TrueSize® Carbide Range Reamer

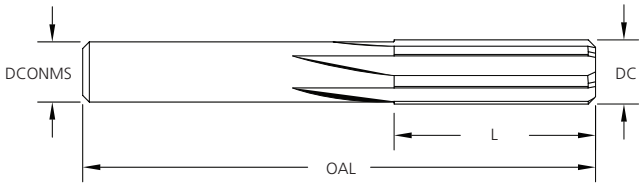
Precision Tolerance OD Series 270P

RHC

- Recommended for precision reaming in most materials.
- Kept in stock as a semi-finished tool. When orders are received tools can be promptly finish ground to the desired diameter. 1 week turn around. (25 piece order maximum).
- Specify size when ordering.
- Right hand cutting.

TrueSize® XP = Xtreme Precision 270P Straight Flute

- Reamer Diameter ≤ .0433" (1.09mm) = No Centers.
- Reamer Diameter .0434"-.1280"(1.10mm - 3.25mm) = Male Centers.
- Reamer Diameter ≥ .1281" (3.26mm) = Female Centers.
- All Diameters with Male Centers, Chamfer Angle = 42° - 44° per side.
- All Diameters without Male Centers, Chamfer Angle = 44° - 46° per side.



Series 270P DC		DCONMS		OAL		L		NOF
Inch	mm	Inch	mm	Inch	mm	Inch	mm	
.0434-.0519	01.10-1.31	.043	1.09	1-1/2	38	3/8	9.5	4
.0520-.0590	01.32-1.49	.046	1.17	1-1/2	38	3/8	9.5	4
.0591-.0660	01.50-1.67	.058	1.47	1-1/2	38	3/8	9.5	4
.0661-.0740	01.68-1.87	.065	1.65	2	51	1/2	12.5	4
.0741-.0810	01.88-2.05	.073	1.85	2	51	1/2	12.5	4
.0811-.0890	02.06-2.26	.080	2.03	2	51	1/2	12.5	4
.0891-.0970	02.27-2.46	.088	2.24	2	51	1/2	12.5	4
.0971-.1050	02.47-2.66	.096	2.44	2-1/2	64	5/8	16	4
.1051-.1130	02.67-2.87	.104	2.64	2-1/2	64	5/8	16	4
.1131-.1210	02.88-3.07	.112	2.84	2-1/2	64	5/8	16	4
.1211-.1280	03.08-3.25	.120	3.05	2-1/2	64	5/8	16	4
.1281-.1360	03.26-3.45	.127	3.23	2-1/2	64	3/4	19	4
.1361-.1440	03.46-3.65	.135	3.43	2-1/2	64	3/4	19	4
.1441-.1520	03.66-3.86	.143	3.63	2-1/2	64	3/4	19	4
.1521-.1590	03.87-4.03	.151	3.84	2-1/2	64	3/4	19	4
.1591-.1670	04.04-4.24	.158	4.01	3	76	7/8	22	4
.1671-.1750	04.25-4.44	.166	4.22	3	76	7/8	22	4
.1751-.1830	04.45-4.64	.174	4.42	3	76	7/8	22	4
.1831-.1910	04.65-4.85	.182	4.62	3	76	7/8	22	4
.1911-.1990	04.86-5.05	.190	4.83	3	76	1	25.5	4
.1991-.2060	05.06-5.23	.198	5.03	3	76	1	25.5	4
.2061-.2140	05.24-5.43	.205	5.21	3	76	1	25.5	4

Inch	
DC	Tolerance
.0434 - .2530	+.0001/+.0000
.2531 - .6350	+.0002/+.0000

Inch	
DCONMS	Tolerance
.0434 - .6350	+.000/-.001
OAL/L	Tolerance
.0434 - .6350	+/- 1/16

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Series 270P DC		DCONMS		OAL		L		NOF
Inch	mm	Inch	mm	Inch	mm	Inch	mm	
.2141-.2220	05.44-5.63	.213	5.41	3	76	1	25.5	4
.2221-.2300	05.64-5.84	.221	5.61	3	76	1	25.5	4
.2301-.2370	05.85-6.01	.229	5.82	3	76	1	25.5	4
.2371-.2450	06.02-6.22	.236	5.99	3	76	1	25.5	4
.2451-.2530	06.23-6.42	.244	6.20	3	76	1	25.5	4
.2531-.2710	06.43-6.88	.252	6.40	3-1/2	89	1-1/8	28.5	6
.2711-.2860	06.89-7.26	.270	6.86	3-1/2	89	1-1/8	28.5	6
.2861-.3020	07.27-7.67	.285	7.24	3-1/2	89	1-1/8	28.5	6
.3021-.3180	07.68-8.07	.301	7.65	3-1/2	89	1-1/8	28.5	6
.3181-.3330	08.08-8.45	.317	8.05	3-1/2	89	1-1/4	32	6
.3331-.3490	08.46-8.86	.332	8.43	3-1/2	89	1-1/4	32	6
.3491-.3640	08.87-9.24	.348	8.84	3-1/2	89	1-1/4	32	6
.3641-.3860	09.25-9.80	.363	9.22	3-1/2	89	1-1/4	32	6
.3861-.4150	09.81-10.54	.380	9.65	3-1/2	89	1-1/4	32	6
.4151-.4450	10.55-11.30	.410	10.41	4	102	1-3/8	35	6
.4451-.4750	11.31-12.06	.440	11.18	4	102	1-3/8	35	6
.4751-.5100	12.07-12.95	.470	11.93	4	102	1-1/2	38	6
.5101-.5400	12.96-13.71	.505	12.83	4	102	1-1/2	38	6
.5401-.5700	13.72-14.47	.535	13.59	4	102	1-1/2	38	6
.5701-.6000	14.48-15.24	.565	14.35	4	102	1-3/4	44.5	6
.6001-.6350	15.25-16.13	.595	15.11	4	102	1-3/4	44.5	6

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TrueSize® Reamer

Troubleshooting Chart

Problem	Possible Solution																		
	Speed & Feed							Tool Geometry							Coolant & Stock Removal				
	Reduce Feed	Increase Feed	Reduce Speed	Increase Speed	Use Larger Reamer	Use Smaller Reamer	Bad Speed & Feed	Worn Tool Margin	Worn Cutting Edge	Uneven Lip Height	Chip Capacity of Reamer	Too Much Clearance	Grind Larger Back Taper	Bent Reamer	Insufficient Stock	Too Much Stock	Use Coolant	Run Dry	Poor Hole Prep
Burnishing		X									X				X				
Reamer Wear	X		X				X									X	X		X
Hole Quality	X		X				X	X	X	X					X	X	X		X
Hole Undersize	X		X		X			X	X						X	X	X		
Hole Oversize		X		X		X		X	X					X		X	X	X	X
Accuracy	X					X				X							X		
Chatter		X	X							X	X	X			X		X		
Out of Round Hole					X			X	X	X	X				X	X	X		
Hole Taper						X		X	X	X			X			X	X		
Bell Mouth		X					X	X	X		X		X	X			X		
Reamer Life		X	X				X			X		X					X		
Scoring in Bore							X	X	X	X					X	X	X		X
Deflection																			

Problem	Possible Solution														
	Set Up									Cutting Errors					
	Alignment	Holder Accuracy	Concentricity	Use Adjustable Holder	Use Floating Holder	Lack of Rigidity in Set-Up	Work Holding Error	Spindle Bearings	Tool Extended Too Far	Poor Regrind	Poor Machinability	Built Up Edge	Wrong Tool	Poor Chip Removal
Burnishing	X						X			X				
Reamer Wear	X	X					X			X	X		X	
Hole Quality	X		X				X			X	X	X	X	
Hole Undersize	X										X			
Hole Oversize	X		X				X			X	X	X	X	
Accuracy							X			X				
Chatter	X	X				X	X	X	X	X				
Out of Round Hole	X						X			X				
Hole Taper	X	X	X	X	X		X			X	X	X		
Bell Mouth	X	X	X	X	X		X			X	X			
Reamer Life	X	X	X			X	X	X	X	X				
Scoring in Bore			X								X	X		X
Deflection	X													

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

TrueSize® Reamer

Total Stock Allowance - **Inch**

Workpiece Material Group		Drill Decimal Equivalent/Size										
		.0135	.029/.028	.055/.052	.113	.238	.3594	.4844	.6094	.7344	.8594	.9844/1.480
		#80	#69/#70	#54/#55	#33	LET "B"	23/64	31/64	39/64	47/64	55/64	63/64
		Reamer Diameter										
		.0150	.0320	.0625	.1250	.2500	.3750	.5000	.6250	.7500	.8750	1.000-1.500
		Total Stock Allowance										
Magnesium		.0014	.0030	.0060	.0110	.0120	.0150	.0160	.0180	.0200	.0210	.0220
Aluminum	< 5%SI	.0014	.0030	.0060	.0110	.0120	.0150	.0160	.0180	.0200	.0210	.0220
	> 5%SI	.0014	.0030	.0060	.0110	.0120	.0130	.0150	.0160	.0180	.0190	.0200
Brass & Soft Bronze	Brass	.0014	.0030	.0060	.0110	.0120	.0130	.0150	.0160	.0180	.0190	.0200
	Bronze	.0014	.0030	.0060	.0110	.0120	.0140	.0150	.0170	.0190	.0200	.0210
Copper & Hard Bronze		.0014	.0030	.0060	.0110	.0120	.0140	.0150	.0170	.0190	.0200	.0210
Cast Iron	Cast	.0013	.0028	.0055	.0099	.0110	.0130	.0140	.0160	.0180	.0190	.0200
	Ductile	.0013	.0028	.0055	.0099	.0110	.0130	.0140	.0150	.0170	.0180	.0190
Steel	< 35% C	.0013	.0028	.0055	.0099	.0110	.0130	.0140	.0160	.0170	.0180	.0190
	> 35% C	.0012	.0025	.0049	.0089	.0100	.0120	.0130	.0150	.0170	.0180	.0190
	Tool	.0012	.0025	.0049	.0089	.0100	.0120	.0130	.0150	.0170	.0180	.0190
	Hard	.0009	.0020	.0040	.0072	.0080	.0100	.0110	.0130	.0140	.0150	.0160
Stainless		.0012	.0025	.0049	.0089	.0100	.0120	.0130	.0150	.0160	.0170	.0180
High Temp Alloys	Soft	.0012	.0025	.0049	.0089	.0100	.0110	.0130	.0140	.0160	.0170	.0180
	Hard	.0010	.0023	.0044	.0081	.0090	.0100	.0120	.0130	.0140	.0150	.0160
Titanium		.0013	.0028	.0055	.0099	.0110	.0130	.0140	.0160	.0170	.0180	.0190

Dowel Pin Chart - **Inch**

Dowel Pin	Nominal Dowel Decimal	Tight Press Fit Reamer		Tight Press Fit Reamer 0.0005		Loose Press Fit Reamer		Tight Slip Fit		Loose Slip Fit Reamer	
Size	Decimal	0.0005	Tool No.	DP(2)	Tool No.	DP(1)	Tool No.	Reamer	Tool No.	OS	Tool No.
1/8	.1250	.1230	27212300	.1245	27212450	.1248	27212480	.1255	27212550	.1260	27212601
3/16	.1875	.1855	27218550	.1870	27218701	.1873	27218730	.1880	27218800	.1885	27218850
1/4	.2500	.2480	27224801	.2495	27224950	.2498	27224980	.2505	27225050	.2510	27225100
5/16	.3125	.3110	27231100	.3120	27231200	.3123	27231230	.3130	27231300	.3135	27231350
3/8	.3750	.3740	27237401	.3745	27237450	.3748	27237480	.3750	27237500	.3760	27237600
7/16	.4375	.4360	27243600	.4370	27243700	.4373	27243730	.4380	27243800	.4385	27243850
1/2	.5000	.4990	27249900	.4995	27249950	.4998	27249980	.5000	27250000	.5010	27250100

+ 0.0001/ +0.0003 Tolerance (Reamer) Normal Dowels are nominal Size +.0001/ -.0001

Safety Note

Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should be fully guarded. Technical data provided should be considered advisory only as variations may be necesary depending on the particular application.

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

TrueSize® Reamer

Total Stock Allowance - **Metric**

Workpiece Material Group		Drill Size (mm)										
		0.30	0.90	1.80	2.70	3.70	4.70	5.70	7.60	9.60	11.60	15.50
		Reamer Diameter										
		0.35	1.00	2.00	3.00	4.00	5.00	6.00	8.00	10.00	12.00	16.00
		Total Stock Allowance										
Magnesium		.04	.09	.19	.27	.29	.29	.30	.34	.38	.40	.46
Aluminum	< 5%SI	.04	.09	.19	.27	.29	.29	.30	.34	.38	.40	.46
	> 5%SI	.04	.09	.19	.27	.29	.29	.30	.32	.34	.37	.41
Brass & Soft Bronze	Brass	.04	.09	.19	.27	.29	.29	.30	.32	.34	.37	.41
	Bronze	.04	.09	.19	.27	.29	.29	.30	.33	.36	.38	.43
Copper & Hard Bronze		.04	.09	.19	.27	.29	.29	.30	.33	.36	.38	.43
Cast Iron	Cast	.03	.09	.17	.24	.26	.27	.28	.31	.33	.35	.41
	Ductile	.03	.09	.17	.24	.26	.27	.28	.31	.33	.35	.38
Steel	< 35% C	.03	.09	.17	.24	.26	.27	.28	.31	.33	.35	.41
	> 35% C	.03	.08	.15	.21	.23	.24	.25	.28	.31	.32	.38
	Tool	.03	.08	.15	.21	.23	.24	.25	.28	.31	.32	.38
	Hard	.02	.06	.12	.17	.19	.19	.20	.23	.26	.27	.33
Stainless		.03	.08	.15	.21	.23	.24	.25	.28	.31	.32	.38
High Temp Alloys	Soft	.03	.08	.15	.21	.23	.24	.25	.27	.29	.32	.36
	Hard	.03	.07	.14	.20	.21	.22	.23	.24	.26	.29	.33
Titanium		.03	.09	.17	.24	.26	.27	.28	.31	.33	.35	.41

Dowel Pin Chart - **Metric**

Dowel Pin	Nominal Dowel Decimal	Tight Press Fit Reamer		Tight Press Fit Reamer 0.013		Loose Press Fit Reamer		Tight Slip Fit		Loose Slip Fit Reamer	
Size (mm)	Decimal	0.013	Tool No.	DP(2)	Tool No.	DP(1)	Tool No.	Reamer	Tool No.	OS	Tool No.
2	0.0787	1.95	27207670	1.98	27207810	1.99	27207850	2.01	27207900	2.02	27207950
3	0.1181	2.95	27211610	2.98	27211750	3.00	27211800	3.01	27211850	3.02	27211900
4	0.1575	3.95	27215550	3.99	27215700	4.00	27215750	4.01	27215800	4.03	27215850
5	0.1969	4.95	27219490	4.99	27219650	5.00	27219690	5.02	27219750	5.03	27219800
6	0.2362	5.95	27223430	5.98	27223550	5.99	27223600	6.01	27223650	6.02	27223700
8	0.3150	7.95	27231300	7.98	27231400	8.00	27231500	8.00	27231500	8.03	27231600
10	0.3937	9.96	27239200	9.98	27239300	10.00	27239370	10.01	27239400	10.03	27239500
12	0.4724	11.96	27247100	11.99	27247200	12.00	27247240	12.01	27247300	12.01	27247300

Tolerance (Reamer) Per DIN 1420 H7 Normal Dowels are nominal size +.0001" / -.0001" (+.0025/-.0025mm)

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

TrueSize® Reamer

Cutting Data - **Inch**

Workpiece Material Group	ISO	Hardness	vc-SFM	Reamer Diameter				
				f-IPR				
				≥ 1/16	> 1/16 - 1/8	> 1/8 - 1/4	> 1/4 - 1/2	> 1/2 - 1
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	200-300	.0005-.0030	.0020-.0060	.0040-.0100	.0060-.0150	.0100-.0300
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	125-200	.0005-.0020	.0020-.0040	.0040-.0060	.0060-.0100	.0100-.0200
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A 128, D2, D3, D4, D5, D7	P	28 to 44 Rc	50-125	.0002-.0010	.0010-.0020	.0020-.0040	.0040-.0060	.0060-.0100
Stainless Steel - Free Machining / Austenitic 304/316	M	up to 28 Rc	120-190	.0005-.0020	.0020-.0040	.0040-.0060	.0060-.0100	.0100-.0200
Stainless Steel - Ferritic / Martensitic	M	up to 28 Rc	80-120					
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	60-100	.0002-.0020	.0010-.0040	.0020-.0060	.0040-.0100	.0060-.0200
Inconel 625/718	S	≤ 40 Rc	40-70	.0002-.0010	.0010-.0020	.0020-.0040	.0040-.0060	.0060-.0100
Stellite / Cobalt Chrome	S	≤ 40 Rc	30-45					
Titanium 6Al-4V	S	≤ 40 Rc	35-50	.0002-.0020	.0010-.0040	.0020-.0060	.0040-.0100	.0060-.0200
Cast Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	150-250	.0002-.0020	.0010-.0040	.0020-.0060	.0040-.0100	.0060-.0200
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	125-200	.0005-.0020	.0020-.0040	.0040-.0060	.0060-.0100	.0100-.0200
Cast Iron - (Martensitic) Hard	K		50-75	.0002-.0010	.0010-.0020	.0020-.0040	.0040-.0060	.0060-.0100
Aluminum/Aluminum Alloys	N		500-1000	.0005-.0030	.0020-.0060	.0040-.0100	.0060-.0150	.0100-.0300
Brass/Bronze Free Machining	N		250-400	.0005-.0020	.0020-.0040	.0040-.0060	.0060-.0100	.0100-.0200
Brass/Bronze (Hard)	N		150-250					
Magnesium/Magnesium Alloys/Plastics/Bakelite Plastic - Glass Filled	N		500-1000	.0005-.0030	.0020-.0060	.0040-.0100	.0060-.0150	.0100-.0300
Copper/Hard Bronze	N		100-150	.0002-.0010	.0010-.0020	.0020-.0040	.0040-.0060	.0060-.0100
Hardened Steels	H	23-32 Rc	125-200	.0005-.0020	.0020-.0040	.0040-.0060	.0060-.0100	.0100-.0200
Hardened Steels	H	32-43 Rc	50-125	.0002-.0010	.0010-.0020	.0020-.0040	.0040-.0060	.0060-.0100
Hardened Steels	H	43-52 Rc	35-50					
Hardened Steels	H	50+ Rc	15-35	.0002-.0010	.0010-.0020	.0020-.0040	.0040-.0060	.0060-.0100

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

TrueSize® Reamer

Cutting Data - **Metric**

Workpiece Material Group	ISO	Hardness	vc-m/min	Reamer Diameter (mm)				
				f-mm/rev				
				≥ 1.5	> 1.5 - 3.0	> 3.0 - 6.0	> 6.0 - 12.0	> 12.0 - 25.0
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	60-90	.010-.080	.050-.150	.100-.250	.150-.380	.250-.760
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	40-60	.010-.050	.050-.100	.100-.150	.150-.250	.250-.510
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A 128, D2, D3, D4, D5, D7	P	28 to 44 Rc	15-40	.010-.030	.030-.050	.050-.100	.100-.150	.150-.250
Stainless Steel - Free Machining / Austenitic 304/316	M	up to 28 Rc	35-60	.010-.050	.050-.100	.100-.150	.150-.250	.250-.500
Stainless Steel - Ferritic / Martensitic	M	up to 28 Rc	25-35					
Stainless Steel - Moderately Difficult 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	20-30	.010-.050	.030-.100	.050-.150	.100-.250	.150-.500
Inconel 625/718	S	≤ 40 Rc	15-20	.010-.030	.030-.050	.050-.100	.100-.150	.150-.250
Stellite / Cobalt Chrome	S	≤ 40 Rc	10-15					
Titanium 6Al-4V	S	≤ 40 Rc	10-15	.010-.050	.030-.100	.050-.150	.100-.250	.150-.500
Cast Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	45-75	.010-.050	.030-.100	.050-.150	.100-.250	.150-.500
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	40-60	.010-.050	.050-.100	.100-.150	.150-.250	.250-.500
Cast Iron - (Martensitic) Hard	K		15-25	.010-.030	.030-.050	.050-.100	.100-.150	.150-.250
Aluminum/Aluminum Alloys	N		150-300	.010-.080	.050-.150	.100-.250	.150-.380	.250-.760
Brass/Bronze Free Machining	N		75-120	.010-.050	.050-.100	.100-.150	.150-.250	.250-.500
Brass/Bronze (Hard)	N		45-75					
Magnesium/Magnesium Alloys/Plastics/Bakelite Plastic - Glass Filled	N		150-300	.010-.080	.050-.150	.100-.250	.150-.380	.250-.760
Copper/Hard Bronze	N		30-45	.010-.030	.030-.050	.050-.100	.100-.150	.150-.250
Hardened Steels	H	23-32 Rc	40-60	.010-.050	.050-.100	.100-.150	.150-.250	.250-.500
Hardened Steels	H	32-43 Rc	15-40	.010-.030	.030-.050	.050-.100	.100-.150	.150-.250
Hardened Steels	H	43-52 Rc	10-15					
Hardened Steels	H	50+ Rc	5-10	.010-.030	.030-.050	.050-.100	.100-.150	.150-.250

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.