



Multi-Material, Coolant Fed, X-Long Length Drills Technical Information

- RedLine Hole Shot High Performance Drills are designed to give optimal performance in a wide range of materials. Our 142° point is designed to reduce thrust and our flute design stabilizes our drills for better positioning and for a more accurate hole.
- All shanks are manufactured to h6 tolerance, suitable for use in shrink-fit holders.
- Multi-Material, Coolant-Fed, High Performance Drills found on pages 271-274 & 279.

Multi-Material, Solid Carbide, Coolant Fed, X-Long Length Speeds & Feeds

Material	Grades	SFM	Tool Diameter (IPR)					
			5MM	1/4	5/16	3/8	7/16	1/2
			(.1968)	(.2500)	(.0312)	(.3750)	(.0437)	(.5000)
P - Steels								
High Strength Tool Steel	A2, D2, P20, H11, H13, S2, 01	260	.0010-.0035	.0010-.0045	.0020-.0076	.0023-.009	.0025-.0096	.0026-.0100
Low Carbon	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	350	.0035	.0042	.0076	.0090	.0096	.0100
Medium Carbon	1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100	260	.0035	.0045	.0076	.0090	.0096	.0100
M - Stainless Steels								
Austenitic	301-304L, 310, 316L, 321, 347	180	.0035	.0046	.0076	.0090	.0096	.0100
Martensitic	403, 410, 416, 420, 430, 431, 440	125	.0035	.0046	.0076	.0090	.0096	.0100
Precipitation Hardening	12/8, 15/5, 17/4, AM-350/355/363, PH13-8MO, PH14-8/MO	125	.0035	.0046	.0076	.0090	.0096	.0100
K - Cast Irons								
Ductile	A536, J434, 60-40-18	260	.0039	.0047	.0076	.0094	.0100	.0110
Gray	A48, A436, A319, Class 20, G4000	400	.0039	.0047	.0076	.0094	.0100	.0110
Malleable	A220, A602, J158	260	.0039	.0047	.0076	.0094	.0100	.0110
N - Non-Ferrous								
Aluminum Alloys	2014, 2024, 6061, 7075	500	.0030	.0066	.0110	.0120	.0130	.0140
Aluminum High Silicon	A380, A390	350	.0030	.0066	.0110	.0120	.0130	.0140
Brass/Bronze	Aluminum Bronze, Low Silicon Bronze	400	.0035	.0042	.0110	.0130	.0150	.0160
Composites	G-10, Fiberglass, Graphite,Graphite Epoxy, Plastics	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Copper		300	.0035	.0046	.0110	.0130	.0140	.0150
Magnesium		300	.0035	.0046	.0110	.0130	.0140	.0150
S - High Temp Alloys								
Cobalt Base	Stellite, HS-21, Haynes 25/188, X40, L605	80	.0007	.0014	.0025	.0028	.0034	.0040
Iron Base	Incoloy 800-802, Multmet N-155, Timkin 16-25-6, Carpenter 22-b3	60	.0007	.0014	.0025	.0028	.0034	.0040
Nickel Base	Inconel 625/718, Inco 700, 713C, 718, Monel 400-401, 404, K401, Rene, Rene 41 & 95 Hastelloy, Waspoloy, Udimet 500 & 700	80	.0007	.0014	.0025	.0028	.0034	.0040
Titanium	Commercially Pure, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si, Ti-8Al-1Mo, Ti-8Al-4Mo	160	.0020	.0024	.0040	.0050	.0060	.0070

NOTE: Speeds and Feeds listed are estimated and will vary by application.



Multi-Material, Coolant Fed, X-Long Length Drills Deep Hole Drilling Techniques



Step 1

Using a coolant or non-coolant pilot drill, start by producing a hole 1.5 x to 3 x diameter deep. Make sure the pilot drill has a point angle the same as or greater than the deep hole drill. You should run this drill at 100% of the final drill speed and 1/2 the normal feed.

Step 2

Retract, then tool change to the final deep hole drill.

Step 3

Ensuring not to exceed 400 to 500 RPM, rapid to clearance plane and enter the pilot hole at 25% of the final speed and 1 to 2 IPM—this helps with true position by eliminating drill whip. Once into the hole, turn on the coolant and advance to the material start. It is here that you can add a dwell to clear any chips that have been left from the previous drill and let the spindle get to full speed. Increase the speed and feed to final drilling parameters.

Step 4

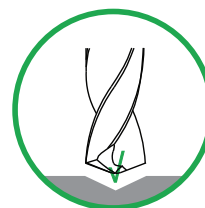
Drill one shot to the final hole depth or through.

Step 5

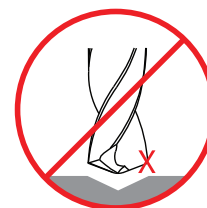
If you experience any squeaking, this could mean that chip packing is occurring. As a result, you may need to retract the drill and increase your feed.

Step 6

Once through the material, reducing the RPM may be required to eliminate breakage of the drill due to drill whip. Now retract to the clearance plane.



CORRECT
Make contact
here with drill



INCORRECT
Do not make
contact here
with drill

Machine Requirements:

High Pressure Pump System (1,000 PSI)
Tool runout of .0003" (.008 mm) Max.