

The Right Tool at the Right Time



High Performance Replaceable Head Drills

Range Extension 2012

Features & Benefits

MATERIAL

Replaceable heads in tough micrograin carbide and hardened steel body with high gloss nickel plating for high resistance to wear and corrosion. One body accommodates multiple head sizes with no compromise on tool rigidity and structural integrity.

SURFACE TREATMENT

Ti-phos coating on the drilling heads for high toughness and oxidation stability - enables high speeds and feeds and resists "built-up edge" which is common when machining softer materials.

POINT GEOMETRY

The self-centering 140° 4-facet split point geometry ensures that required thrust force is low. Pre-drilling / centre drilling is neither necessary nor recommended.

SHANK

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant. Best results are obtained using hydraulic holders; can also be held in ER type and Weldon type toolholders.

GEOMETRY

Heads are held securely in place by two screws; the perfect fit of body and head serrations transmits the torque evenly and allows for precise and easy assembly. The slow spiral offers optimised flute volume for efficient chip evacuation.

INTERNAL COOLANT

Coolant holes in the drill bodies are aligned perfectly with the replaceable heads for efficient delivery of coolant directly to the cutting edge. This not only disperses the heat generated during the hole making process when using high speeds and feeds, but also ensures smooth chip evacuation and long tool life.

HOLE DEPTH

Drilling depths of 3xDiameter and 5xDiameter:

- metric shank available for the entire range of heads
- fractional shank available up to head diameter 30.50mm

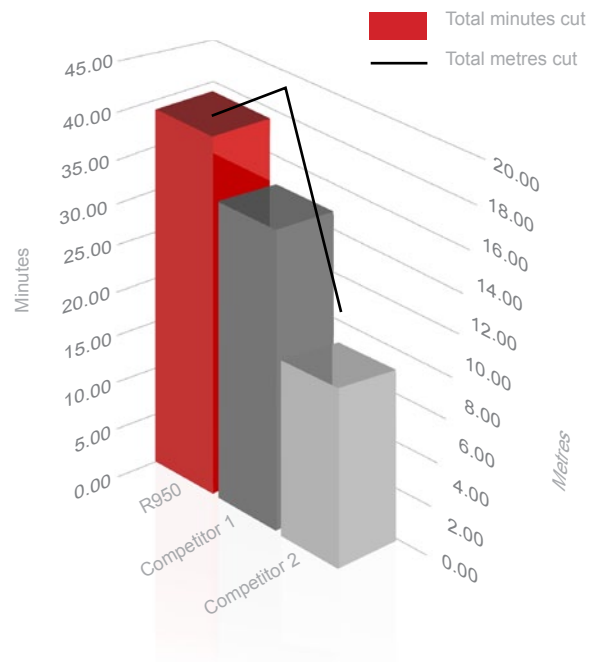
Drilling depth of 8xDiameter available on head diameters 13.50mm and larger.

DIAMETER RANGE

R950 metric sizes available 12.0mm-42.0mm diameter and fractional sizes 15/32"-1.5/8" diameter

R960 metric sizes available 12.0 mm - 30.5mm diameter and fractional sizes 15/32"-1.3/16" diameter

Test Results

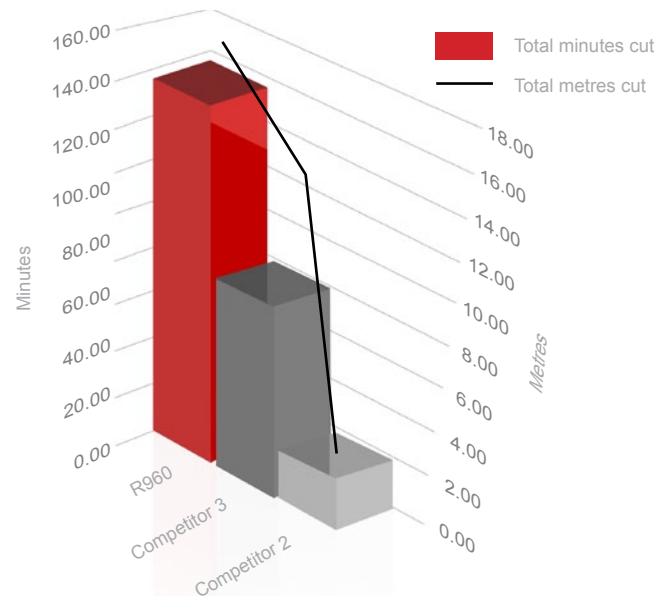


The Hydra for steel head was tested against 2 competitors at manufacturers' recommended cutting conditions in AMG 1.3. All drills were 12mm in diameter, and drilled to a hole depth of 5 x D. For all 3 tool types, the average number of minutes cut and the average number of metres cut until end of tool life were measured. The R950 drilled for almost 40 minutes, more than twice as long as Competitor 2.

Customer *Benefits*

- High productivity across a wide range of materials, including carbon and alloy steels, stainless steel, titanium, nickel and cast iron.
- Two head types available - the R960 head has been developed specifically to give optimum performance in stainless steel and cast iron. The R950 head is recommended for steels.
- Consistently high performance, even after numerous head changes.
- Reduction in inventory costs – one drill body fits multiple head sizes.
- Easy and quick head changes with minimal interruptions to the production process. Heads can be changed without removing the body from the machine.
- Exact fit of head to body maximises tool rigidity for superior hole accuracy and precise tolerances.
- Shank design allows for versatile tool holding.
- A choice of drilling depths, up to 8 x diameter.
- Internal coolant channels provide optimised coolant direction and pressure to give efficient chip evacuation and longer tool life.

Test *Results*



The Hydra for stainless steel head was also tested against 2 competitors at manufacturers' recommended cutting conditions in AMG 2.2. Again, 12mm diameter drills were used to a drilling depth of 5xD. The R960 performance exceeded the nearest competitor, in terms of tool life.



R960

R950

Application *Material Groups*

■ Excellent for Application

● Good for Application

Example

110 = Peripheral speed in metres/minute +/- 10%

W = Feed range - see drill feed chart below

 Fn	Ø						
	12mm	15mm	16mm	20mm	25mm	30mm	40mm
S	0.100	0.123	0.130	0.150	0.170	0.190	0.220
T	0.130	0.160	0.170	0.190	0.210	0.230	0.260
U	0.200	0.223	0.230	0.240	0.270	0.300	0.360
V	0.280	0.310	0.320	0.340	0.400	0.440	0.510
W	0.380	0.418	0.430	0.450	0.470	0.490	0.520
	mm/rev +/- 25%						

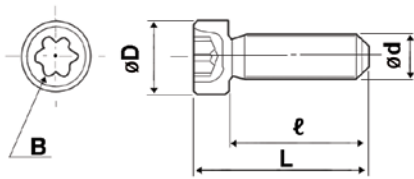
R950			R960		
	HM				
					
H853	H855	H858	H853	H855	H858
					
					
3XD	5XD	8XD	3XD	5XD	8XD
HSS	HSS	HSS	HSS	HSS	HSS
					
					
DIN 6535-HS DIN 6535-HE	DIN 6535-HS DIN 6535-HE	DIN 6535-HS DIN 6535-HE	DIN 6535-HS DIN 6535-HE	DIN 6535-HS DIN 6535-HE	DIN 6535-HS DIN 6535-HE
					

Application Material Groups (AMG)		Hardness HB	Tensile Strength N/mm²	15/32" - 42.00	15/32" - 42.00	15/32" - 42.00	15/32" - 30.50	15/32" - 30.50	13.50 - 30.50
1. Steel	1.1 Magnetic soft steel	<120	<400	■ 110W	■ 110V	■ 100U			
	1.2 Structural Steel / case carburising steel	<200	<700	■ 100W	■ 100V	■ 90U			
	1.3 Plain Carbon steel	<250	<850	■ 100W	■ 100V	■ 90U			
	1.4 Alloy steel	<250	<850	■ 85W	■ 85V	■ 75U			
	1.5 Alloy steel/ Hardened and tempered steel	>250 <350	>850 <1200	■ 85W	■ 85V	■ 75U			
	1.6 Alloy steel/ Hardened and tempered steel	>350	>1200 <1620	● 70U	● 65U	● 60T			
	1.7 Alloy steel Hardened	49-55HRC	>1620						
	1.8 Alloy steel Hardened	55-63HRC	<1960						
2. Stainless Steel	2.1 Free machining Stainless Steel	<250	<850				■ 60V	■ 50V	■ 45U
	2.2 Austenitic	<320	<1100				■ 50T	■ 50S	■ 40S
	2.3 Ferritic + Austenitic, Martensitic	<300	<1000				■ 40T	■ 40S	■ 35S
	2.4 Precipitation Hardened	>320 <410	>1100 <1400				● 35T	● 35S	● 30S
3. Cast Iron	3.1 Lamellar graphite	<150	<500				■ 120V	■ 114V	■ 106U
	3.2 Lamellar graphite	>150 <300	>500 <1000				■ 116V	■ 108V	■ 100U
	3.3 Nodular graphite/ Malleable Cast Iron	<200	<700				■ 88V	■ 85V	■ 80U
	3.4 Nodular graphite/ Malleable Cast Iron	>200 <300	>700 <1000				■ 88V	■ 85V	■ 80U
4. Titanium	4.1 Titanium, unalloyed	<200	<700				● 45T	● 45T	● 35S
	4.2 Titanium, alloyed	<270	<900				● 35T	● 35T	● 30S
	4.3 Titanium, alloyed	>270 <350	>900 <1250				● 30S	● 30S	● 25S
5. Nickel	5.1 Nickel, unalloyed	<150	<500				● 35T	● 35T	● 30S
	5.2 Nickel, alloyed	<270	<900				● 30S	● 30S	● 25S
	5.3 Nickel, alloyed	>270 <350	>900 <1200				● 25S	● 25S	● 20S
6. Copper	6.1 Copper	<100	<350						
	6.2 β-Brass, Bronze	<200	<700						
	6.3 α-Brass	<200	<700						
	6.4 High Strength Bronze	<470	<1500						
7. Aluminium Magnesium	7.1 Al, Mg, unalloyed	<100	<350						
	7.2 Al alloyed, Si<0.5%	<150	<500						
	7.3 Al alloyed, Si>0.5%<10%	<120	<400						
	7.4 Al alloyed, Si>10% Whisker reinforced Al-alloys, Mg alloys	<120	<400						
8. Synthetic Materials	8.1 Thermoplastics	---	---						
	8.2 Thermosetting plastics	---	---						
	8.3 Reinforced plastic materials	---	---						
9. Hard Materials	9.1 Cermets (Metal-ceramics)	<550	<1700						
10. Graphite	10.1 Standard graphite	---	<100						

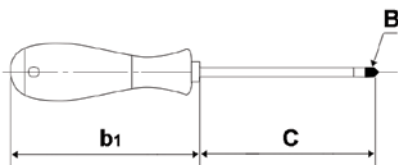
Torque Table

					TORQUE VALUES Nm (metric System)	TORQUE VALUES in/lbs (inch System)
H860	H861	H853 3xD	H855 5xD	H858 8xD		
H860N1	H861N1	12.0mm-15.0mm 31/64"-39/64"	12.0mm-15.0mm 31/64"-39/64"	14.0mm-15.0mm	0.75-0.99	6.6-8.8
H860N2	H861N2	16.0mm-18.0mm 41/64"-23/32"	16.0mm-18.0mm 41/64"-23/32"	16.0mm-18.0mm	0.93-1.24	8.2-11.0
H860N3	H861N3	19.0mm-21.0mm 49/64"-27/32"	19.0mm-21.0mm 49/64"-27/32"	19.0mm-21.0mm	1.84-2.44	16.3-21.6
H860N4	H861N3	22.0mm-24.0mm 57/64"-31/32"	22.0mm-24.0mm 57/64"-31/32"	22.0mm-24.0mm	2.73-3.72	24.2-32.9
H860N5	H861N4	25.0mm-27.0mm 1.1/64"-1.3/32"	25.0mm-27.0mm 1.1/64"-1.3/32"	25.0mm-27.0mm	4.14-5.52	36.6-48.8
H860N6	H861N5	28.0mm-33.5mm 1.1/8"-1.3/16"	28.0mm-33.5mm 1.1/8"-1.3/16"	28.0mm-33.5mm	4.97-6.63	44.0-58.7
H860N7	H861N6	35.0mm-42.5mm	35.0mm-42.5mm	35.0mm-42.5mm	7.20	63.7

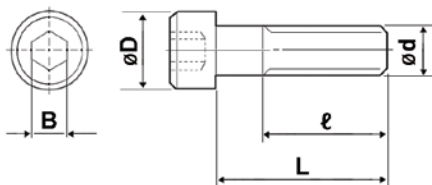
Screws and screw-drivers data



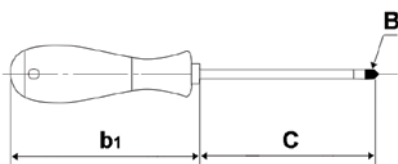
e-code	d	Pitch	L (mm)	l (mm)	D (mm)	B
H860N1	M2.2	0.45	7.5	5.7	3.5	8IP
H860N2	M2.5	0.45	9.0	7.0	4.1	10IP
H860N3	M3.0	0.50	10.5	8.0	4.9	15IP
H860N4	M3.5	0.60	11.5	8.8	5.5	15IP
H860N5	M4.0	0.70	12.5	9.5	6.0	20IP
H860N6	M4.5	0.75	14.3	10.8	6.8	25IP



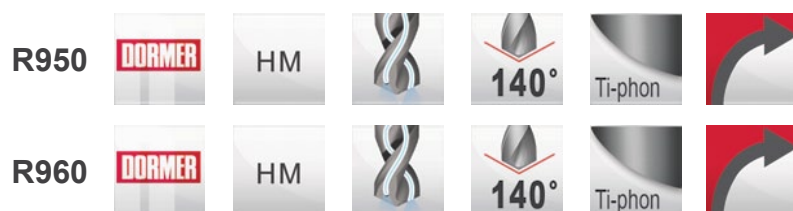
code	B	C	b1
H861N1	8IP	60	104
H861N2	10IP	80	111
H861N3	15IP	80	111
H861N4	20IP	100	118
H861N5	25IP	100	118



e-code	d	Pitch	L (mm)	l (mm)	D (mm)	B
H860N7	M5.0	0.8	15	FULL	8.5	4



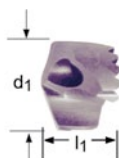
e-code	B	C	b1
H861N6	4	75	111



- ## R950
- Hydra Drill Head for Steel
 - Hydra Drill Head for Steel
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- ## R960
- Hydra Drill Head for Stainless Steel
 - Hydra Drill Head for Stainless Steel
 - Hydra Drill Head for Stainless Steel
 - Hydra Drill Head for Stainless Steel
 - Hydra Drill Head for Stainless Steel
 - Hydra Drill Head for Stainless Steel

R950	▪	1.1	1.2	1.3	1.4	1.5	
	•	1.6					
R960	▪	2.1	2.2	2.3	3.1	3.2	3.3
	•	2.4	4.1	4.2	4.3	5.1	5.2
						5.3	



R950	R960
	
	
15/32 - 42.00	15/32 - 30.50

d ₁ Ø Inch	d ₁ Ø mm	d ₁ decimal Inch	l ₁ mm	R950	R960
15/32	11.91	0.4689	9.1	R95015/32	R96015/32
	12.00	0.4724	9.1	R95012.0	R96012.0
	12.10	0.4764	9.1	R95012.1	R96012.1
	12.20	0.4803	9.1	R95012.2	R96012.2
31/64	12.30	0.4843	9.1	R95031/64	R96031/64
	12.50	0.4921	9.4	R95012.5	R96012.5
	12.60	0.4961	9.4	R95012.6	R96012.6
1/2	12.70	0.5000	9.4	R9501/2	R9601/2
	12.80	0.5039	9.4	R95012.8	R96012.8
	12.90	0.5079	9.4	R95012.9	R96012.9
	13.00	0.5118	9.7	R95013.0	R96013.0
33/64	13.10	0.5157	9.7	R95033/64	R96033/64
	13.20	0.5197	9.7	R95013.2	R96013.2
17/32	13.49	0.5311	9.7	R95017/32	R96017/32
	13.50	0.5315	10.3	R95013.5	R96013.5
	13.60	0.5354	10.3	R95013.6	R96013.6
	13.70	0.5394	10.3	R95013.7	R96013.7
	13.80	0.5433	10.3	R95013.8	R96013.8

d₁ Ø Inch	d₁ Ø mm	d₁ decimal Inch	l₁ mm	R950	R960
35/64	13.89	0.5469	10.3	R95035/64	R96035/64
	14.00	0.5512	10.3	R95014.0	R96014.0
	14.10	0.5551	10.3	R95014.1	R96014.1
	14.20	0.5591	10.3	R95014.2	R96014.2
9/16	14.29	0.5626	10.3	R9509/16	R9609/16
	14.50	0.5709	10.3	R95014.5	R96014.5
	14.60	0.5748	11.0	R95014.6	R96014.6
37/64	14.68	0.5780	11.0	R95037/64	R96037/64
	14.70	0.5787	11.0	R95014.7	R96014.7
	14.80	0.5827	11.0	R95014.8	R96014.8
	15.00	0.5906	11.0	R95015.0	R96015.0
19/32	15.08	0.5937	11.0	R95019/32	R96019/32
	15.10	0.5945	11.0	R95015.1	R96015.1
	15.20	0.5984	11.0	R95015.2	R96015.2
39/64	15.48	0.6094	11.0	R95039/64	R96039/64
	15.50	0.6102	11.0	R95015.5	R96015.5
	15.60	0.6142	11.6	R95015.6	R96015.6
	15.70	0.6181	11.6	R95015.7	R96015.7
5/8	15.88	0.6252	11.6	R9505/8	R9605/8
	16.00	0.6299	11.6	R95016.0	R96016.0
	16.10	0.6339	11.6	R95016.1	R96016.1
	16.20	0.6378	11.6	R95016.2	R96016.2
41/64	16.27	0.6406	11.6	R95041/64	R96041/64
	16.50	0.6496	11.6	R95016.5	R96016.5
	16.60	0.6535	12.2	R95016.6	R96016.6
21/32	16.67	0.6563	12.2	R95021/32	R96021/32
	16.70	0.6575	12.2	R95016.7	R96016.7
	17.00	0.6693	12.2	R95017.0	R96017.0
43/64	17.07	0.6720	12.2	R95043/64	R96043/64
	17.10	0.6732	12.2	R95017.1	R96017.1
	17.20	0.6772	12.2	R95017.2	R96017.2
	17.46	0.6874	12.2	R95011/16	R96011/16
11/16	17.50	0.6890	12.2	R95017.5	R96017.5
	17.60	0.6929	12.9	R95017.6	R96017.6
	17.70	0.6969	12.9	R95017.7	R96017.7
	17.86	0.7031	12.9	R95045/64	R96045/64
45/64	18.00	0.7087	12.9	R95018.0	R96018.0
	18.10	0.7126	12.9	R95018.1	R96018.1
	18.20	0.7165	12.9	R95018.2	R96018.2
	18.26	0.7189	12.9	R95023/32	R96023/32
23/32	18.50	0.7283	12.9	R95018.5	R96018.5
	18.60	0.7323	13.5	R95018.6	R96018.6
	18.65	0.7343	13.5	R95047/64	R96047/64
	18.70	0.7362	13.5	R95018.7	R96018.7
47/64	18.90	0.7441	13.5	R95018.9	R96018.9
	19.00	0.7480	13.5	R95019.0	R96019.0
	19.05	0.7500	13.5	R9503/4	R9603/4
	19.10	0.7520	13.5	R95019.1	R96019.1
3/4	19.20	0.7559	13.5	R95019.2	R96019.2
	19.25	0.7579	13.5	R95019.25	R96019.25
	19.45	0.7657	13.5	R95049/64	R96049/64
	19.50	0.7677	13.5	R95019.5	R96019.5
49/64	19.60	0.7717	14.1	R95019.6	R96019.6
	19.70	0.7756	14.1	R95019.7	R96019.7
	19.84	0.7811	14.1	R95025/32	R96025/32
	20.00	0.7874	14.1	R95020.0	R96020.0
51/64	20.24	0.7969	14.1	R95051/64	R96051/64
	20.50	0.8071	14.1	R95020.5	R96020.5
	20.64	0.8126	14.8	R95013/16	R96013/16
13/16	21.00	0.8268	14.8	R95021.0	R96021.0
	21.03	0.828	14.8	R95053/64	R96053/64
	21.43	0.8437	14.8	R95027/32	R96027/32
53/64	21.50	0.8465	14.8	R95021.5	R96021.5
	21.83	0.8594	15.0	R95055/64	R96055/64
	22.00	0.8661	15.0	R95022.0	R96022.0
7/8	22.22	0.8748	15.0	R9507/8	R9607/8
	22.50	0.8858	15.0	R95022.5	R96022.5
	22.62	0.8906	15.0	R95057/64	R96057/64

d ₁ Ø Inch	d ₁ Ø mm	d ₁ decimal Inch	l ₁ mm	R950	R960
	22.70	0.8937	15.0	R95022.7	R96022.7
	23.00	0.9055	15.1	R95023.0	R96023.0
29/32	23.02	0.9063	15.1	R95029/32	R96029/32
59/64	23.42	0.9220	15.1	R95059/64	R96059/64
	23.50	0.9252	15.1	R95023.5	R96023.5
15/16	23.81	0.9374	15.4	R95015/16	R96015/16
	24.00	0.9449	15.4	R95024.0	R96024.0
61/64	24.21	0.9531	15.4	R95061/64	R96061/64
	24.50	0.9646	15.4	R95024.5	R96024.5
31/32	24.61	0.9689	15.4	R95031/32	R96031/32
	25.00	0.9843	15.8	R95025.0	R96025.0
63/64	25.00	0.9843	15.8	R95063/64	R96063/64
1"	25.40	1.0000	15.8	R9501	R9601
	25.50	1.0039	15.8	R95025.5	R96025.5
	25.65	1.0098	15.8	R95025.65	R96025.65
1.1/64	25.80	1.0157	15.8	R9501.1/64	R9601.1/64
	26.00	1.0236	16.4	R95026.0	R96026.0
1.1/32	26.19	1.0311	16.4	R9501.1/32	R9601.1/32
	26.50	1.0433	16.4	R95026.5	R96026.5
1.3/64	26.59	1.0469	16.4	R9501.3/64	R9601.3/64
1.1/16	26.99	1.0626	17.1	R9501.1/16	R9601.1/16
	27.00	1.0630	17.1	R95027.0	R96027.0
1.5/64	27.38	1.0780	17.1	R9501.5/64	R9601.5/64
	27.50	1.0827	17.1	R95027.5	R96027.5
1.3/32	27.78	1.0937	17.1	R9501.3/32	R9601.3/32
	28.00	1.1024	17.7	R95028.0	R96028.0
1.7/64	28.18	1.1094	17.7	R9501.7/64	R9601.7/64
	28.50	1.1220	17.7	R95028.5	R96028.5
1.1/8	28.58	1.1252	17.7	R9501.1/8	R9601.1/8
1.9/64	28.97	1.1406	18.3	R9501.9/64	R9601.9/64
	29.00	1.1417	18.3	R95029.0	R96029.0
1.5/32	29.37	1.1563	18.3	R9501.5/32	R9601.5/32
	29.50	1.1614	18.3	R95029.5	R96029.5
1.11/64	29.77	1.1720	18.3	R9501.11/64	R9601.11/64
	30.00	1.1811	19.0	R95030.0	R96030.0
1.3/16	30.16	1.1874	19.0	R9501.3/16	R9601.3/16
	30.50	1.2008	19.0	R95030.5	R96030.5
1.7/32	30.96	1.2189	21.0	R9501.7/32	
	31.00	1.2205	21.0	R95031.0	
1.1/4	31.75	1.2500	21.0	R9501.1/4	
	32.00	1.2598	21.0	R95032.0	
	32.50	1.2795	21.0	R95032.5	
1.19/64	32.94	1.2969	21.0	R9501.19/64	
	33.00	1.2992	21.0	R95033.0	
	33.50	1.3189	21.0	R95033.5	
	34.00	1.3386	23.0	R95034.0	
1.11/32	34.13	1.3437	23.0	R9501.11/32	
	34.50	1.3583	23.0	R95034.5	
1.3/8	34.93	1.3752	23.0	R9501.3/8	
	35.00	1.3780	23.0	R95035.0	
	36.00	1.4173	23.0	R95036.0	
1.27/64	36.12	1.4220	23.0	R9501.27/64	
	36.50	1.4370	23.0	R95036.5	
	37.00	1.4567	25.0	R95037.0	
1.15/32	37.31	1.4689	25.0	R9501.15/32	
	37.50	1.4764	25.0	R95037.5	
	38.00	1.4961	25.0	R95038.0	
1.1/2	38.10	1.5000	25.0	R9501.1/2	
	38.50	1.5157	25.0	R95038.5	
1.17/32	38.89	1.5311	25.0	R9501.17/32	
	39.00	1.5354	25.0	R95039.0	
	39.50	1.5551	25.0	R95039.5	
1.9/16	39.69	1.5626	27.0	R9501.9/16	
	40.00	1.5748	27.0	R95040.0	
	41.00	1.6142	27.0	R95041.0	
1.5/8	41.28	1.6252	27.0	R9501.5/8	
	42.00	1.6535	27.0	R95042.0	

H853



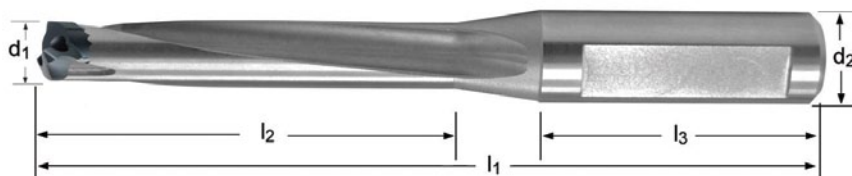
3XD

HSS



H853

- Hydra Body 3xD
- Hydra Body 3xD
- Hydra Body 3xD
- Hydra Body 3xD
- Hydra Body 3xD
- Hydra Body 3xD



Four (4) screws and one (1) screwdriver are included with a drill body
 Lieferung Bohrkörper einschl. vier (4) Schrauben und ein (1) Schraubendreher
 Levering wisselpaatsboor incl. vier (4) schroeven en een (1) schroevendraaier
 Quatre (4) vis et un (1) tournevis sont inclus avec le corps
 Cuatro (4) tornillos y un (1) destornillador incluidos con cada cuerpo
 Quatro (4) parafusos e uma (1) chave estão inclusos com o corpo da broca



	Hydra Body 3xD Metric Shank						Hydra Body 3xD Fractional Shank							
d ₁ Ø	H853 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	H853 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	d ₂ inch	H860 e-Code	H861 e-Code	
15/32 12.00 12.10 12.20 31/64	H85312.0	44.0	105.0	48.0	16.0	H85331/64	44.0	105.0	48.0	15.88	5/8	H860N1	H861N1	
12.50 12.60 1/2 12.80 12.90	H85312.5	44.0	105.0	48.0	16.0	H8531/2	44.0	105.0	48.0	15.88	5/8			
13.00 33/64 13.20 17/32	H85313.0	47.0	110.0	48.0	16.0	H85317/32	47.0	110.0	48.0	15.88	5/8			
13.50 13.60 13.70 13.80 35/64 14.00 14.10 14.20 9/16 14.50	H85314.0	52.5	116.5	48.0	16.0	H8539/16	52.5	116.5	48.0	19.05	3/4			
14.60 37/64 14.70 14.80 15.00 19/32 15.10 15.20 39/64 15.50	H85315.0	55.5	126.5	50.0	20.0	H85339/64	55.5	126.5	50.0	19.05	3/4			

	Hydra Body 3xD Metric Shank						Hydra Body 3xD Fractional Shank							
d ₁ Ø	H853 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm		H853 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	d ₂ inch	H860 e-Code	H861 e-Code
15.60 15.70 5/8 16.00 16.10 16.20 41/64 16.50	H85316.0	59.5	131.5	50.0	20.0		H85341/64	59.5	131.5	50.0	19.05	3/4	H860N2	H861N2
16.60 21/32 16.70 17.00 43/64 17.10 17.20 11/16 17.50	H85317.0	62.5	136.5	50.0	20.0		H85311/16	62.5	136.5	50.0	19.05	3/4		
17.60 17.70 45/64 18.00 18.10 18.20 23/32 18.50	H85318.0	66.5	141.5	50.0	20.0		H85323/32	66.5	141.5	50.0	19.05	3/4		
18.60 47/64 18.70 18.90 19.00 3/4 19.10 19.20 19.25 49/64 19.50	H85319.0	69.5	156.5	56.0	25.0		H85349/64	69.5	156.5	56.0	25.40	1"	H860N3	H861N3
19.60 19.70 25/32 20.00 51/64 20.50	H85320.0	73.5	156.5	56.0	25.0		H85351/64	73.5	156.5	56.0	25.40	1"		
13/16 21.00 53/64 27/32 21.50	H85321.0	76.5	156.5	56.0	25.0		H85327/32	76.5	156.5	56.0	25.40	1"		
55/64 22.00 7/8 22.50 57/64 22.70	H85322.0	80.1	161.5	56.0	25.0		H85357/64	80.1	161.5	56.0	25.40	1"	H860N4	
23.00 29/32 59/64 23.50	H85323.0	82.5	160.5	56.0	25.0		H85359/64	82.5	160.5	56.0	25.40	1"		
15/16 24.00 61/64 24.50 31/32	H85324.0	86.2	170.2	60.0	32.0		H85331/32	86.2	170.2	60.0	25.40	1"		

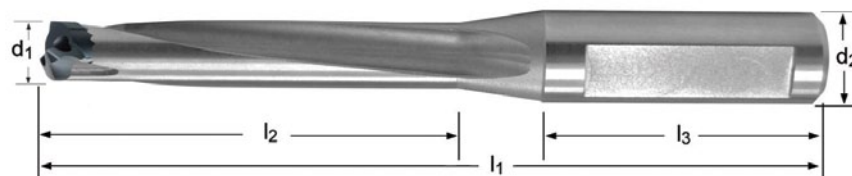
	Hydra Body 3xD Metric Shank					Hydra Body 3xD Fractional Shank							
	H853 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	H853 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	d ₂ inch	H860 e-Code	H861 e-Code
25.00 63/64 1"	H85325.0	88.0	170.0	60.0	32.0	H8531.1/64	88.0	170.0	60.0	31.75	1.1/4	H860N5	H861N4
25.50 25.65 1.1/64													
26.00 1.1/32 26.50 1.3/64													
1.1/16 27.00 1.5/64 27.50 1.3/32	H85327.0	94.0	175.0	60.0	32.0	H8531.3/32	94.0	175.0	60.0	31.75	1.1/4	H860N6	H861N5
28.00 1.7/64 28.50 1.1/8	H85328.0	97.0	180.0	60.0	32.0	H8531.1/8	97.0	180.0	60.0	31.75	1.1/4		
1.9/64 29.00 1.5/32 29.50 1.11/64	H85329.0	100.0	185.0	60.0	32.0	H8531.11/64	100.0	185.0	60.0	31.75	1.1/4		
30.00 1.3/16 30.50	H85330.0	104.0	185.0	60.0	32.0	H8531.3/16	104.0	185.0	60.0	31.75	1.1/4		
1.7/32 31.00 1.1/4 32.00	H85332.0	111.5	196.5	60.0	32.0								
32.50 1.19/64 33.00 33.50	H85333.5	116.5	201.5	60.0	40.0							H860N7	H861N6
34.00 1.11/32 34.50 1.3/8 35.00	H85335.0	121.5	216.5	70.0	40.0								
36.00 1.27/64 36.50	H85336.5	125.5	221.5	70.0	40.0								
37.00 1.15/32 37.50 38.00	H85338.0	131.5	226.5	70.0	40.0								
1.1/2 38.50 1.17/32 39.00 39.50	H85339.5	136.5	231.5	70.0	40.0								
1.9/16 40.00 41.00	H85341.0	146.5	246.5	70.0	40.0								
1.5/8 42.00	H85342.5	151.6	251.6	70.0	40.0								

H855



H855

- Hydra Body 5xD
- Hydra Body 5xD
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- Hydra Body 5xD
- Hydra Body 5xD
- Hydra Body 5xD



Four (4) screws and one (1) screwdriver are included with a drill body
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 Cuatro (4) tornillos y un (1) destornillador incluidos con cada cuerpo
 Quatro (4) parafusos e uma (1) chave estão inclusos com o corpo da broca



	Hydra Body 5xD Metric Shank						Hydra Body 5xD Fractional Shank							
d ₁ Ø	H855 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	H855 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	d ₂ inch	H860 e-Code	H861 e-Code	
15/32 12.00 12.10 12.20 31/64	H85512.0	69.0	130.0	48.0	16.0	H85531/64	69.0	130.0	48.0	15.88	5/8	H860N1	H861N1	
12.50 12.60 1/2 12.80 12.90														
13.00 33/64 13.20 17/32														
13.50 13.60 13.70 35/64 14.00 14.20 9/16 14.50														
14.60 37/64 14.70 14.80 15.00 19/32 15.10 15.20 39/64 15.50														

	Hydra Body 5xD Metric Shank					Hydra Body 5xD Fractional Shank							
	H855 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	H855 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	d ₂ inch	H860 e-Code	H861 e-Code
15.60 15.70 5/8 16.00 16.10 16.20 41/64 16.50	H85516.0	92.5	166.5	50.0	20.0	H85541/64	92.5	166.5	50.0	19.05	3/4	H860N2	H861N2
16.60 21/32 16.70 17.00 43/64 17.10 17.20 11/16 17.50													
17.60 17.70 45/64 18.00 18.10 18.20 23/32 18.50													
18.60 47/64 18.70 18.90 19.00 3/4 19.10 19.20 19.25 49/64 19.50	H85519.0	108.5	191.5	56.0	20.0	H85549/64	108.5	191.5	56.0	25.40	1"	H860N3	H861N3
19.60 19.70 25/32 20.00 51/64 20.50													
13/16 21.00 53/64 27/32 21.50													
55/64 22.00 7/8 22.50 57/64 22.70	H85522.0	125.1	201.1	56.0	25.0	H85557/64	125.1	201.1	56.0	25.40	1"	H860N4	H861N3
23.00 29/32 59/64 23.50													
15/16 24.00 61/64 24.50 31/32													
	H85523.0	129.5	210.5	56.0	25.0	H85559/64	129.5	210.5	56.0	25.40	1"		
	H85524.0	135.2	220.2	60.0	32.0	H85531/32	135.2	220.2	60.0	25.40	1"		

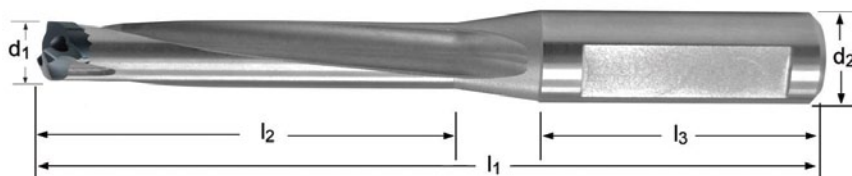
	Hydra Body 5xD Metric Shank					Hydra Body 5xD Fractional Shank							
d_1 Ø	H855 e-Code	l_2 mm	l_1 mm	l_3 mm	d_2 mm	H855 e-Code	l_2 mm	l_1 mm	l_3 mm	d_2 mm	d_2 inch	H860 e-Code	H861 e-Code
25.00 63/64 1"	H85525.0	140.0	225.0	60.0	32.0	H8551.1/64	140.0	225.0	60.0	31.75	1.1/4	H860N5	H861N4
25.50 25.65 1.1/64													
26.00 1.1/32 26.50 1.3/64													
27.00 1.5/64 27.50 1.3/32	H85527.0	151.0	235.0	60.0	32.0	H8551.3/32	151.0	235.0	60.0	31.75	1.1/4	H860N6	H861N5
28.00 1.7/64 28.50 1.1/8	H85528.0	157.0	240.0	60.0	32.0	H8551.1/8	157.0	240.0	60.0	31.75	1.1/4		
29.00 1.5/32 29.50 1.11/64	H85529.0	162.0	245.0	60.0	32.0	H8551.11/64	162.0	245.0	60.0	31.75	1.1/4		
30.00 1.3/16 30.50	H85530.0	167.0	255.0	60.0	32.0	H8551.3/16	167.0	225.0	60.0	31.75	1.1/4		
31.00 1.1/4 32.00	H85532.0	176.5	261.5	60.0	32.0								
32.50 1.19/64 33.00 33.50	H85533.5	186.5	271.5	60.0	40.0								
34.00 1.11/32 34.50 1.3/8 35.00	H85535.0	196.5	291.5	70.0	40.0							H860N7	H861N6
36.00 1.27/64 36.50	H85536.5	201.5	296.5	70.0	40.0								
37.00 1.15/32 37.50 38.00	H85538.0	211.5	306.5	70.0	40.0								
38.50 1.17/32 39.00 39.50	H85539.5	211.5	316.5	70.0	40.0								
40.00 41.00	H85541.0	226.5	325.6	70.0	40.0								
42.00 1.5/8	H85542.5	236.5	336.5	70.0	40.0								

H858



H858

- Hydra Body 8xD
- Hydra Body 8xD
- Hydra Body 8xD
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- Hydra Body 8xD
- Hydra Body 8xD



Four (4) screws and one (1) screwdriver are included with a drill body
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	Hydra Body 8xD Metric Shank							
d ₁ Ø	H858 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	H860 e-Code	H861 e-Code	
13.50	H85814.0	124.5	191.5	48.0	16.0	H860N1	H861N1	
13.60								
13.70								
13.80								
35/64								
14.00								
14.10								
14.20								
9/16								
14.50								
14.60	H85815.0	133.5	201.5	50.0	20.0			
37/64								
14.70								
14.80								
15.00								
19/32								
15.10								
15.20								
39/64								
15.50								

	Hydra Body 8xD Metric Shank							
d ₁ Ø	H858 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	H860 e-Code	H861 e-Code	
15.60 15.70 5/8 16.00 16.10 16.20 41/64 16.50	H85816.0	141.5	211.5	50.0	20.0	H860N2	H861N2	
16.60 21/32 16.70 17.00 43/64 17.10 17.20 11/16 17.50								
17.60 17.70 45/64 18.00 18.10 18.20 23/32 18.50								
18.60 47/64 18.70 18.90 19.00 3/4 19.10 19.20 19.25 49/64 19.50	H85819.0	167.5	251.5	56.0	25.0	H860N3	H861N3	
19.60 19.70 25/32 20.00 51/64 20.50								
21.00 53/64 27/32 21.50								
22.00 7/8 22.50 57/64 22.70	H85822.0	192.1	271.1	56.0	25.0	H860N4		
23.00 29/32 59/64 23.50								
24.00 61/64 24.50 31/32								
	H85823.0	200.5	280.5	56.0	25.0			
	H85824.0	208.2	295.2	60.0	32.0			

	Hydra Body 8xD Metric Shank							
d ₁ Ø	H858 e-Code	l ₂ mm	l ₁ mm	l ₃ mm	d ₂ mm	H860 e-Code	H861 e-Code	
25.00 63/64 1"	H85825.0	217.0	300.0	60.0	32.0	H860N5	H861N4	
25.50								
25.65 1.1/64								
26.00 1.1/32	H85826.0	225.0	310.0	60.0	32.0	H860N5	H861N4	
26.50								
1.3/64								
1.1/16 27.00	H85827.0	234.0	320.0	60.0	32.0	H860N5	H861N4	
1.5/64								
27.50 1.3/32								
28.00 1.7/64	H85828.0	242.0	325.0	60.0	32.00	H860N6	H861N5	
28.50								
1.1/8								
1.9/64 29.00	H85829.0	251.0	335.0	60.0	32.0	H860N6	H861N5	
1.5/32								
29.50 1.11/64								
30.00 1.3/16	H85830.0	259.0	345.0	60.0	32.0	H860N6	H861N5	
30.50								
1.7/32 31.00	H85832.0	271.5	356.5	60.0	32.0			
1.1/4								
32.00								
32.50 1.19/64	H85833.5	286.5	371.5	60.0	40.0	H860N6	H861N5	
33.00								
33.50								
34.00 1.1/32	H85835.0	301.5	396.5	70.0	40.0	H860N7	H861N6	
34.50								
1.3/8 35.00								
36.00 1.27/64	H85836.5	311.5	406.5	70.0	40.0	H860N7	H861N6	
36.50								
37.00 1.15/32	H85838.0	326.5	421.5	70.0	40.0			
37.50								
38.00								
1.1/2 38.50	H85839.5	336.5	431.5	70.0	40.0	H860N7	H861N6	
1.17/32								
39.00 39.50								
1.9/16 40.00	H85841.0	351.5	451.5	70.0	40.0	H860N7	H861N6	
41.00								
1.5/8 42.00								
	H85842.5	361.5	461.5	70.0	40.0			

Drilling Hints & Tips with the *Hydra Drill*

COOLANTS

For maximum chip evacuation and tool performance, coolant use is recommended.

Emulsion coolant concentration of 6 – 8% is recommended for most applications, at a coolant pressure of 20 bar or higher. For high strength steel, stainless steels and tougher drilling applications, use a higher concentration of 10-12%. In these applications, particularly in stainless steels, it is recommended to use the maximum coolant pressure on the machine.

The Hydra-drill coolant holes provide improved web strength and reduce heat at the cutting edges for increased productivity and longer tool life.

HOLDERS

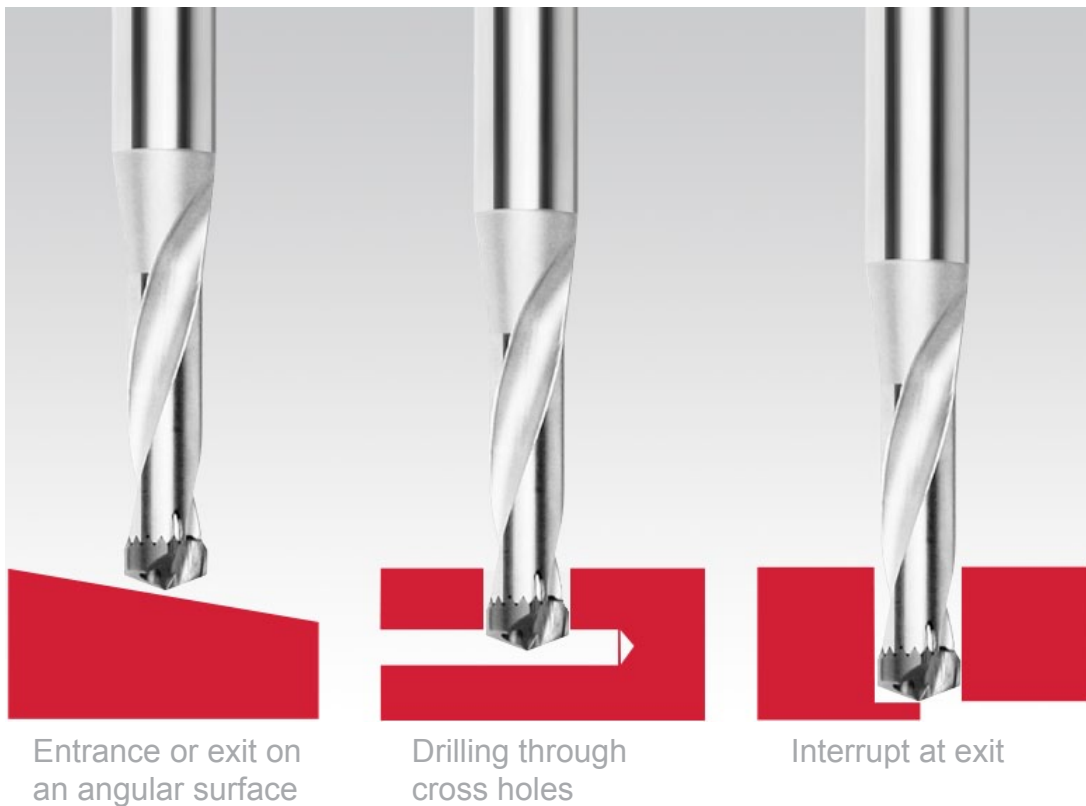
Always use tool holders and collets that provide good concentricity between the drill and the machine spindle. Use a positive stop to prevent the tool from backing up into the holder. Radial runout in the tool assembly must be accurately checked and maintained.

WORKPIECE

A secure and rigid workpiece will minimise deflection, and allow for better accuracy and true position of the hole.

FEEDS

It is important not to underfeed the drill which will cause it to dwell and dull. This is particularly true in work hardening materials. Feed rates should be high enough for proper chip formation.



In these drilling scenarios, reducing feed rate to 1/3 (33%) is generally recommended. Drilling into an entry angle of more than 10° is NOT recommended – surface should be milled flat first.

DORMER

The Right Tool at the Right Time

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