

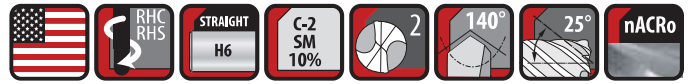
DRILLING RECOMMENDATIONS



Workpiece Material Group	Hardness	IPR												
		Cutting Tool Diameter												
		3/64	1/16	1/8	5/32	3/16	1/4	5/16	3/8	1/2	9/16	5/8	3/4	
		<i>SFM:</i>	405	400	390	380	370	360	350	340	320	300	275	265
Steels	Free Machining & Low Carbon: 10XX, 11XX, 12XX 12LXX, ASTM A27 ASTM A36 ≤ 28 Rc	<i>IPR:</i>	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
	Medium/High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX 51XX, 86XX, 93XX 28 - 38 Rc	<i>IPR:</i>	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
Tool & Die Steels	A2, H13, L6, P20, S7 28 - 44 Rc	<i>SFM:</i>	210	200	200	190	190	185	185	180	180	175	175	170
		<i>IPR:</i>	.0004-.0008	.0008-.0012	.0014-.0030	.0024-.0040	.003-.005	.0035-.0060	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
Stainless Steel	Easy to Machine, 430F, 301, 303, 410, 416 Annealed, 420F, 430 ≤ 28 Rc	<i>SFM:</i>	360	355	350	340	330	320	310	300	275	250	225	200
	Moderately Difficult, 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH ≤ 28 Rc	<i>IPR:</i>	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
	Difficult to Machine, 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics > 28 Rc	<i>IPR:</i>	.0004-.0012	.001-.002	.0020-.0033	.0024-.0035	.0030-.0043	.0031-.0050	.003-.006	.005-.009	.007-.009	.008-.010	.009-.011	.009-.013
Super Alloys	High Temp, Nimonic, Inconel, Monel, Hastelloy ≤ 42 Rc	<i>SFM:</i>	100	90	85	80	75	70	65	60	55	50	45	40
		<i>IPR:</i>	.0004-.0012	.001-.002	.0014-.0033	.0016-.0035	.002-.004	.0023-.0043	.003-.005	.004-.006	.005-.007	.005-.008	.006-.008	.009-.010
	Titanium: Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al ≤ 42 Rc	<i>SFM:</i>	150	140	130	125	120	115	110	105	100	100	90	90
		<i>IPR:</i>	.0004-.0012	.001-.002	.003-.004	.004-.006	.005-.007	.0055-.0080	.006-.009	.007-.010	.008-.011	.008-.010	.010-.014	.011-.015
Cast Iron	Gray: SAE J431, ASTM A48 ≤ 240 HB	<i>SFM:</i>	500	490	480	470	460	430	410	400	390	370	360	350
		<i>IPR:</i>	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015
	Ductile & Malleable, ASTM A536, ASTM 897, ASTM A47, ASTM A220 ASTM A602 > 240 HB	<i>SFM:</i>	300	290	280	270	260	250	240	230	220	210	200	190
		<i>IPR:</i>	.001-.002	.002-.003	.003-.005	.004-.006	.005-.007	.0055-.0080	.006-.009	.007-.010	.008-.011	.009-.014	.010-.014	.011-.015



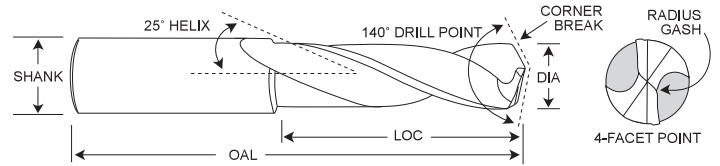
APERTURE^{4X}



nACRo coating provides unrivaled lubricity and temperature reduction

Proprietary drill point technology utilizes a perfected combination of facets, corner breaks, and edge prep to produce the strongest cutting action

4xD perfectly blends the rigidity of 3xD and the versatility of 5xD



DIAMETER TOLERANCE: +0.0000 / -0.0005"

SHANK TOLERANCE: +0.0000 / -0.0005"

SIZE	Dec In	LOC	Shank	OAL	nACRo®
3/64	0.0469	0.281	1/8	1-1/2	434-000469B
#55	0.0520	0.309	0.0520	1-1/2	434-000520B
#54	0.0550	0.325	0.0550	1-1/2	434-000550B
1.5mm	0.0591	8.8mm	3mm	38mm	434-000591B
#53	0.0595	0.348	0.0595	1-1/2	434-000595B
1/16	0.0625	0.363	1/8	1-1/2	434-000625B
#52	0.0635	0.365	0.0635	1-1/2	434-000635B
#50	0.0700	0.399	0.0700	2	434-000700B
#49	0.0730	0.412	0.0730	2	434-000730B
#48	0.0760	0.426	0.0760	2	434-000760B
5/64	0.0781	0.433	1/8	2	434-000781B
2mm	0.0787	10.9mm	3mm	38mm	434-000787B
#46	0.0810	0.446	0.0810	2	434-000810B
#45	0.0820	0.447	0.0820	2	434-000820B
#44	0.0860	0.464	0.0860	2	434-000860B
#43	0.0890	0.476	0.0890	2	434-000890B
#42	0.0935	0.496	0.0935	2	434-000935B
3/32	0.0938	0.492	1/8	2	434-000938B
#41	0.0960	0.499	0.0960	2	434-000960B
#40	0.0980	0.505	0.0980	2	434-000980B
2.5mm	0.0984	12.5mm	3mm	38mm	434-000984B
#39	0.0995	0.507	0.0995	2	434-000995B
#38	0.1015	0.513	0.1015	2	434-001015B
#37	0.1040	0.520	0.1040	2	434-001040B
#36	0.1065	0.527	0.1065	2	434-001065B
7/64	0.1094	0.536	1/8	2	434-001094B
3mm	0.1181	14.1mm	3mm	38mm	434-001181B
#31	0.1200	0.582	0.1200	2	434-001200B
1/8	0.1250	0.600	1/8	2	434-001250B
#30	0.1285	0.610	0.1285	2	434-001285B
#29	0.1360	0.639	0.1360	2	434-001360B
3.5mm	0.1378	15.6mm	4mm	50mm	434-001378B
#28	0.1405	0.653	0.1405	2	434-001405B
9/64	0.1406	0.647	3/16	2	434-001406B
#25	0.1495	0.680	0.1495	2-1/2	434-001495B
5/32	0.1563	0.703	3/16	2-1/2	434-001562B
4mm	0.1575	16.8mm	4mm	50mm	434-001575B
#21	0.1590	0.708	0.1590	2-1/2	434-001590B
#20	0.1610	0.644	0.1610	2-1/2	434-001610B
11/64	0.1719	0.688	3/16	2-1/2	434-001719B
#16	0.1770	0.708	0.1770	2-1/2	434-001770B

DIAMETER TOLERANCE: +0.0000 / -0.0005"

SHANK TOLERANCE: +0.0000 / -0.0005"

SIZE	Dec In	LOC	Shank	OAL	nACRo®
4.5mm	0.1772	18mm	5mm	50mm	434-001772B
3/16	0.1875	0.750	3/16	2-1/2	434-001875B
#11	0.1910	0.764	0.1910	2-1/2	434-001910B
#10	0.1935	0.774	0.1935	2-1/2	434-001935B
5mm	0.1969	20mm	5mm	50mm	434-001969B
#7	0.2010	0.804	0.2010	2-1/2	434-002010B
13/64	0.2031	0.812	1/4	2-1/2	434-002031B
#5	0.2055	0.822	0.2055	2-1/2	434-002055B
#3	0.2130	0.852	0.2130	2-1/2	434-002130B
7/32	0.2188	0.875	1/4	2-1/2	434-002188B
15/64	0.2344	0.938	1/4	2-1/2	434-002344B
6mm	0.2362	24mm	6mm	63mm	434-002362B
1/4	0.2500	1.000	1/4	2-1/2	434-002500B
6.5mm	0.2559	26mm	8mm	75mm	434-002559B
F	0.2570	1.028	0.2570	3	434-002570B
17/64	0.2656	1.062	5/16	3	434-002656B
I	0.2720	1.088	0.2720	3	434-002720B
7mm	0.2756	28mm	8mm	75mm	434-002756B
9/32	0.2813	1.125	5/16	3	434-002812B
7.5mm	0.2953	30mm	8mm	75mm	434-002953B
19/64	0.2969	1.188	5/16	3	434-002969B
5/16	0.3125	1.250	5/16	3	434-003125B
8mm	0.3150	32mm	8mm	75mm	434-003150B
21/64	0.3281	1.313	3/8	3	434-003281B
Q	0.3320	1.328	0.3320	3	434-003320B
8.5mm	0.3346	34mm	10mm	100mm	434-003346B
11/32	0.3438	1.375	3/8	3	434-003438B
9mm	0.3543	36mm	10mm	100mm	434-003543B
23/64	0.3594	1.438	3/8	3	434-003594B
U	0.3680	1.472	0.3680	3	434-003680B
9.5mm	0.3740	38mm	10mm	100mm	434-003740B
3/8	0.3750	1.500	3/8	3	434-003750B
25/64	0.3906	1.563	7/16	4	434-003906B
10mm	0.3937	40mm	10mm	100mm	434-003937B
13/32	0.4063	1.625	7/16	4	434-004063B
10.5mm	0.4134	42mm	12mm	100mm	434-004134B
27/64	0.4219	1.688	7/16	4	434-004219B
11mm	0.4331	44mm	12mm	100mm	434-004331B
7/16	0.4375	1.750	7/16	4	434-004375B
11.5mm	0.4528	46mm	12mm	100mm	434-004528B
29/64	0.4531	1.813	1/2	4	434-004531B
12mm	0.4724	48mm	12mm	100mm	434-004724B
31/64	0.4844	1.938	1/2	4	434-004844B
12.5mm	0.4921	50mm	14mm	100mm	434-004921B
1/2	0.5000	2.000	1/2	4	434-005000B
13mm	0.5118	52mm	14mm	100mm	434-005118B
33/64	0.5156	2.063	9/16	4	434-005156B
17/32	0.5313	2.125	9/16	4	434-005313B
13.5mm	0.5315	54mm	14mm	100mm	434-005315B
35/64	0.5469	2.188	9/16	4	434-005469B
9/16	0.5625	2.250	9/16	4	434-005625B
37/64	0.5781	2.313	5/8	5	434-005781B
19/32	0.5938	2.375	5/8	5	434-005938B
5/8	0.6250	2.500	5/8	5	434-006250B
21/32	0.6563	2.428	3/4	5	434-006563B
11/16	0.6875	2.544	3/4	5	434-006875B
3/4	0.7500	2.775	3/4	5	434-007500B