

The Right Tool at the Right Time

DORMER



高性能
可换刀头的天龙钻



特性和优点

材料

可换刀头以韧性较好的微粉硬质合金制造，刀杆则以淬火钢制造再加高光亮度的镍镀层，可有较好的耐磨性和耐腐蚀性。一支刀杆上可安装多种不同尺寸的刀头，并且不影响刀具的刚度和结构上的整体性。

表面处理

钻削头带有氮化钛涂层，有较高的韧性和氧化稳定性，可在较高的切削速度和进给下工作，并可阻止积屑瘤的产生。在加工较软的材料时，积屑瘤是经常会发生的。

钻尖几何形状

采用自定心的140°四后面的分离式钻尖，可确保钻削时所需的推力较低。不需要也不推荐采用预钻孔或先用定心钻打孔的加工方式。

柄部

带有平面的圆柱形柄部，适合多用途的刀柄系统。可进行精确的夹持，并能可靠地使用内冷。若使用多马公司HydroGrip® 那样的液压刀柄系统，可得到最佳的夹持效果。该柄部也适用于 ER型和削平型的刀柄系统。

几何形状

钻削头靠二个螺钉紧固在位，钻削头和刀杆之间采用完美的锯齿形配合，可均匀地传递扭矩，安装时既精确又容易。较小的螺旋角可提供优化的容屑空间，便于有效地排屑。

内冷却

刀杆上的内冷却孔和可换钻削头上的孔有完美的对正，可把冷却液直接、有效地送到切削刃的位置。在切削速度和进给量较高的情况下，这样能降低钻孔时产生的切削热，并能确保较平稳的排屑效果和较长的刀具寿命。

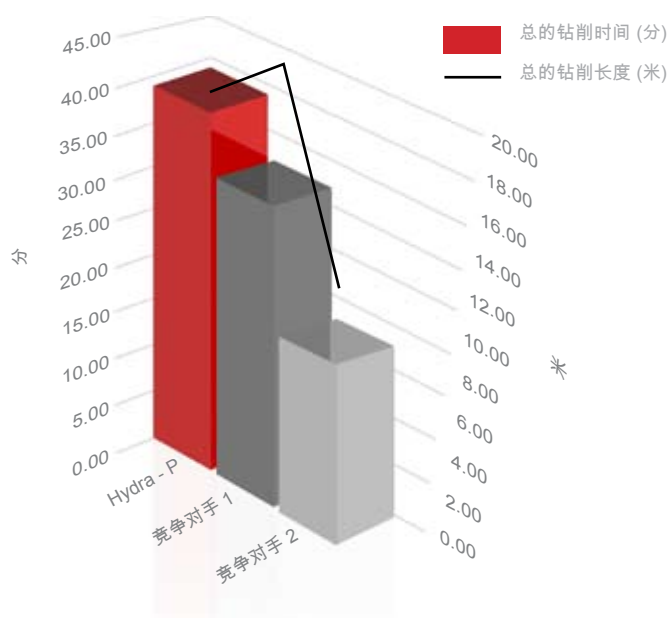
钻孔深度

在整个尺寸范围内，都可提供适合钻深3 x 直径和5 x 直径的刀杆；对于13.5 mm及更大的尺寸，还可提供适合钻深8 x 直径的刀杆。

尺寸范围

钻削头直径的公制尺寸为12.0 mm – 30.5 mm，英制尺寸为15/32” – 1.3/16”。

测试结果



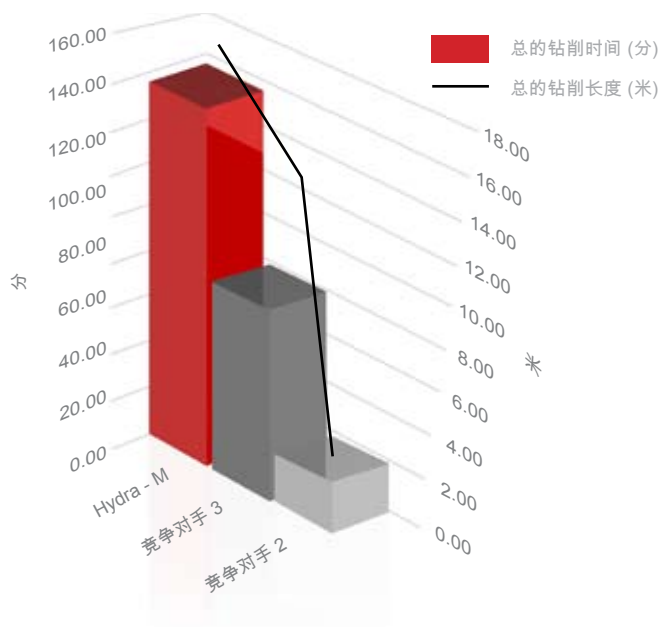
对 Hydra-P 钻削头和另二个竞争对手的类似钻头作了测试，均采用各制造商所推荐的切削数据。钻头直径都是 12 mm，工件材料为 AMG 1.3，钻孔深度为 5 x D。对于所有三种类型的钻头，都测量了它们在刀具寿命终止时的平均钻削时间和平均钻削长度。Hydra-P 钻削头差不多可切削 40 分钟，是竞争对手 2 的二倍还多。



用户可得如下好处

- 对于范围广泛的工件材料，都有较高的生产率，如碳钢、合金钢、不锈钢、钛、镍和铸铁等。
- 可提供二种不同类型的钻削头：Hydra-M 钻削头在加工不锈钢和铸铁时可得到最佳效果，而 Hydra-P 钻削头则推荐用于碳钢和合金钢。
- 有始终不变的高性能，即使更换了多次钻削头后也是如此。
- 可降低刀具库存成本，因为一支刀杆上可安装多个不同尺寸的钻削头。
- 更换钻削头既快速又方便，对生产过程的干扰可降至最低。在更换钻削头时，不需把刀杆从机床上取下。
- 刀头和刀杆的配合精确，可最大限度地提高刀具的刚度，可得到出色的钻孔精度和精确的钻孔公差。
- 柄部的设计适合多用途的刀柄系统。
- 可选择钻削深度，最高可达 $8 \times$ 直径。
- 带有内冷却孔，可使冷却液的定位和压力都达到最佳效果，可得有效的排屑和较长的刀具寿命。

测试结果



也对 Hydra-M 钻削头和另二个竞争对手的类似钻头作了测试，均采用各制造商所推荐的切削数据。工件材料为 AMG 2.2，钻头直径也是 12mm，钻孔深度也是 $5 \times D$ 。以刀具寿命来看，Hydra-M 钻削头也超过了与之最为接近的竞争对手。



适用材料分组 (AMG)

- 性能优异
- 性能良好

实例

110 = 外缘处的切削速度, 米/分 +/- 10%

W = 进给量, 见下面的钻头进给表

Fn	Ø					
	12mm	15mm	16mm	20mm	25mm	30mm
S	0.100	0.123	0.130	0.150	0.170	0.190
T	0.130	0.160	0.170	0.190	0.210	0.230
U	0.200	0.223	0.230	0.240	0.270	0.300
V	0.280	0.310	0.320	0.340	0.400	0.440
W	0.380	0.418	0.430	0.450		
	mm/转 +/- 25%					

R950			R960			
H853	H855	H858	H853	H855	H858	
HM	HM	HM	HM	HM	HM	
3xD	5xD	8xD	3xD	5xD	8xD	
140°	140°	140°	140°	140°	140°	
15/32" - 30.50	15/32" - 30.50	15/32" - 30.50	15/32" - 30.50	15/32" - 30.50	15/32" - 30.50	
2009.02	2009.02	2009.02	2009.02	2009.02	2009.02	
6&10	6&13	6&16	8&10	8&13	8&16	
■110W ■100W ■100W ■85W ■85W ●70U	■110V ■100V ■100V ■85V ■85V ●65U	■100U ■90U ■90U ■75U ■75U ●60T		■60V ■50T ■40T ●35T ■120V ■116V ■88V ■88V ●45T ●35T ●30S ●35T ●30S ●25S	■50V ■50S ■40S ●35S ■114V ■108V ■85V ■85V ●45T ●35T ●30S ●25S	■45U ■40S ■35S ●30S ■106U ■100U ■80U ■80U ●35S ●30S ●25S ●20S

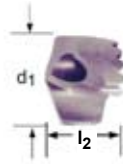
适用材料分组 (AMG)		硬度 HB	抗拉强度 N/mm ²
1. 钢	1.1 铁磁性低碳钢	<120	<400
	1.2 结构钢, 表面渗碳钢	<200	<700
	1.3 普通碳钢	<250	<850
	1.4 合金钢	<250	<850
	1.5 合金钢, 淬火回火钢	>250 <350	>850 <1200
	1.6 合金钢, 淬火回火钢	>350	>1200 <1620
	1.7 热处理合金钢	49-55HRC	>1620
	1.8 淬火合金钢, 耐磨钢	55-63HRC	<1960
2. 不锈钢	2.1 易切削不锈钢	<250	<850
	2.2 奥氏体不锈钢	<320	<1100
	2.3 铁素体 + 奥氏体, 马氏体不锈钢	<300	<1000
	2.4 沉淀硬化不锈钢	>320 <410	>1100 <1400
3. 铸铁	3.1 灰铸铁	<150	<500
	3.2 灰铸铁	>150 <300	>500 <1000
	3.3 球墨铸铁, 可锻铸铁	<200	<700
	3.4 球墨铸铁, 可锻铸铁	>200 <300	>700 <1000
4. 钛	4.1 纯钛	<200	<700
	4.2 钛合金	<270	<900
	4.3 钛合金	>270 <350	>900 <1250
5. 镍	5.1 纯镍	<150	<500
	5.2 镍合金	<270	<900
	5.3 镍合金	>270 <350	>900 <1200
6. 铜	6.1 紫铜	<100	<350
	6.2 β 黄铜, 青铜	<200	<700
	6.3 α 黄铜	<200	<700
	6.4 高强度青铜	<470	<1500
7. 铝 镁	7.1 纯铝, 纯镁	<100	<350
	7.2 铝合金, 硅含量<0.5%	<150	<500
	7.3 铝合金, 硅含量>0.5%<10%	<120	<400
	7.4 铝合金, 硅含量>10% 晶须增强铝合金, 镁合金	<120	<400
8. 合成材料	8.1 热塑性塑料	---	---
	8.2 热固性塑料	---	---
	8.3 增强塑料	---	---
9. 硬质材料	9.1 金属陶瓷	<550	<1700
	10.1 标准石墨	---	<100

扭矩表

螺钉	螺纹	扭矩值 - Ncm (公制)	扭矩值 英寸磅 (英制)	标准扳手	3xD Hydra- 天龙钻体	5xD Hydra- 天龙钻体	8xD Hydra- 天龙钻体
e-code				e-code			
H860N1	M2.2 x 8IP	75 - 100	6.5 - 8.6	H861N1	12.0mm - 15.0mm	12.0mm - 15.0mm	14.0mm - 15.0mm
					31/64" - 39/64"	31/64" - 39/64"	-
H860N2	M2.5 x 10IP	95 - 120	8.2 - 10.4	H861N2	16.0mm - 18.0mm	16.0mm - 18.0mm	16.0mm - 18.0mm
					41/64" - 23/32"	41/64" - 23/32"	-
H860N3	M3.0 x 15IP	185 - 240	16.0 - 20.8	H861N3	19.0mm - 21.0mm	19.0mm - 21.0mm	19.0mm - 21.0mm
					49/64" - 27/32"	49/64" - 27/32"	-
H860N4	M3.5 x 15IP	280 - 370	24.2 - 32.0	H861N3	22.0mm - 24.0mm	22.0mm - 24.0mm	22.0mm - 24.0mm
					57/64" - 31/32"	57/64" - 31/32"	-
H860N5	M4.0 x 20IP	415 - 550	35.9 - 47.6	H861N4	25.0mm - 27.0mm	25.0mm - 27.0mm	25.0mm - 27.0mm
					1.1/64" - 1.3/32"	1.1/64" - 1.3/32"	-
H860N6	M4.5 x 25IP	500 - 660	43.2 - 57.1	H861N5	28.0mm - 30.0mm	28.0mm - 30.0mm	28.0mm - 30.0mm
					1.1/8" - 1.3/16"	1.1/8" - 1.3/16"	-

R950

• Hydra P 钻削头



NEW

2009.02

R950

钻体内包括 4 螺钉和 1 螺丝刀



- 1.1 1.2 1.3 1.4 1.5
- 1.6

d ₁ Ø Inch	d ₁ Ø mm	d ₁ decimal Inch	l ₁ mm	e-Code
15/32	11.91	0.4689	9.1	R95015/32
	12.00	0.4724	9.1	R95012.0
	12.10	0.4764	9.1	R95012.1
	12.20	0.4803	9.1	R95012.2
31/64	12.30	0.4843	9.1	R95031/64
	12.50	0.4921	9.4	R95012.5
	12.60	0.4961	9.4	R95012.6
1/2	12.70	0.5000	9.4	R9501/2
	12.80	0.5039	9.4	R95012.8
	12.90	0.5079	9.4	R95012.9
	13.00	0.5118	9.7	R95013.0
33/64	13.10	0.5157	9.7	R95033/64
	13.20	0.5197	9.7	R95013.2
17/32	13.49	0.5311	9.7	R95017/32
	13.50	0.5315	10.3	R95013.5
	13.60	0.5354	10.3	R95013.6
	13.70	0.5394	10.3	R95013.7
	13.80	0.5433	10.3	R95013.8
35/64	13.89	0.5469	10.3	R95035/64
	14.00	0.5512	10.3	R95014.0
	14.10	0.5551	10.3	R95014.1
	14.20	0.5591	10.3	R95014.2
9/16	14.29	0.5626	10.3	R9509/16
	14.50	0.5709	10.3	R95014.5
	14.60	0.5748	11.0	R95014.6
37/64	14.68	0.5780	11.0	R95037/64
	14.70	0.5787	11.0	R95014.7
	14.80	0.5827	11.0	R95014.8
	15.00	0.5906	11.0	R95015.0
19/32	15.08	0.5937	11.0	R95019/32
	15.10	0.5945	11.0	R95015.1
	15.20	0.5984	11.0	R95015.2
39/64	15.48	0.6094	11.0	R95039/64
	15.50	0.6102	11.0	R95015.5
	15.60	0.6142	11.6	R95015.6
	15.70	0.6181	11.6	R95015.7
5/8	15.87	0.6248	11.6	R9505/8
	16.00	0.6299	11.6	R95016.0
	16.10	0.6339	11.6	R95016.1
	16.20	0.6378	11.6	R95016.2
41/64	16.27	0.6406	11.6	R95041/64
	16.50	0.6496	11.6	R95016.5

d ₁ Ø Inch	d ₁ Ø mm	d ₁ decimal Inch	l ₁ mm	e-Code
	16.60	0.6535	12.2	R95016.6
21/32	16.67	0.6563	12.2	R95021/32
	16.70	0.6575	12.2	R95016.7
	17.00	0.6693	12.2	R95017.0
43/64	17.06	0.6717	12.2	R95043/64
	17.10	0.6732	12.2	R95017.1
	17.20	0.6772	12.2	R95017.2
11/16	17.46	0.6874	12.2	R95011/16
	17.50	0.6890	12.2	R95017.5
	17.60	0.6929	12.9	R95017.6
	17.70	0.6969	12.9	R95017.7
45/64	17.86	0.7031	12.9	R95045/64
	18.00	0.7087	12.9	R95018.0
	18.10	0.7126	12.9	R95018.1
	18.20	0.7165	12.9	R95018.2
23/32	18.26	0.7189	12.9	R95023/32
	18.50	0.7283	12.9	R95018.5
	18.60	0.7323	13.5	R95018.6
47/64	18.65	0.7343	13.5	R95047/64
	18.70	0.7362	13.5	R95018.7
	18.90	0.7441	13.5	R95018.9
	19.00	0.7480	13.5	R95019.0
3/4	19.05	0.7500	13.5	R9503/4
	19.10	0.7520	13.5	R95019.1
	19.20	0.7559	13.5	R95019.2
	19.25	0.7579	13.5	R95019.25
49/64	19.45	0.7657	13.5	R95049/64
	19.50	0.7677	13.5	R95019.5
	19.60	0.7717	14.1	R95019.6
	19.70	0.7756	14.1	R95019.7
25/32	19.84	0.7811	14.1	R95025/32
	20.00	0.7874	14.1	R95020.0
51/64	20.24	0.7969	14.1	R95051/64
	20.50	0.8071	14.1	R95020.5
13/16	20.64	0.8126	14.8	R95013/16
	21.00	0.8268	14.8	R95021.0
53/64	21.03	0.8280	14.8	R95053/64
27/32	21.43	0.8437	14.8	R95027/32
	21.50	0.8465	14.8	R95021.5
55/64	21.83	0.8594	15.0	R95055/64
	22.00	0.8661	15.0	R95022.0
7/8	22.22	0.8748	15.0	R9507/8

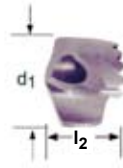
R950

d_1 Ø Inch	d_1 Ø mm	d_1 decimal Inch	l_1 mm	e-Code
	22.50	0.8858	15.0	R95022.5
57/64	22.62	0.8906	15.0	R95057/64
	22.70	0.8937	15.0	R95022.7
	23.00	0.9055	15.1	R95023.0
29/32	23.02	0.9063	15.1	R95029/32
59/64	23.42	0.9220	15.1	R95059/64
	23.50	0.9252	15.1	R95023.5
15/16	23.81	0.9374	15.4	R95015/16
	24.00	0.9449	15.4	R95024.0
61/64	24.21	0.9531	15.4	R95061/64
	24.50	0.9646	15.4	R95024.5
31/32	24.61	0.9689	15.4	R95031/32
63/64	25.00	0.9843	15.8	R95063/64
	25.00	0.9843	15.8	R95025.0
1"	25.40	1.0000	15.8	R9501
	25.50	1.0039	15.8	R95025.5
	25.65	1.0098	15.8	R95025.65
1.1/64	25.80	1.0157	15.8	R9501.1/64
	26.00	1.0236	16.4	R95026.0
1.1/32	26.19	1.0311	16.4	R9501.1/32

d_1 Ø Inch	d_1 Ø mm	d_1 decimal Inch	l_1 mm	e-Code
	26.50	1.0433	16.4	R95026.5
1.3/64	26.59	1.0469	16.4	R9501.3/64
1.1/16	26.99	1.0626	17.1	R9501.1/16
	27.00	1.0630	17.1	R95027.0
1.5/64	27.38	1.0780	17.1	R9501.5/64
	27.50	1.0827	17.1	R95027.5
1.3/32	27.78	1.0937	17.1	R9501.3/32
	28.00	1.1024	17.7	R95028.0
1.7/64	28.18	1.1094	17.7	R9501.7/64
	28.50	1.1220	17.7	R95028.5
1.1/8	28.57	1.1248	17.7	R9501.1/8
1.9/64	28.97	1.1406	18.3	R9501.9/64
	29.00	1.1417	18.3	R95029.0
1.5/32	29.37	1.1563	18.3	R9501.5/32
	29.50	1.1614	18.3	R95029.5
1.11/64	29.77	1.1720	18.3	R9501.11/64
	30.00	1.1811	19.0	R95030.0
1.3/16	30.16	1.1874	19.0	R9501.3/16
	30.50	1.2008	19.0	R95030.5

R960

• Hydra M 钻削头



R960

钻体内包括 4 螺钉和 1 螺丝刀



- 2.1 2.2 2.3 3.1 3.2 3.3 3.4
- 2.4 4.1 4.2 4.3 5.1 5.2 5.3

d ₁ Ø Inch	d ₁ Ø mm	d ₁ decimal Inch	l ₁ mm	e-Code
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	12.10	0.4764	9.1	R96012.1
	12.20	0.4803	9.1	R96012.2
31/64	12.30	0.4843	9.1	R96031/64
	12.50	0.4921	9.4	R96012.5
	12.60	0.4961	9.4	R96012.6
1/2	12.70	0.5000	9.4	R9601/2
	12.80	0.5039	9.4	R96012.8
	12.90	0.5079	9.4	R96012.9
	13.00	0.5118	9.7	R96013.0
33/64	13.10	0.5157	9.7	R96033/64
	13.20	0.5197	9.7	R96013.2
17/32	13.49	0.5311	9.7	R96017/32
	13.50	0.5315	10.3	R96013.5
	13.60	0.5354	10.3	R96013.6
	13.70	0.5394	10.3	R96013.7
	13.80	0.5433	10.3	R96013.8
35/64	13.89	0.5469	10.3	R96035/64
	14.00	0.5512	10.3	R96014.0
	14.10	0.5551	10.3	R96014.1
	14.20	0.5591	10.3	R96014.2
9/16	14.29	0.5626	10.3	R9609/16
	14.50	0.5709	10.3	R96014.5
	14.60	0.5748	11.0	R96014.6
37/64	14.68	0.5780	11.0	R96037/64
	14.70	0.5787	11.0	R96014.7
	14.80	0.5827	11.0	R96014.8
	15.00	0.5906	11.0	R96015.0
19/32	15.08	0.5937	11.0	R96019/32
	15.10	0.5945	11.0	R96015.1
	15.20	0.5984	11.0	R96015.2
39/64	15.48	0.6094	11.0	R96039/64
	15.50	0.6102	11.0	R96015.5
	15.60	0.6142	11.6	R96015.6
	15.70	0.6181	11.6	R96015.7
	5/8	15.87	0.6248	11.6
16.00		0.6299	11.6	R96016.0

d ₁ Ø Inch	d ₁ Ø mm	d ₁ decimal Inch	l ₁ mm	e-Code
41/64	16.10	0.6339	11.6	R96016.1
	16.20	0.6378	11.6	R96016.2
21/32	16.27	0.6406	11.6	R96041/64
	16.50	0.6496	11.6	R96016.5
	16.60	0.6535	12.2	R96016.6
43/64	16.67	0.6563	12.2	R96021/32
	16.70	0.6575	12.2	R96016.7
	17.00	0.6693	12.2	R96017.0
	17.06	0.6717	12.2	R96043/64
11/16	17.10	0.6732	12.2	R96017.1
	17.20	0.6772	12.2	R96017.2
	17.46	0.6874	12.2	R96011/16
	17.50	0.6890	12.2	R96017.5
	17.60	0.6929	12.9	R96017.6
45/64	17.70	0.6969	12.9	R96017.7
	17.86	0.7031	12.9	R96045/64
	18.00	0.7087	12.9	R96018.0
	18.10	0.7126	12.9	R96018.1
23/32	18.20	0.7165	12.9	R96018.2
	18.26	0.7189	12.9	R96023/32
	18.50	0.7283	12.9	R96018.5
	18.60	0.7323	13.5	R96018.6
	47/64	18.65	0.7343	13.5
18.70		0.7362	13.5	R96018.7
18.90		0.7441	13.5	R96018.9
3/4	19.00	0.7480	13.5	R96019.0
	19.05	0.7500	13.5	R9603/4
	19.10	0.7520	13.5	R96019.1
	19.20	0.7559	13.5	R96019.2
	19.25	0.7579	13.5	R96019.25
49/64	19.45	0.7657	13.5	R96049/64
	19.50	0.7677	13.5	R96019.5
	19.60	0.7717	14.1	R96019.6
	19.70	0.7756	14.1	R96019.7
25/32	19.84	0.7811	14.1	R96025/32
	20.00	0.7874	14.1	R96020.0
51/64	20.24	0.7969	14.1	R96051/64
	20.50	0.8071	14.1	R96020.5

R960

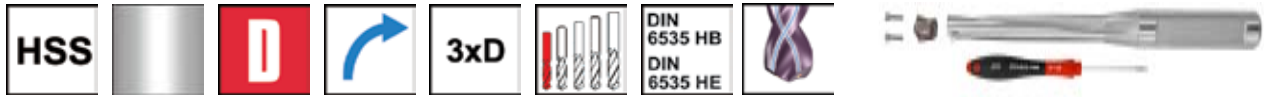
d_1 Ø Inch	d_1 Ø mm	d_1 decimal Inch	l_1 mm	e-Code
13/16	20.64	0.8126	14.8	R96013/16
	21.00	0.8268	14.8	R96021.0
53/64	21.03	0.8280	14.8	R96053/64
27/32	21.43	0.8437	14.8	R96027/32
	21.50	0.8465	14.8	R96021.5
55/64	21.83	0.8594	15.0	R96055/64
	22.00	0.8661	15.0	R96022.0
7/8	22.22	0.8748	15.0	R9607/8
	22.50	0.8858	15.0	R96022.5
57/64	22.62	0.8906	15.0	R96057/64
	22.70	0.8937	15.0	R96022.7
29/32	23.00	0.9055	15.1	R96023.0
	23.02	0.9063	15.1	R96029/32
59/64	23.42	0.9220	15.1	R96059/64
	23.50	0.9252	15.1	R96023.5
15/16	23.81	0.9374	15.4	R96015/16
	24.00	0.9449	15.4	R96024.0
61/64	24.21	0.9531	15.4	R96061/64
	24.50	0.9646	15.4	R96024.5
31/32	24.61	0.9689	15.4	R96031/32
63/64	25.00	0.9843	15.8	R96063/64
	25.00	0.9843	15.8	R96025.0
1"	25.40	1.0000	15.8	R9601
	25.50	1.0039	15.8	R96025.5

d_1 Ø Inch	d_1 Ø mm	d_1 decimal Inch	l_1 mm	e-Code
1.1/64	25.65	1.0098	15.8	R96025.65
	25.80	1.0157	15.8	R9601.1/64
1.1/32	26.00	1.0236	16.4	R96026.0
	26.19	1.0311	16.4	R9601.1/32
1.3/64	26.50	1.0433	16.4	R96026.5
	26.59	1.0469	16.4	R9601.3/64
1.1/16	26.99	1.0626	17.1	R9601.1/16
	27.00	1.0630	17.1	R96027.0
1.5/64	27.38	1.0780	17.1	R9601.5/64
	27.50	1.0827	17.1	R96027.5
1.3/32	27.78	1.0937	17.1	R9601.3/32
	28.00	1.1024	17.7	R96028.0
1.7/64	28.18	1.1094	17.7	R9601.7/64
	28.50	1.1220	17.7	R96028.5
1.1/8	28.57	1.1248	17.7	R9601.1/8
	28.97	1.1406	18.3	R9601.9/64
1.9/64	29.00	1.1417	18.3	R96029.0
	29.37	1.1563	18.3	R9601.5/32
1.5/32	29.50	1.1614	18.3	R96029.5
	29.77	1.1720	18.3	R9601.11/64
1.11/64	30.00	1.1811	19.0	R96030.0
	30.16	1.1874	19.0	R9601.3/16
1.3/16	30.50	1.2008	19.0	R96030.5

R950/R960 (带 3xD 钻体 H853)





H853





Hydra 钻削头		Hydra-天龙钻体 3 x D 公制柄部					Hydra-天龙钻体 3 x D 英制柄部				H860 螺钉	H861 标准扳手	
R950 Hydra-P	R960 Hydra-M	H853	l_2	l_1	d_2 \emptyset	l_3	H853	l_2	l_1	d_2 \emptyset	l_3	H860 螺钉	H861 标准扳手
e-Code	e-Code	e-Code	mm	mm	mm	mm	e-Code	mm	mm	inch	mm	e-Code	e-Code
R95015/32	R96015/32	H85312.0	44.0	105.0	16.0	48.0	H85331/64	44.0	105.0	5/8	48.0	H860N1	H861N1
R95012.0	R96012.0												
R95012.1	R96012.1												
R95012.2	R95012.2												
R95031/64	R96031/64	H85312.5	44.0	105.0	16.0	48.0	H8531/2	44.0	105.0	5/8	48.0		
R95012.5	R96012.5												
R95012.6	R96012.6												
R9501/2	R9601/2												
R95012.8	R96012.8	H85313.0	47.0	110.0	16.0	48.0	H85317/32	47.0	110.0	5/8	48.0		
R95012.9	R96012.9												
R95013.0	R96013.0												
R95033/64	R96033/64												
R95013.2	R96013.2	H85314.0	52.5	116.5	16.0	48.0	H8539/16	52.5	116.5	3/4	48.0		
R95017/32	R96017/32												
R95013.5	R96013.5												
R95013.6	R96013.6												
R95013.7	R96013.7	H85315.0	55.5	126.5	20.0	50.0	H85339/64	55.5	126.5	3/4	50.0		
R95013.8	R96013.8												
R95035/64	R96035/64												
R95014.0	R96014.0												
R95014.1	R96014.1	H85315.0	55.5	126.5	20.0	50.0	H85339/64	55.5	126.5	3/4	50.0		
R95014.2	R96014.2												
R9509/16	R9609/16												
R95014.5	R96014.5												
R95014.6	R96014.6	H85315.0	55.5	126.5	20.0	50.0	H85339/64	55.5	126.5	3/4	50.0		
R95014.7	R96014.7												
R95014.8	R96014.8												
R95015.0	R96015.0												
R95019/32	R96019/32	H85315.0	55.5	126.5	20.0	50.0	H85339/64	55.5	126.5	3/4	50.0		
R95015.1	R96015.1												
R95015.2	R96015.2												
R95039/64	R96039/64												
R95015.5	R96015.5	H85315.0	55.5	126.5	20.0	50.0	H85339/64	55.5	126.5	3/4	50.0		

R950/R960 (带 3xD 钻体 H853)

Hydra 钻削头		 Hydra-天龙钻体 3 x D 公制柄部					 Hydra-天龙钻体 3 x D 英制柄部					H860 螺钉	H861 标准扳手				
R950 Hydra-P e-Code	R960 Hydra-M e-Code	H853 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ mm	l ₃ mm	H853 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ inch	l ₃ mm	H860 e-Code	H861 e-Code				
R95015.6	R96015.6	H85316.0	59.5	131.5	20.0	50.0	H85341/64	59.5	131.5	3/4	50.0	H860N2	H861N2				
R95015.7	R96015.7																
R9505/8	R9605/8																
R95016.0	R96016.0																
R95016.1	R96016.1																
R95016.2	R96016.2																
R95041/64	R96041/64																
R95016.5	R96016.5																
R95016.6	R96016.6	H85317.0	62.5	136.5	20.0	50.0	H85311/16	62.5	136.5	3/4	50.0			H860N2	H861N2		
R95021/32	R96021/32																
R95016.7	R96016.7																
R95017.0	R96017.0																
R95043/64	R96043/64																
R95017.1	R96017.1																
R95017.2	R96017.2																
R95011/16	R96011/16																
R95017.5	R96017.5																
R95017.6	R96017.6	H85318.0	66.5	141.5	20.0	50.0	H85323/32	66.5	141.5	3/4	50.0	H860N2	H861N2				
R95017.7	R96017.7																
R95045/64	R96045/64																
R95018.0	R96018.0																
R95018.1	R96018.1																
R95018.2	R96018.2																
R95023/32	R96023/32																
R95018.5	R96018.5																
R95018.6	R96018.6	H85319.0	69.5	156.5	25.0	56.0	H85349/64	69.5	156.5	1.	56.0			H860N3	H861N3		
R95047/64	R96047/64																
R95018.7	R96018.7																
R95018.9	R96018.9																
R95019.0	R96019.0																
R9503/4	R9603/4																
R95019.1	R96019.1																
R95019.2	R96019.2																
R95019.25	R96019.25																
R95049/64	R96049/64																
R95019.5	R96019.5																
R95019.6	R96019.6	H85320.0	73.5	156.5	25.0	56.0	H85351/64	73.5	156.5	1.	56.0	H860N3	H861N3				
R95019.7	R96019.7																
R95025/32	R96025/32																
R95020.0	R96020.0																
R95051/64	R96051/64	H85321.0	76.5	156.5	25.0	56.0	H85327/32	76.5	156.5	1.	56.0					H860N3	H861N3
R95020.5	R96020.5																
R95013/16	R96013/16																
R95021.0	R96021.0																
R95053/64	R96053/64	H85321.0	76.5	156.5	25.0	56.0	H85327/32	76.5	156.5	1.	56.0			H860N3	H861N3		
R95027/32	R96027/32																
R95021.5	R96021.5																

R950/R960 (带 3xD 钻体 H853)

Hydra 钻削头		 Hydra-天龙钻体 3 x D 公制柄部					 Hydra-天龙钻体 3 x D 英制柄部						
R950 Hydra-P e-Code	R960 Hydra-M e-Code	H853 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ mm	l ₃ mm	H853 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ inch	l ₃ mm	H860 螺钉 e-Code	H861 标准扳手 e-Code
R95055/64	R96055/64	H85322.0	80.1	161.5	25.0	56.0	H85357/64	80.1	161.5	1.	56.0	H860N4	H861N3
R95022.0	R96022.0												
R9507/8	R9607/8												
R95022.5	R96022.5												
R95057/64	R96057/64												
R95022.7	R96022.7												
R95023.0	R96023.0	H85323.0	82.5	160.5	25.0	56.0	H85359/64	82.5	160.5	1.	56.0	H860N4	H861N3
R95029/32	R96029/32												
R95059/64	R96059/64												
R95023.5	R96023.5												
R95015/16	R96015/16												
R95024.0	R96024.0	H85324.0	86.2	170.2	32.0	60.0	H85331/32	86.2	170.2	1.	60.0	H860N4	H861N3
R95061/64	R96061/64												
R95024.5	R96024.5												
R95031/32	R96031/32												
R95025.0	R96025.0												
R95063/64	R96063/64	H85325.0	88.0	170.0	32.0	60.0	H8531.1/64	88.0	170.0	1.1/4	60.0	H860N5	H861N4
R9501	R9601												
R95025.5	R96025.5												
R95025.65	R96025.65												
R9501.1/64	R9601.1/64												
R95026.0	R96026.0	H85326.0	92.0	175.0	32.0	60.0	H8531.3/64	92.0	175.0	1.1/4	60.0	H860N5	H861N4
R9501.1/32	R9601.1/32												
R95026.5	R96026.5												
R9501.3/64	R9601.3/64												
R9501.1/16	R9601.1/16												
R95027.0	R96027.0	H85327.0	94.0	175.0	32.0	60.0	H8531.3/32	94.0	175.0	1.1/4	60.0	H860N5	H861N4
R9501.5/64	R9601.5/64												
R95027.5	R96027.5												
R9501.3/32	R9601.3/32												
R95028.0	R96028.0												
R9501.7/64	R9601.7/64												
R95028.5	R96028.5												
R9501.1/8	R9601.1/8												
R9501.9/64	R9601.9/64												
R95029.0	R96029.0	H85329.0	100.0	185.0	32.0	60.0	H8531.11/64	100.0	185.0	1.1/4	60.0	H860N6	H861N5
R9501.5/32	R9601.5/32												
R95029.5	R96029.5												
R9501.11/64	R9601.11/64												
R95030.0	R96030.0												
R9501.3/16	R9601.3/16	H85330.0	104.0	185.0	32.0	60.0	H8531.3/16	104.0	185.0	1.1/4	60.0	H860N6	H861N5
R95030.5	R96030.5												

R950/R960 (带 5xD 钻体 H855)





H855





Hydra 钻削头		DIN 6535 HE	Hydra-天龙钻体 5 x D 公制柄部					DIN 6535 HB	Hydra-天龙钻体 5 x D 英制柄部				H860 螺钉	H861 标准扳手
R950 Hydra-P	R960 Hydra-M	H855	l_2	l_1	d_2 \emptyset	l_3	H855	l_2	l_1	d_2 \emptyset	l_3	H860 螺钉	H861 标准扳手	
e-Code	e-Code	e-Code	mm	mm	mm	mm	e-Code	mm	mm	inch	mm	e-Code	e-Code	
R95015/32	R96015/32	H85512.0	69.0	130.0	16.0	48.0	H85531/64	69.0	130.0	5/8	48.0	H860N1	H861N1	
R95012.0	R96012.0													
R95012.1	R96012.1													
R95012.2	R95012.2													
R95031/64	R96031/64													
R95012.5	R96012.5	H85512.5	69.0	130.0	16.0	48.0	H8551/2	69.0	130.0	5/8	48.0			
R95012.6	R96012.6													
R9501/2	R9601/2													
R95012.8	R96012.8													
R95012.9	R96012.9													
R95013.0	R96013.0	H85513.0	74.0	140.0	16.0	48.0	H85517/32	74.0	140.0	5/8	48.0			
R95033/64	R96033/64													
R95013.2	R96013.2													
R95017/32	R96017/32													
R95013.5	R96013.5	H85514.0	81.5	146.5	16.0	48.0	H8559/16	81.5	146.5	3/4	48.0			
R95013.6	R96013.6													
R95013.7	R96013.7													
R95013.8	R96013.8													
R95035/64	R96035/64													
R95014.0	R96014.0													
R95014.1	R96014.1													
R95014.2	R96014.2													
R9509/16	R9609/16													
R95014.5	R96014.5	H85515.0	86.5	156.5	20.0	50.0	H85539/64	86.5	156.5	3/4	50.0			
R95014.6	R96014.6													
R95037/64	R96037/64													
R95014.7	R96014.7													
R95014.8	R96014.8													
R95015.0	R96015.0													
R95019/32	R96019/32													
R95015.1	R96015.1													
R95015.2	R96015.2													
R95039/64	R96039/64													
R95015.5	R96015.5													

R950/R960 (带 5xD 钻体 H855)

Hydra 钻削头		 Hydra-天龙钻体 5 x D 公制柄部					 Hydra-天龙钻体 5 x D 英制柄部					H860 螺钉	H861 标准扳手				
R950 Hydra-P e-Code	R960 Hydra-M e-Code	H855 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ mm	l ₃ mm	H855 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ inch	l ₃ mm	H860 e-Code	H861 e-Code				
R95015.6	R96015.6	H85516.0	92.5	166.5	20.0	50.0	H85541/64	92.5	166.5	3/4	50.0	H860N2	H861N2				
R95015.7	R96015.7																
R9505/8	R9605/8																
R95016.0	R96016.0																
R95016.1	R96016.1																
R95016.2	R96016.2																
R95041/64	R96041/64																
R95016.5	R96016.5																
R95016.6	R96016.6	H85517.0	97.5	171.5	20.0	50.0	H85511/16	97.5	171.5	3/4	50.0			H860N2	H861N2		
R95021/32	R96021/32																
R95016.7	R96016.7																
R95017.0	R96017.0																
R95043/64	R96043/64																
R95017.1	R96017.1																
R95017.2	R96017.2																
R95011/16	R96011/16																
R95017.5	R96017.5																
R95017.6	R96017.6	H85518.0	103.5	176.5	20.0	50.0	H85523/32	103.5	176.5	3/4	50.0	H860N2	H861N2				
R95017.7	R96017.7																
R95045/64	R96045/64																
R95018.0	R96018.0																
R95018.1	R96018.1																
R95018.2	R96018.2																
R95023/32	R96023/32																
R95018.5	R96018.5																
R95018.6	R96018.6	H85519.0	108.5	191.5	25.0	56.0	H85549/64	108.5	191.5	1.	56.0			H860N3	H861N3		
R95047/64	R96047/64																
R95018.7	R96018.7																
R95018.9	R96018.9																
R95019.0	R96019.0																
R9503/4	R9603/4																
R95019.1	R96019.1																
R95019.2	R96019.2																
R95019.25	R96019.25																
R95049/64	R96049/64																
R95019.5	R96019.5																
R95019.6	R96019.6	H85520.0	114.5	196.5	25.0	56.0	H85551/64	114.5	196.5	1.	56.0	H860N3	H861N3				
R95019.7	R96019.7																
R95025/32	R96025/32																
R95020.0	R96020.0																
R95051/64	R96051/64	H85521.0	119.5	196.5	25.0	56.0	H85527/32	119.5	196.5	1.	56.0			H860N3	H861N3		
R95020.5	R96020.5																
R95013/16	R96013/16																
R95021.0	R96021.0																
R95053/64	R96053/64	H85521.0	119.5	196.5	25.0	56.0	H85527/32	119.5	196.5	1.	56.0					H860N3	H861N3
R95027/32	R96027/32																
R95021.5	R96021.5																

R950/R960 (带 5xD 钻体 H855)

Hydra 钻削头		 Hydra-天龙钻体 5 x D 公制柄部					 Hydra-天龙钻体 5 x D 英制柄部					H860 螺钉	H861 标准扳手
R950 Hydra-P e-Code	R960 Hydra-M e-Code	H855 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ mm	l ₃ mm	H855 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ inch	l ₃ mm	H860 e-Code	H861 e-Code
R95055/64	R96055/64	H85522.0	125.1	201.1	25.0	56.0	H85557/64	125.1	201.1	1.	56.0	H860N4	H861N3
R95022.0	R96022.0												
R9507/8	R9607/8												
R95022.5	R96022.5												
R95057/64	R96057/64												
R95022.7	R96022.7												
R95023.0	R96023.0	H85523.0	129.5	210.5	25.0	56.0	H85559/64	129.5	210.5	1.	56.0		
R95029/32	R96029/32												
R95059/64	R96059/64												
R95023.5	R96023.5												
R95015/16	R96015/16	H85524.0	135.2	220.2	32.0	60.0	H85531/32	135.2	220.2	1.	60.0		
R95024.0	R96024.0												
R95061/64	R96061/64												
R95024.5	R96024.5												
R95031/32	R96031/32												
R95025.0	R96025.0	H85525.0	140.0	225.0	32.0	60.0	H8551.1/64	140.0	225.0	1.1/4	60.0	H860N5	H861N4
R95063/64	R96063/64												
R9501	R9601												
R95025.5	R96025.5												
R95025.65	R96025.65												
R9501.1/64	R9601.1/64												
R95026.0	R96026.0	H85526.0	146.0	230.0	32.0	60.0	H8551.3/64	146.0	230.0	1.1/4	60.0		
R9501.1/32	R9601.1/32												
R95026.5	R96026.5												
R9501.3/64	R9601.3/64	H85527.0	151.0	235.0	32.0	60.0	H8551.3/32	151.0	235.0	1.1/4	60.0		
R9501.1/16	R9601.1/16												
R95027.0	R96027.0												
R9501.5/64	R9601.5/64												
R95027.5	R96027.5												
R9501.3/32	R9601.3/32												
R95028.0	R96028.0	H85528.0	157.0	240.0	32.0	60.0	H8551.1/8	157.0	240.0	1.1/4	60.0		
R9501.7/64	R9601.7/64												
R95028.5	R96028.5												
R9501.1/8	R9601.1/8	H85529.0	162.0	245.0	32.0	60.0	H8551.11/64	162.0	245.0	1.1/4	60.0	H860N6	H861N5
R9501.9/64	R9601.9/64												
R95029.0	R96029.0												
R9501.5/32	R9601.5/32												
R95029.5	R96029.5												
R9501.11/64	R9601.11/64												
R95030.0	R96030.0	H85530.0	167.0	255.0	32.0	60.0	H8551.3/16	167.0	255.0	1.1/4	60.0		
R9501.3/16	R9601.3/16												
R95030.5	R96030.5												

R950/R960 (带 8xD 钻体 H858)



H858



Hydra 钻削头		Hydra-天龙钻体 8 x D 公制柄部						
R950 Hydra-P	R960 Hydra-M	H858	l_2 mm	l_1 mm	d_2 Ø mm	l_3 mm	H860 螺钉	H861 标准扳手
e-Code	e-Code	e-Code					e-Code	e-Code
R95015/32	R96015/32						H860N1	H861N1
R95012.0	R96012.0	---	---	---	---			
R95012.1	R96012.1	---	---	---	---			
R95012.2	R96012.2	---	---	---	---			
R95031/64	R96031/64							
R95012.5	R96012.5							
R95012.6	R96012.6							
R9501/2	R9601/2	---	---	---	---			
R95012.8	R96012.8							
R95012.9	R96012.9							
R95013.0	R96013.0							
R95033/64	R96033/64	---	---	---	---			
R95013.2	R96013.2							
R95017/32	R96017/32							
R95013.5	R96013.5							
R95013.6	R96013.6							
R95013.7	R96013.7							
R95013.8	R96013.8							
R95035/64	R96035/64	H85814.0	124.5	191.5	16.0	48.0		
R95014.0	R96014.0							
R95014.1	R96014.1							
R95014.2	R96014.2							
R9509/16	R9609/16							
R95014.5	R96014.5							
R95014.6	R96014.6							
R95037/64	R96037/64							
R95014.7	R96014.7							
R95014.8	R96014.8							
R95015.0	R96015.0	H85815.0	133.5	201.5	20.0	50.0		
R95019/32	R96019/32							
R95015.1	R96015.1							
R95015.2	R96015.2							
R95039/64	R96039/64							
R95015.5	R96015.5							

注意：钻削深度达到 8xD 的钻体没有英制尺寸的柄部

R950/R960 (带 8xD 钻体 H858)

Hydra 钻削头		Hydra-天龙钻体 8 x D 公制柄部								
R950 Hydra-P e-Code	R960 Hydra-M e-Code	H858 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ mm	l ₃ mm	H860 螺钉 e-Code	H861 标准扳手 e-Code		
R95015.6	R96015.6	H85816.0	141.5	211.5	20.0	50.0	H860N2	H861N2		
R95015.7	R96015.7									
R9505/8	R9605/8									
R95016.0	R96016.0									
R95016.1	R96016.1									
R95016.2	R96016.2									
R95041/64	R96041/64									
R95016.5	R96016.5									
R95016.6	R96016.6	H85817.0	150.5	221.5	20.0	50.0			H860N2	H861N2
R95021/32	R96021/32									
R95016.7	R96016.7									
R95017.0	R96017.0									
R95043/64	R96043/64									
R95017.1	R96017.1									
R95017.2	R96017.2									
R95011/16	R96011/16									
R95017.5	R96017.5									
R95017.6	R96017.6	H85818.0	158.5	226.5	20.0	50.0	H860N2	H861N2		
R95017.7	R96017.7									
R95045/64	R96045/64									
R95018.0	R96018.0									
R95018.1	R96018.1									
R95018.2	R96018.2									
R95023/32	R96023/32									
R95018.5	R96018.5									
R95018.6	R96018.6	H85819.0	167.5	251.5	25.0	56.0			H860N3	H861N3
R95047/64	R96047/64									
R95018.7	R96018.7									
R95018.9	R96018.9									
R95019.0	R96019.0									
R9503/4	R9603/4									
R95019.1	R96019.1									
R95019.2	R96019.2									
R95019.25	R96019.25									
R95049/64	R96049/64									
R95019.5	R96019.5									
R95019.6	R96019.6	H85820.0	175.5	261.5	25.0	56.0	H860N3	H861N3		
R95019.7	R96019.7									
R95025/32	R96025/32									
R95020.0	R96020.0									
R95051/64	R96051/64									
R95020.5	R96020.5									
R95013/16	R96013/16	H85821.0	184.5	266.5	25.0	56.0			H860N3	H861N3
R95021.0	R96021.0									
R95053/64	R96053/64									
R95027/32	R96027/32									
R95021.5	R96021.5									

注意：钻削深度达到 8xD 的钻体没有英制尺寸的柄部

R950/R960 (带 8xD 钻体 H858)

Hydra 钻削头		Hydra-天龙钻体 8 x D 公制柄部						
R950 Hydra-P e-Code	R960 Hydra-M e-Code	H858 e-Code	l ₂ mm	l ₁ mm	d ₂ ∅ mm	l ₃ mm	H860 螺钉 e-Code	H861 标准扳手 e-Code
R95055/64	R96055/64	H85822.0	192.1	271.1	25.0	56.0	H860N4	H861N3
R95022.0	R96022.0							
R9507/8	R9607/8							
R95022.5	R96022.5							
R95057/64	R96057/64							
R95022.7	R96022.7	H85823.0	200.5	280.5	25.0	56.0	H860N4	H861N3
R95023.0	R96023.0							
R95029/32	R96029/32							
R95059/64	R96059/64							
R95023.5	R96023.5							
R95015/16	R96015/16	H85824.0	208.2	295.2	32.0	60.0	H860N4	H861N3
R95024.0	R96024.0							
R95061/64	R96061/64							
R95024.5	R96024.5							
R95031/32	R96031/32							
R95025.0	R96025.0	H85825.0	217.0	300.0	32.0	60.0	H860N5	H861N4
R95063/64	R96063/64							
R9501	R9601							
R95025.5	R96025.5							
R95025.65	R96025.65							
R9501.1/64	R9601.1/64	H85826.0	225.0	310.0	32.0	60.0	H860N5	H861N4
R95026.0	R96026.0							
R9501.1/32	R9601.1/32							
R95026.5	R96026.5							
R9501.3/64	R9601.3/64							
R9501.1/16	R9601.1/16	H85827.0	234.0	320.0	32.0	60.0	H860N5	H861N4
R95027.0	R96027.0							
R9501.5/64	R9601.5/64							
R95027.5	R96027.5							
R9501.3/32	R9601.3/32							
R95028.0	R96028.0	H85828.0	242.0	325.0	32.0	60.0	H860N6	H861N5
R9501.7/64	R9601.7/64							
R95028.5	R96028.5							
R9501.1/8	R9601.1/8							
R9501.9/64	R9601.9/64							
R95029.0	R96029.0							
R9501.5/32	R9601.5/32							
R95029.5	R96029.5							
R9501.11/64	R9601.11/64	H85830.0	259.0	345.0	32.0	60.0	H860N6	H861N5
R95030.0	R96030.0							
R9501.3/16	R9601.3/16							
R95030.5	R96030.5							

注意：钻削深度达到 8xD 的钻体没有英制尺寸的柄部

使用天龙钻的注意事项

冷却液

为得到最大的排屑效果，并使刀具发挥最佳的性能，建议使用冷却液。

对于大部分的应用场合，建议使用浓度为 6 – 8% 的乳化液作冷却，冷却液压力为 20 巴或更高。对于高强度钢、不锈钢或其他较困难的加工场合，需要浓度较高如 10-12% 的乳化液。在上述加工场合，尤其是加工不锈钢时，建议使用机床所能达到的最高冷却液压力。

天龙钻内冷却孔的设计可增加钻头心部的强度，可降低切削刃上的热量，这样可提高生产率，并得到较长的刀具寿命。

刀柄

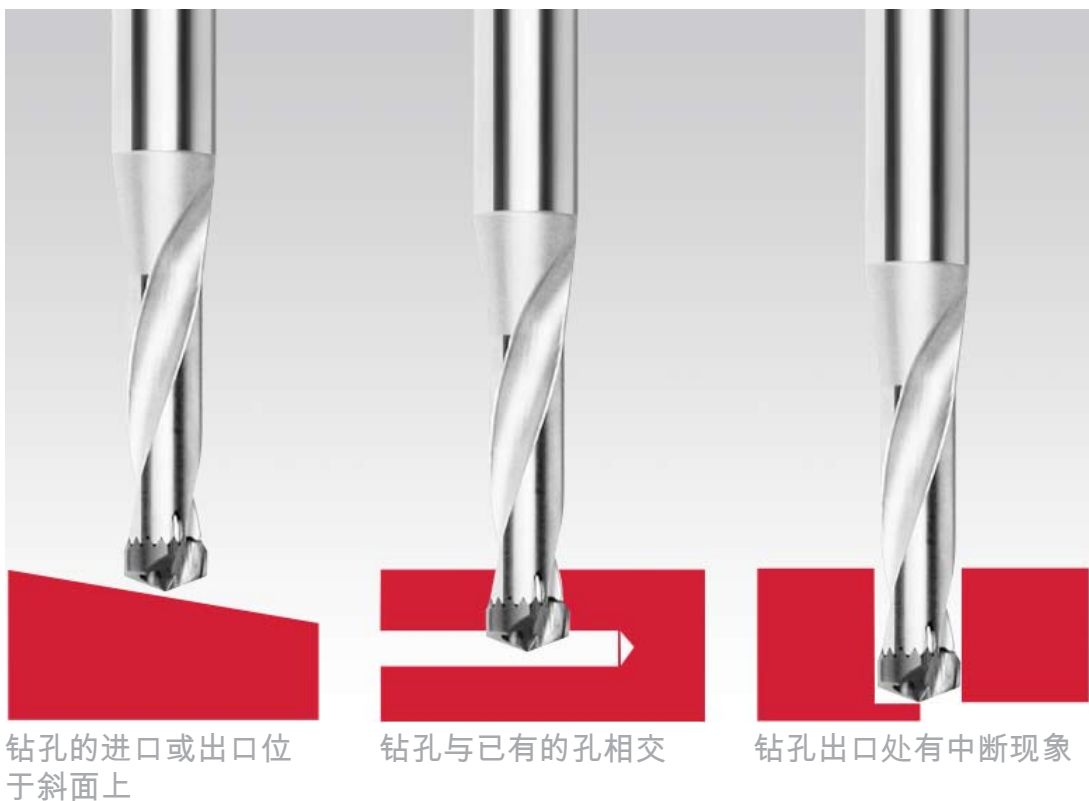
始终要使用能让机床主轴和钻头保持较好同心度的刀柄或夹头。采用限位挡块，防止钻头缩回到刀柄里面去。装配后的天龙钻必须精确测量其径向跳动，并始终保持较小的径向跳动值。

工件

工件应牢固夹持，并有较高的刚性，以使工件的挠曲降至最低，这样可有较好的钻孔精度和定位精度。

进给量

重要的是不能使钻头的进给量太低，进给量过低会使钻头在钻削时产生停顿现象，切削刃容易变钝。在钻削那些会加工硬化的材料时，这一点特别明显。进给量应当足够大，以产生正确的切屑形状。



遇到这些钻削情况时，通常建议把进给量降低到原来的三分之一 (33%)。不推荐在大于 10° 的斜面上钻孔，应当先用铣刀把斜面切平后再钻孔。