2
45	2
40	2
30	1
45	2
30	2
120	5
105	4
90	4
75	3
30	1
200	5
180	5
160	5
150	5
160	5
80	4
180	5
120	4
90	5
75	4
50	4
40	4
85	3
85	3
85	3
85	3

V <sub>c</sub> m/min	进给率代号
180	5
160	5
140	5
130	5
150	4
70	5
160	4
110	5
80	4
65	4
45	4
35	4
70	3
70	3
70	3
70	3

## Multiplex HPC 应用推荐

订单号  
 标准/DIN  
 刀具材质  
 硬质合金等级  
 类型  
 类型  
 柄部形式  
 页码

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

冷却方式:  
 ○ 气冷  
 ● 纯油  
 ● 乳化液

进给代号为粗体的刀具是优选项

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		○
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		○
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		○
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		○
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	○
硬化钢	-		≤48 HRC	○
			≤66 HRC	○
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.86681</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		○
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		○
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		○
钛及钛合金	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2	≤850		○
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
铝及铝合金	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤600		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○



# HARTNER

## ≤1,5xD

86722
钴领标准
整体硬质合金
K/P
1,5xD
普通钢
446

86725
钴领标准
整体硬质合金
K/P
1,5xD
不锈钢
455

86723
钴领标准
整体硬质合金
K/P
1,5xD
铸铁
449

86724
钴领标准
整体硬质合金
K/P
1,5xD
铝和铝合金
452

## ≤3xD

86722
钴领标准
整体硬质合金
K/P
3xD
普通钢
446

86725
钴领标准
整体硬质合金
K/P
3xD
不锈钢
455

86723
钴领标准
整体硬质合金
K/P
3xD
铸铁
449

86724
钴领标准
整体硬质合金
K/P
3xD
铝和铝合金
452



Vc m/min	进给率代号	Vc m/min	进给率代号	Vc m/min	进给率代号	Vc m/min	进给率代号	Vc m/min	进给率代号	Vc m/min	进给率代号	Vc m/min	进给率代号
130	6					130	6						
110	5					110	5						
130	7					130	7						
110	6					110	6						
130	6					130	6						
125	6					125	6						
110	5					110	5						
110	6					110	6						
90	5					90	5						
130	7					130	7						
110	6					110	6						
70	4					70	4						
105	5					105	5						
70	4					70	4						
60	5					60	5						
55	4					55	4						
55	3					55	3						
50	2					50	2						
		25	2					25	2				
		55	3					55	3				
		40	3					40	3				
		35	3					35	3				
				100	6					100	6		
				90	6					90	6		
				120	7					120	7		
				100	6					100	6		
		90	6					90	6				
				80	5					80	5		
				80	5					80	5		
				80	5					80	5		
				80	5					80	5		
		25	2					25	2				
		40	3					40	3				
		35	2					35	2				
						200	7					200	7
						180	7					180	7
						150	7					150	7
						120	7					120	7
						180	7					180	7
						70	6					70	6
						180	7					180	7
						120	6					120	6
						70	6					70	6
						50	6					50	6
						45	6					45	6
						35	5					35	5

# Multiplex HPC 应用推荐

- 订单号
- 标准/DIN
- 刀具材质
- 硬质合金等级
- 类型
- 类型
- 柄部形式
- 页码

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

冷却方式:  
 ○ 气冷  
 ● 纯油  
 ⊙ 乳化液

进给代号为粗体的刀具是优选项

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.86681</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99.5, <b>3.7114</b> TiAl5Sn2.5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2.5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99.5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1.5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0.5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○





# HARTNER

## ≤5xD

86722
钴领标准
整体硬质合金
K/P
1,5xD
普通钢
446

86725
钴领标准
整体硬质合金
K/P
1,5xD
不锈钢
455

86723
钴领标准
整体硬质合金
K/P
1,5xD
铸铁
449

86724
钴领标准
整体硬质合金
K/P
1,5xD
铝和铝合金
452

## ≤7xD

86722
钴领标准
整体硬质合金
K/P
3xD
普通钢
446

86725
钴领标准
整体硬质合金
K/P
3xD
不锈钢
455

86723
钴领标准
整体硬质合金
K/P
3xD
铸铁
449

86724
钴领标准
整体硬质合金
K/P
3xD
铝和铝合金
452



V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号	V <sub>c</sub> m/min	进给率代号
125	6					120	5										
105	5					105	4										
125	7					120	6										
105	6					105	5										
125	6					120	5										
120	6					110	5										
105	5					100	4										
105	6					100	5										
85	5					85	4										
125	7					120	6										
105	6					100	5										
70	4					70	4										
105	5					105	4										
70	4					70	3										
55	5					55	4										
50	4					50	3										
55	3					55	2										
50	2					50	2										
		25	2					25	1								
		55	3					55	2								
		40	3					40	2								
		35	3					35	2								
				100	6					80	6						
				90	6					70	6						
				120	7					100	7						
				100	6					80	6						
		90	6							70	6						
				80	5					60	5						
				80	5					60	5						
				80	5					60	5						
				80	5					60	5						
		25	2							25	1						
		40	3							40	2						
		35	2							35	1						
						180	7									180	6
						180	7									180	6
						140	7									140	6
						110	7									110	6
						180	7									180	6
						70	6									70	5
						180	7									180	6
						120	6									120	5
						70	6									70	5
						50	6									50	5
						45	6									45	5
						35	5									35	4

## Multiplex HPC 应用推荐

订单号  
标准/DIN  
刀具材质  
硬质合金等级  
类型  
类型  
柄部形式  
页码

钻头直径 Ø mm	进给代号								
	1	2	3	4	5	6	7	8	9
	f (mm/rev.)								
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

冷却方式:  
○ 气冷  
● 纯油  
● 乳化液

进给代号为粗体的刀具是优选项

材料组	材料例举,最新牌号(括弧内为旧牌号) 粗体数字=材料代号依据DIN EN	拉伸强度 MPa (N/mm²)	硬度	冷却方式
普通结构钢	<b>1.0035</b> S185(St33), <b>1.0486</b> P275N(StE285), <b>1.0345</b> P235GH(H1), <b>1.0425</b> P265GH(H2)	≤500		○
	<b>1.0050</b> E295 (St50-2), <b>1.0070</b> E360 (St70-2), <b>1.8937</b> P500NH (WStE500)	≤1000		○
易切削钢	<b>1.0718</b> 11SMnPb30 (9SMnPb28), <b>1.0736</b> 11SMn37 (9SMn36)	≤850		○
	<b>1.0727</b> 46S20 (45S20), <b>1.0728</b> (60S20), <b>1.0757</b> 46SPb20 (45SPb20)	≤1000		○
非合金热处理钢	<b>1.0402</b> C22, <b>1.1178</b> C30E (Ck30)	≤700		○
	<b>1.0503</b> C45, <b>1.1191</b> C45E (Ck45)	≤850		○
	<b>1.0601</b> C60, <b>1.1221</b> C60E (Ck60)	≤1000		○
合金热处理钢	<b>1.5131</b> 50MnSi4, <b>1.7003</b> 38Cr2, <b>1.7030</b> 28Cr4	≤1000		○
	<b>1.5710</b> 36NiCr6, <b>1.7035</b> 41Cr4, <b>1.7225</b> 42CrMo4	≤1400		○
非合金表面硬化钢	<b>1.0301</b> (C10), <b>1.1121</b> C10E (Ck10)	≤850		○
合金表面硬化钢	<b>1.7276</b> 10CrMo11, <b>1.5125</b> 11MnSi6	≤1000		●
	<b>1.5752</b> 15NiCr13, <b>1.7131</b> 16MnCr5, <b>1.7264</b> 20CrMo5	≤1400		●
氮化钢	<b>1.8504</b> 34CrAl6	≤1000		○
	<b>1.8519</b> 31CrMoV9, <b>1.8550</b> 34CrAlNi7	≤1400		●
工具钢	<b>1.1750</b> C75W, <b>1.2067</b> 102Cr6, <b>1.2307</b> 29CrMoV9	≤850		○
	<b>1.2080</b> X210Cr12, <b>1.2083</b> X42Cr13, <b>1.2419</b> 105WCr6, <b>1.2767</b> X45NiCrMo4	≤1400		○
高速钢	<b>1.3243</b> S 6-5-2-5, <b>1.3343</b> S 6-5-2, <b>1.3344</b> S 6-5-3	≤1400		●
弹簧钢	<b>1.5026</b> 55Si7, <b>1.7176</b> 55Cr3, <b>1.8159</b> 51CrV4 (51CrV4)		≤350 HB	●
硬化钢	-		≤48 HRC	●
			≤66 HRC	●
不锈钢,硫化	<b>1.4005</b> X12CrS13, <b>1.4104</b> X14CrMoS17, <b>1.86681</b> X6CrMoS17, <b>1.4305</b> X8CrNiS18-9	≤900		●
奥氏体	<b>1.4301</b> X5CrNi18-10 (V2A), <b>1.4541</b> X6CrNiTi18-10, <b>1.4571</b> X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
马氏体	<b>1.4057</b> X20CrNi172 (X17CrNi16-2), <b>1.4122</b> X39CrMo17-1, <b>1.4521</b> X2CrMoTi18-2	≤1500		●
铸铁	<b>0.6010</b> EN-GJL-100 (GG10), <b>0.6020</b> EN-GJL-200 (GG20)		≤240 HB	○
	<b>0.6025</b> EN-GJL-250 (GG25), <b>0.6035</b> EN-GJL-350 (GG35)		≤350 HB	○
球墨铸铁和	<b>0.7050</b> EN-GJS-500-7 (GGG50), <b>0.8035</b> EN-GJMW-350-4 (GTW35)		≤240 HB	○
可锻铸铁	<b>0.7070</b> EN-GJS-700-2 (GGG70), <b>0.8170</b> EN-GJMB-700-2 (GTS70)		≤350 HB	○
冷激铸铁	-		≤350 HB	○
蠕墨铸铁 GGV	<b>EN-GJV250</b> (GGV25), <b>EN-GJV350</b> (GGV35)		≤220 HB	○
	<b>EN-GJV400</b> (GGV40), <b>EN-GJV500</b> (GGV50), SiMo 6		≤300 HB	○
蠕墨铸铁 ADI	<b>EN-GJS-800-8</b> (ADI800), <b>EN-GJS-1000-5</b> (ADI1000)	≤1000		○
	<b>EN-GJS-1200-2</b> (ADI1200), <b>EN-GJS-1400-1</b> (ADI1400)	≤1400		○
特殊合金	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
钛及钛合金	<b>3.7024</b> Ti99,5, <b>3.7114</b> TiAl5Sn2,5, <b>3.7124</b> TiCu2	≤850		●
	<b>3.7154</b> TiAl6Zr5, <b>3.7165</b> TiAl6V4, <b>3.7184</b> TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
铝及铝合金	<b>3.0255</b> Al99,5, <b>3.2315</b> AlMgSi1, <b>3.3515</b> AlMg1	≤400		○
锻铝合金	<b>3.0615</b> AlMgSiPb, <b>3.1325</b> AlCuMg1, <b>3.3245</b> AlMg3Si, <b>3.4365</b> AlZnMgCu1,5	≤650		○
铸铝 ≤ 10 % Si	<b>3.2131</b> G-AlSi5Cu1, <b>3.2153</b> G-AlSi7Cu3, <b>3.2573</b> G-AlSi9	≤600		○
≤ 24 % Si	<b>3.2581</b> G-AlSi12, <b>3.2583</b> G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
镁合金	<b>3.5200</b> MgMn2, <b>3.5812.05</b> G-MgAl8Zn1, <b>3.5612.05</b> G-MgAl6Zn1	≤400		○
低合金铜	<b>2.0070</b> SE-Cu, <b>2.1020</b> CuSn6, <b>2.1096</b> G-CuSn5ZnPb	≤500		○
黄铜,短屑	<b>2.0380</b> CuZn39Pb2, <b>2.0401</b> CuZn39Pb3, <b>2.0410</b> CuZn43Pb2	≤600		○
长屑	<b>2.0250</b> CuZn20, <b>2.0280</b> CuZn33, <b>2.0332</b> CuZn37Pb0,5	≤600		○
青铜,短屑	<b>2.1090</b> CuSn7ZnPb, <b>2.1170</b> CuPb5Sn5, <b>2.1176</b> CuPb10Sn	≤600		○
	<b>2.0790</b> CuNi18Zn19Pb	≤850		○
青铜,长屑	<b>2.0916</b> CuAl5, <b>2.0960</b> CuAl9Mn, <b>2.1050</b> CuSn10	≤850		○
	<b>2.0980</b> CuAl11Ni, <b>2.1247</b> CuBe2	≤1000		○
热固塑料	环氧树脂, Resopal, Pertinax, Moltopren	≤150		○
热塑塑料	Plexiglass, Hostalen, Novodur, Makralon	≤100		○
Kevlar 合成纤维	Kevlar	≤1000		○
玻璃/碳纤维	GFK/CFK	≤1000		○














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