

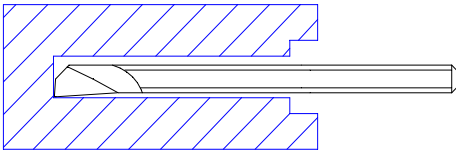
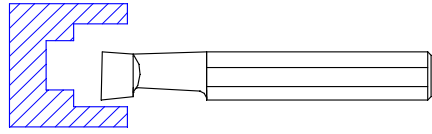
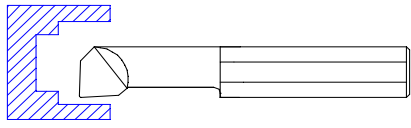
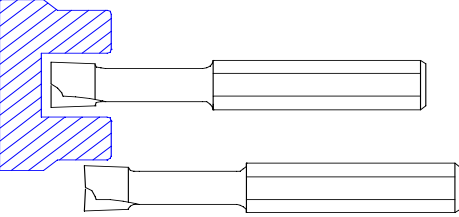
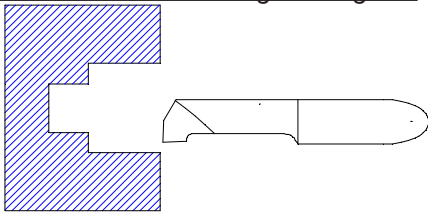
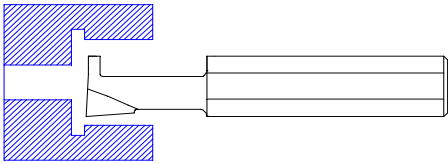
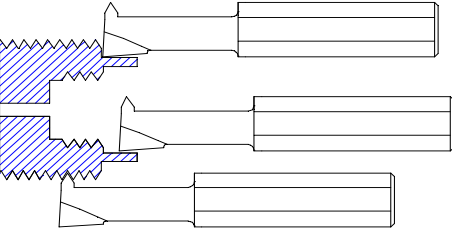
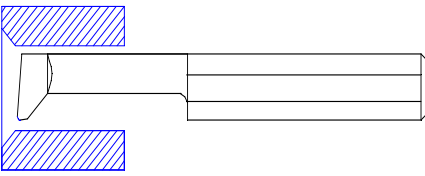
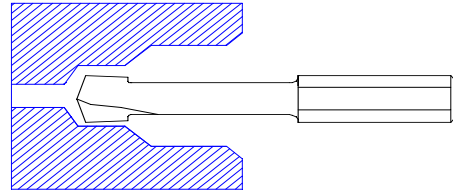
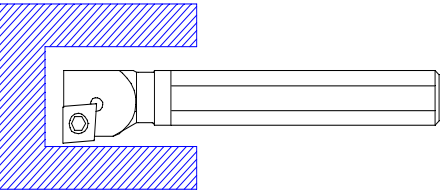
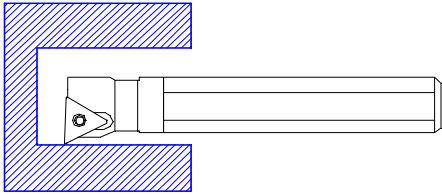
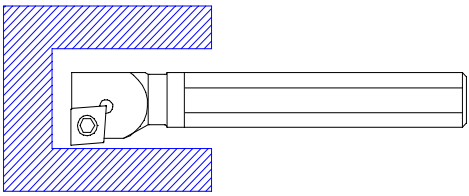
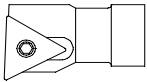
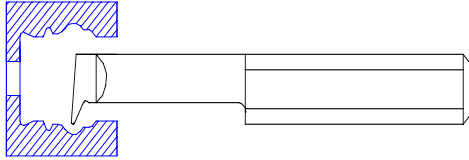
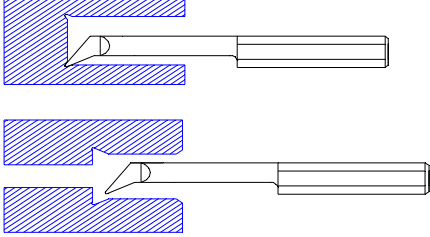
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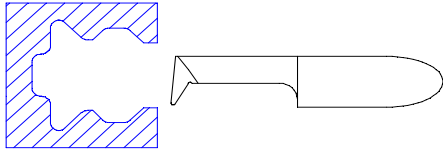
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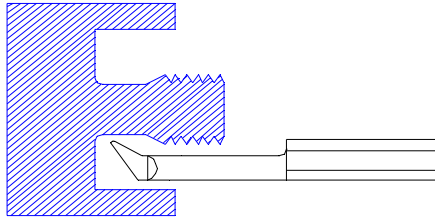
<p><u>SERIES 04 Multi-Reach boring tools</u></p>  <p>APPLICATION: DEEP HOLE BORING</p> <p style="text-align: right;">page 9</p>	<p><u>SERIES 10 Standard boring tool</u></p>  <p>APPLICATION: BORING ALL TYPES OF MATERIALS</p> <p style="text-align: right;">page 6-7</p>	<p><u>SERIES 18 ALTiN coated Max-Bore</u></p>  <p>APPLICATION: BORING TOUGH TO MACHINE MATERIALS. STAINLESS ETC.</p> <p style="text-align: right;">page 8</p>
<p><u>SERIES 54 Double edge bore tools</u></p>  <p>APPLICATION: DRILL, BORE & TURN WITH THE SAME TOOL</p> <p style="text-align: right;">page 11</p>	<p><u>SERIES 42 Quick Change boring tool</u></p>  <p>APPLICATION: BORING ALL TYPES OF MATERIALS</p> <p style="text-align: right;">page 10</p>	<p><u>SERIES 48 Bore & Groove tools</u></p>  <p>APPLICATION: BORE & GROOVE WITH THE SAME TOOL</p> <p style="text-align: right;">page 12</p>
<p><u>SERIES 50 Bore & Thread tools</u></p>  <p>APPLICATION: BORE & THREAD WITH THE SAME TOOL</p> <p style="text-align: right;">page 12</p>	<p><u>SERIES 55 Bore & Back chamfer tools</u></p>  <p>APPLICATION: BORE & BACK CHAMFER WITH THE SAME TOOL</p> <p style="text-align: right;">page 11</p>	<p><u>SERIES 59 Drill & bore tools</u></p>  <p>APPLICATION: DRILL & BORE WITH THE SAME TOOL</p> <p style="text-align: right;">page 11</p>
<p><u>SERIES 12 Diamond Insert Bars</u></p>  <p>APPLICATION: FOR BORING ALUMINUM</p> <p style="text-align: right;">page 18-19</p>	<p><u>SERIES 14 Triangle Insert Bars</u></p>  <p>APPLICATION: IDBORING</p> <p style="text-align: right;">page 14-15</p>	<p><u>SERIES 16 Diamond Insert Bars</u></p>  <p>APPLICATION: FOR BORING STEEL</p> <p style="text-align: right;">page 16-17</p>
<p><u>SERIES 40 Replacment Heads</u></p>  <p>APPLICATION: HEADS & SCREWS</p> <p style="text-align: right;">page 31</p>	<p><u>SERIES 56 Profile tools</u></p>  <p>APPLICATION: I.D. PROFILING</p> <p style="text-align: right;">page 42</p>	<p><u>SERIES 56 R.H. offset profile tools</u></p>  <p>APPLICATION: PROFILING</p> <p style="text-align: right;">page 43</p>

SERIES 42 Quick Change profile tool



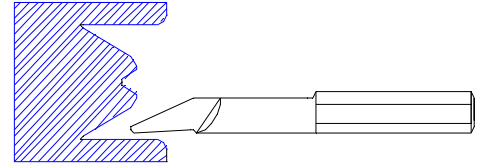
APPLICATION:
PROFILING ALL TYPES
OF MATERIALS page 37

SERIES 56 L.H.offset profile tools



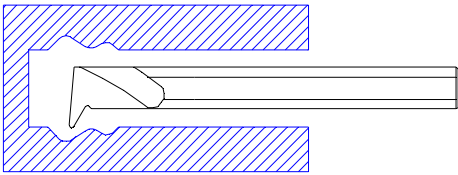
APPLICATION:
LEFT HAND OFFSET PROFILING page 43

SERIES 56 Fine point profile tools



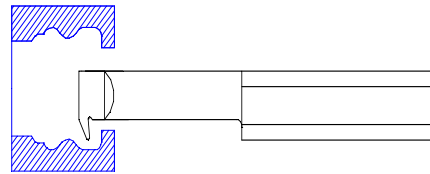
APPLICATION:
FINE POINT PROFILING page 43

SERIES 09 Multi-Reach Profile Tools



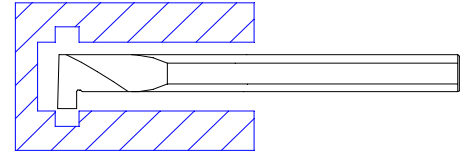
APPLICATION:
DEEP HOLE PROFILING page 42

SERIES 56 Reverse Profile tools



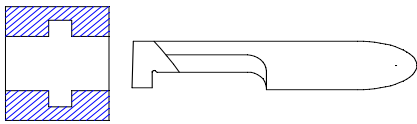
APPLICATION:
I.D. REVERSE PROFILING page 42

SERIES 06 Multi-Reach groove tools



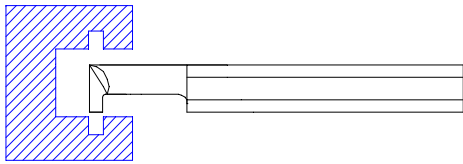
APPLICATION:
DEEP HOLE GROOVING page 22

SERIES 42 Quick Change groove tool



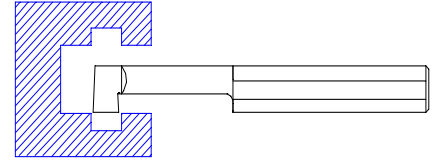
APPLICATION:
GROOVING ALL TYPES
OF MATERIALS page 26

SERIES 22 ALTiN coated Max Groove



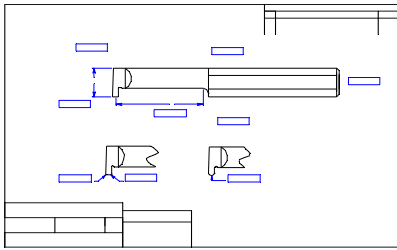
APPLICATION:
GROOVING TOUGH TO MACHINE
MATERIALS. STAINLESS ETC. page 24-25

SERIES 20 Standard grooving tools



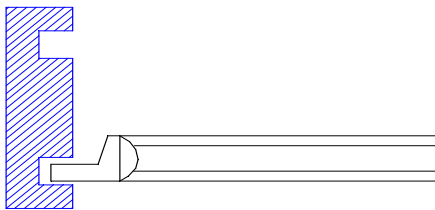
APPLICATION:
GROOVING ALL TYPES OF MATL page 20-21

Groove Tools Made to Order



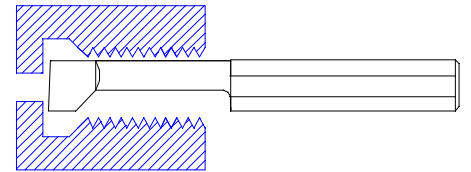
APPLICATION:
SPECIAL GROOVE TOOLS page 28

SERIES 73 Face Grooving Tools



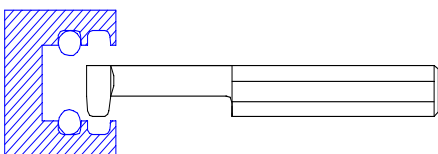
APPLICATION:
FACE GROOVING page 33

SERIES 46 Thread relief tools



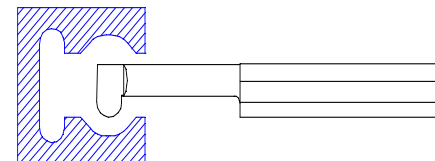
APPLICATION:
BORE A THREAD RELIEF page 36

SERIES 27 O-Ring groove tools



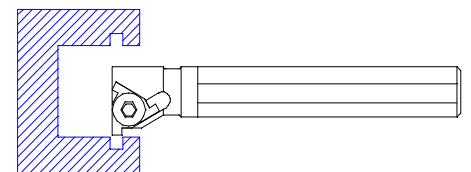
APPLICATION:
GROOVING FOR O'RINGS page 22

SERIES 24 Full radius groove tools

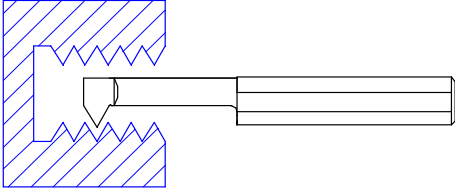
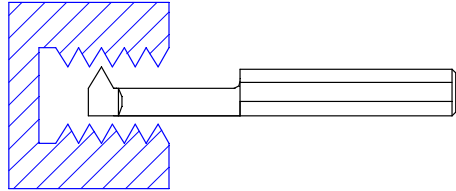
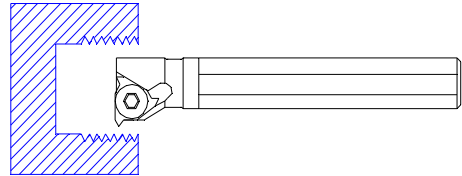
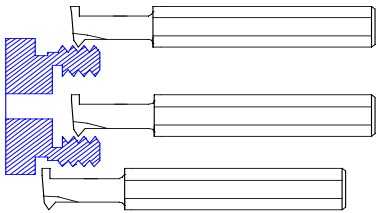
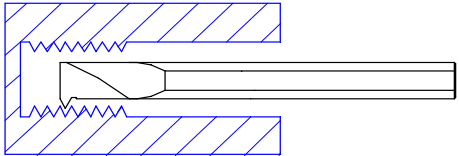
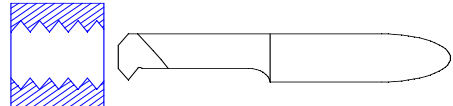
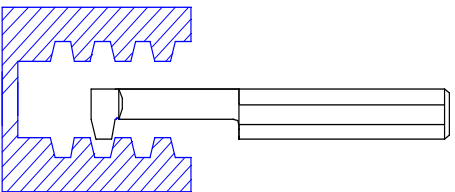

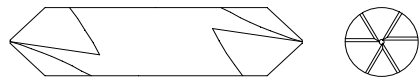
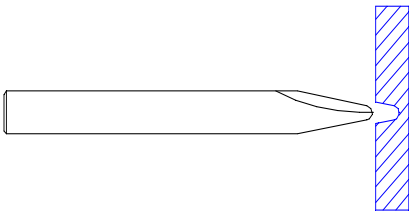
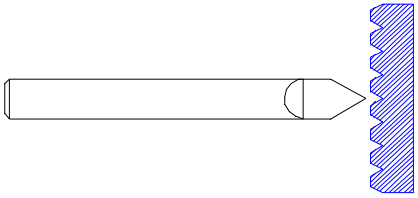
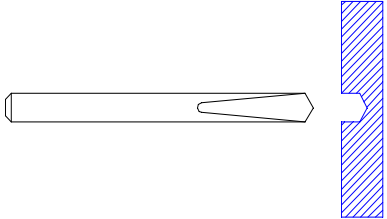
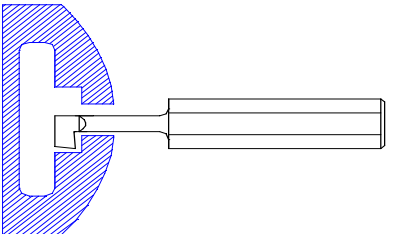
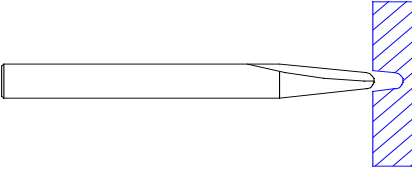



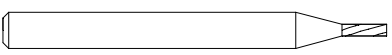
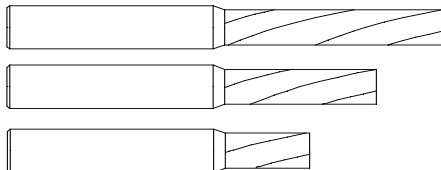
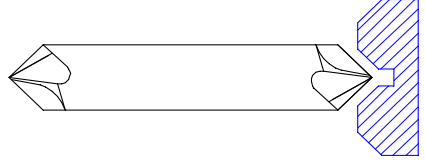
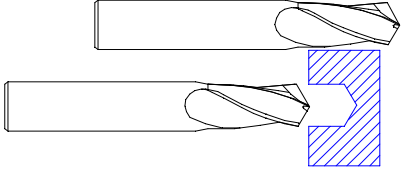
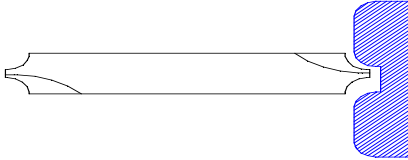
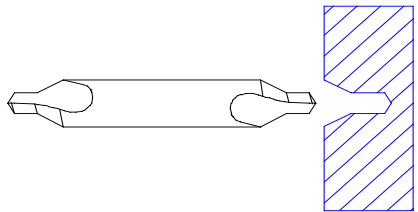
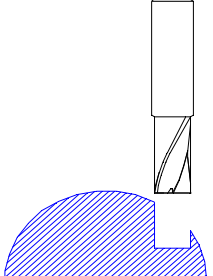
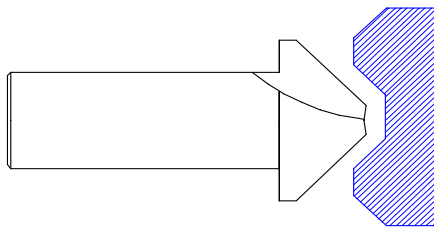
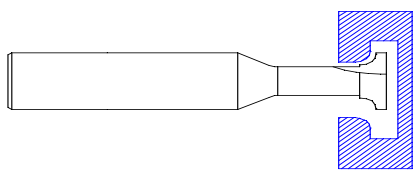
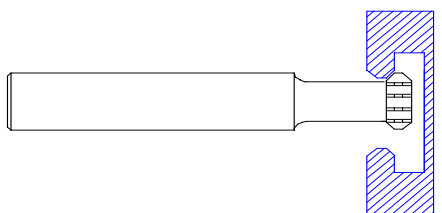
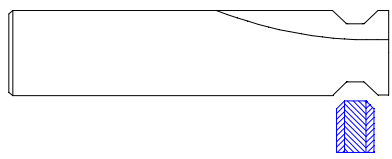

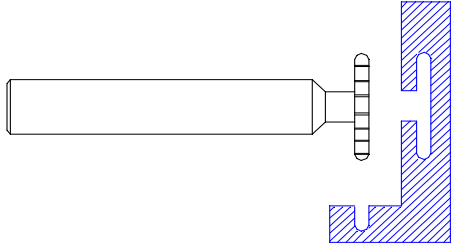
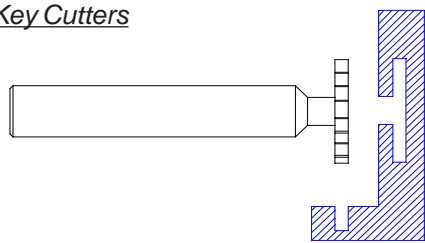
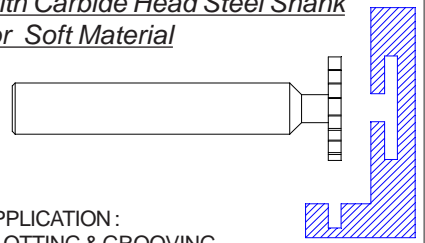
APPLICATION:
GROOVING - PROFILING page 27

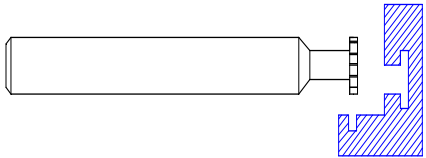
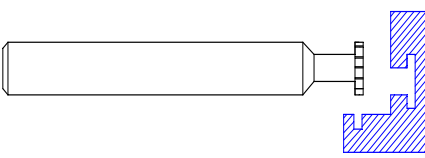
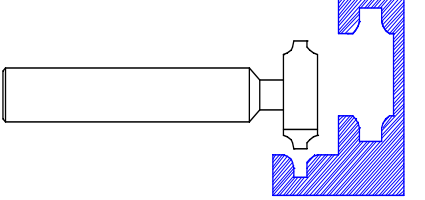
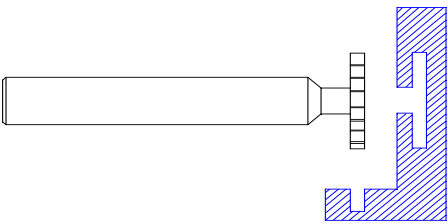
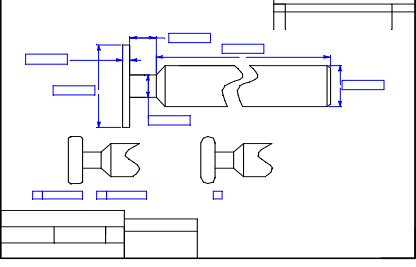
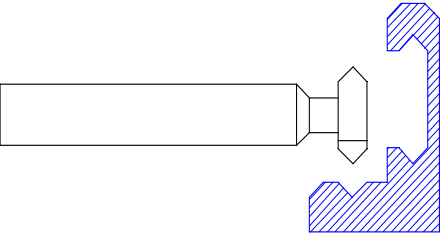
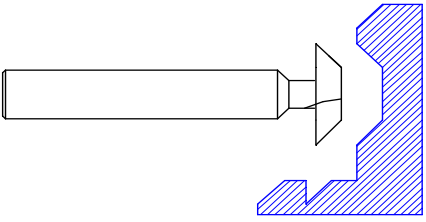
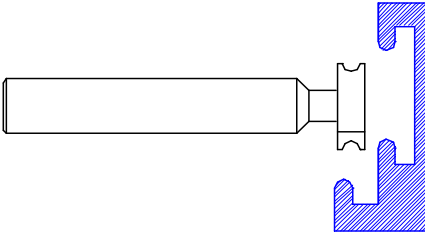
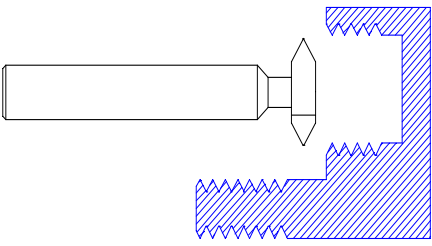
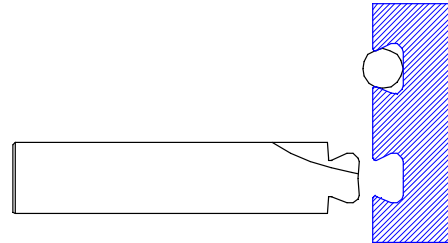
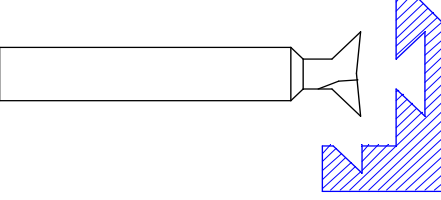
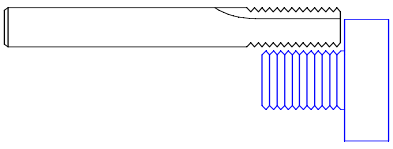
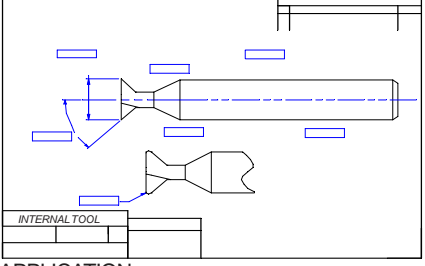
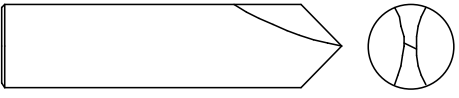
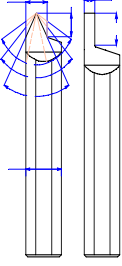
SERIES 26 Insert Grooving Tools



APPLICATION:
INSERT GROOVE TOOL page 30

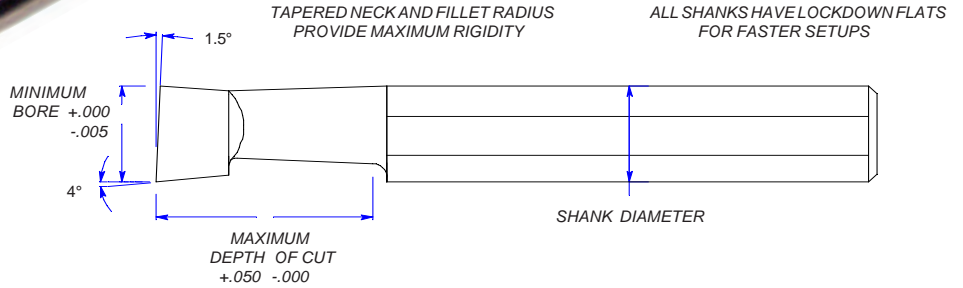
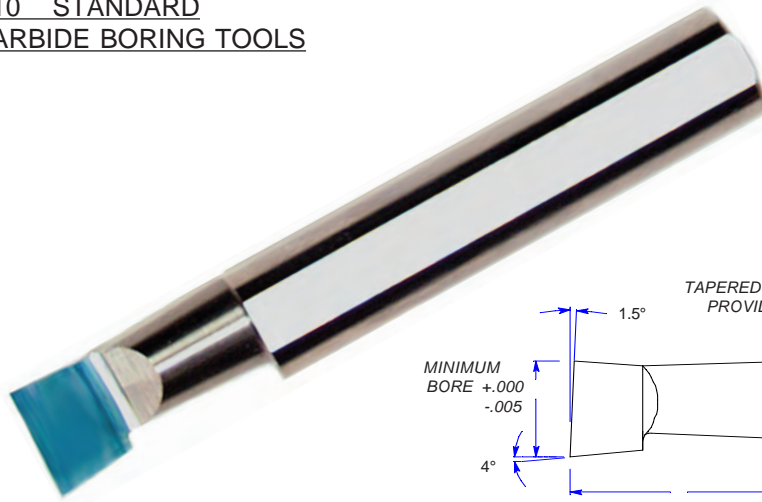
<p><u>SERIES 30 Threading tools</u></p>  <p>APPLICATION: STANDARD I.D. THREADING <i>page 34</i></p>	<p><u>SERIES 31 Left Hand threading tools</u></p>  <p>APPLICATION: LEFT HAND I.D. THREADING <i>page 34</i></p>	<p><u>SERIES 36 Insert Threading Tools</u></p>  <p>APPLICATION: ID INSERT THREADING <i>page 38-40</i></p>
<p><u>SERIES 52 Thread & groove tools</u></p>  <p>APPLICATION: THREAD & GROOVE WITH THE SAME TOOL <i>page 22</i></p>	<p><u>SERIES 08 Multi-Reach threading tools</u></p>  <p>APPLICATION: DEEP HOLE THREADING <i>page 36</i></p>	<p><u>SERIES 42 Quick Change thread tool</u></p>  <p>APPLICATION: THREADING ALL TYPES OF MATERIALS <i>page 36</i></p>
<p><u>SERIES 32 & 34 Acme threading tools</u></p>  <p>APPLICATION: ACME I.D. THREADING <i>page 35</i></p>	<p><u>SERIES 39 external o'ring groove tools</u></p>  <p>APPLICATION: EXTERNAL GROOVE <i>page 29</i></p>	<p><u>SERIES 63 countersinks</u></p>  <p>APPLICATION: COUNTERSINKING <i>page 41</i></p>
<p><u>SERIES 61 Runner cutters</u></p>  <p>APPLICATION: MACHINING RUNNERS IN MOLDS <i>page 41</i></p>	<p><u>SERIES 62 Engraving tools</u></p>  <p>APPLICATION: ENGRAVING, CHAMFERING, C'SINKING <i>page 50-51</i></p>	<p><u>SERIES 58 Spade Drills</u></p>  <p>APPLICATION: DRILLING HARD MATERIALS <i>page 45</i></p>
<p><u>SERIES 66 CNC Backspot facers</u></p>  <p>APPLICATION: CNC BACK SPOT FACING <i>page 52</i></p>	<p><u>SERIES 60 Die Sinkers</u></p>  <p>APPLICATION: TAPERED BALL MILLING <i>page 41</i></p>	<p><u>SERIES 69 TAPERED ENDMILLS</u></p>  <p>APPLICATION: TAPERED MILLING <i>page 46</i></p>

<p><u>SERIES 21 & 41 micro endmills</u></p>  <p>APPLICATION : MILLING SMALL PARTS page 48</p>	<p><u>SERIES 41 Endmills in special lengths and sizes</u></p>  <p>APPLICATION : MILLING SPECIAL PARTS page 49</p>	<p><u>SERIES 64 Chamfer Mills</u></p>  <p>APPLICATION : MILLING ANGLES & CHAMFERS page 54-57</p>
<p><u>SERIES 49 Drill-Mills</u></p>  <p>APPLICATION : DRILL & MILL WITH THE SAME TOOL page 44</p>	<p><u>SERIES 68 Corner Rounders</u></p>  <p>APPLICATION : ROUNDING CORNERS page 58</p>	<p><u>SERIES 71 Center Drills</u></p>  <p>APPLICATION : CENTER DRILLING page 45</p>
<p><u>SERIES 85 N/C C'bores</u></p>  <p>APPLICATION : C'BORING page 93</p>	<p><u>SERIES 81 Anglers</u></p>  <p>APPLICATION : MACHINING LARGE ANGLES page 80</p>	<p><u>SERIES 67 Reverse Corner Rounders</u></p>  <p>APPLICATION : ROUNDING BACK OR INSIDE CORNERS page 53</p>
<p><u>SERIES 65 Edge Breakers</u></p>  <p>APPLICATION : EDGE BREAKING / CHAMFERING page 52</p>	<p><u>SERIES 72 double chamfer cutters</u></p>  <p>APPLICATION : chamfering both sides of a plate page 53</p>	<p><u>SERIES 93 carbide reamers</u></p>  <p>APPLICATION : reaming page 92</p>
<p><u>SERIES 80 Full Radius Key Cutters</u></p>  <p>APPLICATION : FULL RADIUS SLOTS page 75</p>	<p><u>SERIES 78 Carbide Head Key Cutters</u></p>  <p>APPLICATION : SLOTTING & GROOVING page 66-69</p>	<p><u>SERIES 78 Carbide Key Cutters with Carbide Head Steel Shank for Soft Material</u></p>  <p>APPLICATION : SLOTTING & GROOVING SOFT MATERIAL ALUMINUM BRASS PLASTIC ETC page 61</p>

<p>SERIES 76 Solid Carbide Key Cutters</p>  <p>APPLICATION: SLOTting & GROOVING <i>page 62-63</i></p>	<p>SERIES 76 Carbide Key Cutters for Soft Material</p>  <p>APPLICATION: SLOTting & GROOVING SOFT MATERIAL ALUMINUM BRASS PLASTIC ETC <i>page 60</i></p>	<p>SERIES 84 Dbl Concave Cutters</p>  <p>APPLICATION: RADIUS WORK <i>page 78</i></p>
<p>SERIES 78 3/8 Shank Key Cutters</p>  <p>APPLICATION: FOR LIVE TOOLING <i>page 74</i></p>	<p>Carbide Key Cutters Made to Order</p>  <p>APPLICATION: SPECIAL CUTTERS <i>page 79</i></p>	<p>SERIES 92 Double Angle Cutters</p>  <p>APPLICATION: ANGLES & CHAMFERS <i>page 88-89</i></p>
<p>SERIES 90 Single Angle Cutters</p>  <p>APPLICATION: ANGLE CUTS & CHAMFERS <i>page 73</i></p>	<p>SERIES 82 Concave Rad Key Cutters</p>  <p>APPLICATION: RADIUS WORK <i>page 80</i></p>	<p>SERIES 88 Thread Mills</p>  <p>APPLICATION: ID & OD THREADING <i>page 90</i></p>
<p>SERIES 51 O-ring Dovetail Cutters</p>  <p>APPLICATION: FACE GROOVE DOVETAILS <i>page 82</i></p>	<p>SERIES 86 Dovetail Cutters</p>  <p>APPLICATION: DOVETAIL SLOTS & CHAMFERS <i>page 82-85</i></p>	<p>SERIES 89 multiple thread threadmills</p>  <p>APPLICATION: MILL MULTIPLE THREADS IN ONE PASS <i>page 91</i></p>
<p>Dovetail Cutters Made to Order</p>  <p>APPLICATION: SPECIAL DOVETAILS <i>page 86</i></p>	<p>SERIES 75 Spotting Drills</p>  <p>APPLICATION: CENTER DRILLING-C/SINK <i>page 45</i></p>	<p>SERIES 39 external groove and chamfer tools</p>  <p>APPLICATION: EXTERNAL GROOVE AND CHAMFER <i>page 29</i></p>

**SERIES 10 STANDARD
SOLID CARBIDE BORING TOOLS**

**APPLICATION : STANDARD
GENERAL PURPOSE BORING TOOL
FOR BORING ALL TYPES OF MATERIALS**



BORING TOOLS made from ITI CARBIDE

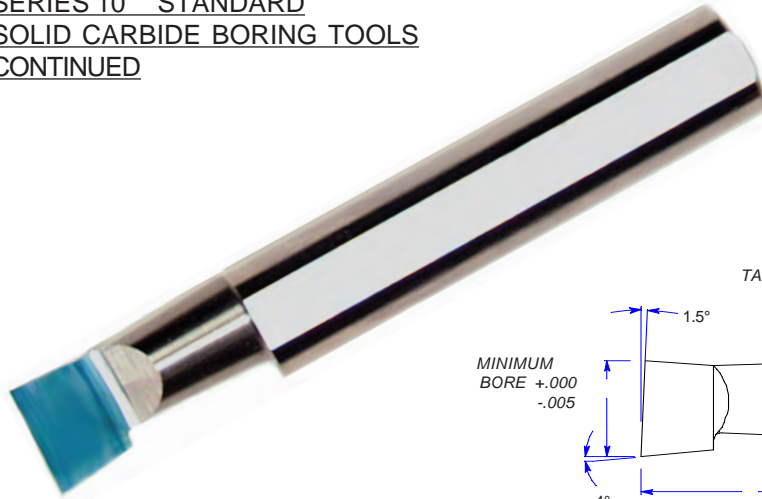
MINIMUM BORE	MAXIMUM DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.050	.150	10-1000	B-050-150	1/8 X 2" O.A.L.
	.200	10-1005	B-050-200	
	.300	10-1010	B-050-300	
	.400	10-1015	B-050-400	
.060	.150	10-1020	B-060-150	1/8 X 2" O.A.L.
	.200	10-1025	B-060-200	
	.300	10-1030	B-060-300	
	.400	10-1035	B-060-400	
	.500	10-1040	B-060-500	
.080	.150	10-1045	B-080-150	1/8 X 2" O.A.L.
	.200	10-1050	B-080-200	
	.300	10-1055	B-080-300	
	.400	10-1060	B-080-400	
	.500	10-1065	B-080-500	
	.600	10-1070	B-080-600	
.100	.150	10-1075	B-100-150	1/8 X 2" O.A.L.
	.200	10-1080	B-100-200	
	.300	10-1085	B-100-300	
	.400	10-1090	B-100-400	
	.500	10-1095	B-100-500	
	.600	10-1100	B-100-600	
	.700	10-1105	B-100-700	
	.800	10-1110	B-100-800	
.110	.150	10-1110	B-110-150	1/8 X 2" O.A.L.
	.200	10-1115	B-110-200	
	.300	10-1120	B-110-300	
	.400	10-1125	B-110-400	
	.500	10-1130	B-110-500	
	.600	10-1135	B-110-600	
	.700	10-1140	B-110-700	
	.800	10-1145	B-110-800	
.120	.250	10-1145	B-120-250	3/16 X 2-1/2" O.A.L.
	.350	10-1150	B-120-350	
	.500	10-1155	B-120-500	
	.600	10-1160	B-120-600	
	.700	10-1165	B-120-700	
	.800	10-1170	B-120-800	

MINIMUM BORE	MAXIMUM DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.140	.250	10-1175	B-140-250	3/16 X 2-1/2" O.A.L.
	.400	10-1180	B-140-400	
	.500	10-1185	B-140-500	
	.600	10-1190	B-140-600	
	.700	10-1195	B-140-700	
	.750	10-1200	B-140-750	
	.800	10-1205	B-140-800	
	.900	10-1210	B-140-900	
.160	.250	10-1210	B-160-250	3/16 X 2-1/2" O.A.L.
	.400	10-1215	B-160-400	
	.500	10-1220	B-160-500	
	.600	10-1225	B-160-600	
	.750	10-1230	B-160-750	
	.900	10-1235	B-160-900	
.180	.350	10-1245	B-180-350	1/4 X 2-1/2" O.A.L.
	.500	10-1250	B-180-500	
	.600	10-1255	B-180-600	
	.750	10-1260	B-180-750	
	.900	10-1265	B-180-900	
	1.000	10-1270	B-180-1000	
	1.100	10-1275	B-180-1100	
	1.200	10-1280	B-180-1200	
.200	.400	10-1280	B-200-400	1/4 X 2-1/2" O.A.L.
	.500	10-1285	B-200-500	
	.600	10-1290	B-200-600	
	.700	10-1295	B-200-700	
	.800	10-1300	B-200-800	
	.900	10-1305	B-200-900	
	1.000	10-1310	B-200-1000	
	1.100	10-1315	B-200-1100	
	1.200	10-1320	B-200-1200	
	1.300	10-1325	B-200-1300	

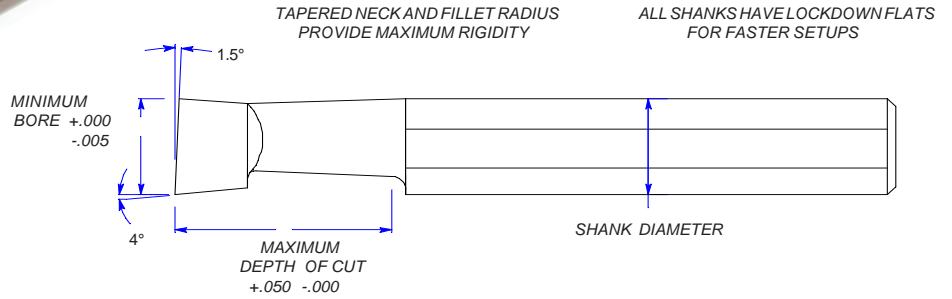
ALL TOOLS ON THIS PAGE ARE AVAILABLE IN LEFT HAND
ADD -LH TO EDP NUMBER WHEN ORDERING
Example : 10-1630-LH

BORING TOOLS

**SERIES 10 STANDARD
SOLID CARBIDE BORING TOOLS
CONTINUED**



APPLICATION : STANDARD
GENERAL PURPOSE BORING TOOL
FOR BORING ALL TYPES OF MATERIALS



BORING TOOLS

made from **ITL CARBIDE**

MINIMUM BORE	MAXIMUM DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.230	.400	10-1330	B-230-400	5/16 X 2-1/2 O.A.L.
	.500	10-1335	B-230-500	
	.600	10-1340	B-230-600	
	.700	10-1345	B-230-700	
	.800	10-1350	B-230-800	
	.900	10-1355	B-230-900	
	1.000	10-1360	B-230-1000	
	1.150	10-1365	B-230-1150	
	1.200	10-1370	B-230-1200	
	1.250	10-1375	B-230-1250	
	1.400	10-1380	B-230-1400	
.290	.500	10-1395	B-290-500	3/8 X 2-1/2" O.A.L.
	.600	10-1400	B-290-600	
	.750	10-1405	B-290-750	
	.900	10-1410	B-290-900	
	1.000	10-1415	B-290-1000	
	1.100	10-1420	B-290-1100	
	1.250	10-1425	B-290-1250	
	1.350	10-1430	B-290-1350	
	1.500	10-1435	B-290-1500	
	1.600	10-1440	B-290-1600	
.320	.500	10-1450	B-320-500	3/8 X 2-1/2" O.A.L.
	.600	10-1455	B-320-600	
	.750	10-1460	B-320-750	
	.900	10-1465	B-320-900	
	1.000	10-1470	B-320-1000	
	1.100	10-1475	B-320-1100	
	1.250	10-1480	B-320-1250	
	1.500	10-1485	B-320-1500	
	1.600	10-1490	B-320-1600	
.320	1.800	10-1495	B-320-1800	3/8 X 4" O.A.L.
	2.000	10-1500	B-320-2000	
	2.500	10-1505	B-320-2500	
	3.000	10-1510	B-320-3000	

MINIMUM BORE	MAXIMUM DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.360	.500	10-1515	B-360-500	3/8 X 2-1/2" O.A.L.
	.600	10-1520	B-360-600	
	.750	10-1525	B-360-750	
	.900	10-1530	B-360-900	
	1.000	10-1535	B-360-1000	
	1.150	10-1540	B-360-1150	
	1.250	10-1545	B-360-1250	
	1.500	10-1550	B-360-1500	
	1.600	10-1555	B-360-1600	
	1.800	10-1560	B-360-1800	
.360	2.000	10-1565	B-360-2000	3/8 X 4" O.A.L.
	2.500	10-1570	B-360-2500	
	3.000	10-1575	B-360-3000	
.490	.750	10-1580	B-490-750	1/2 X 3" O.A.L.
	1.000	10-1585	B-490-1000	
	1.250	10-1590	B-490-1250	
	1.500	10-1595	B-490-1500	
.490	2.000	10-1600	B-490-2000	1/2 X 4" O.A.L.
	2.500	10-1605	B-490-2500	
	2.600	10-1610	B-490-2600	
.490	3.000	10-1615	B-490-3000	1/2 X 6" O.A.L.
	3.500	10-1620	B-490-3500	
	4.000	10-1625	B-490-4000	
	4.500	10-1630	B-490-4500	

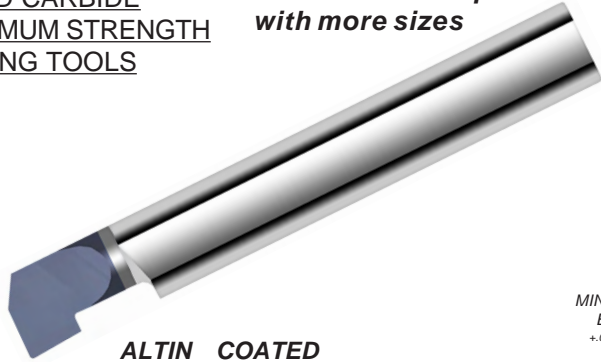
ALL TOOLS ON THIS PAGE ARE AVAILABLE IN LEFT HAND
ADD -LH TO EDP NUMBER WHEN ORDERING
Example : 10-1630-LH

BORING TOOLS

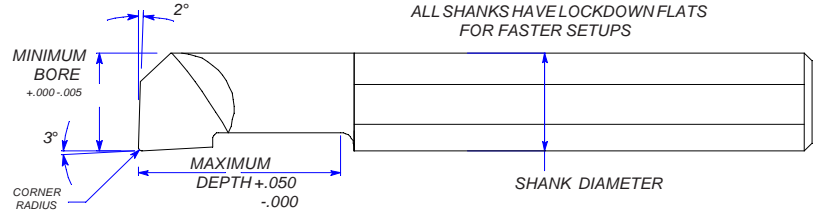
CATALOG TWENTY TWELVE

**SERIES 18 MAX BORE
SOLID CARBIDE
MAXIMUM STRENGTH
BORING TOOLS**

**Series 18 is what used to be our
series 11 now expanded
with more sizes**



**ALTiN COATED
GROUND WITH HELICAL RAKE
ELLIPTICAL NECK FOR GREATER STRENGTH
MAX-BORE BORING TOOLS**



made from **IT** CARBIDE

BORING TOOLS

MINIMUM BORE	ORDER EDP#	TOOL IDENTIFICATION	MAXIMUM DEPTH	CORNER RADIUS	SHANK & OVERALL LENGTH
.050	18-1000	MB-050-200	.200	.007	1/8 X 2" O.A.L.
	18-1005	MB-050-300	.300		
	18-1010	MB-050-400	.400		
.060	18-1015	MB-060-200	.200	.007	1/8 X 2" O.A.L.
	18-1020	MB-060-300	.300		
	18-1025	MB-060-400	.400		
	18-1030	MB-060-500	.500		
.080	18-1035	MB-080-200	.200	.007	1/8 X 2" O.A.L.
	18-1040	MB-080-300	.300		
	18-1045	MB-080-400	.400		
	18-1050	MB-080-500	.500		
	18-1055	MB-080-600	.600		
.090	18-1060	MB-090-400	.400	.007	1/8 X 2" O.A.L.
	18-1065	MB-090-500	.500		
	18-1070	MB-090-600	.600		
.100	18-1075	MB-100-300	.300	.007	1/8 X 2" O.A.L.
	18-1080	MB-100-400	.400		
	18-1085	MB-100-500	.500		
	18-1090	MB-100-600	.600		
	18-1095	MB-100-700	.700		
.110	18-1100	MB-110-300	.300	.007	1/8 X 2" O.A.L.
	18-1105	MB-110-400	.400		
	18-1110	MB-110-500	.500		
	18-1115	MB-110-600	.600		
	18-1120	MB-110-700	.700		
.120	18-1125	MB-120-400	.400	.007	1/8 X 2" O.A.L.
	18-1130	MB-120-500	.500		
	18-1135	MB-120-600	.600		
	18-1140	MB-120-700	.700		
	18-1145	MB-120-800	.800		
.140	18-1150	MB-140-400	.400	.007	3/16 X 2-1/2" O.A.L.
	18-1155	MB-140-500	.500		
	18-1160	MB-140-600	.600		
	18-1165	MB-140-700	.700		
	18-1170	MB-140-800	.800		
	18-1175	MB-140-900	.900		
	18-1180	MB-140-1000	1.000		
18-1185	MB-140-1250	1.250			
.160	18-1190	MB-160-500	.500	.007	3/16 X 2-1/2" O.A.L.
	18-1195	MB-160-600	.600		
	18-1200	MB-160-800	.800		
	18-1205	MB-160-1000	1.000		
	18-1210	MB-160-1250	1.250		

MINIMUM BORE	ORDER EDP#	TOOL IDENTIFICATION	MAXIMUM DEPTH	CORNER RADIUS	SHANK & OVERALL LENGTH
.180	18-1212	MB-180-400	.400	.007	3/16 X 2-1/2" O.A.L.
	18-1215	MB-180-500	.500		
	18-1220	MB-180-600	.600		
	18-1225	MB-180-800	.800		
	18-1230	MB-180-1000	1.000		
.200	18-1235	MB-180-1250	1.250	.007	1/4 X 2-1/2" O.A.L.
	18-1240	MB-180-1500	1.500		
	18-1242	MB-200-400	.400		
	18-1245	MB-200-500	.500		
	18-1250	MB-200-800	.800		
	18-1255	MB-200-1000	1.000		
.240	18-1260	MB-200-1250	1.250	.007	1/4 X 2-1/2" O.A.L.
	18-1265	MB-200-1500	1.500		
	18-1270	MB-200-1750	1.750		
	18-1275	MB-240-500	.500		
	18-1280	MB-240-800	.800		
.290	18-1285	MB-240-1000	1.000	.007	5/16 X 2-1/2" O.A.L.
	18-1290	MB-240-1250	1.250		
	18-1295	MB-240-1500	1.500		
	18-1300	MB-290-750	.750		
	18-1305	MB-290-1000	1.000		
.310	18-1310	MB-290-1250	1.250	.007	5/16 X 2-1/2" O.A.L.
	18-1315	MB-290-1500	1.500		
	18-1320	MB-290-1750	1.750		
	18-1322	MB-310-500	.500		
	18-1325	MB-310-750	.750		
	18-1330	MB-310-1000	1.000		
	18-1335	MB-310-1250	1.250		
.360	18-1340	MB-310-1500	1.500	.015	3/8 X 2-1/2" O.A.L.
	18-1345	MB-310-1750	1.750		
	18-1350	MB-360-500	.500		
	18-1355	MB-360-750	.750		
	18-1360	MB-360-1000	1.000		
.490	18-1365	MB-360-1250	1.250	.015	1/2 X 2-1/2" O.A.L.
	18-1370	MB-360-1500	1.500		
	18-1375	MB-490-750	.750		
	18-1380	MB-490-1000	1.000		
	18-1385	MB-490-1250	1.250		
18-1390	MB-490-1500	1.500			

SERIES 91 PLASTIC BORE
CARBIDE BORING TOOLS MADE FOR CUTTING PLASTICS

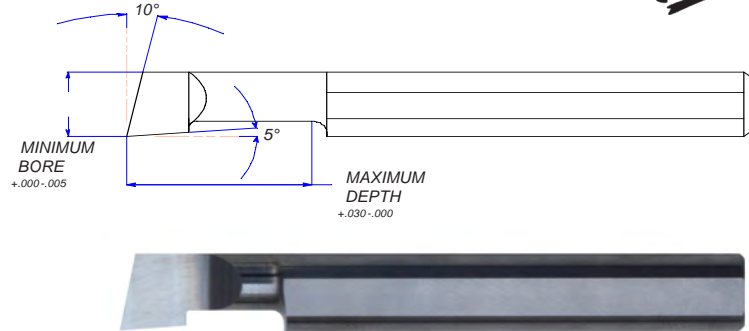
APPLICATION : **CLEARANCE AND RELIEF ANGLES**
FOR CUTTING PLASTIC

PLASTIC CUTTING BORING TOOLS

SERIES 91 *made from* **ITI CARBIDE**

New!

MINIMUM BORE	ORDER EDP#	MAXIMUM DEPTH	SHANK & OVERALL LENGTH
.120	91-1000	.250	1/8 X 2" O.A.L.
	91-1010	.500	
	91-1020	.800	
.180	91-1030	.500	3/16 X 2-1/2" O.A.L.
	91-1040	.750	
	91-1050	1.250	
.240	91-1060	.500	1/4 X 2-1/2" O.A.L.
	91-1070	.750	
	91-1080	1.250	
.370	91-1090	.500	3/8 X 2-1/2" O.A.L.
	91-1100	.750	
	91-1110	1.250	
.490	91-1120	.750	1/2 X 3" O.A.L.
	91-1130	1.000	
	91-1140	1.500	



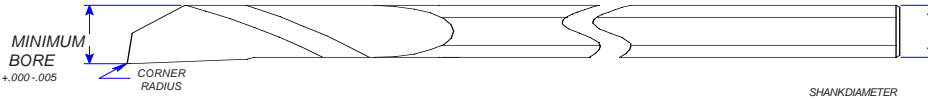
SERIES 04 LONG REACH CARBIDE BORING TOOLS
SERIES 04 *made from* **ITI CARBIDE**

APPLICATION : **MULTI-REACH BORING**
NO LONGER LIMITED BY NECK LENGTH.
ONE TOOL REPLACES A SERIES OF OTHERS.

MULTI-REACH BORING TOOLS

MINIMUM BORE	ORDER EDP#	ALTiN COATED ORDER EDP#	SHANK DIAMETER	CORNER RADIUS	SHANK LENGTH
.220	04-1095	04-1095-C	3/16"	.005	4"
.280	04-1100	04-1100-C	1/4"	.007	4"
.350	04-1110	04-1110-C	5/16"	.007	4"
.420	04-1120	04-1120-C	3/8"	.010	6"
.560	04-1130	04-1130-C	1/2"	.010	6"
.700	04-1140	04-1140-C	5/8"	.015	6"

SOLID CARBIDE SHANKS PROVIDE MAXIMUM RIDGIDITY.



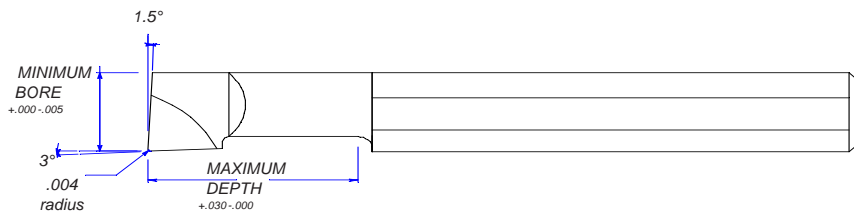
CBN AND PCD TIPPED BORING TOOLS

APPLICATION : **CBN** for hard ferrous materials 45 rc and harder.
PCD for abrasive non ferrous materials.

New!

SERIES 108

MINIMUM BORE	CBN EDP#	PCD EDP#	MAXIMUM DEPTH	SHANK & OVERALL LENGTH
.120	108-1000	108-5000	.250	1/8 X 2" O.A.L.
	108-1050	108-5050	.500	
	108-1100	108-5100	.800	
.180	108-1150	108-5150	.500	3/16 X 2-1/2" O.A.L.
	108-1200	108-5200	.750	
	108-1250	108-5250	1.250	
.240	108-1300	108-5300	.500	1/4 X 2-1/2" O.A.L.
	108-1350	108-5350	.750	
	108-1400	108-5400	1.250	
.370	108-1450	108-5450	.500	3/8 X 2-1/2" O.A.L.
	108-1500	108-5500	.750	
	108-1550	108-5550	1.250	
.490	108-1600	108-5600	.750	1/2 X 3" O.A.L.
	108-1650	108-5650	1.000	
	108-1700	108-5700	1.500	



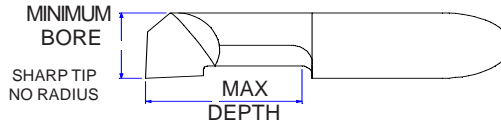
SERIES 42 QUICK CHANGE BORE
SOLID CARBIDE
HIGH PRODUCTION
BORING TOOL TIPS

ALL THE DETAIL AND QUALITY FROM OUR STANDARD LINE
LESS EXPENSIVE QUICK CHANGE STYLE
NEW FEATURE - AXIAL RAKE FOR FASTER FREER CUTTING
QUICK CHANGE - REPLACE TOOLS QUICKLY AND ACCURATELY

**QUICK CHANGE
BORING TOOLS**

made from **ITI CARBIDE**

MINIMUM BORE	MAX DEPTH	ORDER EDP#	ALTIN COATED EDP#
.020	.050	42-0970	42-0970-C
	.080	42-0975	42-0975-C
.030	.100	42-0980	42-0980-C
	.150	42-0985	42-0985-C
.040	.200	42-0990	42-0990-C
	.300	42-0995	42-0995-C
.050	.200	42-1000	42-1000-C
	.300	42-1005	42-1005-C
.060	.200	42-1010	42-1010-C
	.300	42-1015	42-1015-C
	.400	42-1020	42-1020-C
	.500	42-1025	42-1025-C
.080	.200	42-1030	42-1030-C
	.300	42-1035	42-1035-C
	.400	42-1040	42-1040-C
	.500	42-1045	42-1045-C
.100	.200	42-1050	42-1050-C
	.300	42-1055	42-1055-C
	.400	42-1060	42-1060-C
	.500	42-1065	42-1065-C
.120	.600	42-1070	42-1070-C
	.700	42-1075	42-1075-C
	.200	42-1080	42-1080-C
	.300	42-1085	42-1085-C
.140	.400	42-1090	42-1090-C
	.500	42-1095	42-1095-C
	.600	42-1100	42-1100-C
	.700	42-1105	42-1105-C



MINIMUM BORE	MAX DEPTH	ORDER EDP#	ALTIN COATED EDP#
.140	.200	42-1110	42-1105-C
	.300	42-1115	42-1110-C
	.400	42-1120	42-1115-C
	.500	42-1125	42-1120-C
	.600	42-1130	42-1125-C
	.700	42-1135	42-1130-C
.160	.200	42-1140	42-1135-C
	.300	42-1145	42-1140-C
	.400	42-1150	42-1145-C
	.500	42-1155	42-1150-C
	.600	42-1160	42-1155-C
	.700	42-1165	42-1160-C
	.800	42-1170	42-1165-C
.180	.900	42-1175	42-1170-C
	1.000	42-1180	42-1175-C
	1.100	42-1185	42-1180-C
	.200	42-1190	42-1185-C
	.300	42-1195	42-1190-C
.200	.400	42-1200	42-1195-C
	.500	42-1205	42-1200-C
	.600	42-1210	42-1205-C
	.700	42-1215	42-1210-C
	.800	42-1220	42-1215-C
	.900	42-1225	42-1220-C
	1.000	42-1230	42-1225-C
	1.100	42-1235	42-1230-C



**QUICK CHANGE
HOLDERS**

HOLDERS ARE AVAILABLE WITH
3/8, 1/2, 5/8, & 3/4 SHANK SIZES.
STANDARD STYLE

- 3/8" SHANK EDP# 42-9000
- 1/2" SHANK EDP# 42-9005
- 5/8" SHANK EDP# 42-9010
- 3/4" SHANK EDP# 42-9015
- 22 MM SHANK EDP# 42-9020

COOLANT HOLE STYLE

- 3/8" SHANK EDP #42-9500
- 1/2" SHANK EDP #42-9505
- 5/8" SHANK EDP #42-9510
- 3/4" SHANK EDP #42-9515
- 22 MM SHANK EDP #42-9520

EXTRA SCREW EDP# 42-8888

BORING TOOLS

SERIES 19 ALUMINUM BORE
SOLID CARBIDE FOR ALUMINUM

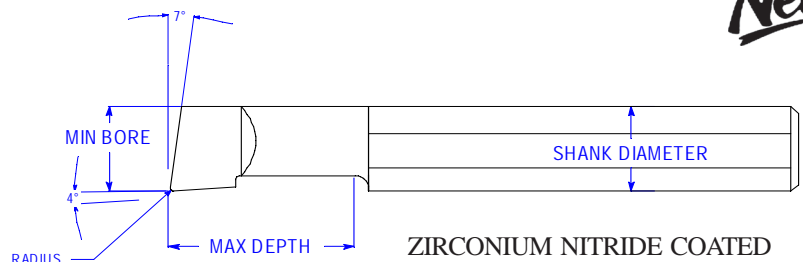
ALUMINUM CUTTING BORING TOOLS

made from **ITI CARBIDE**

APPLICATION : CLEARANCE AND RELIEF ANGELS
FOR CUTTING ALUMINUM

New!

MINIMUM BORE	ORDER EDP#	MAXIMUM DEPTH	CORNER RADIUS	SHANK & OVERALL LENGTH
.120	19-1200	.250	.007	1/8" X 2" O.A.L.
	19-1250	.500		
	19-1290	.800		
.180	19-1300	.500	.007	3/16" X 2-1/2" O.A.L.
	19-1350	.750		
	19-1390	1.250		
.240	19-1400	.500	.007	1/4" X 2-1/2" O.A.L.
	19-1450	.750		
	19-1490	1.250		
.370	19-1500	.500	.015	3/8" X 2-1/2" O.A.L.
	19-1550	.750		
	19-1590	1.250		
.490	19-1600	.750	.015	1/2" X 3" O.A.L.
	19-1650	1.000		
	19-1690	1.500		



**SERIES 55 BORE & BACK CHAMFER
SOLID CARBIDE**

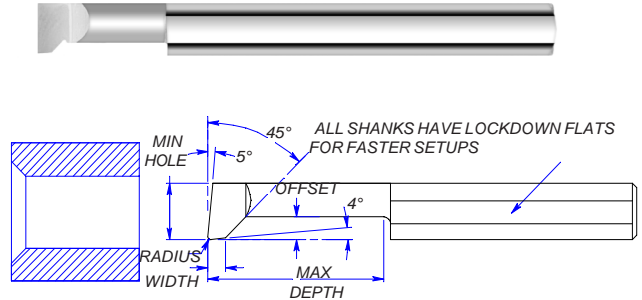
made from **IT** CARBIDE

BORE & BACK CHAMFER TOOLS

MIN HOLE	WIDTH	OFFSET	RADIUS	MAX DEPTH	ORDER EDP#	ALTIM COATED EDP#	SHANK & OVERALL LENGTH
1/8	.050	.045	.015	.300	55-1100	55-1100-C	1/8 X 2" O.A.L.
				.500	55-1105	55-1105-C	
3/16	.060	.050	.015	.400	55-1110	55-1110-C	3/16 X 2-1/2 O.A.L.
				.800	55-1115	55-1115-C	
1/4	.080	.060	.015	.500	55-1120	55-1120-C	1/4 X 2-1/2 O.A.L.
				1.000	55-1125	55-1125-C	
5/16	.080	.080	.020	.750	55-1130	55-1130-C	5/16 X 2-1/2 O.A.L.
				1.250	55-1135	55-1135-C	
3/8	.100	.120	.020	.750	55-1140	55-1140-C	3/8 X 2-1/2 O.A.L.
				1.250	55-1145	55-1145-C	
1/2	.110	.130	.030	1.000	55-1150	55-1150-C	1/2 X 3" O.A.L.
				1.500	55-1155	55-1155-C	

APPLICATION :

**BORING
RELIEVING
PROFILING
BORE YOUR HOLE THEN MOVE
OVER & REMOVE THE BURR ON
THE BACKSIDE OF THE HOLE**



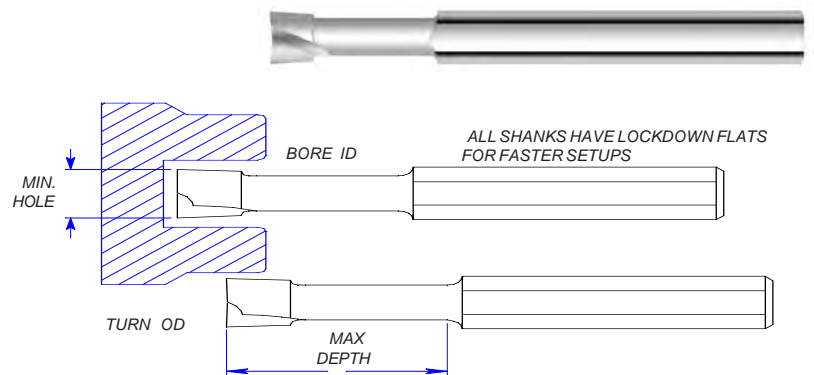
SERIES 54 DOUBLE EDGE SOLID CARBIDE

DOUBLE EDGE BORING TOOLS

MIN HOLE	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
1/4	.500	54-1100	DB-240-500	1/4 X 2-1/2 O.A.L.
	.750	54-1105	DB-240-750	
	1.000	54-1110	DB-240-1000	
5/16	.500	54-1115	DB-310-500	5/16 X 2-1/2 O.A.L.
	.750	54-1120	DB-310-750	
	1.000	54-1125	DB-310-1000	
3/8	.500	54-1130	DB-360-500	3/8 X 2-1/2 O.A.L.
	.750	54-1135	DB-360-750	
	1.000	54-1140	DB-360-1000	
1/2	.500	54-1145	DB-490-500	1/2 X 3" O.A.L.
	.750	54-1150	DB-490-750	
	1.000	54-1155	DB-490-1000	

made from **IT** CARBIDE

APPLICATION : **DRILL, BORE, AND
TURN ALL WITH THE SAME TOOL.**



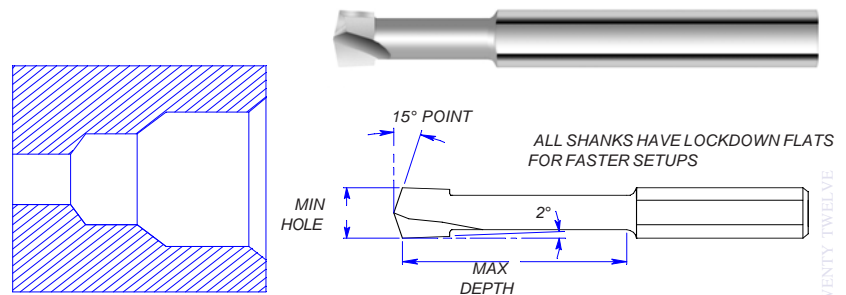
SERIES 59 DRILL & BORE SOLID CARBIDE

DRILL & BORE TOOLS

MIN HOLE	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
1/4	.500	59-1200	DBO-250-500	1/4 X 2-1/2 O.A.L.
	.750	59-1205	DBO-250-750	
	1.000	59-1210	DBO-250-1000	
5/16	.500	59-1215	DBO-312-500	5/16 X 2-1/2 O.A.L.
	.750	59-1220	DBO-312-750	
	1.000	59-1225	DBO-312-1000	
3/8	.500	59-1230	DBO-375-500	3/8 X 2-1/2 O.A.L.
	.750	59-1235	DBO-375-750	
	1.000	59-1240	DBO-375-1000	
1/2	.500	59-1245	DBO-500-500	1/2 X 3" O.A.L.
	.750	59-1250	DBO-500-750	
	1.000	59-1255	DBO-500-1000	

made from **IT** CARBIDE

APPLICATION : **DRILL, BORE, AND TURN ALL WITH THE SAME TOOL.
FEATURING A DRILL POINT FOR FASTER, STRAIGHTER CUTTING**



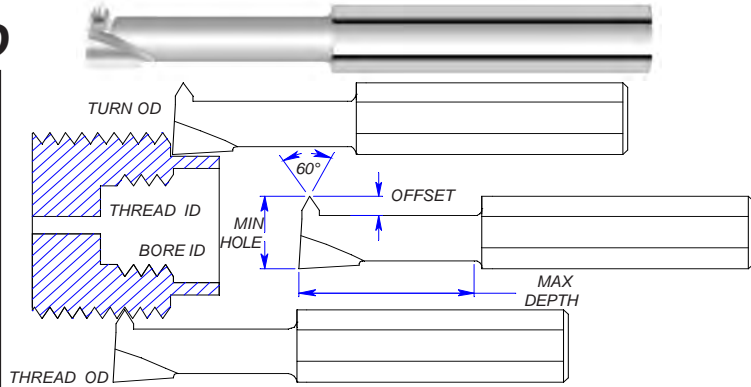
COMBINATION TOOLS
ALL TOOLS ON THIS PAGE ARE RIGHT HAND CUTTING

APPLICATION : **BORING & THREADING WITH THE SAME TOOL.**

SERIES 50 *made from ITI CARBIDE*

COMBINATION BORE & THREAD

MIN HOLE	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	THREAD WIDTH	OFFSET	SHANK & OVERALL LENGTH
1/4	.500	50-1100	CM-240-500	.055	.050	1/4 X 2-1/2 O.A.L.
	.750	50-1105	CM-240-750			
	1.000	50-1110	CM-240-1000			
5/16	.500	50-1115	CM-310-500	.065	.060	5/16 X 2-1/2 O.A.L.
	.750	50-1120	CM-310-750			
	1.000	50-1125	CM-310-1000			
3/8	.500	50-1130	CM-360-500	.090	.080	3/8 X 2-1/2 O.A.L.
	.750	50-1135	CM-360-750			
	1.000	50-1140	CM-360-1000			



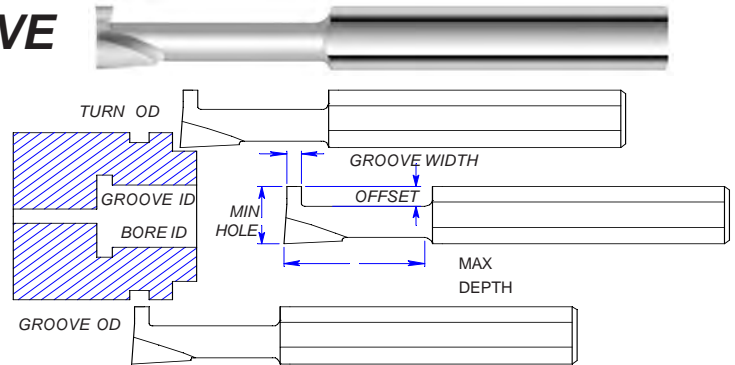
SERIES 48 *made from ITI CARBIDE*

GROOVE WIDTH CAN BE MODIFIED NO EXTRA CHARGE

APPLICATION : **BORING & GROOVING WITH THE SAME TOOL.**

COMBINATION BORE & GROOVE

MIN HOLE	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	GROOVE WIDTH	OFFSET	SHANK & OVERALL LENGTH
1/4	.500	48-1100	BG-240-500	.094	.050	1/4 X 2-1/2 O.A.L.
	.750	48-1105	BG-240-750			
	1.000	48-1110	BG-240-1000			
5/16	.500	48-1115	BG-310-500	.125	.060	5/16 X 2-1/2 O.A.L.
	.750	48-1120	BG-310-750			
	1.000	48-1125	BG-310-1000			
3/8	.500	48-1130	BG-360-500	.156	.080	3/8 X 2-1/2 O.A.L.
	.750	48-1135	BG-360-750			
	1.000	48-1140	BG-360-1000			



BORING / GROOVING TOOL HOLDER

SERIES 98

APPLICATION : **A HOLDER THAT WILL HOLD OUR STANDARD SET SCREW FLAT STYLE 1/8" THRU 1/2" DIAMETER SHANK TOOLS.**

Tool holder for all set screw flat type shanks

Series 98 HOLDERS

ORDER EDP#	SHANK STYLE
98-2400	3/4" ROUND
98-2405	1" SQUARE



Series 98 BUSHINGS

ORDER EDP#	BUSHING SIZE
98-2450	1/8
98-2455	3/16
98-2460	1/4
98-2465	5/16
98-2470	3/8
98-2475	1/2

SERIES 14

5/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	SHANK STYLES		
							STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
T11-31	1/4	5/32	99-1100	BHF-0203S	1/16	3"	14-1030	14-1033	14-1036
						6"	14-1039	14-1042	14-1045



INSERTS FOR 5/16" BARS - 5/32" INSERT I.C.

CARBIDE GRADE	TIP RADIUS	SUMITOMO NUMBER	ORDER EDP#
T2000Z	.007	TBGT-521L	15-1100
T1200A CERMET	.007	TBGT-520.5LFW	15-1110
AC5104 TIN COATED	.007	TBGT-520.5LFX	15-1120
T1200A CERMET	.015	TBGT-521L	15-1130
AC325 TIN COATED	.015	TBGT-521LFX	15-1140

INDEXABLE INSERT TRIANGLE 5/32 I.C.

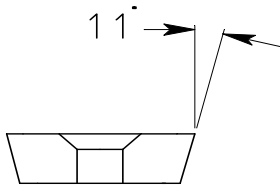
SERIES 14

3/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	SHANK STYLES		
							STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
T11-37	5/16	3/16	99-1105	BHF-0203B	3/32	3"	14-1048	14-1051	14-1054
						6"	14-1057	14-1060	14-1063

7/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	SHANK STYLES		
							STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
T11-43	3/8	3/16	99-1105	BHF-0203B	3/32	3"	14-1066	14-1069	14-1072
						6"	14-1075	14-1078	14-1081



INDEXABLE INSERT TRIANGLE 3/16 I.C.

INSERTS FOR 3/8" & 7/16" BARS - 3/16" INSERT I.C.

CARBIDE GRADE	TIP RADIUS	SUMITOMO NUMBER	ORDER EDP#
T2000Z	.007	TPGT-630.5L	15-1150
T12A CERMET	.007	TPGT-630.5L	15-1160
AC5104 TIN COATED	.007	TPGT-630.5L	15-1170
T12A CERMET	.015	TPGT-631L	15-1180
AC5104 TIN COATED	.015	TPGT-631LFX	15-1190

NOTICE: INSERT BORING BARS ARE MADE TO ORDER; PLEASE CALL FOR DELIVERY TIME, OTHERWISE THE DELIVERY TIME WILL BE QUOTED IN AN ORDER CONFIRMATION

SERIES 14

1/2" MINIMUM BORE

							SHANK STYLES		
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T11-50	3/8	1/4	99-1110	BHF0306R	1/8	3"	14-1084	14-1087	14-1090
						6"	14-1093	14-1096	14-1099

9/16" MINIMUM BORE

							SHANK STYLES		
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T11-56	1/2	1/4	99-1165	BHF0308R	1/8	3"	14-1102	14-1105	14-1108
						6"	14-1111	14-1114	14-1117
						9"	14-1120	14-1123	14-1126
						12"	14-1129	14-1132	14-1135

5/8" MINIMUM BORE

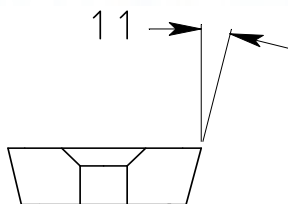
							SHANK STYLES		
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T11-62	1/2	1/4	99-1165	BHF0308R	1/8	3"	14-1138	14-1141	14-1144
						6"	14-1147	14-1150	14-1153
						9"	14-1156	14-1159	14-1162
						12"	14-1165	14-1168	14-1171

11/16" MINIMUM BORE

							SHANK STYLES		
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T11-68	5/8	1/4	99-1165	BHF0308R	1/8	3"	14-1174	14-1177	14-1180
						6"	14-1183	14-1186	14-1189
						9"	14-1192	14-1195	14-1198
						12"	14-1201	14-1204	14-1207

3/4" MINIMUM BORE

							SHANK STYLES		
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T11-75	5/8	1/4	99-1165	BHF0308R	1/8	3"	14-1210	14-1213	14-1216
						6"	14-1219	14-1222	14-1225
						9"	14-1228	14-1231	14-1234
						12"	14-1237	14-1240	14-1243



INDEXABLE INSERT TRIANGLE 1/4 I.C.

INSERTS FOR ABOVE BARS - 1/4" INSERT I.C.

CARBIDE GRADE	TIP RADIUS	SUMITOMO NUMBER	ORDER EDP#
T130Z CERMET	.007	TPGG-220.5L	15-1200
T2000Z UN-COATED	.007	TPGG-220.5L	15-1210
T2000Z UN-COATED	.015	TPGG-221L	15-1220
T130Z CERMET	.015	TPGG-221L	15-1230

BORING TOOLS



SERIES 14

7/8" MINIMUM BORE

SHANK STYLES

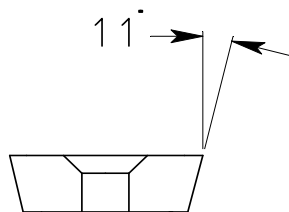
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
T11-87	3/4	3/8	99-1115	BFXO410R	3/16	3"	14-1246	14-1249	14-1252
						6"	14-1255	14-1258	14-1261
						9"	14-1264	14-1267	14-1270
						12"	14-1273	14-1276	14-1279

1" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
T11-100	3/4	3/8	99-1115	BFXO410R	3/16	3"	14-1282	14-1285	14-1288
						6"	14-1291	14-1294	14-1297
						9"	14-1300	14-1303	14-1306
						12"	14-1309	14-1312	14-1315

1-1/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK
							ORDER EDP#	ORDER EDP#
T11-112	1"	3/8	99-1115	BFXO410R	3/16	3"	14-1318	14-1321
						6"	14-1327	14-1330
						9"	14-1336	14-1339
						12"	14-1345	14-1348



INDEXABLE INSERT TRIANGLE 3/8 I.C.

INSERTS FOR ABOVE BARS - 3/8" INSERT I.C.

CARBIDE GRADE	TIP RADIUS	SUMITOMO NUMBER	ORDER EDP#
G10E C-2	.007	TPGG-330.5L	15-1250
T1200A CERMET	.007	TPGG-330.5L	15-1260
G10E C-2	.015	TPGG-331L	15-1270
AC-200 TIN COATED	.015	TPMT-331ENF	15-1280
EH10Z TIN COATED	.031	TPMT-332ENF	15-1290
AC-2500 TIN COATED	.031	TPMT-332ENF	15-1300
EH-10	.031	TPMT-332ENF	15-1310

NOTICE: INSERT BORING BARS ARE MADE TO ORDER; PLEASE CALL FOR DELIVERY TIME, OTHERWISE THE DELIVERY TIME WILL BE QUOTED IN AN ORDER CONFIRMATION

BORING TOOLS

LOGO TWENTY TWELVE

SERIES 16

1/4 I.C.



**CCGT 21.51
INSERT**

TOOL GEOMETRY FOR BORING STEEL & TOUGH MATERIALS

3/8" MINIMUM BORE

SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-37	5/16	1/4	99-1120	S-90	3/32	3"	16-1660	16-1663	16-1666
						6"	16-1669	16-1672	16-1675

7/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-43	3/8	1/4	99-1125	S-95	3/32	3"	16-1678	16-1681	16-1684
						6"	16-1687	16-1690	16-1693

1/2" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-50	3/8	1/4	99-1125	S-95	3/32	3"	16-1696	16-1699	16-1702
						6"	16-1705	16-1708	16-1711

9/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-56	1/2	1/4	99-1125	S-95	3/32	3"	16-1714	16-1717	16-1720
						6"	16-1723	16-1726	16-1729
						9"	16-1732	16-1735	16-1738
						12"	16-1741	16-1744	16-1747

5/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-62	1/2	1/4	99-1125	S-95	3/32	3"	16-1750	16-1753	16-1756
						6"	16-1759	16-1762	16-1765
						9"	16-1768	16-1771	16-1774
						12"	16-1777	16-1780	16-1783

11/16" MINIMUM BORE

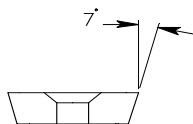
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-68	5/8	1/4	99-1125	S-95	3/32	3"	16-1786	16-1789	16-1792
						6"	16-1795	16-1798	16-1801
						9"	16-1804	16-1807	16-1810
						12"	16-1813	16-1816	16-1819

3/4" MINIMUM BORE

HEAD I.D.	SHANK	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-75	5/8	1/4	99-1125	S-95	3/32	3"	16-1822	16-1825	16-1828
						6"	16-1831	16-1834	16-1837
						9"	16-1840	16-1843	16-1846
						12"	16-1849	16-1852	16-1855

INSERTS FOR ABOVE BARS - 1/4" INSERT I.C.

CARBIDE GRADE	TIP RADIUS	ORDER EDP#
C-2	.015	17-1490
C-6	.015	17-1500
TIN COATED	.015	17-1510
C-2	.032	17-1520
C-6	.032	17-1530
TIN COATED	.032	17-1540



**INDEXABLE INSERT
DIAMOND 5/16 I.C.**

BORING TOOLS

SERIES 16

3/8 I.C.



TOOL GEOMETRY FOR BORING STEEL & TOUGHER APPLICATIONS

5/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-62B	1/2	3/8	99-1132	S-98-S	5/32	3"	16-1859	16-1860	16-1862
						6"	16-1863	16-1865	16-1866
						9"	16-1868	16-1869	16-1871
						12"	16-1872	16-1874	16-1875

11/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-68B	5/8	3/8	99-1132	S-98-S	5/32	3"	16-1877	16-1878	16-1880
						6"	16-1881	16-1883	16-1884
						9"	16-1886	16-1887	16-1889
						12"	16-1890	16-1892	16-1893

3/4" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-75B	5/8	3/8	99-1132	S-98	5/32	3"	16-1895	16-1896	16-1898
						6"	16-1899	16-1901	16-1902
						9"	16-1904	16-1905	16-1907
						12"	16-1908	16-1910	16-1911

7/8" MINIMUM BORE

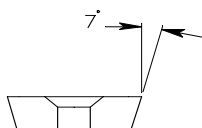
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-87	3/4	3/8	99-1132	S-98	5/32	3"	16-1858	16-1861	16-1864
						6"	16-1867	16-1870	16-1873
						9"	16-1876	16-1879	16-1882
						12"	16-1885	16-1888	16-1891

1" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-100	3/4	3/8	99-1132	S-98	5/32	3"	16-1894	16-1897	16-1900
						6"	16-1903	16-1906	16-1909
						9"	16-1912	16-1915	16-1918
						12"	16-1921	16-1924	16-1927

1-1/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK
							ORDER EDP#	ORDER EDP#
D07-112	1"	3/8	99-1132	S-98	5/32	3"	16-1930	16-1933
						6"	16-1939	16-1942
						9"	16-1948	16-1951
						12"	16-1957	16-1960



INSERTS FOR ABOVE BARS
- 3/8" INSERT I.C.

INDEXABLE INSERT
CCMT 32.51
3/8" I.C.

CARBIDE GRADE	TIP RADIUS	ORDER EDP#
C-2	.015	17-1550
C-6	.015	17-1560
TIN COATED	.015	17-1570
C-2	.032	17-1580
C-6	.032	17-1590
TIN COATED	.032	17-1600



**CPGT 21.51
INSERT**

SERIES 12

TOOL GEOMETRY FOR BORING ALUMINUM & SOFT MATERIALS

SHANK STYLES

3/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-37	5/16	1/4	99-1120	S-90	3/32	3"	12-1660	12-1663	12-1666
						6"	12-1669	12-1672	12-1675

7/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-43	3/8	1/4	99-1125	S-95	3/32	3"	12-1678	12-1681	12-1684
						6"	12-1687	12-1690	12-1693

1/2" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-50	3/8	1/4	99-1125	S-95	3/32	3"	12-1696	12-1699	12-1702
						6"	12-1705	12-1708	12-1711

9/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-56	1/2	1/4	99-1125	S-95	3/32	3"	12-1714	12-1717	12-1720
						6"	12-1723	12-1726	12-1729
						9"	12-1732	12-1735	12-1738
						12"	12-1741	12-1744	12-1747

5/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-62	1/2	1/4	99-1125	S-95	3/32	3"	12-1750	12-1753	12-1756
						6"	12-1759	12-1762	12-1765
						9"	12-1768	12-1771	12-1774
						12"	12-1777	12-1780	12-1783

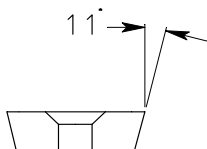
11/16" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-68	5/8	1/4	99-1125	S-95	3/32	3"	12-1786	12-1789	12-1792
						6"	12-1795	12-1798	12-1801
						9"	12-1804	12-1807	12-1810
						12"	12-1813	12-1816	12-1819

3/4" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-75	5/8	1/4	99-1125	S-95	3/32	3"	12-1822	12-1825	12-1828
						6"	12-1831	12-1834	12-1837
						9"	12-1840	12-1843	12-1846
						12"	12-1849	12-1852	12-1855

INSERTS FOR ABOVE BARS
- 1/4" INSERT I.C.



INDEXABLE INSERT
CPGT 21.51
1/4" I.C.

CARBIDE GRADE	TIP RADIUS	ORDER EDP#
C-2	.015	17-1430
C-6	.015	17-1440
TIN COATED	.015	17-1450
C-2	.032	17-1460
C-6	.032	17-1470
TIN COATED	.032	17-1480

**INDEXABLE INSERT BORING BARS
USING 11 DEGREE DIAMOND SHAPED INSERTS
CPGT 32.51**



SERIES 12

TOOL GEOMETRY FOR BORING ALUMINUM & SOFTER MATERIALS

7/8" MINIMUM BORE

SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-87	3/4	3/8	99-1130	S-98	5/32	3"	12-1858	12-1861	12-1864
						6"	12-1867	12-1870	12-1873
						9"	12-1876	12-1879	12-1882
						12"	12-1885	12-1888	12-1891

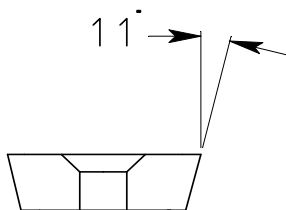
1" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D11-100	3/4	3/8	99-1130	S-98	5/32	3"	12-1894	12-1897	12-1900
						6"	12-1903	12-1906	12-1909
						9"	12-1912	12-1915	12-1918
						12"	12-1921	12-1924	12-1927

1-1/8" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK
							ORDER EDP#	ORDER EDP#
D11-112	1"	3/8	99-1130	S-98	5/32	3"	12-1930	12-1933
						6"	12-1939	12-1942
						9"	12-1948	12-1951
						12"	12-1957	12-1960

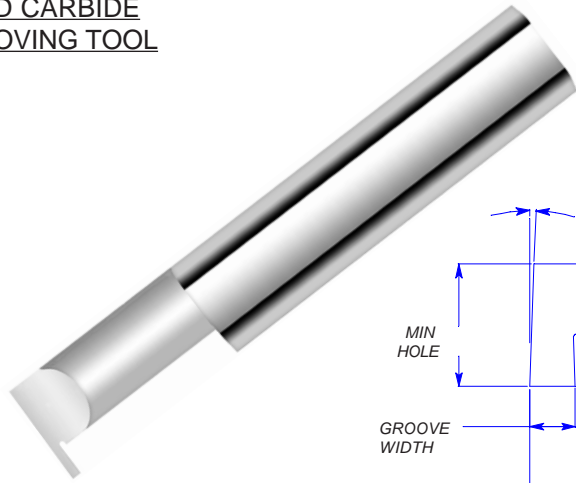
INSERTS FOR ABOVE BARS - 3/8" INSERT I.C.



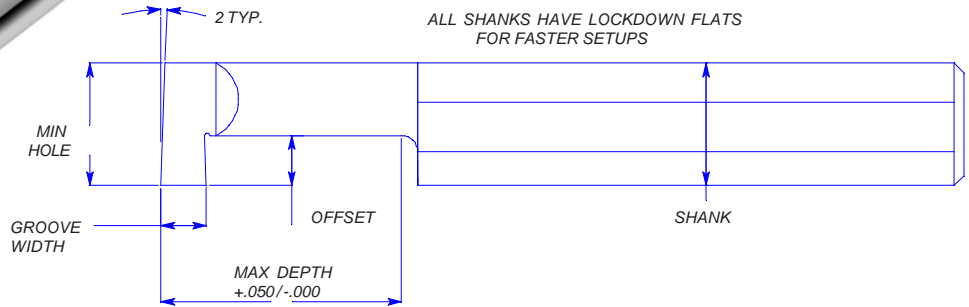
CARBIDE GRADE	TIP RADIUS	ORDER EDP#
C-2	.015	17-1370
C-6	.015	17-1380
TIN COATED	.015	17-1390
C-2	.032	17-1400
C-6	.032	17-1410
TIN COATED	.032	17-1420

NOTICE: INSERT BORING BARS ARE MADE TO ORDER; PLEASE CALL FOR DELIVERY TIME, OTHERWISE THE DELIVERY TIME WILL BE QUOTED IN AN ORDER CONFIRMATION

**SERIES 20 STANDARD
SOLID CARBIDE
GROOVING TOOL**



APPLICATION :
FOR RETAINING RING GROOVES & INTERNAL RELIEFS.



GROOVE TOOLS

SERIES 20 *made from ITI CARBIDE*

GROOVING TOOLS

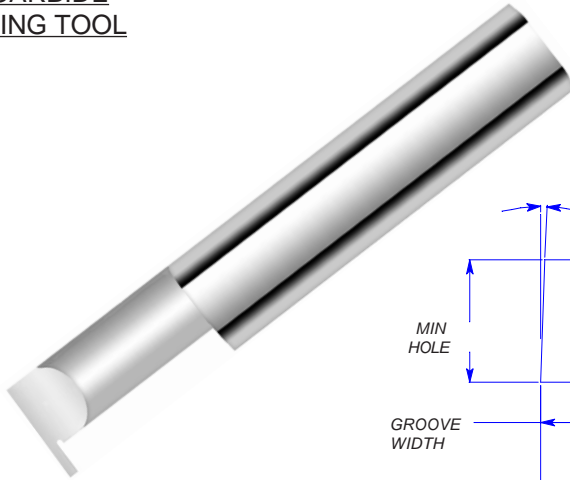
MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH
1/16	.031/.032	3/16	20-1170	G-032-3	.020	1/8 X 2" O.A.L.
		1/4	20-1175	G-032-4		
		3/8	20-1180	G-032-6		
3/32	.046/.047	1/4	20-1185	G-047-4	.030	
		3/8	20-1190	G-047-6		
		1/2	20-1195	G-047-8		
1/8	.062/.063	1/4	20-1200	G-064-4	.040	
		3/8	20-1205	G-064-6		
		1/2	20-1210	G-064-8		
		5/8	20-1215	G-064-10		
		1"	20-1220	G-064-12		
3/16	.017/.018	1/4	20-1220	G-018-4	.050	3/16 X 2-1/2 O.A.L.
		3/8	20-1225	G-018-6		
		1/2	20-1230	G-018-8		
		5/8	20-1235	G-018-10		
		1"	20-1240	G-018-12		
	.025/.026	1/4	20-1240	G-026-4		
		3/8	20-1245	G-026-6		
		1/2	20-1250	G-026-8		
		5/8	20-1255	G-026-10		
	.030/.031	1/4	20-1260	G-031-4		
		3/8	20-1265	G-031-6		
		1/2	20-1270	G-031-8		
	.062/.063	1/2	20-1275	G-031-10		
		1/4	20-1280	G-061-4		
		3/8	20-1285	G-061-6		
		1/2	20-1290	G-061-8		
		5/8	20-1295	G-061-10		

SERIES 20 *made from ITI CARBIDE*

GROOVING TOOLS

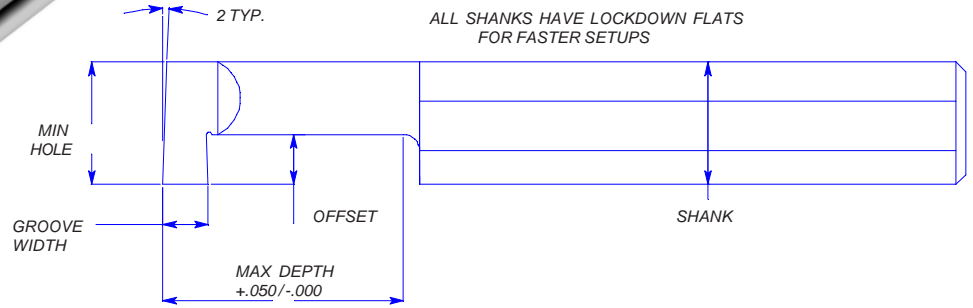
MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH		
1/4	.017/.018	1/4	G-017-4	20-1300	.050	1/4 X 2-1/2 O.A.L.		
		3/8	G-017-6	20-1305				
		1/2	G-017-8	20-1310				
		5/8	G-017-10	20-1315				
		1"	G-017-12	20-1320				
	.025/.026	1/4	G-025-4	20-1320				
		3/8	G-025-6	20-1325				
		1/2	G-025-8	20-1330				
		5/8	G-025-10	20-1335				
	.030/.031	1/4	G-030-4	20-1340				
		3/8	G-030-6	20-1345				
		1/2	G-030-8	20-1350				
	.062/.064	1/2	G-030-10	20-1355				
		3/8	G-060-6	20-1356				
		1/2	G-060-8	20-1357				
		5/8	G-060-10	20-1358				
5/16	.033/.034	1/4	G-033-4	20-1360	.100	5/16 X 2-1/2 O.A.L.		
		3/8	G-033-6	20-1365				
		1/2	G-033-8	20-1370				
		3/4	G-033-12	20-1375				
	.038/.039	1/4	G-038-4	20-1380				
		3/8	G-038-6	20-1385				
		1/2	G-038-8	20-1390				
	.062/.064	3/4	G-038-12	20-1395				
		1/2	G-063-8	20-1400				
		3/4	G-063-12	20-1405				
			1"	G-063-16			20-1410	
	.093/.095	1/2	G-094-8	20-1415				
		3/4	G-094-12	20-1420				
		1"	G-094-16	20-1425				

**SERIES 20 STANDARD
SOLID CARBIDE
GROOVING TOOL**



APPLICATION :

FOR RETAINING RING GROOVES & INTERNAL RELIEFS.



SERIES 20 *made from ITC CARBIDE*
GROOVING TOOLS

MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH
3/8	.039/.041	1/4	20-1430	G-039-4	.100	3/8 X 2-1/2 O.A.L.
		3/8	20-1435	G-039-6		
		1/2	20-1440	G-039-8		
		3/4	20-1445	G-039-12		
		1"	20-1450	G-039-16		
		1-1/4	20-1455	G-039-20		
	.046/.048	1/4	20-1460	G-046-4		
		3/8	20-1465	G-046-6		
		1/2	20-1470	G-046-8		
		3/4	20-1475	G-046-12		
		1"	20-1480	G-046-16		
		1-1/4	20-1485	G-046-20		
	.055/.057	1/4	20-1490	G-055-4		
		3/8	20-1495	G-055-6		
		1/2	20-1500	G-055-8		
		3/4	20-1505	G-055-12		
		1"	20-1510	G-055-16		
		1-1/4	20-1515	G-055-20		
	.062/.064	1/4	20-1520	G-062-4		
		3/8	20-1525	G-062-6		
		1/2	20-1530	G-062-8		
		3/4	20-1535	G-062-12		
		1"	20-1540	G-062-16		
		1-1/4	20-1545	G-062-20		
.069/.071	1/4	20-1550	G-069-4			
	3/8	20-1555	G-069-6			
	1/2	20-1560	G-069-8			
	3/4	20-1565	G-069-12			
	1"	20-1570	G-069-16			
	1-1/4	20-1575	G-069-20			

SERIES 20 *made from ITC CARBIDE*
GROOVING TOOLS

MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH	
3/8 CONT.	.087/.089	1/4	20-1580	G-087-4	.100	3/8 X 2-1/2 O.A.L.	
		3/8	20-1585	G-087-6			
		1/2	20-1590	G-087-8			
		3/4	20-1595	G-087-12			
		1"	20-1600	G-087-16			
		1-1/4	20-1605	G-087-20			
	.093/.095	1/2	20-1610	G-095-8			
		3/4	20-1615	G-095-12			
		1"	20-1620	G-095-16			
		.125/.127	1/2	20-1625			G-126-8
			3/4	20-1630			G-126-12
			1"	20-1635			G-126-16
.093/.095	1/2		20-1640	G-093-8	.150	1/2 X 3" O.A.L.	
	3/4		20-1645	G-093-12			
	1"		20-1650	G-093-16			
	1-1/4	20-1655	G-093-20				
	1-1/2	20-1660	G-093-24				
	.125/.127	1/2	20-1665	G-125-8			
3/4		20-1670	G-125-12				
1"		20-1675	G-125-16				
1-1/4		20-1680	G-125-20				
1-1/2		20-1685	G-125-24				
.156/.158		1/2	20-1690	G-156-8			
	3/4	20-1695	G-156-12				
	1"	20-1700	G-156-16				
	1-1/4	20-1705	G-156-20				
	1-1/2	20-1710	G-156-24				
	.187/.189	1/2	20-1715	G-187-8			
3/4		20-1720	G-187-12				
1"		20-1725	G-187-16				
1-1/4		20-1730	G-187-20				
1-1/2		20-1735	G-187-24				
.250/.252		1/2	20-1740	G-250-8			
	3/4	20-1745	G-250-12				
	1"	20-1750	G-250-16				
	1-1/4	20-1755	G-250-20				
	1-1/2	20-1760	G-250-24				

GROOVE TOOLS

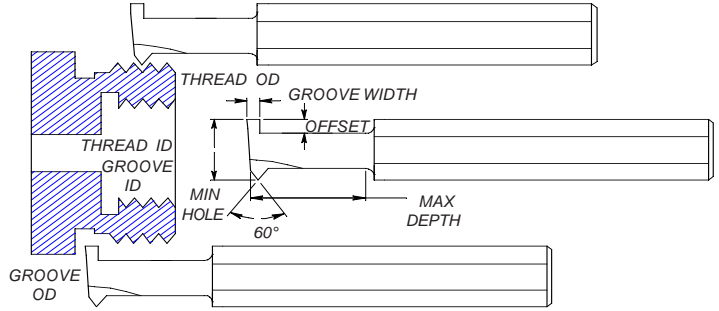
SERIES 52

made from **ITI CARBIDE**

GROOVE WIDTH CAN BE MODIFIED NO EXTRA CHARGE

APPLICATION : **THREADING & GROOVING WITH THE SAME TOOL.**

COMBINATION THREAD & GROOVE



MIN HOLE	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	GROOVE WIDTH	OFFSET	SHANK & OVERALL LENGTH
1/4	.500	52-1100	TG-240-500	.094	.050	1/4 X 2-1/2 O.A.L.
	.750	52-1105	TG-240-750			
	1.000	52-1110	TG-240-1000			
5/16	.500	52-1115	TG-310-500	.125	.060	5/16 X 2-1/2 O.A.L.
	.750	52-1120	TG-310-750			
	1.000	52-1125	TG-310-1000			
3/8	.500	52-1130	TG-360-500	.156	.080	3/8 X 2-1/2 O.A.L.
	.750	52-1135	TG-360-750			
	1.000	52-1140	TG-360-1000			

SERIES 06

made from **ITI CARBIDE**

APPLICATION : **MULTI-REACH GROOVING**

**NO LONGER LIMITED BY NECK LENGTH.
ONE TOOL REPLACES A SERIES OF OTHERS.**

MULTI-REACH GROOVING TOOLS

MINIMUM HOLE	TOOL I.D.	GROOVE WIDTH	ORDER EDP#	ALTN COATED EDP#	OFFSET	SHANK DIAMETER	SHANK LENGTH
.310	LG-310-032	.032	06-1200	06-1200-C	.060	1/4"	4"
	LG-310-063	.063	06-1205	06-1205-C			
	LG-310-094	.094	06-1210	06-1210-C			
	LG-310-125	.125	06-1215	06-1215-C			
.390	LG-390-032	.032	06-1220	06-1220-C	.075	5/16"	4"
	LG-390-063	.063	06-1225	06-1225-C			
	LG-390-094	.094	06-1230	06-1230-C			
	LG-390-125	.125	06-1235	06-1235-C			
.475	LG-475-032	.032	06-1240	06-1240-C	.100	3/8"	6"
	LG-475-063	.063	06-1245	06-1245-C			
	LG-475-094	.094	06-1250	06-1250-C			
	LG-475-125	.125	06-1255	06-1255-C			
.620	LG-620-032	.032	06-1260	06-1260-C	.120	1/2"	6"
	LG-620-063	.063	06-1265	06-1265-C			
	LG-620-094	.094	06-1270	06-1270-C			
	LG-620-125	.125	06-1275	06-1275-C			

WIDTHS CAN BE SIZED TO YOUR SPECIFICATIONS

CARBIDE SHANKS PROVIDE MAXIMUM RIDGIDITY.



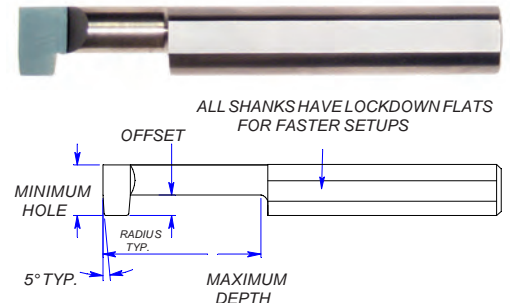
SERIES 27

made from **ITC CARBIDE**

APPLICATION : **O-RING GROOVING WITH TAPERED SIDES**

O-RING GROOVE TOOLS

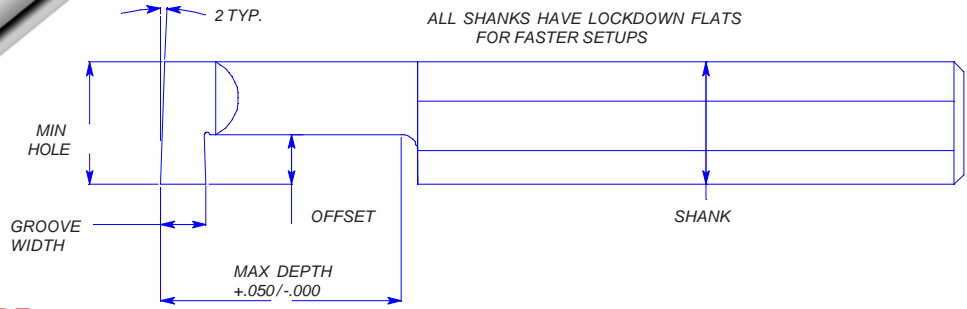
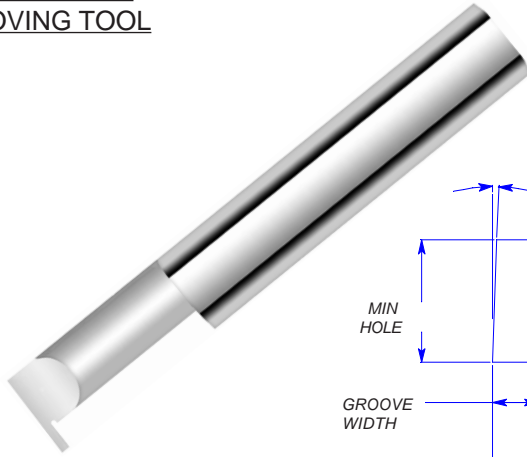
MINIMUM HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTN COATED #	TOOL ID	CORNER RADIUS	OFFSET	SHANK
.250	.096/.098	.500	27-1300	27-1300-C	O-096-8	.010/.020	.100	1/4 X 2-1/2 O.A.L.
	.141/.143	.562	27-1305	27-1305-C	O-141-9	.035/.045		
	.144/.146	.625	27-1310	27-1310-C	O-144-10	.035/.045		
.375	.174/.176	.750	27-1315	27-1315-C	O-174-12	.010/.020	.115	3/8 X 2-1/2 O.A.L.
	.208/.210	.812	27-1320	27-1320-C	O-208-13	.035/.045		
	.241/.243	.940	27-1325	27-1325-C	O-241-15	.035/.045		



GROOVE TOOLS

**SERIES 20 STANDARD
SOLID CARBIDE
GROOVING TOOL**

**APPLICATION:
FOR RETAINING RING GROOVES & INTERNAL RELIEFS.**



SERIES 20 *made from* **IT CARBIDE**

METRIC GROOVING TOOLS

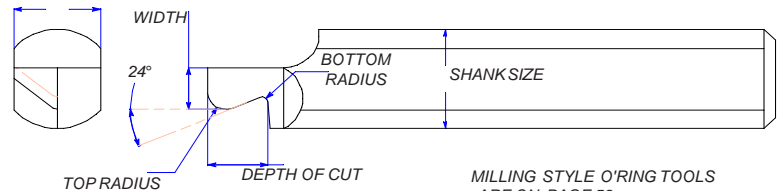
MIN HOLE	GROOVE WIDTH +/- .0254mm	MAX DEPTH	ORDER EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH
6.5 (.250)	.5 MM (.0197)	13MM	20-9920	G-.5-13	.050	1/4 X 2-1/2 O.A.L.
	.9 MM (.0354)	13MM	20-9930	G-.9-13		
	1.1 MM (.0433)	13MM	20-9940	G-1.1-13		
	1.3 MM (.0512)	13MM	20-9950	G-1.3-13		
9.5 (.375)	1.85 MM (.0728)	13MM	20-9960	G-1.85-13	.100	3/8 X 2-1/2 O.A.L.
	2.15 MM (.0847)	13MM	20-9970	G-2.15-13		
	2.65 MM (.1044)	13MM	20-9980	G-2.65-13		
	3.0 MM (.1182)	13MM	20-9982	G-3.0-13		
12.7 (.500)	3.0 MM (.1182)	19MM	20-9985	G-3.0-19	.150	1/2 X 3" O.A.L.
	4.0 MM (.1576)	19MM	20-9990	G-4.0-19		
	6.0 MM (.2364)	19MM	20-9995	G-6.0-19		

SERIES 53

APPLICATION :

USED TO CUT-TURN 24° O-RING DOVETAILED. THEY CUT WITH BOTH TOP & BOTTOM RADIUS.

A FLAT ON BOTH SIDES LET YOU FLIP THE TOOL TO CUT BOTH SIDES OF THE SLOT



made from **IT CARBIDE**

MILLING STYLE O-RING TOOLS ARE ON PAGE 58

SERIES 53

O-RING DOVETAIL GROOVERS

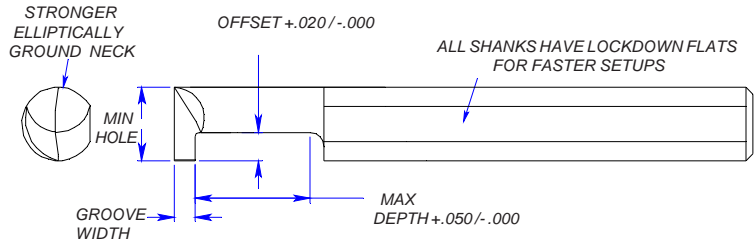
O-RING SIZE	WIDTH	EDP NUMBER	DEPTH OF CUT	BOTTOM RADIUS	TOP RADIUS	SHANK & OVERALL LENGTH
.070	.040	53-4000	.051	.005	.015	1/8 x 2.0
.093	.060	53-4005	.075	.010	.015	1/8 x 2.0
.103	.065	53-4010	.082	.010	.015	1/8 x 2.0
.125	.082	53-4015	.102	.010	.031	3/16 x 2.5
.139	.085	53-4020	.112	.010	.031	3/16 x 2.5
.187	.130	53-4025	.154	.015	.031	1/4 x 2.5
.210	.140	53-4030	.172	.015	.031	1/4 x 2.5
.250	.173	53-4035	.212	.015	.062	1/4 x 2.5
.275	.180	53-4040	.232	.015	.062	5/16 x 2.5
.375	.240	53-4045	.317	.020	.094	5/16 x 2.5

SERIES 22



made from **ITI CARBIDE**

APPLICATION : FOR INTERNAL GROOVING AND RELIEVING



Max-groove is the Ultimate in grooving tools. Featuring an elliptical neck for greater strength, a special top rake for maximum shearing action with a better finish, and a ALTIN coating for a longer life. Max-Groove out performs and outlasts our competitors groove tools two to one.

GROOVE TOOLS

MAX-GROOVE GROOVING TOOLS

MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	OFFSET	SHANK
1/4	.017/.018	1/4	22-1100	MG-25-017-250	.050	1/4 X 2-1/2 O.A.L.
		3/8	22-1105	MG-25-017-375		
		1/2	22-1110	MG-25-017-500		
		5/8	22-1115	MG-25-017-625		
	.025/.026	1/4	22-1120	MG-25-025-250		
		3/8	22-1125	MG-25-025-375		
		1/2	22-1130	MG-25-025-500		
		5/8	22-1135	MG-25-025-625		
	.030/.031	1/4	22-1140	MG-25-030-250		
		3/8	22-1145	MG-25-030-375		
		1/2	22-1150	MG-25-030-500		
		5/8	22-1155	MG-25-030-625		
.062/.064	1/4	22-1160	MG-25-063-250			
	3/8	22-1165	MG-25-063-375			
	1/2	22-1170	MG-25-063-500			
	5/8	22-1175	MG-25-063-625			
.093/.095	1/4	22-1180	MG-25-094-250			
	3/8	22-1185	MG-25-094-375			
	1/2	22-1190	MG-25-094-500			
.125/.127	5/8	22-1195	MG-25-094-625			
	1/4	22-1200	MG-25-125-250			
	3/8	22-1205	MG-25-125-375			
5/16	.033/.034	1/2	22-1210	MG-25-125-500	.100	5/16 X 2-1/2 O.A.L.
		5/8	22-1215	MG-25-125-625		
		1/4	22-1220	MG-31-033-250		
		3/8	22-1225	MG-31-033-375		
	.038/.039	1/2	22-1230	MG-31-033-500		
		5/8	22-1235	MG-31-033-625		
		1/4	22-1240	MG-31-038-250		
		3/8	22-1245	MG-31-038-375		
	.062/.064	1/2	22-1250	MG-31-038-500		
		5/8	22-1255	MG-31-038-625		
		1/2	22-1260	MG-31-063-500		
		3/4	22-1265	MG-31-063-750		
.093/.095	1"	22-1270	MG-31-063-1000			
	1/2	22-1275	MG-31-094-500			
	3/4	22-1280	MG-31-094-750			
	1"	22-1285	MG-31-094-1000			
.125/.127	1/2	22-1290	MG-31-125-500			
	3/4	22-1295	MG-31-125-750			
	1"	22-1300	MG-31-125-1000			

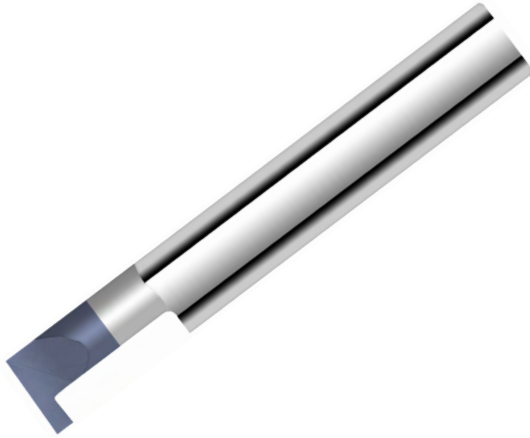
ALTIN: THE VERY LATEST IN HIGH PERFORMANCE COATING

MAX-GROOVE GROOVING TOOLS

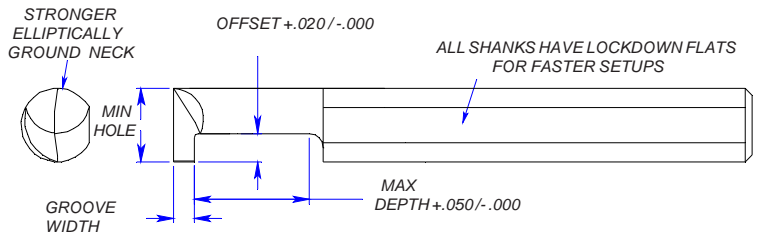
MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	OFFSET	SHANK
3/8	.039/.041	1/4	22-1305	MG-37-039-250	.100	3/8 X 2-1/2 O.A.L.
		3/8	22-1310	MG-37-039-375		
		1/2	22-1315	MG-37-039-500		
		3/4	22-1320	MG-37-039-750		
		1"	22-1325	MG-37-039-1000		
		1-1/4	22-1330	MG-37-039-1250		
	.046/.048	1/4	22-1335	MG-37-046-250		
		3/8	22-1340	MG-37-046-375		
		1/2	22-1345	MG-37-046-500		
		3/4	22-1350	MG-37-046-750		
		1"	22-1355	MG-37-046-1000		
		1-1/4	22-1360	MG-37-046-1250		
	.055/.057	1/4	22-1365	MG-37-055-250		
		3/8	22-1370	MG-37-055-375		
		1/2	22-1375	MG-37-055-500		
		3/4	22-1380	MG-37-055-750		
		1"	22-1385	MG-37-055-1000		
		1-1/4	22-1390	MG-37-055-1250		
	.062/.064	1/4	22-1395	MG-37-063-250		
		3/8	22-1400	MG-37-063-375		
		1/2	22-1405	MG-37-063-500		
		3/4	22-1410	MG-37-063-750		
		1"	22-1415	MG-37-063-1000		
		1-1/4	22-1420	MG-37-063-1250		
.069/.071	1/4	22-1425	MG-37-069-250			
	3/8	22-1430	MG-37-069-375			
	1/2	22-1435	MG-37-069-500			
	3/4	22-1440	MG-37-069-750			
	1"	22-1445	MG-37-069-1000			
	1-1/4	22-1450	MG-37-069-1250			
.087/.089	1/4	22-1455	MG-37-087-250			
	3/8	22-1460	MG-37-087-375			
	1/2	22-1465	MG-37-087-500			
	3/4	22-1470	MG-37-087-750			
	1"	22-1475	MG-37-087-1000			
	1-1/4	22-1480	MG-37-087-1250			

CONTINUED ON NEXT PAGE

SERIES 22



APPLICATION : FOR INTERNAL GROOVING AND RELIEVING



Max-groove is the Ultimate in grooving tools. Featuring an elliptical neck for greater strength, a special top rake for maximum shearing action with a better finish, and a ALTIN coating for a longer life. Max-Groove out performs and outlasts our competitors groove tools two to one.

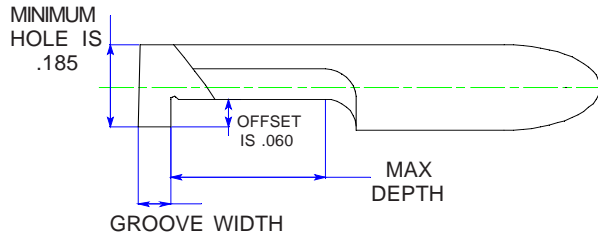
made from **ITI CARBIDE**

MAX-GROOVE GROOVING TOOLS

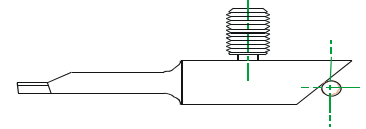
MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	OFFSET	SHANK
3/8 CONT.	.093/.095	1/2	22-1485	MG-37-094-500	.100	3/8
		3/4	22-1490	MG-37-094-750		
		1"	22-1495	MG-37-094-1000		
	.125/.127	1/2	22-1500	MG-37-125-500		2-1/2
		3/4	22-1505	MG-37-125-750		
		1"	22-1510	MG-37-125-1000		
1/2	.062/.064	1/2	22-1515	MG-50-063-500	.150	1/2 X 3"
		3/4	22-1520	MG-50-063-750		
		1"	22-1525	MG-50-063-1000		
		1-1/4	22-1530	MG-50-063-1250		
		1-1/2	22-1535	MG-50-063-1500		
	.093/.095	1/2	22-1540	MG-50-094-500		
		3/4	22-1545	MG-50-094-750		
		1"	22-1550	MG-50-094-1000		
		1-1/4	22-1555	MG-50-094-1250		
	.125/.127	1-1/2	22-1560	MG-50-094-1500		
		1/2	22-1565	MG-50-125-500		
		3/4	22-1570	MG-50-125-750		
		1"	22-1575	MG-50-125-1000		
	.156/.158	1-1/4	22-1580	MG-50-125-1250		
		1-1/2	22-1585	MG-50-125-1500		
		1/2	22-1590	MG-50-156-500		
		3/4	22-1595	MG-50-156-750		
	.187/.189	1"	22-1600	MG-50-156-1000		
		1-1/4	22-1605	MG-50-156-1250		
		1-1/2	22-1610	MG-50-156-1500		
		1/2	22-1615	MG-50-187-500		
	.250/.252	3/4	22-1620	MG-50-187-750		
		1"	22-1625	MG-50-187-1000		
		1-1/4	22-1630	MG-50-187-1250		
		1-1/2	22-1635	MG-50-187-1500		
		1/2	22-1640	MG-50-250-500		
		3/4	22-1645	MG-50-250-750		
		1"	22-1650	MG-50-250-1000		
		1-1/4	22-1655	MG-50-250-1250		
		1-1/2	22-1660	MG-50-250-1500		

GROOVE TOOLS

**SERIES 42
SOLID CARBIDE
QUICKCHANGE
GROOVING TOOL**



made from **ITI CARBIDE**



ALL TOOLS HAVE A GROUND ANGLE ON THE SHANK WHICH LOCKS IN PLACE AGAINST A LOCATING PIN, MAINTAINING AN EXACT RADIAL AND AXIAL POSITION

**SERIES 42
QUICK CHANGE
GROOVING TOOLS**

GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTIN COATED EDP#
.018	.200	42-7000	42-7000-C
	.300	42-7005	42-7005-C
	.400	42-7010	42-7010-C
	.500	42-7015	42-7015-C
	.600	42-7020	42-7020-C
	.700	42-7025	42-7025-C
.029	.200	42-7030	42-7030-C
	.300	42-7035	42-7035-C
	.400	42-7040	42-7040-C
	.500	42-7045	42-7045-C
	.600	42-7050	42-7050-C
	.700	42-7055	42-7055-C
.032	.200	42-7060	42-7060-C
	.300	42-7065	42-7065-C
	.400	42-7070	42-7070-C
	.500	42-7075	42-7075-C
	.600	42-7080	42-7080-C
	.700	42-7085	42-7085-C
.033	.200	42-7090	42-7090-C
	.300	42-7095	42-7095-C
	.400	42-7100	42-7100-C
	.500	42-7105	42-7105-C
	.600	42-7110	42-7110-C
	.700	42-7115	42-7115-C
.039	.200	42-7120	42-7120-C
	.300	42-7125	42-7125-C
	.400	42-7130	42-7130-C
	.500	42-7135	42-7135-C
	.600	42-7140	42-7140-C
	.700	42-7145	42-7145-C

HOLDERS ARE AVAILABLE WITH 3/8, 1/2, 5/8, & 3/4 SHANK SIZES.

STANDARD STYLE

3/8" SHANK	EDP# 42-9000
1/2" SHANK	EDP# 42-9005
5/8" SHANK	EDP# 42-9010
3/4" SHANK	EDP# 42-9015
22 MM SHANK	EDP# 42-9020

**SERIES 42
QUICK CHANGE
GROOVING TOOLS**

GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTIN COATED EDP#
.040	.200	42-7150	42-7150-C
	.300	42-7155	42-7155-C
	.400	42-7160	42-7160-C
	.500	42-7165	42-7165-C
	.600	42-7170	42-7170-C
	.700	42-7175	42-7175-C
.046	.200	42-7180	42-7180-C
	.300	42-7185	42-7185-C
	.400	42-7190	42-7190-C
	.500	42-7195	42-7195-C
	.600	42-7200	42-7200-C
	.700	42-7205	42-7205-C
.048	.200	42-7210	42-7210-C
	.300	42-7215	42-7215-C
	.400	42-7220	42-7220-C
	.500	42-7225	42-7225-C
	.600	42-7230	42-7230-C
	.700	42-7235	42-7235-C
.056	.200	42-7240	42-7240-C
	.300	42-7245	42-7245-C
	.400	42-7250	42-7250-C
	.500	42-7255	42-7255-C
	.600	42-7260	42-7260-C
	.700	42-7265	42-7265-C
.062	.200	42-7270	42-7270-C
	.300	42-7275	42-7275-C
	.400	42-7280	42-7280-C
	.500	42-7285	42-7285-C
	.600	42-7290	42-7290-C
	.700	42-7295	42-7295-C

HOLDERS ARE AVAILABLE WITH 3/8, 1/2, 5/8, & 3/4 SHANK SIZES.

COOLANT HOLE STYLE

3/8" SHANK	EDP #42-9500
1/2" SHANK	EDP #42-9505
5/8" SHANK	EDP #42-9510
3/4" SHANK	EDP #42-9515
22 MM SHANK	EDP #42-9520

EXTRA SCREW EDP# 42-8888

GROOVE TOOLS

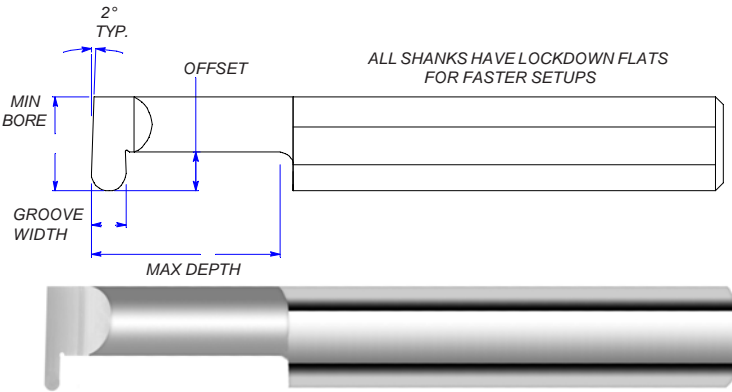
SERIES 24

made from **ITI CARBIDE**

FULL RADIUS GROOVING TOOLS

MIN BORE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTIN COATED EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH
1/4	.017	1/4	24-1300	24-1300-C	R-017-4	.050	1/4 X 2-1/2 O.A.L.
		3/8	24-1305	24-1305-C	R-017-6		
	.018	1/2	24-1310	24-1310-C	R-017-8		
		5/8	24-1315	24-1315-C	R-017-10		
	.025	1/4	24-1320	24-1320-C	R-025-4		
		3/8	24-1325	24-1325-C	R-025-6		
	.026	1/2	24-1330	24-1330-C	R-025-8		
		5/8	24-1335	24-1335-C	R-025-10		
	.030	1/4	24-1340	24-1340-C	R-030-4		
		3/8	24-1345	24-1345-C	R-030-6		
	.031	1/2	24-1350	24-1350-C	R-030-8		
		5/8	24-1355	24-1355-C	R-030-10		
.062	3/8	24-1356	24-1356-C	R-060-6			
	1/2	24-1357	24-1357-C	R-060-8			
.064	5/8	24-1358	24-1358-C	R-060-10			
	1/4	24-1360	24-1360-C	R-033-4			
5/16	.033	3/8	24-1365	24-1365-C	R-033-6	.100	5/16 X 2-1/2 O.A.L.
		1/2	24-1370	24-1370-C	R-033-8		
	.034	5/8	24-1372	24-1372-C	R-033-10		
		3/4	24-1375	24-1375-C	R-033-12		
	.038	1/4	24-1380	24-1380-C	R-038-4		
		3/8	24-1385	24-1385-C	R-038-6		
	.039	1/2	24-1390	24-1390-C	R-038-8		
		3/4	24-1395	24-1395-C	R-038-12		
	.062	1/2	24-1400	24-1400-C	R-063-8		
		3/4	24-1405	24-1405-C	R-063-12		
	.064	1"	24-1410	24-1410-C	R-063-16		
		1/2	24-1415	24-1415-C	R-094-8		
.093	3/4	24-1420	24-1420-C	R-094-12			
	1"	24-1425	24-1425-C	R-094-16			
3/8	.039	1/4	24-1430	24-1430-C	R-039-4	.100	3/8 X 2-1/2 O.A.L.
		3/8	24-1435	24-1435-C	R-039-6		
	.041	1/2	24-1440	24-1440-C	R-039-8		
		5/8	24-1442	24-1442-C	R-039-10		
	.046	3/4	24-1445	24-1445-C	R-039-12		
		1"	24-1450	24-1450-C	R-039-16		
	.048	1-1/4	24-1455	24-1455-C	R-039-20		
		1/4	24-1460	24-1460-C	R-046-4		
	.046	3/8	24-1465	24-1465-C	R-046-6		
		1/2	24-1470	24-1470-C	R-046-8		
	.048	3/4	24-1475	24-1475-C	R-046-12		
		1"	24-1480	24-1480-C	R-046-16		
.055	1-1/4	24-1485	24-1485-C	R-046-20			
	1/4	24-1490	24-1490-C	R-055-4			
.057	3/8	24-1495	24-1495-C	R-055-6			
	1/2	24-1500	24-1500-C	R-055-8			
.062	3/4	24-1505	24-1505-C	R-055-12			
	1"	24-1510	24-1510-C	R-055-16			
.064	1-1/4	24-1515	24-1515-C	R-055-20			
	1/4	24-1520	24-1520-C	R-062-4			
.062	3/8	24-1525	24-1525-C	R-062-6			
	1/2	24-1530	24-1530-C	R-062-8			
.064	3/4	24-1535	24-1535-C	R-062-12			
	1"	24-1540	24-1540-C	R-062-16			
.062	1-1/4	24-1545	24-1545-C	R-062-20			

APPLICATION : **FULL RADIUS GROOVES AND PROFILE WORK.**



FULL RADIUS GROOVING TOOLS

MIN BORE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTIN COATED EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH
3/8	.069	1/4	24-1550	24-1550-C	R-069-4	.100	3/8 X 2-1/2 O.A.L.
		3/8	24-1555	24-1555-C	R-069-6		
		1/2	24-1560	24-1560-C	R-069-8		
		3/4	24-1565	24-1565-C	R-069-12		
	.071	1"	24-1570	24-1570-C	R-069-16		
		1-1/4	24-1575	24-1575-C	R-069-20		
		1/4	24-1580	24-1580-C	R-087-4		
		3/8	24-1585	24-1585-C	R-087-6		
	.087	1/2	24-1590	24-1590-C	R-087-8		
		3/4	24-1595	24-1595-C	R-087-12		
		1"	24-1600	24-1600-C	R-087-16		
		1-1/4	24-1605	24-1605-C	R-087-20		
.093	1/2	24-1610	24-1610-C	R-095-8			
	3/4	24-1615	24-1615-C	R-095-12			
.095	1"	24-1620	24-1620-C	R-095-16			
	5/8	24-1625	24-1625-C	R-126-8			
.125	3/8	24-1630	24-1630-C	R-126-12			
	1/2	24-1635	24-1635-C	R-126-16			
1/2	.093	1/2	24-1640	24-1640-C	R-093-8	.150	1/2 X 3" O.A.L.
		3/4	24-1645	24-1645-C	R-093-12		
		1"	24-1650	24-1650-C	R-093-16		
		1-1/4	24-1655	24-1655-C	R-093-20		
	.095	1-1/2	24-1660	24-1660-C	R-093-24		
		1/2	24-1665	24-1665-C	R-125-8		
		3/4	24-1670	24-1670-C	R-125-12		
		1"	24-1675	24-1675-C	R-125-16		
	.125	1-1/4	24-1680	24-1680-C	R-125-20		
		1-1/2	24-1685	24-1685-C	R-125-24		
		1/2	24-1690	24-1690-C	R-156-8		
		3/4	24-1695	24-1695-C	R-156-12		
.156	1"	24-1700	24-1700-C	R-156-16			
	1-1/4	24-1705	24-1705-C	R-156-20			
	1-1/2	24-1710	24-1710-C	R-156-24			
	1/2	24-1715	24-1715-C	R-187-8			
.187	3/4	24-1720	24-1720-C	R-187-12			
	1"	24-1725	24-1725-C	R-187-16			
	1-1/4	24-1730	24-1730-C	R-187-20			
	1-1/2	24-1735	24-1735-C	R-187-24			
.250	1/2	24-1740	24-1740-C	R-250-8			
	3/4	24-1745	24-1745-C	R-250-12			
	1"	24-1750	24-1750-C	R-250-16			
	1-1/4	24-1755	24-1755-C	R-250-20			
.252	1-1/2	24-1760	24-1760-C	R-250-24			

GROOVE TOOLS

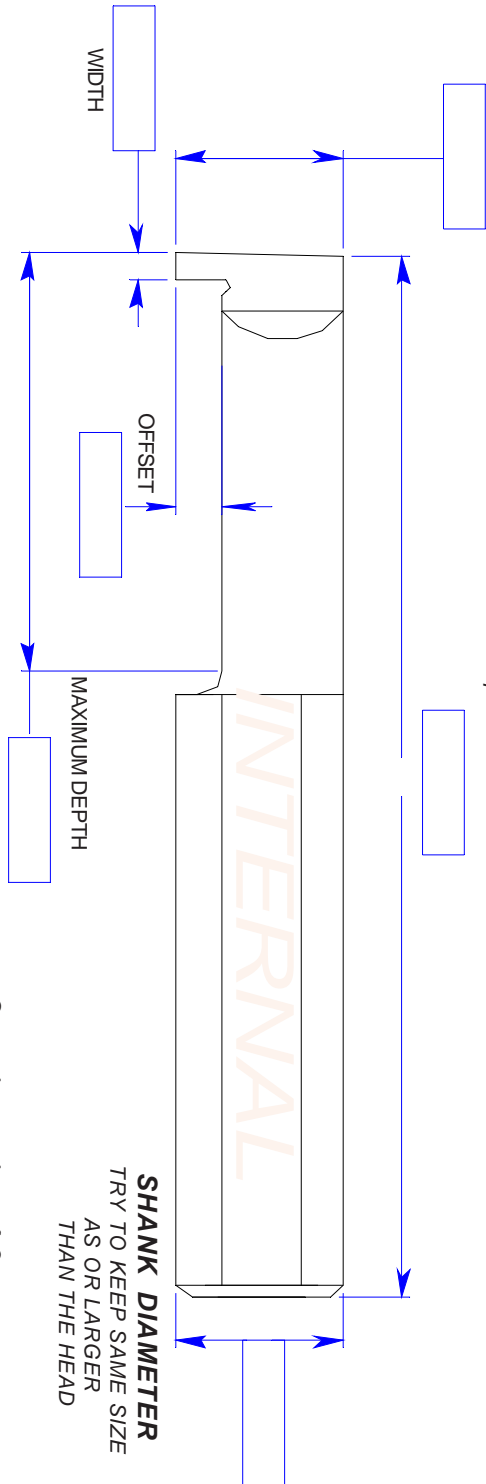
Simply make a copy
fill in the information below and fax or email to us. fax # 909-392-2627
we will quote as soon as possible. INFO@internaltool.com

MAJOR DIAMETER

Try to keep same size
as shank or smaller

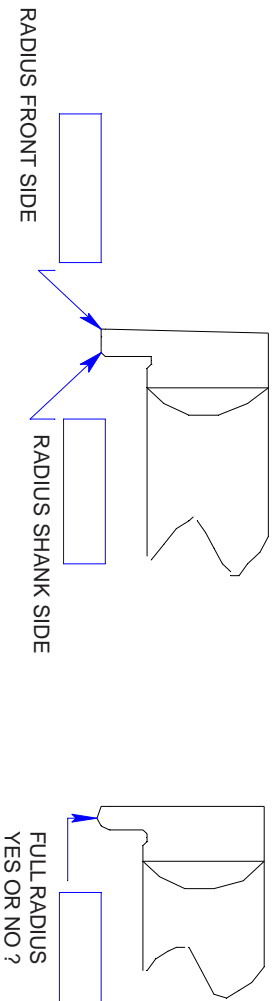
OVERALL LENGTH

If not sure leave blank
we will quote standard



SHANK DIAMETER
TRY TO KEEP SAME SIZE
AS OR LARGER
THAN THE HEAD

Quote in quantities of ?
THE MORE YOU BUY
THE CHEAPER THEY GET QUANTITY: _____



YOUR COMPANY NAME: _____

CONTACT: _____

PHONE: _____

FAX: _____

YOUR DISTRIBUTOR: _____

REVISIONS:	



DRAWN BY: _____

DATE: _____

REV: _____

TOOL NUMBER: _____

TOLERANCE UNLESS
OTHERWISE SPECIFIED

X = +/- 1/32

.XX = +/- .010

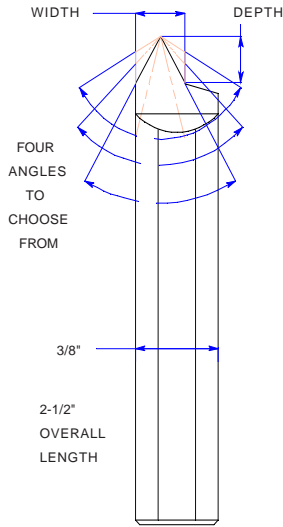
.XXX = +/- .002

.XXXX = +/- .0005

ANGLES +/- 0.15°

SERIES 39

EXTERNAL THREAD / CHAMFER TOOLS

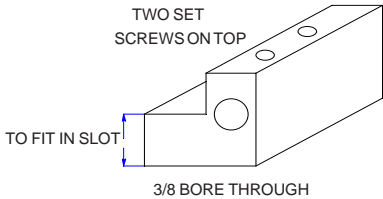


INC. ANGLE	WIDTH	DEPTH	TYPE	ORDER EDP#	TOOL I.D.
30°	.102	.190	DBL ANGLE	39-1000	EX-30-DBL
60°	.250	.216	DBL ANGLE	39-1005	EX-60-DBL
90°	.187	.187	DBL ANGLE	39-1010	EX-90-DBL
120°	.187	.108	DBL ANGLE	39-1015	EX-120-DBL

SERIES 39

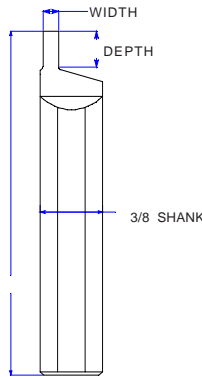
HOLDERS

ORDER EDP#	TO FIT IN THIS SIZE SLOT
39-7400	1/2" SQUARE
39-7410	5/8" SQUARE
39-7420	3/4" SQUARE
39-7430	1" SQUARE



SERIES 39

EXTERNAL GROOVE TOOLS



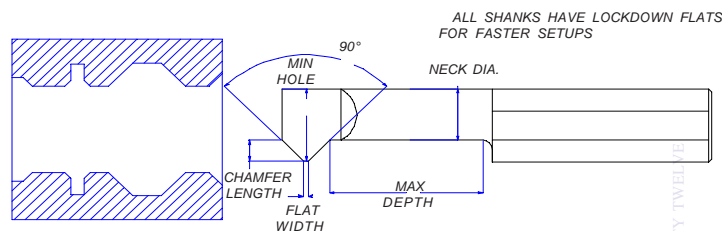
WIDTH	DEPTH	ORDER EDP#	TOOL I.D.
.030 / .031	.072	39-6000	EX-030-RET
.035 / .036	.075	39-6005	EX-035-RET
.041 / .042	.090	39-6010	EX-041-RET
.047 / .049	.095	39-6015	EX-047-RET
.056 / .057	.125	39-6020	EX-056-RET
.068 / .071	.130	39-6025	EX-068-RET

SERIES 43

LATHE I.D. CHAMFER TOOLS *made from ITI CARBIDE*

APPLICATION : **INSIDE CHAMFERS**

MIN HOLE	NECK DIA.	FLAT WIDTH	CHAMFER LENGTH	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.115	.075	.030	.040	.500	43-2000	LA-115-500	1/8 X 2" O.A.L.
				.750	43-2005	LA-115-750	
.175	.125	.030	.050	.750	43-2010	LA-175-750	3/16 X 2-1/2 O.A.L.
				1.000	43-2015	LA-175-1000	
.240	.170	.030	.070	.750	43-2020	LA-240-750	1/4 X 2-1/2 O.A.L.
				1.250	43-2025	LA-240-1250	
.300	.210	.030	.090	.750	43-2030	LA-300-750	5/16 X 2-1/2 O.A.L.
				1.250	43-2035	LA-300-1250	
.360	.250	.030	.110	.750	43-2040	LA-360-750	3/8 X 2-1/2 O.A.L.
				1.250	43-2045	LA-360-1250	
.490	.350	.030	.140	1.000	43-2050	LA-490-1000	1/2 X 3" O.A.L.
				1.500	43-2055	LA-490-1500	





GROOVE TOOLS

SERIES 26

.640 MINIMUM BORE

SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
G-640	1/2	3/8	99-1155	S-16-S	9/64	3"	26-1100	26-1105	26-1110
						6"	26-1115	26-1120	26-1125
						9"	26-1130	26-1135	26-1140
						12"	26-1145	26-1150	26-1155

SERIES 26

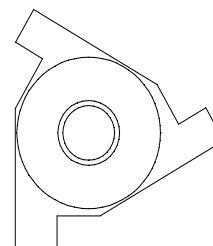
.750 MINIMUM BORE

SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
G-750	5/8	3/8	99-1155	S-16	9/64	3"	26-1160	26-1165	26-1170
						6"	26-1175	26-1180	26-1185
						9"	26-1190	26-1195	26-1200
						12"	26-1205	26-1210	26-1215

INSERTS FOR ABOVE BARS - 3/8" INSERT I.C.

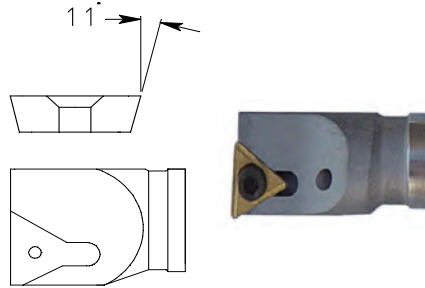
CARBIDE GRADE	GROOVE WIDTH	CUTTING DEPTH	ORDER EDP#
C-2 UNCOATED	.031	.046	26-1700
TIN COATED	.031	.046	26-1735
C-2 UNCOATED	.047	.062	26-1705
TIN COATED	.047	.062	26-1740
C-2 UNCOATED	.062	.062	26-1710
TIN COATED	.062	.062	26-1745
C-2 UNCOATED	.078	.078	26-1715
TIN COATED	.078	.078	26-1750
C-2 UNCOATED	.094	.078	26-1720
TIN COATED	.094	.078	26-1755
C-2 UNCOATED	.097	.070	26-1725
TIN COATED	.097	.070	26-1760
C-2 UNCOATED	.125	.050	26-1730
TIN COATED	.125	.050	26-1765



NOTICE: INSERT GROOVING BARS ARE MADE TO ORDER; PLEASE CALL FOR DELIVERY TIME, OTHERWISE THE DELIVERY TIME WILL BE QUOTED IN AN ORDER CONFIRMATION

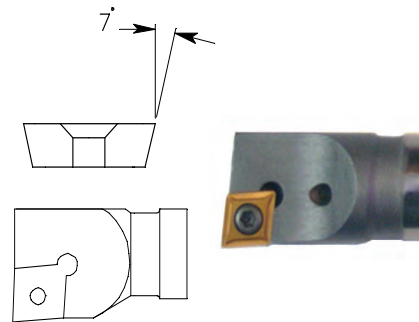
SERIES 40 11 DEGREE TRIANGLE

MIN BORE	SHANK DIA.	HEAD I.D.	ORDER EDP#	INSERT	I.C.	INSERT THICKNESS
5/16	1/4	T11-31	40-1110	TBGP-520	5/32	1/16
3/8	5/16	T11-37	40-1115	TPGP-630	3/16	3/32
7/16	3/8	T11-43	40-1120	TPGP-630	3/16	3/32
1/2	3/8	T11-50	40-1125	TPGG-22YL	1/4	1/8
9/16	1/2	T11-56	40-1130	TPGG-22YL	1/4	1/8
5/8	1/2	T11-62	40-1135	TPGG-22YL	1/4	1/8
11/16	5/8	T11-68	40-1140	TPGG-22YL	1/4	1/8
3/4	5/8	T11-75	40-1145	TPGG-22YL	1/4	1/8
7/8	3/4	T11-87	40-1150	TPGG-33YL	3/8	3/16
1"	3/4	T11-10	40-1155	TPGG-33YL	3/8	3/16
1-1/8	1"	T11-11	40-1160	TPGG-33YL	3/8	3/16



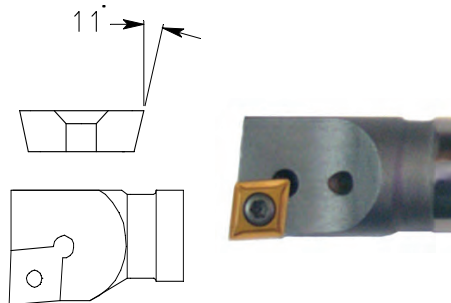
SERIES 40 7 DEGREE DIAMOND

MIN BORE	SHANK DIA.	HEAD I.D.	ORDER EDP#	INSERT	I.C.	INSERT THICKNESS
3/8	5/16	D07-37	40-1165	CCMT-21.51	1/4	3/32
7/16	3/8	D07-43	40-1170	CCMT-21.51	1/4	3/32
1/2	3/8	D07-50	40-1175	CCMT-21.51	1/4	3/32
9/16	1/2	D07-56	40-1180	CCMT-21.51	1/4	3/32
5/8	1/2	D07-62	40-1185	CCMT-21.51	1/4	3/32
5/8	1/2	D07-62B	40-1187	CCMT-32.51	3/8	5/32
11/16	5/8	D07-68	40-1190	CCMT-21.51	1/4	3/32
11/16	5/8	D07-68B	40-1192	CCMT-32.51	3/8	5/32
3/4	5/8	D07-75	40-1195	CCMT-21.51	1/4	3/32
3/4	5/8	D07-75B	40-1197	CCMT-32.51	3/8	5/32
7/8	3/4	D07-87	40-1200	CCMT-32.51	3/8	5/32
1"	3/4	D07-10	40-1205	CCMT-32.51	3/8	5/32
1-1/8	1"	D07-11	40-1210	CCMT-32.51	3/8	5/32



SERIES 40 11 DEGREE DIAMOND

MIN BORE	SHANK DIA.	HEAD I.D.	ORDER EDP#	INSERT	I.C.	INSERT THICKNESS
3/8	5/16	D11-37	40-1215	CPGT-21.51	1/4	3/32
7/16	3/8	D11-43	40-1220	CPGT-21.51	1/4	3/32
1/2	3/8	D11-50	40-1225	CPGT-21.51	1/4	3/32
9/16	1/2	D11-56	40-1230	CPGT-21.51	1/4	3/32
5/8	1/2	D11-62	40-1235	CPGT-21.51	1/4	3/32
11/16	5/8	D11-68	40-1240	CPGT-21.51	1/4	3/32
3/4	5/8	D11-75	40-1245	CPGT-21.51	1/4	3/32
7/8	3/4	D11-87	40-1250	CPGT-32.51	3/8	5/32
1"	3/4	D11-10	40-1255	CPGT-32.51	3/8	5/32
1-1/8	1"	D11-11	40-1260	CPGT-32.51	3/8	5/32



SERIES 40 LAY DOWN STYLE THREADING TOOLS

MIN BORE	SHANK DIA.	HEAD I.D.	ORDER EDP#	I.C.
.236	3/16	T001	40-1265	5/32
.307	1/4	T002	40-1270	3/16
.354	5/16	T003	40-1275	3/16
.390	5/16	T003.5	40-1277	1/4
.470	3/8	T004	40-1280	1/4
.625	1/2	T005	40-1285	1/4
.640	1/2	T006	40-1290	3/8
.750	5/8	T007	40-1295	3/8
1.000	3/4	T008	40-1300	3/8



SERIES 40 LAY DOWN STYLE GROOVING TOOLS

MIN BORE	SHANK DIA.	HEAD I.D.	ORDER EDP#	I.C.
.640	1/2	G-640	40-1305	3/8
.750	5/8	G-750	40-1310	3/8



SCREWS

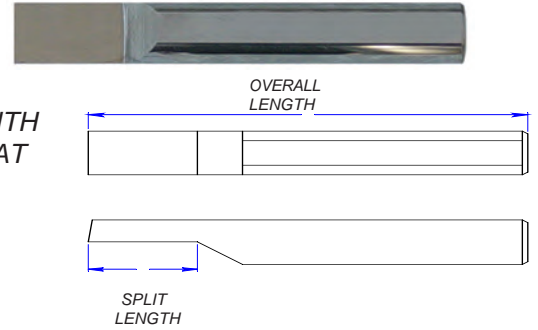
ORDER EDP#	SCREW#
99-1100	BHF-0203S
99-1105	BHF-0203B
99-1110	BHF-0306R
99-1115	BFX-0410R
99-1120	S-90
99-1125	S-95
99-1130	S-98
99-1132	S-98-S
99-1135	S-6
99-1145	S-8
99-1150	S-11
99-1155	S-16-S
99-1160	S-16
99-1165	BHF-0308R
99-1170	BFTX-02506

SERIES 70 *made from ITI CARBIDE* APPLICATION : A BLANK THAT THE USER CAN GRIND INTO THEIR OWN SPECIAL TOOL.

SINGLE END SPLIT BLANKS

DIAMETER	ORDER EDP#	TOOL IDENTIFICATION	SPLIT LENGTH	OVERALL LENGTH
1/8	70-1100	SP-125-SGL	1/4	1-1/2"
3/16	70-1105	SP-187-SGL	5/16	2"
1/4	70-1110	SP-250-SGL	3/8	2"
5/16	70-1115	SP-312-SGL	1/2	2"
3/8	70-1120	SP-375-SGL	1/2	2"
1/2	70-1125	SP-500-SGL	5/8	2-1/2"

ALL GROUND WITH SET SCREW FLAT ON TOP

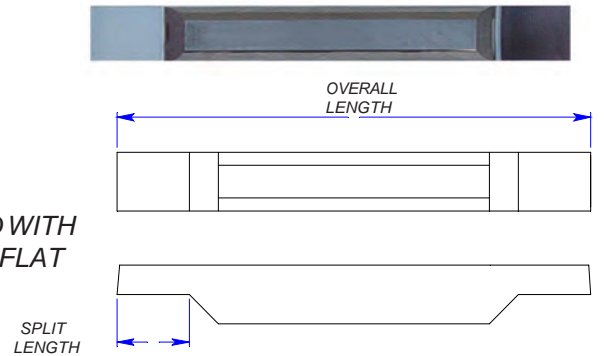


SERIES 70 *made from ITI CARBIDE* APPLICATION : A DOUBLE END BLANK THAT THE USER CAN GRIND INTO THEIR OWN SPECIAL TOOL.

DOUBLE END SPLIT BLANKS

DIAMETER	ORDER EDP#	TOOL IDENTIFICATION	SPLIT LENGTH	OVERALL LENGTH
1/8	70-1200	SP-125-DBL	1/4	2"
3/16	70-1205	SP-187-DBL	5/16	2-1/2"
1/4	70-1210	SP-250-DBL	3/8	2-1/2"
5/16	70-1215	SP-312-DBL	1/2	2-1/2"
3/8	70-1220	SP-375-DBL	1/2	2-1/2"
1/2	70-1225	SP-500-DBL	5/8	3"

ALL GROUND WITH SET SCREW FLAT ON TOP



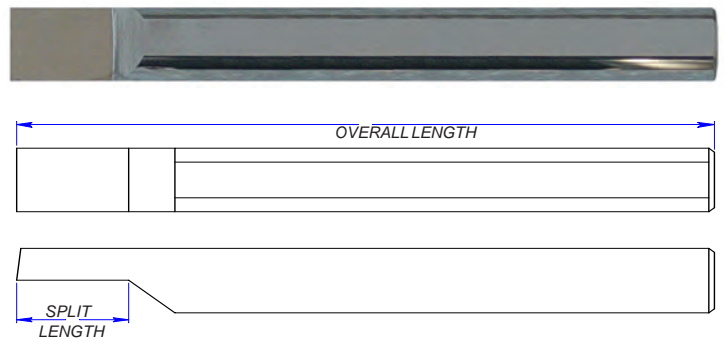
SERIES 70 *made from ITI CARBIDE*

LONG LENGTH SINGLE END SPLIT BLANKS

DIAMETER	ORDER EDP#	TOOL IDENTIFICATION	SPLIT LENGTH	OVERALL LENGTH
1/8	70-1400	SP-125-LNG	3/8	4"
3/16	70-1405	SP-187-LNG	3/8	4"
1/4	70-1410	SP-250-LNG	3/8	4"
5/16	70-1415	SP-312-LNG	1/2	4"
3/8	70-1420	SP-375-LNG	1/2	6"
1/2	70-1425	SP-500-LNG	5/8	6"

APPLICATION : A LONG LENGTH BLANK THAT THE USER CAN GRIND INTO THEIR OWN SPECIAL TOOL.

ALL GROUND WITH SET SCREW FLAT ON TOP

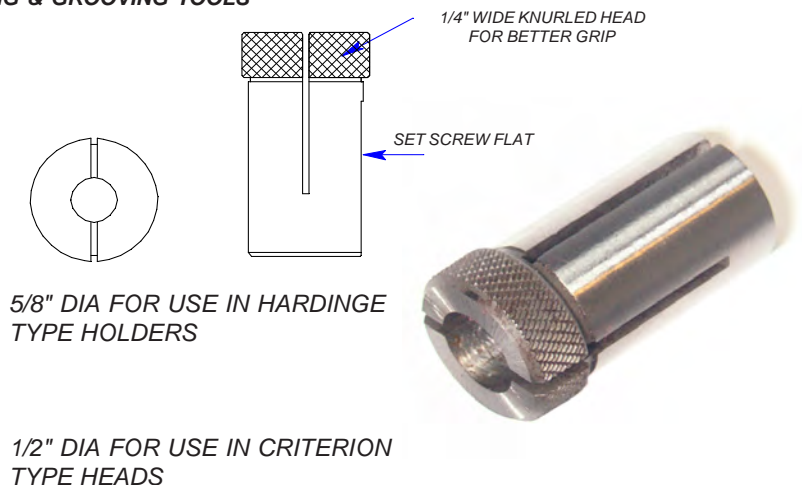


SERIES 94

APPLICATION : USED TO HOLD OUR BORING & GROOVING TOOLS

SPLIT BUSHINGS

INSIDE DIAMETER	BUSHING ID	ORDER EDP#	OUTSIDE DIAMETER	O.A.L. LENGTH
1/8	SB-125	94-1100	5/8	1-1/4
3/16	SB-187	94-1105		
1/4	SB-250	94-1110		
5/16	SB-312	94-1115		
3/8	SB-375	94-1120		
7/16	SB-437	94-1125		
1/2	SB-500	94-1130	1/2	1-1/4
1/8	SB-125-5	94-1135		
3/16	SB-187-5	94-1140		
1/4	SB-250-5	94-1145		
5/16	SB-312-5	94-1150		
3/8	SB-375-5	94-1155		



5/8" DIA FOR USE IN HARDINGE TYPE HOLDERS

1/2" DIA FOR USE IN CRITERION TYPE HEADS

SERIES 73 *made from ITI CARBIDE*

DOUBLE END FACE / OD GROOVE TOOLS

SQUARE NOSE double end

GROOVE WIDTH	GROOVE DEPTH	ORDER EDP#	ALTiN COATED EDP#
.017	.040	73-1000	73-1000-C
.025	.065	73-1005	73-1005-C
.032	.080	73-1010	73-1010-C
.063	.150	73-1015	73-1015-C
.094	.200	73-1020	73-1020-C
.125	.200	73-1025	73-1025-C
.187	.200	73-1030	73-1030-C

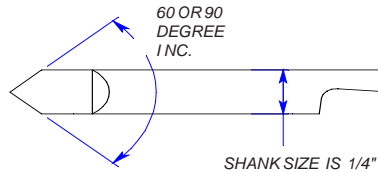
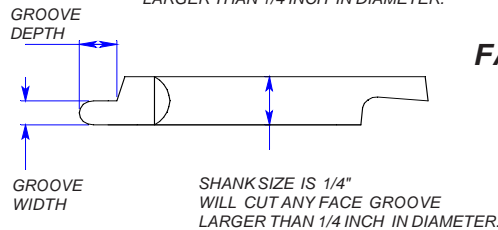
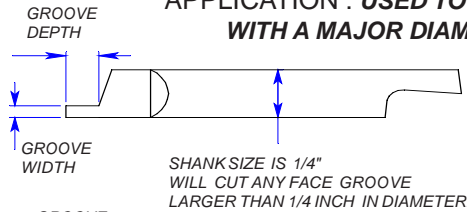
FULL RADIUS NOSE double end

GROOVE WIDTH	GROOVE DEPTH	ORDER EDP#	ALTiN COATED EDP#
.017	.040	73-2000	73-2000-C
.025	.065	73-2005	73-2005-C
.032	.080	73-2010	73-2010-C
.063	.150	73-2015	73-2015-C
.094	.200	73-2020	73-2020-C
.125	.200	73-2025	73-2025-C
.187	.200	73-2030	73-2030-C

DOUBLE ANGLE

INCLUDED ANGLE	ORDER EDP#	ALTiN COATED EDP#
60°	73-4000	73-4000-C
90°	73-4500	73-4500-C

APPLICATION : USED TO CREATE ANY FACE GROOVE WITH A MAJOR DIAMETER GREATER THAN 1/4"



HOLDERS SERIES 96

ORDER EDP#	SHANK SIZE	OVERALL LENGTH
96-1300	5/8 ROUND	4"
96-1305	3/4 ROUND	
96-1310	1" SQUARE	

FACE GROOVER BUSHING

BUSHING SIZE	ORDER EDP#
1/4	96-1930



TOOLS ARE ROUND SHANK AND CAN BE HELD IN A COLLET BUT FOR EASE OF USE AND FASTER TOOL CHANGES WE RECOMMEND OUR SERIES 96 HOLDER SHOWN HERE.

SERIES 73 *made from ITI CARBIDE*

SINGLE END FACE / OD GROOVE TOOLS

SQUARE NOSE

MIN DIA.	GROOVE WIDTH	GROOVE DEPTH	RIGHT HAND ORDER EDP#	LEFT HAND ORDER EDP#
1/4	.032	.095	73-5000	73-7500
	.063	.180	73-5005	73-7505
	.094	.250	73-5010	73-7510
	.125	.280	73-5015	73-7515
3/8	.187	.300	73-5020	73-7520
	.250	.375	73-5025	73-7525
	.312	.500	73-5030	73-7530
	.370	.600	73-5035	73-7535

FULL RADIUS NOSE

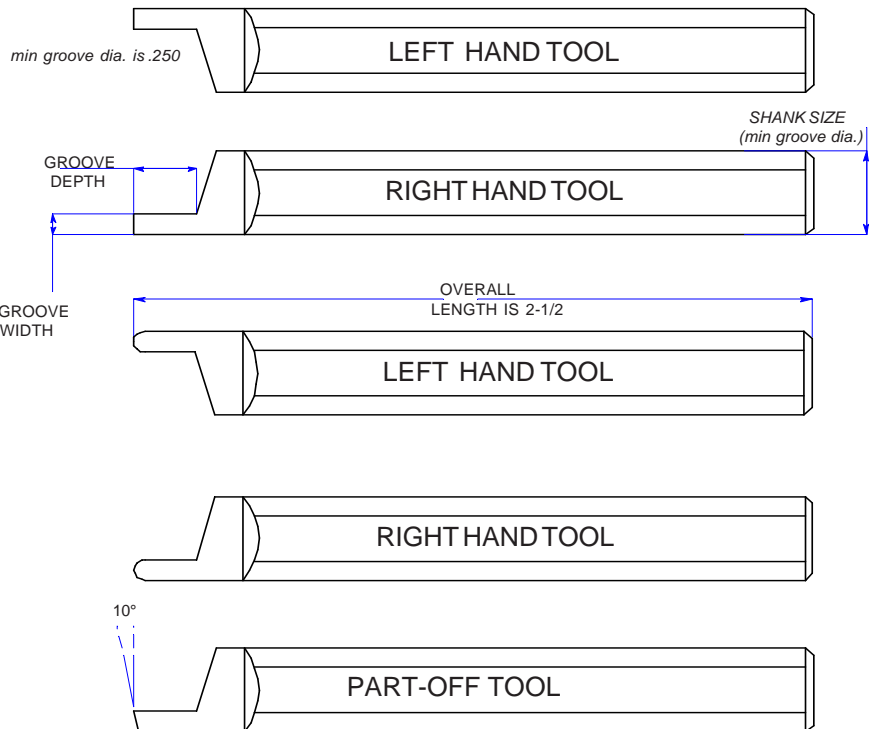
MIN DIA.	GROOVE WIDTH	GROOVE DEPTH	RIGHT HAND ORDER EDP#	LEFT HAND ORDER EDP#
1/4	.032	.095	73-6000	73-8000
	.063	.180	73-6005	73-8005
	.094	.250	73-6010	73-8010
	.125	.280	73-6015	73-8015
3/8	.187	.300	73-6020	73-8020
	.250	.375	73-6025	73-8025
	.312	.500	73-6030	73-8030
	.370	.600	73-6035	73-8035

PART-OFF NOSE

MIN DIA.	GROOVE WIDTH	GROOVE DEPTH	ORDER EDP#
1/4	.094	.325	73-7000
	.125	.400	73-7020
3/8	.187	.500	73-7030

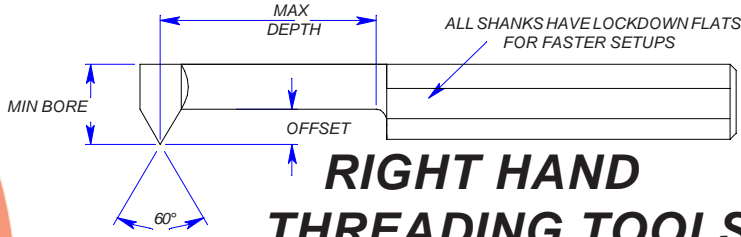
APPLICATION : SIMILAR TO ABOVE EXCEPT SINGLE END. LONGER SHANKS WITH LARGER DIAMETERS AND GREATER DEPTHS OF CUT. CAN ALSO BE USED FOR OD GROOVING.

TOOLS ARE ROUND SHANK AND CAN BE HELD IN A COLLET BUT FOR EASE OF USE AND FASTER TOOL CHANGES WE RECOMMEND OUR SERIES 98 HOLDER SHOWN ON PAGE 12



SERIES 30

APPLICATION : **RIGHT HAND ID THREADING.**
made from **ITI CARBIDE**



**RIGHT HAND
THREADING TOOLS**

MIN BORE	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#	TOOL I.D.	OFFSET	SHANK
.060	.150	30-1340	30-1340-C	T-060-150	.020	1/8 X 2" O.A.L.
	.200	30-1345	30-1345-C	T-060-200		
	.300	30-1350	30-1350-C	T-060-300		
.090	.200	30-1355	30-1355-C	T-090-200	.025	1/8 X 2" O.A.L.
	.300	30-1360	30-1360-C	T-090-300		
	.400	30-1365	30-1365-C	T-090-400		
.120	.300	30-1370	30-1370-C	T-120-300	.030	3/16 X 2-1/2 O.A.L.
	.400	30-1375	30-1375-C	T-120-400		
	.500	30-1380	30-1380-C	T-120-500		
.140	.300	30-1385	30-1385-C	T-140-300	.035	3/16 X 2-1/2 O.A.L.
	.400	30-1390	30-1390-C	T-140-400		
	.500	30-1395	30-1395-C	T-140-500		
.160	.400	30-1396	30-1396-C	T-160-400	.040	3/16 X 2-1/2 O.A.L.
	.500	30-1397	30-1397-C	T-160-500		
	.750	30-1398	30-1398-C	T-160-750		
.180	1.000	30-1399	30-1399-C	T-160-1000	.040	1/4 X 2-1/2 O.A.L.
	.350	30-1400	30-1400-C	T-180-350		
	.500	30-1405	30-1405-C	T-180-500		
.200	.750	30-1410	30-1410-C	T-180-750	.045	1/4 X 2-1/2 O.A.L.
	1.000	30-1415	30-1415-C	T-180-1000		
	.400	30-1420	30-1420-C	T-200-400		
.230	.600	30-1425	30-1425-C	T-200-600	.055	5/16 X 2-1/2 O.A.L.
	.750	30-1430	30-1430-C	T-200-750		
	1.000	30-1435	30-1435-C	T-200-1000		
.290	.400	30-1440	30-1440-C	T-230-400	.070	5/16 X 2-1/2 O.A.L.
	.600	30-1445	30-1445-C	T-230-600		
	.750	30-1450	30-1450-C	T-230-750		
.320	1.000	30-1455	30-1455-C	T-230-1000	.075	3/8 X 2-1/2 O.A.L.
	1.500	30-1460	30-1460-C	T-230-1500		
	.500	30-1465	30-1465-C	T-290-500		
.290	.750	30-1470	30-1470-C	T-290-750	.070	5/16 X 2-1/2 O.A.L.
	1.000	30-1475	30-1475-C	T-290-1000		
	1.250	30-1480	30-1480-C	T-290-1250		
.320	1.500	30-1482	30-1482-C	T-290-1500	.075	3/8 X 2-1/2 O.A.L.
	1.750	30-1485	30-1485-C	T-290-1750		
	.500	30-1490	30-1490-C	T-320-500		
.320	.750	30-1495	30-1495-C	T-320-750	.075	3/8 X 2-1/2 O.A.L.
	1.000	30-1500	30-1500-C	T-320-1000		
	1.250	30-1505	30-1505-C	T-320-1250		
.320	1.500	30-1507	30-1507-C	T-320-1500	.075	3/8 X 2-1/2 O.A.L.
	1.800	30-1510	30-1510-C	T-320-1800		

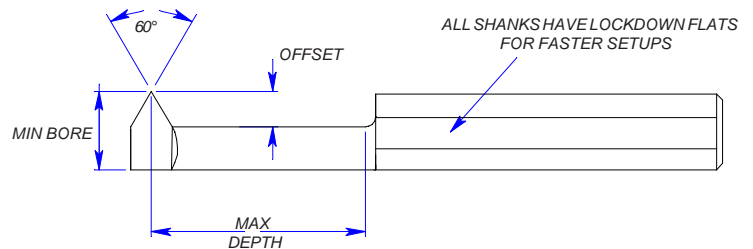
**RIGHT HAND
THREADING TOOLS CONT.**

MIN BORE	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#	TOOL I.D.	OFFSET	SHANK
.360	.500	30-1515	30-1515-C	T-360-500	.085	3/8 X 2-1/2 O.A.L.
	.750	30-1520	30-1520-C	T-360-750		
	1.000	30-1525	30-1525-C	T-360-1000		
	1.250	30-1530	30-1530-C	T-360-1250		
	1.500	30-1532	30-1532-C	T-360-1500		
.490	1.800	30-1535	30-1535-C	T-360-1800	.120	1/2 X 3" O.A.L.
	.750	30-1540	30-1540-C	T-490-750		
	1.000	30-1542	30-1542-C	T-490-1000		
	1.500	30-1545	30-1545-C	T-490-1500		
	2.000	30-1550	30-1550-C	T-490-2000		

SERIES 31

made from **ITI CARBIDE**

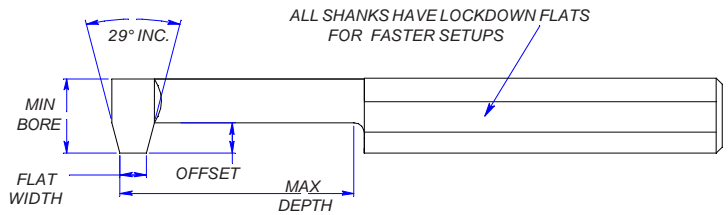
APPLICATION : **LEFT HAND AND EXTERNAL THREADING.**



**LEFT HAND
THREADING TOOLS**

MIN BORE	MAX DEPTH	ORDER EDP#	TOOL I.D.	OFFSET	SHANK
.180	.500	31-1200	TL-180-500	.040	1/4 X 2-1/2
	.750	31-1205	TL-180-750		
	1.000	31-1210	TL-180-1000		
.200	.500	31-1215	TL-200-500	.045	1/4 X 2-1/2
	.750	31-1220	TL-200-750		
	1.000	31-1225	TL-200-1000		
.230	.500	31-1230	TL-230-500	.055	5/16 X 2-1/2
	.750	31-1235	TL-230-750		
	1.000	31-1240	TL-230-1000		
.290	.500	31-1245	TL-290-500	.070	5/16 X 2-1/2
	.750	31-1250	TL-290-750		
	1.000	31-1255	TL-290-1000		
.320	.500	31-1260	TL-320-500	.075	3/8 X 2-1/2
	.750	31-1265	TL-320-750		
	1.000	31-1270	TL-320-1000		
.360	.500	31-1275	TL-360-500	.085	3/8 X 2-1/2
	.750	31-1280	TL-360-750		
	1.000	31-1285	TL-360-1000		

SERIES 32-34 APPLICATION: ACME ID THREADING



SERIES 32 *made from ITI CARBIDE*
ACME THREADING TOOLS

MIN BORE	THREADS PER INCH	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#	OFFSET	FLAT WIDTH	SHANK
.200	16	.400	32-1200	32-1200-C	.045	.021	1/4 X 2-1/2
		.600	32-1205	32-1205-C			
		.750	32-1210	32-1210-C			
	14	1.000	32-1215	32-1215-C			
		.500	32-1220	32-1220-C			
		.750	32-1225	32-1225-C			
		1.000	32-1230	32-1230-C			
.290	14	1.250	32-1235	32-1235-C	.070	.024	5/16 X 2-1/2
		1.750	32-1240	32-1240-C			
		.500	32-1245	32-1245-C			
.360	12	.750	32-1250	32-1250-C	.085	.028	3/8 X 2-1/2
		1.000	32-1255	32-1255-C			
		1.250	32-1260	32-1260-C			
.490	10	1.800	32-1265	32-1265-C	.120	.032	1/2 X 3"
		.750	32-1270	32-1270-C			
		1.500	32-1275	32-1275-C			
.490	8	2.000	32-1280	32-1280-C	.120	.041	1/2 X 3"
		.750	32-1285	32-1285-C			
		1.500	32-1290	32-1290-C			
.490	6	2.000	32-1295	32-1295-C	.120	.057	1/2 X 3"
		.750	32-1300	32-1300-C			
		1.500	32-1305	32-1305-C			
.490	5	2.000	32-1310	32-1310-C	.120	.069	1/2 X 3"
		.750	32-1315	32-1315-C			
		1.500	32-1320	32-1320-C			
.490	4	2.000	32-1325	32-1325-C	.150	.088	1/2 X 3"
		.750	32-1330	32-1330-C			
		1.500	32-1335	32-1335-C			
		2.000	32-1340	32-1340-C			

SERIES 34 *made from ITI CARBIDE*
STUB ACME THREADING TOOLS

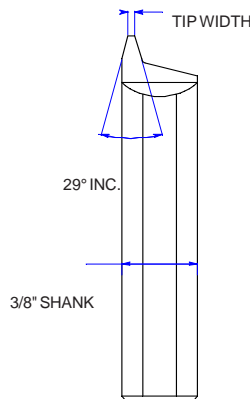
MIN BORE	THREADS PER INCH	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#	OFFSET	FLAT WIDTH	SHANK
.200	16	.400	34-1400	34-1400-C	.045	.024	1/4 X 2-1/2
		.600	34-1405	34-1405-C			
		.750	34-1410	34-1410-C			
	14	1.000	34-1415	34-1415-C			
		.500	34-1420	34-1420-C			
		.750	34-1425	34-1425-C			
		1.000	34-1430	34-1430-C			
.290	14	1.250	34-1435	34-1435-C	.070	.028	5/16 X 2-1/2
		1.750	34-1440	34-1440-C			
		.500	34-1445	34-1445-C			
.360	12	.750	34-1450	34-1450-C	.085	.033	3/8 X 2-1/2
		1.000	34-1455	34-1455-C			
		1.250	34-1460	34-1460-C			
.490	10	1.800	34-1465	34-1465-C	.120	.037	1/2 X 3"
		.750	34-1470	34-1470-C			
		1.500	34-1475	34-1475-C			
.490	9	2.000	34-1480	34-1480-C	.120	.042	1/2 X 3" O.A.L.
		.750	34-1485	34-1485-C			
		1.500	34-1490	34-1490-C			
.490	8	2.000	34-1495	34-1495-C	.120	.048	1/2 X 3" O.A.L.
		.750	34-1500	34-1500-C			
		1.500	34-1505	34-1505-C			
.490	7	2.000	34-1510	34-1510-C	.120	.055	1/2 X 3" O.A.L.
		.750	34-1515	34-1515-C			
		1.500	34-1520	34-1520-C			
.490	6	2.000	34-1525	34-1525-C	.120	.065	1/2 X 3" O.A.L.
		.750	34-1530	34-1530-C			
		1.500	34-1535	34-1535-C			
.490	5	2.000	34-1540	34-1540-C	.120	.079	1/2 X 3" O.A.L.
		.750	34-1545	34-1545-C			
		1.500	34-1550	34-1550-C			
		2.000	34-1555	34-1555-C			

THREAD TOOLS

SERIES 33

EXTERNAL ACME THREAD TOOLS

PITCH	TIP WIDTH	ORDER EDP#	TOOL IDENTIFICATION
16	.021	33-1000	EX-16-ACME
14	.024	33-1005	EX-14-ACME
12	.028	33-1010	EX-12-ACME
10	.032	33-1015	EX-10-ACME
8	.041	33-1020	EX-8-ACME
6	.057	33-1025	EX-6-ACME
5	.069	33-1030	EX-5-ACME
4	.088	33-1035	EX-4-ACME



SERIES 33

EXTERNAL STUB ACME THREAD TOOLS

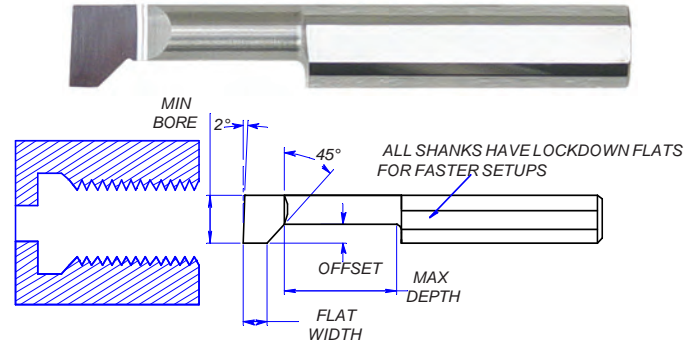
PITCH	TIP WIDTH	ORDER EDP#	TOOL IDENTIFICATION
16	.024	33-2000	EX-16-STUB
14	.028	33-2005	EX-14-STUB
12	.033	33-2010	EX-12-STUB
10	.037	33-2015	EX-10-STUB
9	.042	33-2020	EX-9-STUB
8	.048	33-2025	EX-8-STUB
7	.055	33-2030	EX-7-STUB
6	.065	33-2035	EX-6-STUB
5	.079	33-2040	EX-5-STUB

SERIES 46

THREAD RELIEF TOOLS

made from **ITI CARBIDE**

MIN BORE	FLAT WIDTH	OFFSET	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK
1/8	.060	.045	.300	46-1100	TR-125-300	1/8 X 2" O.A.L.
			.400	46-1105	TR-125-400	
3/16	.080	.060	.400	46-1110	TR-187-400	3/16 X 2-1/2 O.A.L.
			.800	46-1115	TR-187-800	
1/4	.095	.050	.500	46-1120	TR-250-500	1/4 X 2-1/2 O.A.L.
			1.000	46-1125	TR-250-1000	
5/16	.095	.080	.750	46-1130	TR-312-750	5/16 X 2-1/2 O.A.L.
			1.250	46-1135	TR-312-1250	
3/8	.130	.120	.750	46-1140	TR-375-750	3/8 X 2-1/2 O.A.L.
			1.250	46-1145	TR-375-1250	
1/2	.160	.130	1.000	46-1150	TR-500-1000	1/2 X 3" O.A.L.
			1.500	46-1155	TR-500-1500	



THREAD TOOLS

SERIES 08

made from **ITI CARBIDE**

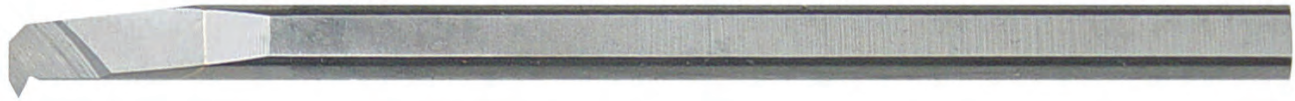
APPLICATION : **MULTI-REACH THREADING**

MULTI-REACH THREADING TOOLS

NO LONGER LIMITED BY NECK LENGTH. ONE TOOL REPLACES A SERIES OF OTHERS.

MINIMUM BORE	TOOL I.D.	ORDER EDP#	ALTN EDP#	OFFSET	LARGEST PITCH	SHANK DIAMETER	SHANK LENGTH
.310	LT-310-4	08-1500	08-1500-C	.060	16	1/4"	4"
.375	LT-375-4	08-1505	08-1505-C	.060	16	5/16"	4"
.460	LT-460-6	08-1510	08-1510-C	.080	11	3/8"	6"
.610	LT-610-6	08-1515	08-1515-C	.100	9	1/2"	6"
.750	LT-750-6	08-1520	08-1520-C	.120	8	5/8"	6"

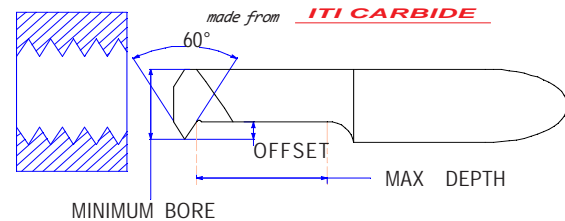
CARBIDE SHANKS PROVIDE MAXIMUM RIDGIDITY.



SERIES 42

QUICK CHANGE THREADING TOOLS

MINIMUM BORE	OFFSET	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#
.060	.025	.200	42-3000	42-3000-C
		.300	42-3005	42-3005-C
.080	.025	.200	42-3010	42-3010-C
		.300	42-3015	42-3015-C
		.400	42-3020	42-3020-C
		.500	42-3025	42-3025-C
.100	.030	.200	42-3030	42-3030-C
		.300	42-3035	42-3035-C
		.400	42-3040	42-3040-C
.120	.035	.500	42-3045	42-3045-C
		.200	42-3050	42-3050-C
		.300	42-3055	42-3055-C
		.400	42-3060	42-3060-C
.140	.040	.500	42-3065	42-3065-C
		.200	42-3070	42-3070-C
		.300	42-3075	42-3075-C
		.400	42-3080	42-3080-C
		.500	42-3085	42-3085-C
.160	.045	.600	42-3090	42-3090-C
		.700	42-3095	42-3095-C
		.200	42-3100	42-3100-C
		.300	42-3105	42-3105-C
.180	.045	.400	42-3110	42-3110-C
		.500	42-3115	42-3115-C
		.600	42-3120	42-3120-C
		.700	42-3125	42-3125-C
		.200	42-3130	42-3130-C
.160	.045	.300	42-3135	42-3135-C
		.400	42-3140	42-3140-C
		.500	42-3145	42-3145-C
		.600	42-3150	42-3150-C
.180	.045	.700	42-3155	42-3155-C



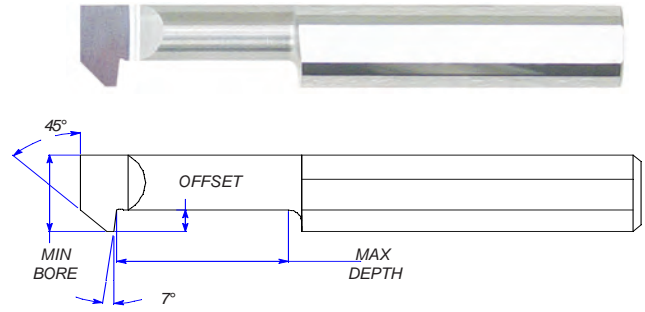
SEE HOLDERS ON PAGE 10

MINIMUM BORE	OFFSET	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#
.160	.045	.200	42-3100	42-3100-C
		.300	42-3105	42-3105-C
		.400	42-3110	42-3110-C
		.500	42-3115	42-3115-C
		.600	42-3120	42-3120-C
.180	.045	.700	42-3125	42-3125-C
		.200	42-3130	42-3130-C
		.300	42-3135	42-3135-C
		.400	42-3140	42-3140-C
		.500	42-3145	42-3145-C
.160	.045	.600	42-3150	42-3150-C
		.700	42-3155	42-3155-C

SERIES 38 BUTTRESS THREADING TOOLS

MIN BORE	THREADS PER INCH	OFFSET	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK
1/4	20	.050	.375	38-1100	BU-20-375	1/4 X 2-1/2 O.A.L.
			.750	38-1105	BU-20-750	
5/16	16	.060	.375	38-1110	BU-16-375	5/16 X 2-1/2 O.A.L.
			.750	38-1115	BU-16-750	
3/8	12	.070	.500	38-1120	BU-12-500	3/8 X 2-1/2 O.A.L.
			1.000	38-1125	BU-12-1000	
3/8	10	.080	.500	38-1130	BU-10-500	3/8 X 2-1/2 O.A.L.
			1.000	38-1135	BU-10-1000	
1/2	8	.090	.750	38-1140	BU-8-750	1/2 X 3" O.A.L.
			1.250	38-1145	BU-8-1250	
1/2	6	.120	.750	38-1150	BU-6-1000	1/2 X 3" O.A.L.
			1.250	38-1155	BU-6-1250	

made from **ITI CARBIDE**

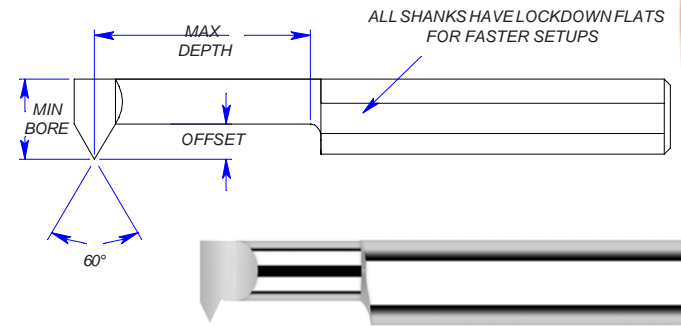


SERIES 30 METRIC THREADING TOOLS

made from **ITI CARBIDE**

APPLICATION : **RIGHT HAND ID THREADING.**

THRED SIZE	PITCH RANGE	MIN BORE	MAX DEPTH MM INCH	ORDER EDP#	OFFSET	SHANK
2MM	0.20 0.70	1.52 MM	4.0 (.157)	30-1800	.635 MM	1/8 X 2"
			8.0 (.315)	30-1805		
3MM	0.20 0.80	2.28 MM	4.0 (.157)	30-1810	.762 MM	1/8 X 2"
			8.0 (.315)	30-1815		
			12.0 (.472)	30-1820		
4MM	0.20 1.00	3.04 MM	4.0 (.157)	30-1825	.889 MM	1/8 X 2"
			8.0 (.315)	30-1830		
			12.0 (.472)	30-1835		
5MM	0.20 1.40	4.20 MM	10.0 (.394)	30-1840	1.27 MM	1/4 X 2-1/2 O.A.L.
			14.0 (.551)	30-1845		
			18.0 (.709)	30-1850		
			25.0 (.985)	30-1855		
6MM	0.20 2.10	5.08 MM	12.0 (.472)	30-1860	1.90 MM	5/16 X 2-1/2 O.A.L.
			18.0 (.709)	30-1865		
			25.0 (.985)	30-1870		
8MM	0.20 2.20	7.36 MM	12.0 (.472)	30-1880	2.03 MM	3/8 X 2-1/2 O.A.L.
			18.0 (.709)	30-1890		
			25.0 (.985)	30-1895		
			40.0 (1.576)	30-1900		

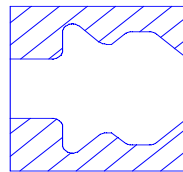


THRED SIZE	PITCH RANGE	MIN BORE	MAX DEPTH MM INCH	ORDER EDP#	OFFSET	SHANK
10MM	0.20 2.20	8.12 MM	12.0 (.472)	30-1905	1.95 MM	3/8 X 2-1/2 O.A.L.
			18.0 (.709)	30-1910		
			25.0 (.985)	30-1915		
			40.0 (1.576)	30-1920		
12MM	0.20 2.50	9.10 MM	12.0 (.472)	30-1925	2.15 MM	3/8 X 2-1/2 O.A.L.
			18.0 (.709)	30-1930		
			25.0 (.985)	30-1935		
16MM	0.20 3.50	12.5 MM	12.0 (.472)	30-1945	3.01 MM	1/2 X 3" O.A.L.
			18.0 (.709)	30-1950		
			25.0 (.985)	30-1955		
			40.0 (1.576)	30-1960		

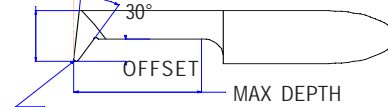
SERIES 42 QUICK CHANGE PROFILE TOOLS

made from **ITI CARBIDE**

MINIMUM BORE	TIP RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#
.080	.005	.040	.200	42-5000	42-5000-C
			.300	42-5005	42-5005-C
.100	.005	.040	.200	42-5010	42-5010-C
			.300	42-5015	42-5015-C
.120	.007	.050	.200	42-5020	42-5020-C
			.300	42-5025	42-5025-C
			.400	42-5030	42-5030-C
			.500	42-5035	42-5035-C
			.600	42-5040	42-5040-C
.140	.007	.050	.700	42-5045	42-5045-C
			.200	42-5050	42-5050-C
			.300	42-5055	42-5055-C
			.400	42-5060	42-5060-C
			.500	42-5065	42-5065-C
			.600	42-5070	42-5070-C
			.700	42-5075	42-5075-C



SEE HOLDERS ON PAGE 10



MINIMUM BORE	TIP RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#
.160	.007	.060	.200	42-5080	42-5080-C
			.300	42-5085	42-5085-C
			.400	42-5090	42-5090-C
			.500	42-5095	42-5095-C
			.600	42-5100	42-5100-C
.180	.007	.080	.700	42-5105	42-5105-C
			.200	42-5110	42-5110-C
			.300	42-5115	42-5115-C
			.400	42-5120	42-5120-C
			.500	42-5125	42-5125-C
			.600	42-5130	42-5130-C
			.700	42-5135	42-5135-C

THREAD TOOLS

INDEXABLE INSERT THREADING BARS

SERIES 36

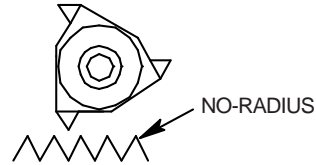
.236 MINIMUM BORE

SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK
						ORDER EDP#	ORDER EDP#
T001	3/16	5/32	99-1135	S-6	3"	36-1100	36-1105
					6"	36-1110	36-1115

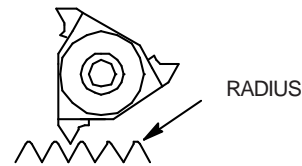
60 DEGREE INSERTS FOR .236 BARS

PITCH RANGE	TIN COATED
20-48	37-1300



FULL PROFILE INSERTS FOR .236 BARS

PITCH	ORDER EDP# TIN COATED
32	37-1304
28	37-1308
24	37-1312
20	37-1316
18	37-1320



SERIES 36

.307 MINIMUM BORE

SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
						ORDER EDP#	ORDER EDP#	ORDER EDP#
T002	1/4	3/16	99-1145	S-8	3"	36-1120	36-1125	36-1130
					6"	36-1135	36-1140	36-1145

SERIES 56

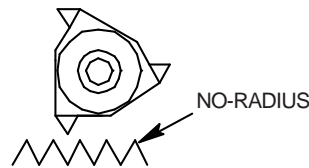
.354 MINIMUM BORE

SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
						ORDER EDP#	ORDER EDP#	ORDER EDP#
T003	5/16	3/16	99-1145	S-8	3"	36-1150	36-1155	36-1160
					6"	36-1165	36-1170	36-1175

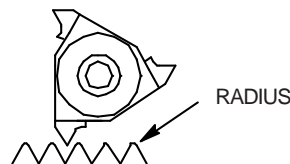
3/16 I.C. 60 DEGREE INSERTS FOR .307 & .354 BARS

PITCH RANGE	TIN COATED
16-48	37-1324



3/16 I.C. FULL PROFILE INSERTS FOR .307 & .354 BARS

PITCH	ORDER EDP# TIN COATED
32	37-1328
28	37-1332
24	37-1336
20	37-1340
18	37-1344
16	37-1348



THREAD TOOLS



SERIES 36 **.390** MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T003.5	5/16	1/4	99-1150	S-11	3"	36-1180	36-1185	36-1190
					6"	36-1200	36-1205	36-1210

SERIES 36 **.470** MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T004	3/8	1/4	99-1150	S-11	3"	36-1215	36-1220	36-1225
					6"	36-1230	36-1235	36-1240

SERIES 36 **.625** MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T005	1/2	1/4	99-1150	S-11	3"	36-1245	36-1250	36-1255
					6"	36-1260	36-1265	36-1270

60 DEGREE INSERTS FOR .390, .470 & .625 BARS

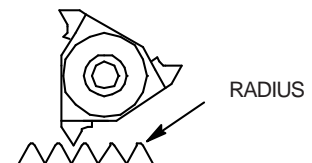
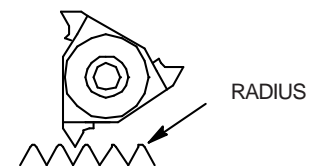
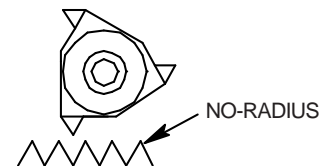
PITCH RANGE	TIN COATED
16-48	37-1368

FULL PROFILE INSERTS FOR .390, .470 & .625 BARS

PITCH	ORDER EDP# UN-COATED C-2	ORDER EDP# TIN COATED
36	37-1370	37-1372
32	37-1374	37-1376
28	37-1378	37-1380
24	37-1382	37-1384
20	37-1383	37-1385
18	37-1386	37-1388
16	37-1390	37-1392
14	13-1394	37-1396
13	37-1398	37-1400
12	37-1401	37-1403
11	37-1405	37-1407

PIPE THREAD INSERTS FOR .390, .470 & .625 BARS

PITCH	C-2 UNCOATED	TIN COATED
27	37-1402	37-1404
18	37-1406	37-1408



SERIES 36 .640 MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
						ORDER EDP#	ORDER EDP#	ORDER EDP#
T006	1/2	3/8	99-1155	S-16-S	3"	36-1275	36-1280	36-1285
					6"	36-1290	36-1295	36-1300
					9"	36-1305	36-1310	36-1315

SERIES 36 .750 MINIMUM BORE

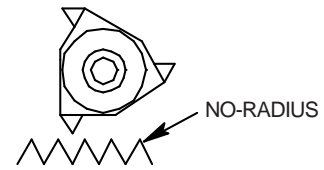
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
						ORDER EDP#	ORDER EDP#	ORDER EDP#
T007	5/8	3/8	99-1160	S-16	3"	36-1320	36-1325	36-1330
					6"	36-1335	36-1340	36-1345
					9"	36-1350	36-1355	36-1360

SERIES 36 1" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
						ORDER EDP#	ORDER EDP#	ORDER EDP#
T008	3/4	3/8	99-1160	S-16	3"	36-1365	36-1370	36-1375
					6"	36-1380	36-1385	36-1390
					9"	36-1395	36-1400	36-1405

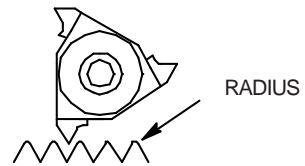
60 DEGREE INSERTS FOR .640 .750 & 1" BARS

PITCH RANGE	C-2 UNCOATED	TIN COATED
16-48	37-1410	37-1412
8-48	37-1414	37-1416
8-14	37-1415	37-1417



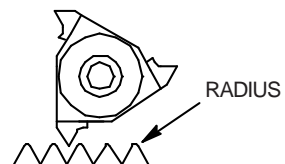
FULL PROFILE INSERTS FOR .640 .750 & 1" BARS

PITCH	ORDER EDP# UN-COATED C-2	ORDER EDP# TIN COATED
36	37-1418	37-1420
32	37-1422	37-1424
28	37-1426	37-1428
24	37-1430	37-1432
20	37-1434	37-1436
18	37-1438	37-1440
16	37-1442	37-1444
14	37-1446	37-1448
12	37-1450	37-1452
10	37-1454	37-1456
8	37-1458	37-1460



PIPE THREAD INSERTS FOR .640 .750 & 1" BARS

PITCH	C-2 UNCOATED	TIN COATED
27	37-1462	37-1464
18	37-1466	37-1468
14	37-1470	37-1472
11-1/2	37-1474	37-1476
8	37-1478	37-1480



THREAD TOOLS

SERIES 63

made from **ITI CARBIDE**

APPLICATION: **FOR COUNTER SINKING HOLES**

CARBIDE COUNTERSINKS

INCLUDED ANGLE	ORDER EDP #	SHANK DIA	O.A.L.
60°	63-3000	.250	2-1/2"
	63-5000	.375	2-1/2"
	63-6000	.500	3"
82°	63-3100	.250	2-1/2"
	63-5100	.375	2-1/2"
	63-6100	.500	3"
90°	63-3200	.250	2-1/2"
	63-5200	.375	2-1/2"
	63-6200	.500	3"

**6 FLUTE DOUBLE END
CHATTER FREE STYLE**



SERIES 61

made from **ITI CARBIDE**

RUNNER CUTTERS

SHANK DIA.	TIP RADIUS	TAPER PER SIDE	ORDER EDP#	TOOL IDENTIFICATION	LENGTH OF CUT	O.A.L.
.125	.031	3°	61-1200	RU-125-3	.590	2"
		5°	61-1250	RU-125-5	.370	
		10°	61-1300	RU-125-10	.175	
.187	.039	3°	61-1350	RU-187-3	.750	2-1/2"
		5°	61-1400	RU-187-5	.620	
		10°	61-1450	RU-187-10	.310	
.250	.047	3°	61-1500	RU-250-3	1.000	2-1/2"
		5°	61-1550	RU-250-5	.890	
		10°	61-1600	RU-250-10	.442	
.312	.062	3°	61-1650	RU-312-3	1.100	2-1/2"
		5°	61-1700	RU-312-5	1.060	
		10°	61-1750	RU-312-10	.530	
.375	.078	3°	61-1800	RU-375-3	1.375	3"
		5°	61-1850	RU-375-5	1.240	
		10°	61-1900	RU-375-10	.610	
.500	.094	3°	61-1950	RU-500-3	3.062	4"
		5°	61-2000	RU-500-5	2.310	
		10°	61-2050	RU-500-10	.850	

APPLICATION: **FOR MACHINING TAPERS OR RELIEFS.**

SPECIAL SIZES
AVAILABLE ON REQUEST



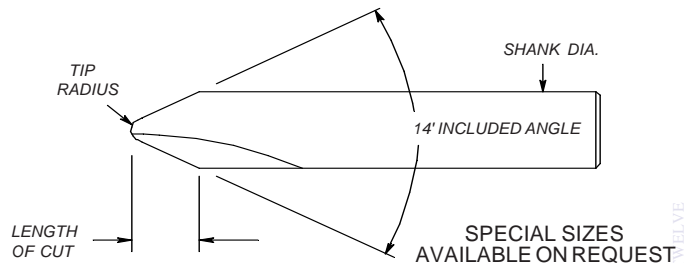
SERIES 60

made from **ITI CARBIDE**

DIE SINKERS

SHANK DIA.	TIP RADIUS	LENGTH OF CUT	ORDER EDP#	TOOL IDENTIFICATION	O.A.L.
1/8	.032	5/16	60-1400	A7-312-B	2"
5/32	.040	5/16	60-1405	A7-313-B	2"
3/16	.046	3/8	60-1410	A7-375-B	2-1/2"
1/4	.062	1/2	60-1415	A7-500-B	2-1/2"
5/16	.078	5/8	60-1420	A7-625-B	2-1/2"
3/8	.093	3/4	60-1425	A7-750-B	2-1/2"
7/16	.109	7/8	60-1430	A7-875-B	2-1/2"
1/2	.125	1"	60-1435	A7-1000-B	3"

APPLICATION: **FOR DIE SINKING OR RELIEF WORK.**

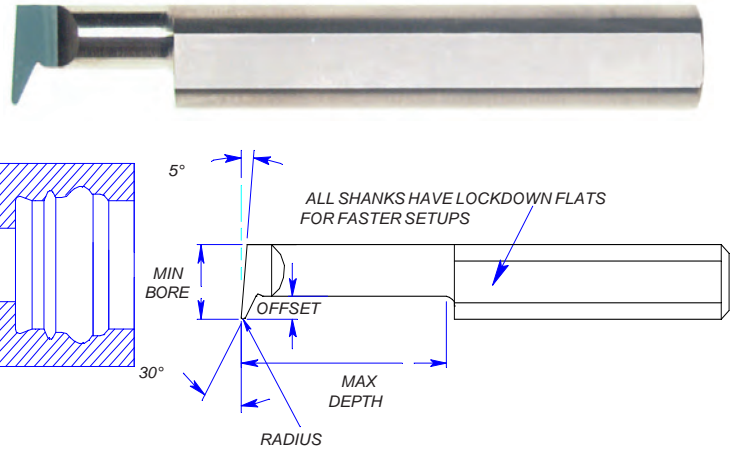


SERIES 56

made from **ITC CARBIDE**

PROFILE TOOLS

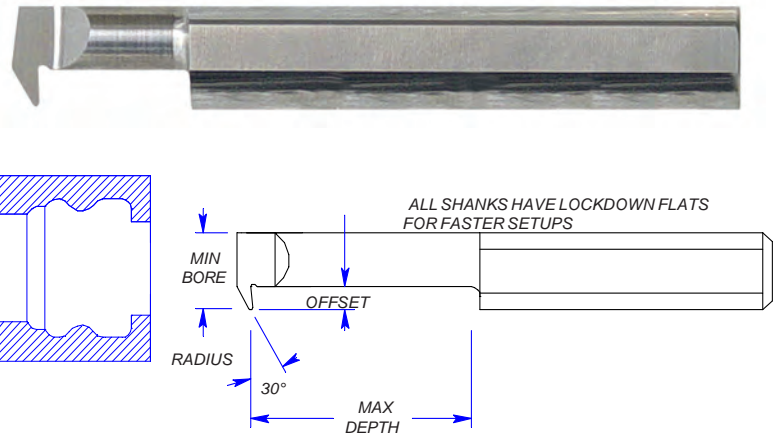
APPLICATION : **STANDARD PROFILING TOOL**



MIN BORE	TIP RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	ALTiN COATED EDP#	SHANK & OVERALL LENGTH
.090	.005	.040	.200	56-1000	56-1000-C	1/8
			.300	56-1005	56-1005-C	x
			.400	56-1010	56-1010-C	2"
.120	.007	.080	.250	56-1080	56-1080-C	1/8
			.500	56-1085	56-1085-C	x
			.750	56-1090	56-1090-C	2"
.180	.010	.080	.500	56-1100	56-1100-C	3/16
			.750	56-1105	56-1105-C	x
			1.000	56-1110	56-1110-C	2-1/2
.220	.010	.080	.500	56-1115	56-1115-C	1/4
			.750	56-1120	56-1120-C	x
			1.000	56-1125	56-1125-C	2-1/2
.300	.015	.110	.500	56-1130	56-1130-C	5/16
			.750	56-1135	56-1135-C	x
			1.000	56-1140	56-1140-C	2-1/2
.360	.015	.130	.500	56-1145	56-1145-C	3/8
			.750	56-1150	56-1150-C	x
			1.000	56-1155	56-1155-C	2-1/2
			1.250	56-1160	56-1160-C	
.490	.015	.160	.500	56-1165	56-1165-C	1/2
			.750	56-1170	56-1170-C	x
			1.000	56-1175	56-1175-C	3"
			1.250	56-1180	56-1180-C	

REVERSE PROFILE TOOLS

APPLICATION : **REVERSE PROFILING TOOL**



SERIES 56

made from **ITC CARBIDE**

MIN BORE	TIP RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	ALTiN COATED EDP#	SHANK & OVERALL LENGTH
.180	.010	.080	.500	56-1500	56-1500-C	3/16
			.750	56-1505	56-1505-C	x
			1.000	56-1510	56-1510-C	2-1/2
.220	.010	.080	.500	56-1515	56-1515-C	1/4
			.750	56-1520	56-1520-C	x
			1.000	56-1525	56-1525-C	2-1/2
.300	.015	.110	.500	56-1530	56-1530-C	5/16
			.750	56-1535	56-1535-C	x
			1.000	56-1540	56-1540-C	2-1/2
.360	.015	.130	.500	56-1545	56-1545-C	3/8
			.750	56-1550	56-1550-C	x
			1.000	56-1555	56-1555-C	2-1/2
			1.250	56-1560	56-1560-C	
.490	.015	.160	.500	56-1565	56-1565-C	1/2
			.750	56-1570	56-1570-C	x
			1.000	56-1575	56-1575-C	3"
			1.250	56-1580	56-1580-C	

SERIES 09

made from **ITC CARBIDE**

MULTI-REACH PROFILE TOOLS

APPLICATION : **MULTI-REACH PROFILING**
NO LONGER LIMITED BY NECK LENGTH.
ONE TOOL REPLACES A SERIES OF OTHERS.

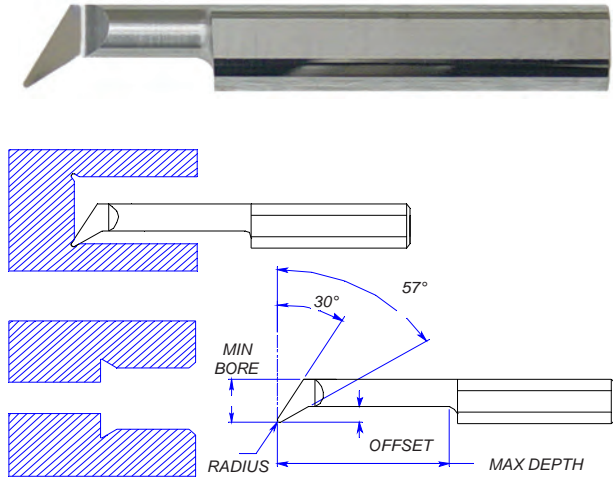
MIN BORE	ORDER EDP#	ALTiN COATED EDP#	OFFSET	RADIUS	SHANK DIAMETER	SHANK LENGTH
.360	09-1400	09-1400-C	.100	.010	1/4"	4"
.420	09-1405	09-1405-C	.100	.015	5/16"	4"
.480	09-1410	09-1410-C	.100	.015	3/8"	6"
.615	09-1415	09-1415-C	.110	.015	1/2"	6"
.750	09-1420	09-1420-C	.125	.020	5/8"	6"

CARBIDE SHANKS PROVIDE MAXIMUM RIDGIDITY



SERIES 56

R.H. OFFSET PROFILE TOOLS



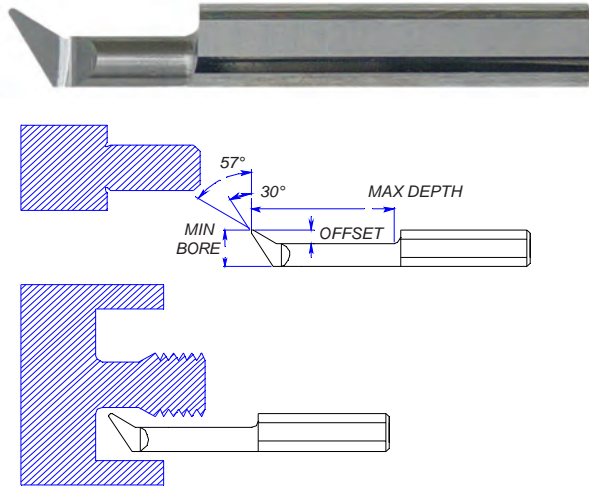
SERIES 56

made from **ITC CARBIDE**

APPLICATION : **RIGHT HAND OFFSET PROFILING TOOL.**

MIN BORE	RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.220	.010	.080	.500	56-1815	ROP-220-500	1/4 X
			.750	56-1820	ROP-220-750	2-1/2
			1.000	56-1825	ROP-220-1000	O.A.L.
.300	.015	.110	.500	56-1830	ROP-300-500	5/16 X
			.750	56-1835	ROP-300-750	2-1/2
			1.000	56-1840	ROP-300-1000	O.A.L.
.360	.015	.130	.500	56-1845	ROP-360-500	3/8 X 2-1/2 O.A.L.
			.750	56-1850	ROP-360-750	
			1.000	56-1855	ROP-360-1000	
			1.250	56-1860	ROP-360-1250	
.490	.015	.160	.500	56-1865	ROP-490-500	1/2 X 3" O.A.L.
			.750	56-1870	ROP-490-750	
			1.000	56-1875	ROP-490-1000	
			1.250	56-1880	ROP-490-1250	

L.H. OFFSET PROFILE TOOLS



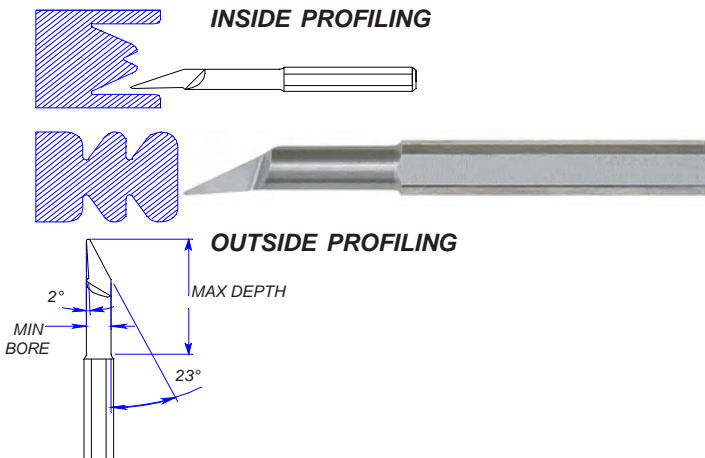
SERIES 56

made from **ITC CARBIDE**

APPLICATION : **LEFT HAND OFFSET PROFILING TOOL.**

MIN BORE	RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.220	.010	.080	.500	56-1915	LOP-220-500	1/4 X
			.750	56-1920	LOP-220-750	2-1/2
			1.000	56-1925	LOP-220-1000	O.A.L.
.300	.015	.110	.500	56-1930	LOP-300-500	5/16 X
			.750	56-1935	LOP-300-750	2-1/2
			1.000	56-1940	LOP-300-1000	O.A.L.
.360	.015	.130	.500	56-1945	LOP-360-500	3/8 X 2-1/2 O.A.L.
			.750	56-1950	LOP-360-750	
			1.000	56-1955	LOP-360-1000	
			1.250	56-1960	LOP-360-1250	
.490	.015	.160	.500	56-1965	LOP-490-500	1/2 X 3" O.A.L.
			.750	56-1970	LOP-490-750	
			1.000	56-1975	LOP-490-1000	
			1.250	56-1980	LOP-490-1250	

FINE POINT PROFILE TOOLS



SERIES 56

made from **ITC CARBIDE**

APPLICATION : **FINE POINT PROFILING TOOL.**

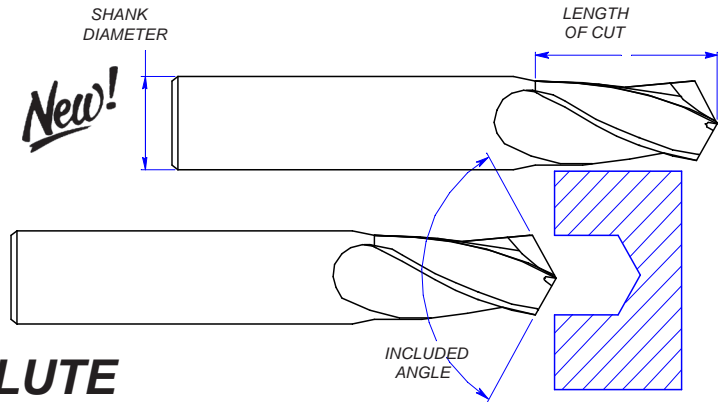
MIN BORE	RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	SHANK & OVERALL LENGTH
.220	.010	.020	.500	56-1315	FIP-220-500	1/4 X
			.750	56-1320	FIP-220-750	2-1/2
			1.000	56-1325	FIP-220-1000	
.300	.015	.020	.750	56-1330	FIP-300-750	5/16 X
			1.000	56-1335	FIP-300-1000	2-1/2
			.750	56-1340	FIP-360-750	3/8 X 2-1/2
1.000	56-1345	FIP-360-1000				
1.250	56-1350	FIP-360-1250				
.490	.015	.020	1.000	56-1360	FIP-490-1000	1/2 X 3"
			1.250	56-1365	FIP-490-1250	
			1.500	56-1370	FIP-490-1500	

SERIES 49 *made from* **ITC CARBIDE**

APPLICATION : **DRILL & MILL WITH ONE TOOL.**

DRILL-MILLS

**CENTER CUTTING
30° RIGHT HAND HELIX
RIGHT HAND CUT**



NOW AVAILABLE IN 2 AND 4 FLUTE

also available with altin coating simply add - C after the tool number when ordering

60° INCLUDED ANGLE

SIZE	4 FLUTE EDP #	2 FLUTE EDP #	LENGTH OF CUT	OVERALL LENGTH	SHANK DIAMETER
.125	49-1015	49-2015	5/8	2"	1/8
.187	49-1065	49-2065	3/4	2-1/2	3/16
.218	49-1115	49-2115	3/4	2-1/2	1/4
.250	49-1165	49-2165	1"	3"	1/4
.281	49-1215	49-2215	1"	3"	5/16
.312	49-1265	49-2265	1"	3"	5/16
.343	49-1315	49-2315	1"	3"	3/8
.375	49-1365	49-2365	1"	3"	3/8
.406	49-1415	49-2415	1"	3"	7/16
.437	49-1465	49-2465	1"	3"	7/16
.468	49-1515	49-2515	1"	3"	1/2
.500	49-1565	49-2565	1"	3"	1/2

82° INCLUDED ANGLE

SIZE	4 FLUTE EDP #	2 FLUTE EDP #	LENGTH OF CUT	OVERALL LENGTH	SHANK DIAMETER
.125	49-1010	49-2010	5/8	2"	1/8
.187	49-1060	49-2060	3/4	2-1/2	3/16
.218	49-1110	49-2110	3/4	2-1/2	1/4
.250	49-1160	49-2160	1"	3"	1/4
.281	49-1210	49-2210	1"	3"	5/16
.312	49-1260	49-2260	1"	3"	5/16
.343	49-1310	49-2310	1"	3"	3/8
.375	49-1360	49-2360	1"	3"	3/8
.406	49-1410	49-2410	1"	3"	7/16
.437	49-1460	49-2460	1"	3"	7/16
.468	49-1510	49-2510	1"	3"	1/2
.500	49-1560	49-2560	1"	3"	1/2

also available with altin coating simply add - C after the tool number when ordering

90° INCLUDED ANGLE

SIZE	4 FLUTE EDP #	2 FLUTE EDP #	LENGTH OF CUT	OVERALL LENGTH	SHANK DIAMETER
.125	49-1005	49-2005	5/8	2"	1/8
.187	49-1055	49-2055	3/4	2-1/2	3/16
.218	49-1105	49-2105	3/4	2-1/2	1/4
.250	49-1155	49-2155	1"	3"	1/4
.281	49-1205	49-2205	1"	3"	5/16
.312	49-1255	49-2255	1"	3"	5/16
.343	49-1305	49-2305	1"	3"	3/8
.375	49-1355	49-2355	1"	3"	3/8
.406	49-1405	49-2405	1"	3"	7/16
.437	49-1455	49-2455	1"	3"	7/16
.468	49-1505	49-2505	1"	3"	1/2
.500	49-1555	49-2555	1"	3"	1/2

120° INCLUDED ANGLE

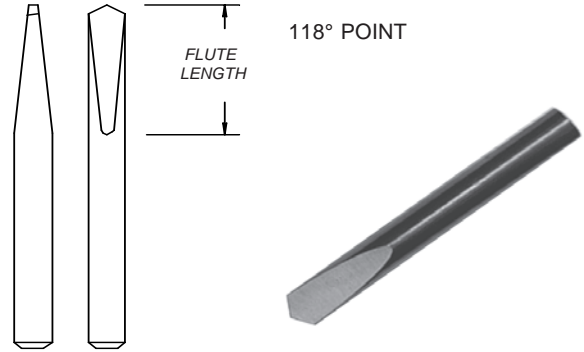
SIZE	4 FLUTE EDP #	2 FLUTE EDP #	LENGTH OF CUT	OVERALL LENGTH	SHANK DIAMETER
.125	49-1000	49-2000	5/8	2"	1/8
.187	49-1050	49-2050	3/4	2-1/2	3/16
.218	49-1100	49-2100	3/4	2-1/2	1/4
.250	49-1150	49-2150	1"	3"	1/4
.281	49-1200	49-2200	1"	3"	5/16
.312	49-1250	49-2250	1"	3"	5/16
.343	49-1300	49-2300	1"	3"	3/8
.375	49-1350	49-2350	1"	3"	3/8
.406	49-1400	49-2400	1"	3"	7/16
.437	49-1450	49-2450	1"	3"	7/16
.468	49-1500	49-2500	1"	3"	1/2
.500	49-1550	49-2550	1"	3"	1/2

SERIES 58 *made from ITC CARBIDE*

SPADE DRILLS

DRILL DIAMETER	FLUTE LENGTH	SHANK DIA.	ORDER EDP#	TOOL ID	OVERALL LENGTH
.125 (1/8)	1/2	.125	58-1108	SD-125	1-1/2
.156 (5/32)	9/16	.187	58-1110	SD-156	2"
.187 (3/16)	11/16	.187	58-1112	SD-187	2"
.218 (7/32)	11/16	.250	58-1114	SD-218	2"
.250 (1/4)	13/16	.250	58-1116	SD-250	2"
.281 (9/32)	7/8	.312	58-1118	SD-281	2-1/2"
.312 (5/16)	7/8	.312	58-1120	SD-312	2-1/2"
.343 (11/32)	15/16	.375	58-1122	SD-343	2-1/2"
.375 (3/8)	1-1/8	.375	58-1124	SD-375	2-1/2"
.406 (13/32)	1-1/8	.437	58-1126	SD-406	3"
.437 (7/16)	1-1/8	.437	58-1128	SD-437	3"
.468 (15/32)	1-3/16	.500	58-1130	SD-468	3"
.500 (1/2)	1-3/16	.500	58-1132	SD-500	3"

APPLICATION: FOR DRILLING SHALLOW DEPTH HOLES IN HARD MATERIALS

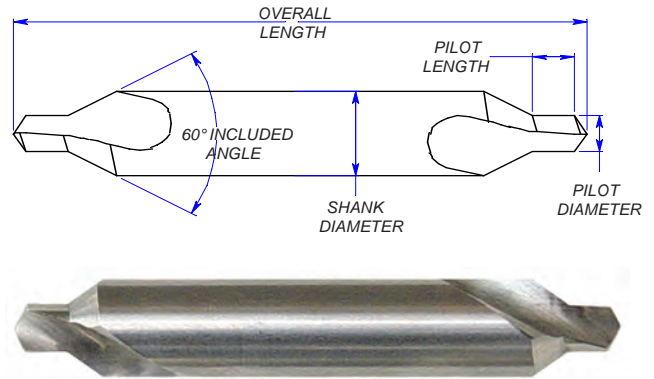


SERIES 71 *made from ITC CARBIDE*

CARBIDE CENTER DRILLS

SIZE	MAJOR DIAMETER	PILOT DIAMETER	PILOT LENGTH	OVERALL LENGTH	ORDER EDP#
#0	1/8	1/32 (.031)	1/32 (.031)	2"	71-1005
#1	1/8	3/64 (.046)	3/64 (.046)	2"	71-1010
#2	3/16	5/64 (.078)	5/64 (.078)	2-1/2"	71-1015
#3	1/4	7/64 (.109)	7/64 (.109)	2-1/2"	71-1020
#4	5/16	1/8 (.125)	1/8 (.125)	2-1/2"	71-1025
#5	7/16	3/16 (.187)	3/16 (.187)	3"	71-1030
#6	1/2	7/32 (.218)	7/32 (.218)	3"	71-1035

APPLICATION: DRILLING CENTERS IN JUST ABOUT ANY MATERIAL.



SPOTTING DRILLS

SERIES 75 *made from ITC CARBIDE*

90° INCLUDED ANGLE

SIZE	EDP NUMBER	TOOL ID #	SHANK DIAMETER
.125	75-2000	SPD-125-90	1/8
.187	75-2005	SPD-187-90	3/16
.250	75-2010	SPD-250-90	1/4
.312	75-2015	SPD-312-90	5/16
.375	75-2020	SPD-375-90	3/8
.500	75-2025	SPD-500-90	1/2

120° INCLUDED ANGLE

SIZE	EDP NUMBER	TOOL ID #	SHANK DIAMETER
.125	75-3000	SPD-125-120	1/8
.187	75-3005	SPD-187-120	3/16
.250	75-3010	SPD-250-120	1/4
.312	75-3015	SPD-312-120	5/16
.375	75-3020	SPD-375-120	3/8
.500	75-3025	SPD-500-120	1/2

New!

APPLICATION: CNC SPOT DRILLING FASTER THAN CENTER DRILLING CAN BE USED AS A COUNTERBINK



82° INCLUDED ANGLE

FOR FLAT HEAD SCREWS

SIZE	EDP NUMBER	TOOL ID #	SCREW SIZE	SHANK DIAMETER
.250	75-1000	SPD-250-82	UP TO #2 SCREW	1/4
.312	75-1005	SPD-312-82	UP TO #6 SCREW	5/16
.375	75-1010	SPD-375-82	UP TO #8 SCREW	3/8
.500	75-1015	SPD-500-82	UP TO #10 SCREW	1/2
.562	75-1020	SPD-562-82	UP TO 1/4" SCREW	1/2
.687	75-1025	SPD-687-82	UP TO 5/16" SCREW	1/2
.812	75-1030	SPD-812-82	UP TO 3/8" SCREW	1/2
.937	75-1035	SPD-937-82	UP TO 1/2" SCREW	1/2

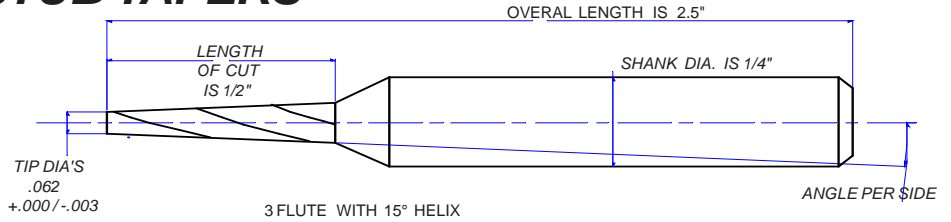
SERIES 69

made from **ITI CARBIDE**

APPLICATION: **FOR MILLING TAPERS OR TAPERED REAMING**

SMALL CARBIDE STUB TAPERS

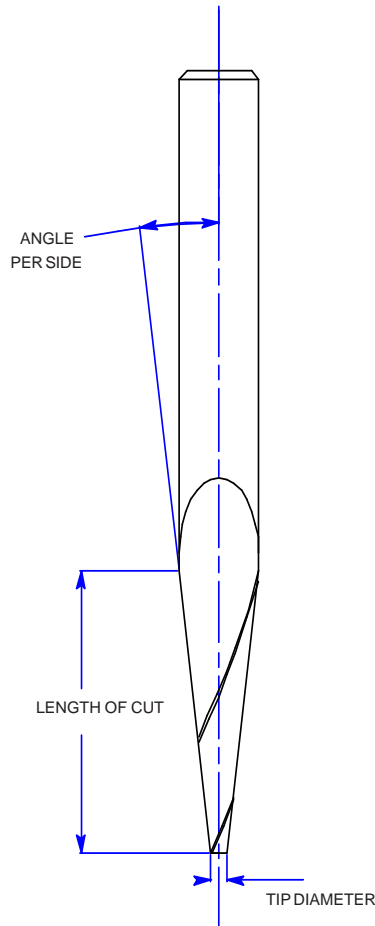
ANGLE PER SIDE	ORDER EDP#	TOOL IDENTIFICATION
1°	69-1000	ST-1
2°	69-1020	ST-2
3°	69-1030	ST-3
4°	69-1040	ST-4
5°	69-1050	ST-5
6°	69-1060	ST-6
7°	69-1070	ST-7
8°	69-1080	ST-8
9°	69-1090	ST-9
10°	69-1100	ST-10
11°	69-1105	ST-11



SERIES 69

STANDARD TAPERED CARBIDE ENDMILLS

ANGLE PER SIDE	TIP DIAMETER	LENGTH OF CUT	SHANK AND O.A.L.	ORDER EDP#	ALTiN COATED EDP#
1°	.094	.750	1/4 X 2.5	69-2000	69-2000-C
	.125	1.000	1/4 X 3.0	69-2020	69-2020-C
	.250	1.250	3/8 X 3.5	69-2030	69-2030-C
1-1/2°	.094	.750	1/4 X 2.5	69-2040	69-2040-C
	.125	1.000	1/4 X 3.0	69-2050	69-2050-C
	.250	1.250	3/8 X 3.5	69-2060	69-2060-C
2°	.094	.750	1/4 X 2.5	69-2070	69-2070-C
	.125	1.000	1/4 X 3.0	69-2080	69-2080-C
	.250	1.250	3/8 X 3.5	69-2090	69-2090-C
3°	.094	1.000	1/4 X 3.0	69-3000	69-3000-C
	.125	1.000	1/4 X 3.0	69-3010	69-3010-C
	.250	1.250	3/8 X 3.5	69-3020	69-3020-C
4°	.094	1.000	1/4 X 3.0	69-3030	69-3030-C
	.125	1.000	3/8 X 3.0	69-3040	69-3040-C
	.250	1.250	1/2 X 3.5	69-3050	69-3050-C
5°	.094	.750	1/4 X 3.0	69-3060	69-3060-C
	.125	1.250	3/8 X 3.5	69-3070	69-3070-C
	.250	1.250	1/2 X 3.5	69-3080	69-3080-C
7°	.094	.750	1/4 X 3.0	69-3090	69-3090-C
	.125	1.000	3/8 X 3.0	69-4000	69-4000-C
	.250	1.000	1/2 X 3.5	69-4010	69-4010-C
10°	.094	.750	3/8 X 2.5	69-4020	69-4020-C
	.125	1.000	1/2 X 3.5	69-4030	69-4030-C
	.250	1.250	3/4 X 4.0	69-4040	69-4040-C
15°	.094	.250	1/4 X 2.5	69-4050	69-4050-C
	.125	.500	3/8 X 2.5	69-4060	69-4060-C
	.250	1.000	1/2 X 3.5	69-4070	69-4070-C
30°	.094	.250	3/8 X 2.5	69-4080	69-4080-C
	.125	.250	1/2 X 3.0	69-4090	69-4090-C
	.250	1.000	3/4 X 4.0	69-5000	69-5000-C
45°	.125	.500	3/4 X 3-3/4	69-5010	69-5010-C



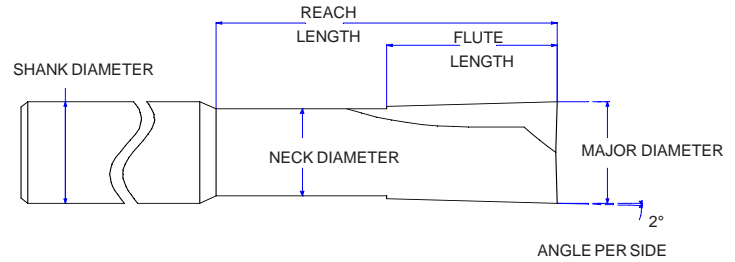
SERIES 45 *made from ITI CARBIDE*
BACK-DRAFT CUTTERS
 REVERSE TAPERED ENDMILLS

New!
 4 FLUTE WITH 15° HELIX

MAJOR DIAMETER	FLUTE LENGTH	NECK DIAMETER	REACH LENGTH	ORDER EDP#	SHANK DIA.	O.A.L.
3/16	1/4	.156	1/2	45-1100	3/16	2-1/2"
			3/4	45-1105		
			1"	45-1110		
1/4	3/8	.210	5/8	45-1115	1/4	2-1/2"
			3/4	45-1120		
			1"	45-1125		
3/8	1/2	.320	5/8	45-1130	3/8	2-1/2"
			3/4	45-1135		
			1"	45-1140		
1/2	5/8	.425	5/8	45-1145	1/2	3"
			3/4	45-1150		
			1"	45-1155		



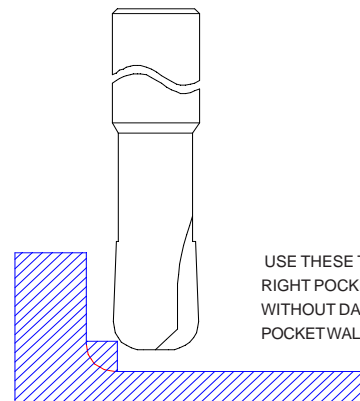
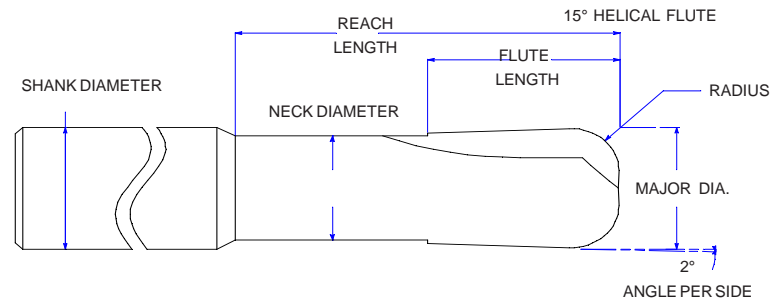
15° HELICAL FLUTE



SERIES 45 *made from ITI CARBIDE*
BACK-DRAFT RADIUS CUTTERS
 REVERSE TAPERED ENDMILLS WITH A CORNER RADIUS

New!
 4 FLUTE WITH 15° HELIX

MAJOR DIAMETER	FLUTE LENGTH	NECK DIA.	RADIUS SIZE	REACH LENGTH	ORDER EDP#	SHANK DIA.	O.A.L.
3/16	1/4	.156	1/32	1/2	45-3100	3/16	2-1/2"
			1/32	3/4	45-3105		
			1/32	1"	45-3110		
			1/16	1/2	45-3115		
			1/16	3/4	45-3120		
1/4	3/8	.210	1/32	5/8	45-3130	1/4	2-1/2"
			1/32	3/4	45-3135		
			1/32	1"	45-3140		
			1/16	5/8	45-3145		
			1/16	3/4	45-3150		
3/8	1/2	.320	1/32	3/4	45-3160	3/8	2-1/2"
			1/32	1"	45-3165		
			1/32	1-1/4	45-3170		
			1/16	3/4	45-3175		
			1/16	1"	45-3180		
			1/16	1-1/4	45-3185		
			3/32	3/4	45-3190		
			3/32	1"	45-3195		
1/2	5/8	.425	1/32	3/4	45-3205	1/2	3"
			1/32	1"	45-3210		
			1/32	1-1/4"	45-3215		
			1/16	3/4	45-3220		
			1/16	1"	45-3225		
			1/16	1-1/4"	45-3230		
			3/32	3/4	45-3235		
			3/32	1"	45-3240		
			3/32	1-1/4"	45-3245		
			1/8	3/4	45-3250		
			1/8	1"	45-3255		
1/8	1-1/4"	45-3260					



2 & 4 FLUTE SQUARE

SIZE	LENGTH OF CUT	2 FLUTE EDP #	4 FLUTE EDP #
.005	.015	21-7000	41-7000
.006	.018	21-7005	41-7005
.007	.021	21-7010	41-7010
.008	.024	21-7015	41-7015
.009	.027	21-7020	41-7020
.010	.030	21-7025	41-7025
.011	.033	21-7030	41-7030
.012	.036	21-7035	41-7035
.013	.039	21-7040	41-7040
.014	.042	21-7045	41-7045
.015	.045	21-7050	41-7050
.016	.048	21-7055	41-7055
.017	.051	21-7060	41-7060
.018	.054	21-7065	41-7065
.019	.057	21-7070	41-7070
.020	.060	21-7075	41-7075
.021	.063	21-7080	41-7080
.022	.066	21-7085	41-7085
.023	.069	21-7090	41-7090
.024	.072	21-7095	41-7095
.025	.075	21-7100	41-7100
.026	.078	21-7105	41-7105
.027	.081	21-7110	41-7110
.028	.084	21-7115	41-7115
.029	.087	21-7120	41-7120
.030	.090	21-7125	41-7125
.031	.093	21-7130	41-7130
.035	.105	21-7135	41-7135
.040	.120	21-7140	41-7140
.045	.135	21-7145	41-7145
.047	.141	21-7150	41-7150
.050	.150	21-7155	41-7155
.055	.165	21-7160	41-7160
.060	.180	21-7165	41-7165
.065	.195	21-7170	41-7170
.070	.210	21-7175	41-7175
.075	.225	21-7180	41-7180
.080	.240	21-7185	41-7185
.085	.255	21-7190	41-7190
.090	.270	21-7195	41-7195
.100	.300	21-7200	41-7200
.105	.315	21-7205	41-7205
.110	.330	21-7210	41-7210
.115	.345	21-7215	41-7215
.120	.360	21-7220	41-7220
.125	.375	21-7225	41-7225

New!



CENTER CUTTING
30° RIGHT HAND HELIX, RIGHT HAND CUT

SERIES 21 TWO FLUTE *made from* **ITC CARBIDE**

SERIES 41 FOUR FLUTE *made from* **ITC CARBIDE**

2 & 4 FLUTE BALL

SIZE	LENGTH OF CUT	2 FLUTE EDP #	4 FLUTE EDP #
.010	.030	21-6000	-- --
.015	.045	21-6005	-- --
.020	.060	21-6010	41-6010
.025	.075	21-6015	41-6015
.030	.090	21-6020	41-6020
.031	.093	21-6025	41-6025
.035	.105	21-6030	41-6030
.040	.120	21-6035	41-6035
.045	.135	21-6040	41-6040
.047	.141	21-6045	41-6045
.050	.150	21-6050	41-6050
.055	.165	21-6055	41-6055
.060	.180	21-6060	41-6060
.065	.195	21-6065	41-6065
.070	.210	21-6070	41-6070
.075	.225	21-6075	41-6075
.080	.240	21-6080	41-6080
.085	.255	21-6085	41-6085
.090	.270	21-6090	41-6090
.095	.285	21-6095	41-6095
.100	.300	21-6100	41-6100
.120	.360	21-6105	41-6105

CARBIDE ENDMILLS
STANDARD SIZES
AS WELL AS
UNUSUAL LENGTHS AND DIAMETERS

A GREAT QUALITY ENDMILL
FOR A GOOD PRICE

THE RIGHT LENGTH
OF CUT
FOR
ANY JOB



CENTER CUTTING
30° RIGHT HAND HELIX, RIGHT HAND CUT

SERIES 41 4 FLUTE *made from* **ITC CARBIDE**

SIZE +0.00/-0.02	EDP NUMBER	ALTIM COATED EDP NUMBER	LENGTH OF CUT	OVERALL LENGTH	SHANK DIA.
1/16 .062	41-0621	41-0621-C	.200	1-1/2"	1/8
5/64 .078	41-0781	41-0781-C	.280	1-1/2"	1/8
3/32 .094	41-0941	41-0941-C	.190	1-1/2"	1/8
	41-0942	41-0942-C	.380	1-1/2"	1/8
	41-0943	41-0943-C	.500	2"	1/8
	41-0944	41-0944-C	.750	2-1/2"	1/8
2.5mm .098	41-0981	41-0981-C	.250	2"	1/8
7/64 .109	41-1091	41-1091-C	.250	2"	1/8
	41-1092	41-1092-C	.500	2"	1/8
3mm .118	41-1181	41-1181-C	.400	2"	1/8
	41-1251	41-1251-C	.250	2"	1/8
1/8 .125	41-1252	41-1252-C	.380	2"	1/8
	41-1253	41-1253-C	.500	2"	1/8
	41-1254	41-1254-C	.750	2-1/2"	1/8
	41-1255	41-1255-C	1.000	3"	1/8
9/64 .141	41-1411	41-1411-C	.380	2"	3/16
	41-1412	41-1412-C	.750	2-1/2"	3/16
5/32 .156	41-1561	41-1561-C	.380	2"	3/16
	41-1562	41-1562-C	.650	2-1/2"	3/16
4mm .158	41-1581	41-1581-C	.380	2"	3/16
	41-1721	41-1721-C	.380	2"	3/16
11/64 .172	41-1722	41-1722-C	.650	2-1/2"	3/16
	41-1871	41-1871-C	.380	2"	3/16
3/16 .187	41-1872	41-1872-C	.650	2"	3/16
	41-1873	41-1873-C	.750	2-1/2"	3/16
	41-1874	41-1874-C	1.000	2-1/2"	3/16
	41-1875	41-1875-C	1.300	3"	3/16
5mm .197	41-1971	41-1971-C	.500	2"	1/4
	41-2031	41-2031-C	.400	2"	1/4
13/64 .203	41-2032	41-2032-C	.800	2-1/2"	1/4
	41-2181	41-2181-C	.400	2"	1/4
7/32 .218	41-2182	41-2182-C	.800	2-1/2"	1/4
	41-2341	41-2341-C	.400	2"	1/4
15/64 .234	41-2342	41-2342-C	.800	2-1/2"	1/4
	41-2361	41-2361-C	.500	2"	1/4
1/4 .250	41-2501	41-2501-C	.500	2"	1/4
	41-2502	41-2502-C	.800	2-1/2"	1/4
	41-2503	41-2503-C	1.000	3"	1/4
	41-2504	41-2504-C	1.300	3"	1/4
	41-2505	41-2505-C	1.500	4"	1/4
	41-2506	41-2506-C	1.800	4"	1/4
17/64 .266	41-2661	41-2661-C	.500	2"	5/16
	41-2662	41-2662-C	1.000	2-1/2"	5/16
7mm .276	41-2761	41-2761-C	.650	2-1/2"	5/16
	41-2811	41-2811-C	.500	2"	5/16
9/32 .281	41-2812	41-2812-C	.800	2-1/2"	5/16
	41-2971	41-2971-C	.500	2"	5/16
19/64 .297	41-2972	41-2972-C	.800	2-1/2"	5/16
	41-3121	41-3121-C	.500	2"	5/16
5/16 .312	41-3122	41-3122-C	.750	2-1/2"	5/16
	41-3123	41-3123-C	1.000	3"	5/16
	41-3124	41-3124-C	1.250	3"	5/16
	41-3125	41-3125-C	1.500	4"	5/16
	41-3126	41-3126-C	1.800	4"	5/16

SIZE +0.00/-0.02	EDP NUMBER	ALTIM COATED EDP NUMBER	LENGTH OF CUT	OVERALL LENGTH	SHANK DIA.
8 mm .315	41-3151	41-3151-C	.500	2"	3/8
	41-3152	41-3152-C	.750	2-1/2"	3/8
21/64 .328	41-3281	41-3281-C	.500	2"	3/8
	41-3282	41-3282-C	.750	2-1/2"	3/8
11/32 .344	41-3441	41-3441-C	.500	2"	3/8
	41-3442	41-3442-C	.750	2-1/2"	3/8
9 mm .354	41-3541	41-3541-C	.500	2"	3/8
	41-3591	41-3591-C	.500	2"	3/8
23/64 .359	41-3592	41-3592-C	.750	2-1/2"	3/8
	41-3751	41-3751-C	.500	2"	3/8
3/8 .375	41-3752	41-3752-C	.750	2-1/2"	3/8
	41-3753	41-3753-C	1.000	3"	3/8
	41-3754	41-3754-C	1.250	3"	3/8
	41-3755	41-3755-C	1.500	4"	3/8
	41-3756	41-3756-C	1.750	4"	3/8
	41-3757	41-3757-C	2.000	4"	3/8
	25/64 .391	41-3911	41-3911-C	.750	2-1/2"
41-3912		41-3912-C	1.000	3"	7/16
10 mm .394	41-3941	41-3941-C	.750	2-1/2"	7/16
	41-3942	41-3942-C	1.000	3"	7/16
13/32 .406	41-4061	41-4061-C	.750	2-1/2"	7/16
	41-4062	41-4062-C	1.000	3"	7/16
27/64 .422	41-4221	41-4221-C	.750	2-1/2"	7/16
	41-4222	41-4222-C	1.000	3"	7/16
11 mm .433	41-4331	41-4331-C	.750	2-1/2"	7/16
	41-4371	41-4371-C	.750	2-1/2"	7/16
7/16 .437	41-4372	41-4372-C	1.000	3"	7/16
	41-4373	41-4373-C	1.800	4"	7/16
	41-4531	41-4531-C	.750	2-1/2"	1/2
29/64 .453	41-4532	41-4532-C	1.250	3"	1/2
	41-4691	41-4691-C	.750	2-1/2"	1/2
15/32 .469	41-4692	41-4692-C	1.250	3"	1/2
	41-4721	41-4721-C	.750	2-1/2"	1/2
12 mm .472	41-4722	41-4722-C	1.250	3"	1/2
	41-4841	41-4841-C	.750	2-1/2"	1/2
31/64 .484	41-4842	41-4842-C	1.250	3"	1/2
	41-5001	41-5001-C	.750	2-1/2"	1/2
1/2 .500	41-5002	41-5002-C	1.000	3"	1/2
	41-5003	41-5003-C	1.250	3"	1/2
	41-5004	41-5004-C	1.500	4"	1/2
	41-5005	41-5005-C	1.750	4"	1/2
	41-5006	41-5006-C	2.000	4"	1/2
	41-5007	41-5007-C	3.000	6"	1/2
	41-5008	41-5008-C	4.000	6"	1/2

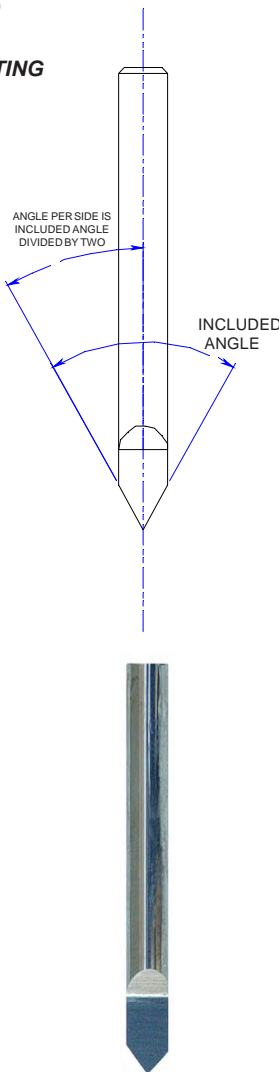
SERIES 62 *made from* **ITICARBIDE**

APPLICATION: **WE CALL THEM ENGRAVING TOOLS. BUT THEY ARE ALSO USED FOR CHAMFERING, COUNTER SINKING, TAPERED REAMING ETC.**

ENGRAVING TOOLS

STANDARD POINT
TIP DIA APROX .015 FASTER FREE CUTTING

SHANK DIA.	TIP INCLUDED ANGLE	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
1/8	30°	62-1095	62-1095-C	2"
	40°	62-1100	62-1100-C	
	60°	62-1105	62-1105-C	
	90°	62-1110	62-1110-C	
	120°	62-1115	62-1115-C	
3/16	30°	62-1117	62-1117-C	2-1/2"
	40°	62-1120	62-1120-C	
	60°	62-1125	62-1125-C	
	90°	62-1130	62-1130-C	
	120°	62-1135	62-1135-C	
1/4	30°	62-1137	62-1137-C	2-1/2"
	40°	62-1140	62-1140-C	
	60°	62-1145	62-1145-C	
	90°	62-1150	62-1150-C	
	120°	62-1155	62-1155-C	
5/16	30°	62-1157	62-1157-C	2-1/2"
	40°	62-1160	62-1160-C	
	60°	62-1162	62-1162-C	
	90°	62-1165	62-1165-C	
	120°	62-1167	62-1167-C	
3/8	30°	62-1170	62-1170-C	2-1/2"
	40°	62-1172	62-1172-C	
	60°	62-1175	62-1175-C	
	90°	62-1177	62-1177-C	
	120°	62-1180	62-1180-C	
1/2	30°	62-1182	62-1182-C	3"
	40°	62-1185	62-1185-C	
	60°	62-1187	62-1187-C	
	90°	62-1190	62-1190-C	
	120°	62-1192	62-1192-C	



FINE POINT ENGRAVING TOOLS

TIP DIA APROX .002 SLOWER CUTTING FOR VERY FINE CUTS

SHANK DIA.	TIP INCLUDED ANGLE	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
1/8	40°	62-1200	62-1200-C	2"
	60°	62-1205	62-1205-C	
	90°	62-1210	62-1210-C	

EXTRA LONG ENGRAVING TOOLS

STANDARD POINT
TIP DIA APROX .015 FASTER FREE CUTTING

SHANK DIA.	TIP INCLUDED ANGLE	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
1/8	40°	62-1800	62-1800-C	4"
	60°	62-1805	62-1805-C	
	90°	62-1810	62-1810-C	
3/16	40°	62-1820	62-1820-C	4"
	60°	62-1825	62-1825-C	
	90°	62-1830	62-1830-C	
1/4	40°	62-1840	62-1840-C	6"
	60°	62-1845	62-1845-C	
	90°	62-1850	62-1850-C	
	120°	62-1855	62-1855-C	

DOUBLE END ENGRAVING TOOLS

STANDARD POINT DOUBLE TOOL LIFE
TIP DIA APROX .015 FASTER FREE CUTTING

SHANK DIA.	TIP INCLUDED ANGLE	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
1/8	30°	62-1400	62-1400-C	2"
	40°	62-1402	62-1402-C	
	60°	62-1405	62-1405-C	
	90°	62-1410	62-1410-C	
	120°	62-1415	62-1415-C	
3/16	30°	62-1417	62-1417-C	2-1/2"
	40°	62-1420	62-1420-C	
	60°	62-1425	62-1425-C	
	90°	62-1430	62-1430-C	
	120°	62-1435	62-1435-C	
1/4	30°	62-1437	62-1437-C	2-1/2"
	40°	62-1440	62-1440-C	
	60°	62-1445	62-1445-C	
	90°	62-1450	62-1450-C	
	120°	62-1455	62-1455-C	

SOFT MATERIAL ENGRAVING TOOLS

TIP DIA APROX .015
GROUND WITH INCREASED CLEARANCE FOR CUTTING ALUM, BRASS, PLASTIC ETC.

SHANK DIA.	TIP INCLUDED ANGLE	ORDER EDP#	TIN COATED EDP#	O.A.L.
1/8	40°	62-1500	62-1500-C	2"
	60°	62-1505	62-1505-C	
	90°	62-1510	62-1510-C	
3/16	40°	62-1520	62-1520-C	2-1/2"
	60°	62-1525	62-1525-C	
	90°	62-1530	62-1530-C	
1/4	40°	62-1540	62-1540-C	2-1/2"
	60°	62-1545	62-1545-C	
	90°	62-1550	62-1550-C	

ENGRAVING TOOLS

SERIES 62 *made from* **ITI CARBIDE**



SPIRAL FLUTE ENGRAVING TOOLS

TIP DIA APROX .004 STRONGER AND SLICES BETTER THAN STRAIGHT FLUTE

SHANK DIA.	TIP INCLUDED ANGLE	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
1/8	40°	62-1600	62-1600-C	2"
	60°	62-1605	62-1605-C	
	90°	62-1610	62-1610-C	
3/16	40°	62-1615	62-1615-C	2.5
	60°	62-1620	62-1620-C	
	90°	62-1625	62-1625-C	
1/4	40°	62-1630	62-1630-C	2.5
	60°	62-1635	62-1635-C	
	90°	62-1640	62-1640-C	



CHISEL STYLE ENGRAVING TOOLS

TIP DIA APROX .002 SLOWER CUTTING GREAT FOR CHAMFERING SMALL HOLES

SHANK DIA.	TIP INCLUDED ANGLE	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
1/8	40°	62-2400	62-2400-C	2"
	60°	62-2405	62-2405-C	
	90°	62-2410	62-2410-C	
3/16	40°	62-2415	62-2415-C	2.5
	60°	62-2420	62-2420-C	
	90°	62-2425	62-2425-C	
1/4	40°	62-2430	62-2430-C	2.5
	60°	62-2435	62-2435-C	
	90°	62-2440	62-2440-C	



RADIUS TIP ENGRAVING TOOLS

STRONGER THAN POINTED LONGER LASTING

SHANK DIA.	TIP INCLUDED ANGLE	TIP RADIUS	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
1/8	30°	.005	62-2200	62-2200-C	2"
		.010	62-2205	62-2205-C	
		.015	62-2210	62-2210-C	
		.020	62-2215	62-2215-C	
1/8	40°	.005	62-2220	62-2220-C	2"
		.010	62-2225	62-2225-C	
		.015	62-2230	62-2230-C	
		.020	62-2235	62-2235-C	
1/8	60°	.005	62-2240	62-2240-C	2"
		.010	62-2250	62-2250-C	
		.015	62-2260	62-2260-C	
		.020	62-2270	62-2270-C	
1/8	90°	.005	62-2280	62-2280-C	2"
		.010	62-2290	62-2290-C	
		.015	62-2300	62-2300-C	
		.020	62-2310	62-2310-C	



2 FLUTE ENGRAVING TOOLS

BETTER FOR SLOWER RPM MACHINES

TIP INCLUDED ANGLE	SHANK DIA.	WEB THICKNESS	ORDER EDP#	ALTIN COATED EDP#	O.A.L.
30°	1/8	.005	62-2600	62-2600-C	2.0
	3/16	.005	62-2605	62-2605-C	2.5
	1/4	.005	62-2610	62-2610-C	2.5
60°	1/8	.005	62-2615	62-2615-C	2.0
	1/8	.010	62-2620	62-2620-C	2.0
	3/16	.005	62-2625	62-2625-C	2.5
90°	1/4	.005	62-2630	62-2630-C	2.5
	1/8	.005	62-2635	62-2635-C	2.0
	1/8	.010	62-2640	62-2640-C	2.0
120°	3/16	.005	62-2650	62-2650-C	2.5
	1/4	.005	62-2660	62-2660-C	2.5
	1/8	.005	62-2670	62-2670-C	2.0
120°	3/16	.005	62-2680	62-2680-C	2.5
	1/4	.005	62-2690	62-2690-C	2.5

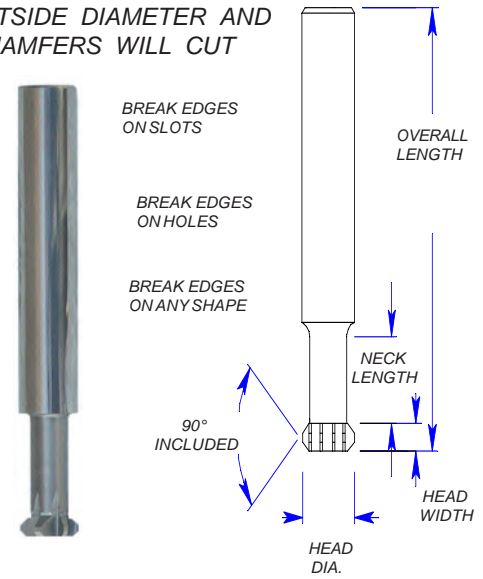
SERIES 65 APPLICATION: FOR EDGE BREAKING / CHAMFERING.

EDGE BREAKERS

made from **ITC CARBIDE**

OUTSIDE DIAMETER AND CHAMFERS WILL CUT

HEAD DIA.	HEAD WIDTH	NECK DIAMETER	CHAMFER SIZE	NECK LENGTH	ORDER EDP#	ALTIM COATED EDP#	SHANK DIA.	OVERALL LENGTH
.075	.040	.050	.012	.187	65-1180	65-1180-C	1/8	2"
				.375	65-1185	65-1185-C		
.090	.045	.060	.015	.187	65-1190	65-1190-C	1/8	2"
				.375	65-1195	65-1195-C		
.120	.072	.075	.020	.250	65-1200	65-1200-C	1/8	2"
				.500	65-1205	65-1205-C		
.180	.093	.100	.032	.250	65-1210	65-1210-C	3/16	2-1/2"
				.500	65-1215	65-1215-C		
				.750	65-1220	65-1220-C		
				1.000	65-1225	65-1225-C		
.240	.093	.165	.032	.250	65-1230	65-1230-C	1/4	2-1/2"
				.500	65-1235	65-1235-C		
				.750	65-1240	65-1240-C		
				1.000	65-1245	65-1245-C		
.310	.093	.200	.032	.250	65-1250	65-1250-C	5/16	2-1/2"
				.500	65-1255	65-1255-C		
				.750	65-1260	65-1260-C		
				1.000	65-1265	65-1265-C		
.360	.125	.250	.046	.250	65-1270	65-1270-C	3/8	2-1/2"
				.500	65-1275	65-1275-C		
				.750	65-1280	65-1280-C		
.490	.156	.350	.062	.500	65-1290	65-1290-C	1/2	3"
				.750	65-1295	65-1295-C		
				1.000	65-1300	65-1300-C		



APPLICATION : USED TO CREATE A C'BORE ON THE BACK SIDE OR INSIDE OF A PART USING CIRCULAR INTERPOLATION ON A CNC MILL

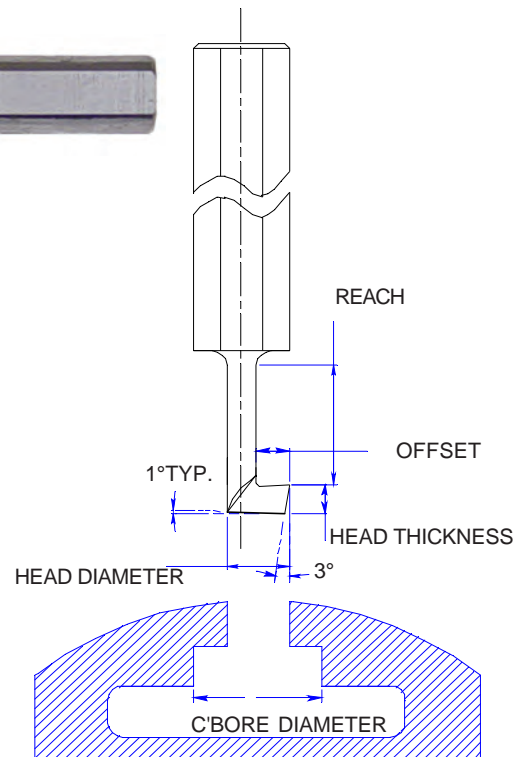
SERIES 66

made from **ITC CARBIDE**



CNC BACK-SPOT FACERS

HEAD DIAMETER	OFFSET	MAXIMUM C'BORE DIA.	HEAD THICKNESS	REACH	ORDER EDP#	ALTIM COATED	SHANK	OVERALL LENGTH
.135	.050	.235	3/32	.375	66-1100	66-1100-C	3/16	2-1/2"
				.625	66-1105	66-1105-C		
.180	.065	.310	3/32	.375	66-1110	66-1110-C	1/4	2-1/2"
				.625	66-1115	66-1115-C		
.225	.085	.395	1/8	.500	66-1120	66-1120-C	5/16	2-1/2"
				.750	66-1125	66-1125-C		
.270	.100	.470	1/8	.500	66-1130	66-1130-C	3/8	2-1/2"
				.750	66-1135	66-1135-C		
.370	.130	.630	1/8	.500	66-1140	66-1140-C	1/2	3"
				.750	66-1145	66-1145-C		
				1.000	66-1150	66-1150-C		
.435	.190	.815	5/32	.500	66-1155	66-1155-C	5/8	3-1/2"
				.750	66-1160	66-1160-C		
				1.000	66-1165	66-1165-C		
.530	.225	.980	3/16	.500	66-1175	66-1175-C	3/4	4"
				.750	66-1180	66-1180-C		
				1.000	66-1185	66-1185-C		
				1.250	66-1190	66-1190-C		



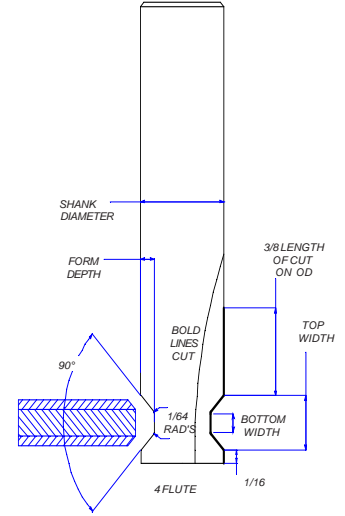
SERIES 72

APPLICATION: **FOR CHAMFERING BOTH SIDES OF A PART OR PLATE**

DOUBLE CHAMFER CUTTERS

made from **ITC CARBIDE**

SHANK DIA.	TOP WIDTH	FORM DEPTH	BOTTOM WIDTH	ORDER EDP#	TOOL ID	OVERALL LENGTH
.250	.100	.044	.020	72-1000	DC-250-100	2-1/2
.312	.135	.050	.023	72-1020	DC-312-135	2-1/2
.375	.160	.060	.028	72-1030	DC-375-160	2-1/2
.500	.200	.080	.042	72-1040	DC-500-210	3"
.500	.260	.080	.089	72-1050	DC-500-260	3"
.500	.320	.080	.149	72-1060	DC-500-320	3"
.500	.375	.080	.214	72-1070	DC-500-385	3"
.500	.510	.080	.339	72-1080	DC-500-510	3"
.500	.635	.080	.464	72-1090	DC-500-635	3"
.500	.760	.100	.569	72-2000	DC-500-760	4"



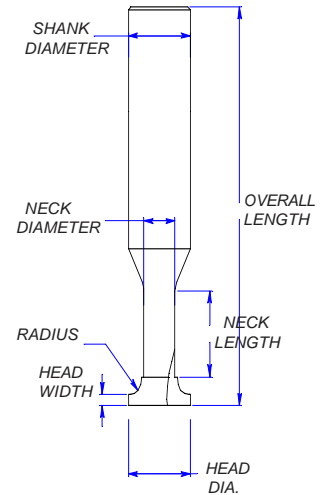
SERIES 67

APPLICATION: **FOR ROUNDING BACK OR INSIDE CORNERS**

REVERSE CORNER ROUNDERS

made from **ITC CARBIDE**

HEAD DIA.	RADIUS SIZE	NECK DIAMETER	NECK LENGTH	ORDER EDP#	ALTIN COATED	SHANK DIA.	HEAD WIDTH	OVERALL LENGTH
.187	.031	.110	.250	67-1400	67-1400-C	3/16	1/16	2-1/2
			.500	67-1405	67-1405-C			
			.750	67-1410	67-1410-C			
.250	.047	.140	.375	67-1415	67-1415-C	1/4	1/16	2-1/2
			.625	67-1420	67-1420-C			
			.875	67-1425	67-1425-C			
.312	.062	.170	.375	67-1430	67-1430-C	5/16	1/16	2-1/2
			.625	67-1435	67-1435-C			
			.875	67-1440	67-1440-C			
.375	.093	.170	1.000	67-1445	67-1445-C	3/8	3/32	2-1/2
			.500	67-1450	67-1450-C			
			.750	67-1455	67-1455-C			
.500	.125	.230	1.000	67-1460	67-1460-C	1/2	3/32	3"
			1.250	67-1465	67-1465-C			
			.500	67-1470	67-1470-C			
.625	.187	.230	.750	67-1475	67-1475-C	5/8	3/32	3-1/2
			1.000	67-1480	67-1480-C			
			1.250	67-1485	67-1485-C			
.500	.125	.230	.500	67-1490	67-1490-C	5/8	3/32	3-1/2
			.750	67-1495	67-1495-C			
			1.000	67-1500	67-1500-C			
.625	.187	.230	1.250	67-1505	67-1505-C	5/8	3/32	3-1/2



SERIES 64 2 FLUTE

SINGLE END

SERIES 64 4FLUTE

**2 FLUTE
SINGLE END
CHAMFER MILLS**



APPLICATION : **GROUND WITH POSITIVE AXIAL
RAKE & CLEARANCE
PRIMARILY FOR ALUMINUM &
SOFTER MATERIALS**

made from **ITI CARBIDE**

**4 FLUTE
SINGLE END
CHAMFER MILLS**

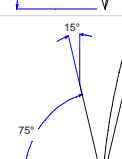
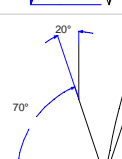
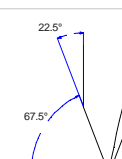
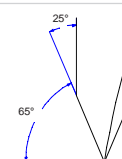
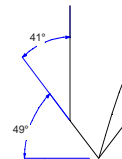
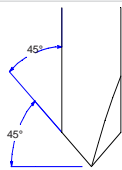
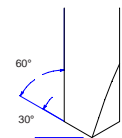
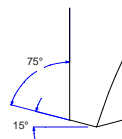


APPLICATION : **GROUND WITH POSITIVE AXIAL
RAKE & CLEARANCE
PRIMARILY FOR STEEL &
TOUGHER MATERIALS**

made from **ITI CARBIDE**

CHAMFERMILLS

INCLUDED ANGLE	UN-COATED EDP#	ALTiN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
150° 2 flute 75° PER SIDE	64-2740	64-2740-C	1/8	2"	.012
	64-2750	64-2750-C	3/16	2-1/2	.021
	64-2760	64-2760-C	1/4	2-1/2	.030
	64-2770	64-2770-C	5/16	2-1/2	.039
	64-2780	64-2780-C	3/8	2-1/2	.047
	64-2790	64-2790-C	1/2	3"	.064
120° 2 flute 60° PER SIDE	64-2795	64-2795-C	1/8	2"	.035
	64-2800	64-2800-C	3/16	2-1/2	.050
	64-2810	64-2810-C	1/4	2-1/2	.060
	64-2820	64-2820-C	5/16	2-1/2	.090
	64-2830	64-2830-C	3/8	2-1/2	.105
	64-2840	64-2840-C	1/2	3"	.140
90° 2 flute 45° PER SIDE	64-2845	64-2845-C	1/8	2"	.060
	64-2850	64-2850-C	3/16	2-1/2	.090
	64-2860	64-2860-C	1/4	2-1/2	.125
	64-2870	64-2870-C	5/16	2-1/2	.156
	64-2880	64-2880-C	3/8	2-1/2	.187
	64-2890	64-2890-C	1/2	3"	.250
82° 2 flute 41° PER SIDE	64-2892	64-2892-C	1/8	2"	.070
	64-2894	64-2894-C	3/16	2-1/2	.105
	64-2895	64-2895-C	1/4	2-1/2	.140
	64-2896	64-2896-C	5/16	2-1/2	.180
	64-2897	64-2897-C	3/8	2-1/2	.200
	64-2898	64-2898-C	1/2	3"	.280
60° 2 flute 30° PER SIDE	64-2899	64-2899-C	1/8	2"	.105
	64-2900	64-2900-C	3/16	2-1/2	.160
	64-2910	64-2910-C	1/4	2-1/2	.200
	64-2920	64-2920-C	5/16	2-1/2	.270
	64-2930	64-2930-C	3/8	2-1/2	.312
	64-2940	64-2940-C	1/2	3"	.420
50° 2 flute 25° PER SIDE	64-7210	64-7210-C	1/8	2"	.130
	64-7215	64-7215-C	3/16	2-1/2	.195
	64-7220	64-7220-C	1/4	2-1/2	.250
	64-7225	64-7225-C	5/16	2-1/2	.310
	64-7230	64-7230-C	3/8	2-1/2	.375
	64-7235	64-7235-C	1/2	3"	.500
45° 2 flute 22.5° PER SIDE	64-7237	64-7237-C	1/8	2"	.145
	64-7238	64-7238-C	3/16	2-1/2	.220
	64-7240	64-7240-C	1/4	2-1/2	.280
	64-7245	64-7245-C	5/16	2-1/2	.350
	64-7250	64-7250-C	3/8	2-1/2	.430
	64-7255	64-7255-C	1/2	3"	.580
40° 2 flute 20° PER SIDE	64-7257	64-7257-C	1/8	2"	.165
	64-7258	64-7258-C	3/16	2-1/2	.250
	64-7260	64-7260-C	1/4	2-1/2	.320
	64-7265	64-7265-C	5/16	2-1/2	.405
	64-7270	64-7270-C	3/8	2-1/2	.490
	64-7275	64-7275-C	1/2	3"	.660
30° 2 flute 15° PER SIDE	64-7280	64-7280-C	1/8	2"	.215
	64-7285	64-7285-C	3/16	2-1/2	.340
	64-7290	64-7290-C	1/4	2-1/2	.460
	64-7295	64-7295-C	5/16	2-1/2	.580
	64-7300	64-7300-C	3/8	2-1/2	.690
	64-7305	64-7305-C	1/2	3"	.920



INCLUDED ANGLE	UN-COATED EDP#	ALTiN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
150° 4 flute 75° PER SIDE	64-4730	64-4730-C	1/8	2"	.012
	64-4740	64-4740-C	3/16	2-1/2	.021
	64-4750	64-4750-C	1/4	2-1/2	.030
	64-4760	64-4760-C	5/16	2-1/2	.039
	64-4780	64-4780-C	3/8	2-1/2	.047
	64-4790	64-4790-C	1/2	3"	.064
120° 4 flute 60° PER SIDE	64-4795	64-4795-C	1/8	2"	.035
	64-4800	64-4800-C	3/16	2-1/2	.050
	64-4810	64-4810-C	1/4	2-1/2	.060
	64-4820	64-4820-C	5/16	2-1/2	.090
	64-4830	64-4830-C	3/8	2-1/2	.105
	64-4840	64-4840-C	1/2	3"	.140
90° 4 flute 45° PER SIDE	64-4845	64-4845-C	1/8	2"	.060
	64-4850	64-4850-C	3/16	2-1/2	.090
	64-4860	64-4860-C	1/4	2-1/2	.125
	64-4870	64-4870-C	5/16	2-1/2	.156
	64-4880	64-4880-C	3/8	2-1/2	.187
	64-4890	64-4890-C	1/2	3"	.250
82° 4 flute 41° PER SIDE	64-4891	64-4891-C	1/8	2"	.070
	64-4892	64-4892-C	3/16	2-1/2	.105
	64-4893	64-4893-C	1/4	2-1/2	.140
	64-4894	64-4894-C	5/16	2-1/2	.180
	64-4895	64-4895-C	3/8	2-1/2	.200
	64-4896	64-4895-C	1/2	3"	.280
60° 4 flute 30° PER SIDE	64-4898	64-4898-C	1/8	2"	.105
	64-4900	64-4900-C	3/16	2-1/2	.160
	64-4910	64-4910-C	1/4	2-1/2	.200
	64-4920	64-4920-C	5/16	2-1/2	.270
	64-4930	64-4930-C	3/8	2-1/2	.312
	64-4940	64-4940-C	1/2	3"	.420
50° 4 flute 25° PER SIDE	64-7380	64-7380-C	1/8	2-1/2	.130
	64-7390	64-7390-C	3/16	2-1/2	.195
	64-7400	64-7400-C	1/4	2-1/2	.250
	64-7402	64-7402-C	5/16	3"	.310
	64-7410	64-7410-C	3/8	2-1/2	.375
	64-7415	64-7415-C	1/2	2-1/2	.500
45° 4 flute 22.5° PER SIDE	64-7416	64-7416-C	1/8	2"	.145
	64-7418	64-7418-C	3/16	2-1/2	.220
	64-7420	64-7420-C	1/4	2-1/2	.280
	64-7425	64-7425-C	5/16	3"	.350
	64-7430	64-7430-C	3/8	2-1/2	.430
	64-7435	64-7435-C	1/2	2-1/2	.580
40° 4 flute 20° PER SIDE	64-7438	64-7438-C	1/8	2"	.165
	64-7439	64-7439-C	3/16	2-1/2	.250
	64-7440	64-7440-C	1/4	2-1/2	.320
	64-7445	64-7445-C	5/16	2-1/2	.405
	64-7450	64-7450-C	3/8	2-1/2	.490
	64-7455	64-7455-C	1/2	3"	.660
30° 4 flute 15° PER SIDE	64-7460	64-7460-C	1/8	2"	.215
	64-7465	64-7465-C	3/16	2-1/2	.340
	64-7470	64-7470-C	1/4	2-1/2	.460
	64-7475	64-7475-C	5/16	2-1/2	.580
	64-7480	64-7480-C	3/8	2-1/2	.690
	64-7485	64-7485-C	1/2	3"	.920

LONG SINGLE END

SERIES 64 2 FLUTE LONG

SERIES 64 4 FLUTE LONG



**2 FLUTE LONG REACH
CHAMFER MILLS**

made from **ITI CARBIDE**

APPLICATION :
GROUND WITH POSITIVE AXIAL
RAKE & CLEARANCE
PRIMARILY FOR ALUMINUM &
SOFTER MATERIALS

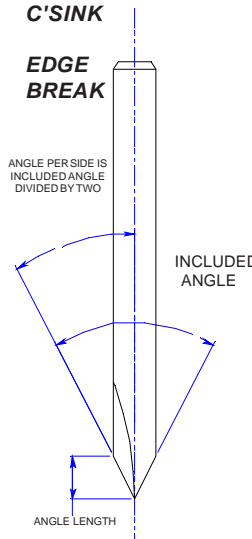
INCLUDED ANGLE	UN-COATED EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 2 flute	64-6800	64-6800-C	3/16	4"	.050
	64-6810	64-6810-C	1/4	4"	.060
	64-6820	64-6820-C	5/16	4"	.090
	64-6830	64-6830-C	3/8	6"	.105
60° PER SIDE	64-6840	64-6840-C	1/2	6"	.140
	64-6850	64-6850-C	3/16	4"	.090
90° 2 flute	64-6860	64-6860-C	1/4	4"	.125
	64-6870	64-6870-C	5/16	4"	.156
	64-6880	64-6880-C	3/8	6"	.187
	64-6890	64-6890-C	1/2	6"	.250
45° PER SIDE	64-6900	64-6900-C	3/16	4"	.160
	64-6910	64-6910-C	1/4	4"	.200
60° 2 flute	64-6920	64-6920-C	5/16	4"	.270
	64-6930	64-6930-C	3/8	6"	.312
	64-6940	64-6940-C	1/2	6"	.420
	30° PER SIDE				

NOW AVAILABLE WITH ALTN COATING

CHAMFER

C'SINK

EDGE BREAK



**4 FLUTE LONG REACH
CHAMFER MILLS**

made from **ITI CARBIDE**

APPLICATION :
GROUND WITH POSITIVE AXIAL RAKE & CLEARANCE
PRIMARILY FOR STEEL & TOUGHER MATERIALS

INCLUDED ANGLE	UN-COATED EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 4 flute	64-8800	64-8800-C	3/16	4"	.050
	64-8810	64-8810-C	1/4	4"	.060
	64-8820	64-8820-C	5/16	4"	.090
	64-8830	64-8830-C	3/8	6"	.105
60° PER SIDE	64-8840	64-8840-C	1/2	6"	.140
	64-8850	64-8850-C	3/16	4"	.090
90° 4 flute	64-8860	64-8860-C	1/4	4"	.125
	64-8870	64-8870-C	5/16	4"	.156
	64-8880	64-8880-C	3/8	6"	.187
	64-8890	64-8890-C	1/2	6"	.250
45° PER SIDE	64-8900	64-8900-C	3/16	4"	.160
	64-8910	64-8910-C	1/4	4"	.200
60° 4 flute	64-8920	64-8920-C	5/16	4"	.270
	64-8930	64-8930-C	3/8	6"	.312
	64-8940	64-8940-C	1/2	6"	.420
	30° PER SIDE				

LONG DOUBLE END

SERIES 64 2 FLUTE LONG

SERIES 64 4 FLUTE LONG

**2 FLUTE LONG REACH
CHAMFER MILLS**

made from **ITI CARBIDE**

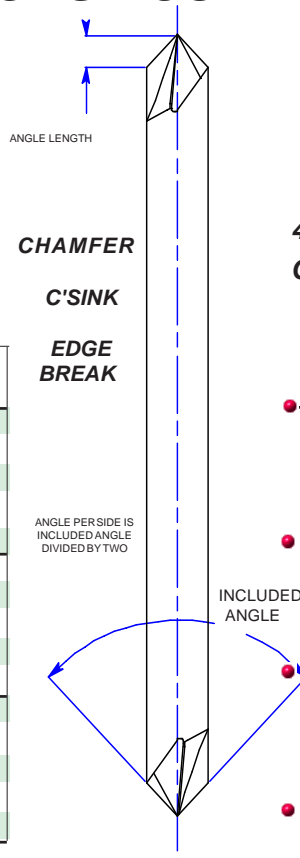
APPLICATION :
GROUND WITH POSITIVE AXIAL
RAKE & CLEARANCE
PRIMARILY FOR ALUMINUM &
SOFTER MATERIALS

INCLUDED ANGLE	UN-COATED EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 2 flute	64-9000	64-9000-C	3/16	4"	.050
	64-9010	64-9010-C	1/4	4"	.060
	64-9020	64-9020-C	5/16	4"	.090
	64-9030	64-9030-C	3/8	6"	.105
60° PER SIDE	64-9040	64-9040-C	1/2	6"	.140
	64-9050	64-9050-C	3/16	4"	.090
90° 2 flute	64-9060	64-9060-C	1/4	4"	.125
	64-9070	64-9070-C	5/16	4"	.156
	64-9080	64-9080-C	3/8	6"	.187
	64-9090	64-9090-C	1/2	6"	.250
45° PER SIDE	64-9100	64-9100-C	3/16	4"	.160
	64-9110	64-9110-C	1/4	4"	.200
60° 2 flute	64-9120	64-9120-C	5/16	4"	.270
	64-9130	64-9130-C	3/8	6"	.312
	64-9140	64-9140-C	1/2	6"	.420
	30° PER SIDE				

CHAMFER

C'SINK

EDGE BREAK



**4 FLUTE LONG REACH
CHAMFER MILLS**

made from **ITI CARBIDE**

APPLICATION :
GROUND WITH POSITIVE AXIAL RAKE & CLEARANCE
PRIMARILY FOR STEEL & TOUGHER MATERIALS

INCLUDED ANGLE	UN-COATED EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 4 flute	64-9150	64-9150-C	3/16	4"	.050
	64-9160	64-9160-C	1/4	4"	.060
	64-9170	64-9170-C	5/16	4"	.090
	64-9180	64-9180-C	3/8	6"	.105
60° PER SIDE	64-9190	64-9190-C	1/2	6"	.140
	64-9200	64-9200-C	3/16	4"	.090
90° 4 flute	64-9210	64-9210-C	1/4	4"	.125
	64-9220	64-9220-C	5/16	4"	.156
	64-9230	64-9230-C	3/8	6"	.187
	64-9240	64-9240-C	1/2	6"	.250
45° PER SIDE	64-9250	64-9250-C	3/16	4"	.160
	64-9260	64-9260-C	1/4	4"	.200
60° 4 flute	64-9270	64-9270-C	5/16	4"	.270
	64-9280	64-9280-C	3/8	6"	.312
	64-9290	64-9290-C	1/2	6"	.420
	30° PER SIDE				

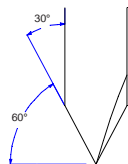
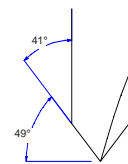
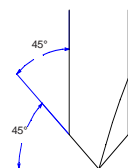
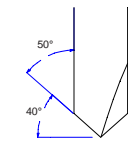
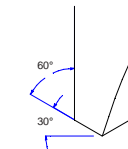
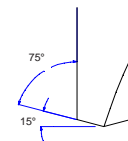
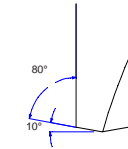
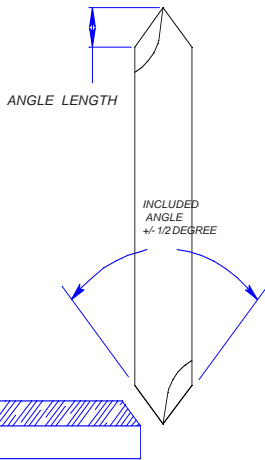
SERIES 64 2 FLUTE

APPLICATION: **GROUND WITH POSITIVE AXIAL RAKE & CLEARANCE
PRIMARILY FOR ALUMINUM & SOFTER MATERIALS**

**2 FLUTE DOUBLE END
CHAMFER MILLS**

NOW AVAILABLE
WITH
ALTiN COATING

- CHAMFER
- C'SINK
- EDGE BREAK



made from **ITI CARBIDE** SERIES 64 2 FLUTE

INCLUDED ANGLE	UN-COATED EDP#	ALTiN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
160° 2 flute 80° PER SIDE	64-1115	64-1115-C	1/8	2"	.007
	64-1120	64-1120-C	3/16	2-1/2"	.012
	64-1125	64-1125-C	1/4	2-1/2"	.019
	64-1130	64-1130-C	5/16	2-1/2"	.025
	64-1135	64-1135-C	3/8	2-1/2"	.030
150° 2 flute 75° PER SIDE	64-1140	64-1140-C	1/2	3"	.040
	64-1145	64-1145-C	1/8	2"	.012
	64-1150	64-1150-C	3/16	2-1/2"	.021
	64-1155	64-1155-C	1/4	2-1/2"	.030
	64-1160	64-1160-C	5/16	2-1/2"	.039
120° 2 flute 60° PER SIDE	64-1165	64-1165-C	3/8	2-1/2"	.047
	64-1170	64-1170-C	1/2	3"	.064
	64-1175	64-1175-C	1/8	2"	.035
	64-1180	64-1180-C	3/16	2-1/2"	.050
	64-1200	64-1200-C	1/4	2-1/2"	.060
100° 2 flute 50° PER SIDE	64-1203	64-1203-C	5/16	2-1/2"	.090
	64-1205	64-1205-C	3/8	2-1/2"	.105
	64-1210	64-1210-C	1/2	3"	.140
	64-1211	64-1211-C	5/8	3-1/2"	.180
	64-2200	64-2200-C	1/8	2"	.050
90° 2 flute 45° PER SIDE	64-2205	64-2205-C	3/16	2-1/2"	.075
	64-2210	64-2210-C	1/4	2-1/2"	.100
	64-2215	64-2215-C	5/16	2-1/2"	.130
	64-2220	64-2220-C	3/8	2-1/2"	.155
	64-2225	64-2225-C	1/2	3"	.205
82° 2 flute 41° PER SIDE	64-2230	64-2230-C	5/8	3-1/2"	.260
	64-1212	64-1212-C	1/8	2"	.060
	64-1213	64-1213-C	3/16	2-1/2"	.090
	64-1215	64-1215-C	1/4	2-1/2"	.125
	64-1217	64-1217-C	5/16	2-1/2"	.156
60° 2 flute 30° PER SIDE	64-1220	64-1220-C	3/8	2-1/2"	.187
	64-1225	64-1225-C	1/2	3"	.250
	64-1226	64-1226-C	5/8	3-1/2"	.310
	64-1229	64-1229-C	3/4	4"	.370
	64-1231	64-1231-C	1"	4"	.490
60° 2 flute 30° PER SIDE	64-1224	64-1224-C	1/8	2"	.070
	64-1227	64-1227-C	3/16	2-1/2"	.105
	64-1230	64-1230-C	1/4	2-1/2"	.140
	64-1232	64-1232-C	5/16	2-1/2"	.180
	64-1235	64-1235-C	3/8	2-1/2"	.200
60° 2 flute 30° PER SIDE	64-1240	64-1240-C	1/2	3"	.280
	64-1241	64-1241-C	5/8	3-1/2"	.350
	64-1239	64-1239-C	1/8	2"	.105
	64-1242	64-1242-C	3/16	2-1/2"	.160
	64-1245	64-1245-C	1/4	2-1/2"	.200
60° 2 flute 30° PER SIDE	64-1247	64-1247-C	5/16	2-1/2"	.270
	64-1250	64-1250-C	3/8	2-1/2"	.312
	64-1255	64-1255-C	1/2	3"	.420
	64-1260	64-1260-C	5/8	3-1/2"	.540

CHAMFER MILLS

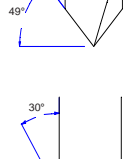
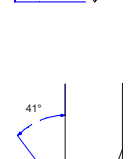
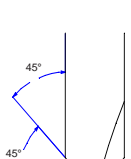
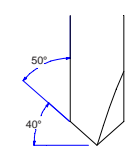
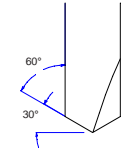
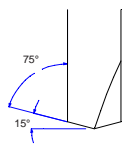
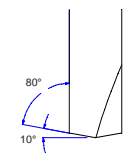
SERIES 64 4 FLUTE

4 FLUTE DOUBLE END CHAMFER MILLS

NOW AVAILABLE WITH ALTiN COATING

made from **IT** CARBIDE

INCLUDED ANGLE	UN-COATED EDP#	ALTiN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
160° 4 flute 80° PER SIDE	64-1330	64-1330-C	1/8	2"	.007
	64-1335	64-1335-C	3/16	2-1/2	.012
	64-1340	64-1340-C	1/4	2-1/2	.019
	64-1345	64-1345-C	5/16	2-1/2	.025
	64-1350	64-1350-C	3/8	2-1/2	.030
	64-1355	64-1355-C	1/2	3"	.040
150° 4 flute 75° PER SIDE	64-1360	64-1360-C	1/8	2"	.012
	64-1365	64-1365-C	3/16	2-1/2	.021
	64-1370	64-1370-C	1/4	2-1/2	.030
	64-1375	64-1375-C	5/16	2-1/2	.039
	64-1380	64-1380-C	3/8	2-1/2	.047
	64-1385	64-1385-C	1/2	3"	.064
120° 4 flute 60° PER SIDE	64-1390	64-1390-C	1/8	2"	.035
	64-1395	64-1395-C	3/16	2-1/2	.050
	64-1400	64-1400-C	1/4	2-1/2	.060
	64-1403	64-1403-C	5/16	2-1/2	.090
	64-1405	64-1405-C	3/8	2-1/2	.105
	64-1410	64-1410-C	1/2	3"	.140
100° 4 flute 50° PER SIDE	64-1411	64-1411-C	5/8	3-1/2	.180
	64-4400	64-4400-C	1/8	2"	.050
	64-4405	64-4405-C	3/16	2-1/2	.075
	64-4410	64-4410-C	1/4	2-1/2	.100
	64-4415	64-4415-C	5/16	2-1/2	.130
	64-4420	64-4420-C	3/8	2-1/2	.155
90° 4 flute 45° PER SIDE	64-4425	64-4425-C	1/2	3"	.205
	64-4430	64-4430-C	5/8	3-1/2	.260
	64-1412	64-1412-C	1/8	2"	.060
	64-1413	64-1413-C	3/16	2-1/2	.090
	64-1415	64-1415-C	1/4	2-1/2	.125
	64-1417	64-1417-C	5/16	2-1/2	.156
82° 4 flute 41° PER SIDE	64-1420	64-1420-C	3/8	2-1/2	.187
	64-1425	64-1425-C	1/2	3"	.250
	64-1426	64-1426-C	5/8	3-1/2	.310
	64-1429	64-1429-C	3/4	4"	.370
	64-1431	64-1431-C	1"	4"	.490
	64-1424	64-1424-C	1/8	2"	.070
60° 4 flute 30° PER SIDE	64-1427	64-1427-C	3/16	2-1/2	.105
	64-1430	64-1430-C	1/4	2-1/2	.140
	64-1432	64-1432-C	5/16	2-1/2	.180
	64-1435	64-1435-C	3/8	2-1/2	.200
	64-1440	64-1440-C	1/2	3"	.280
	64-1441	64-1441-C	5/8	3-1/2	.350
60° 4 flute 30° PER SIDE	64-1439	64-1439-C	1/8	2"	.105
	64-1442	64-1442-C	3/16	2-1/2	.160
	64-1445	64-1445-C	1/4	2-1/2	.200
	64-1447	64-1447-C	5/16	2-1/2	.270
	64-1450	64-1450-C	3/8	2-1/2	.312
	64-1455	64-1455-C	1/2	3"	.420
64-1460	64-1460-C	5/8	3-1/2	.540	

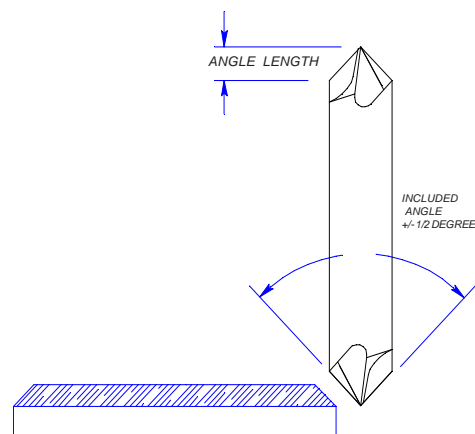


APPLICATION:
GROUND WITH RAKE & CLEARANCE FOR STEEL & TOUGHER MATERIALS

- CHAMFER
- C'SINK
- EDGE BREAK



CHAMFER MILLS



CORNER ROUNDING ENDMILLS

SERIES 68 *made from* **ITI CARBIDE**

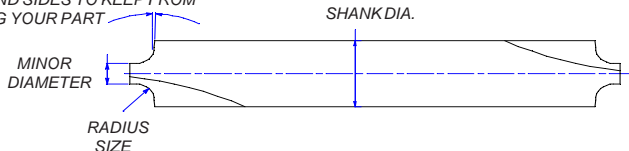
**2 FLUTE
CORNER ROUNDING ENDMILLS**

APPLICATION: **USE IN TIGHT SPOTS WHERE THE TIP DIAMETER NEEDS TO BE SMALLER OR IN SOFTER MATERIALS THAT CAN TAKE HIGHER RPMs**

CORNER ROUNDERS

SHANK DIA.	RADIUS SIZE	MINOR DIAMETER	ORDER EDP#	TOOL ID	O.A.L.
1/8	.0050	.040	68-1500	SR-125-005	2"
	.0079 (0.2 MM)	.040	68-1505	SR-125-008	
	.0100	.040	68-1510	SR-125-010	
	.0118 (0.3 MM)	.040	68-1515	SR-125-012	
	.0150	.040	68-1520	SR-125-015	
	.0157 (0.4 MM)	.040	68-1525	SR-125-016	
	.0197 (0.5 MM)	.040	68-1530	SR-125-019	
	.0200	.040	68-1535	SR-125-020	
	.0236 (0.6 MM)	.040	68-1540	SR-125-024	
	.0250	.040	68-1545	SR-125-025	
	.0276 (0.7 MM)	.040	68-1550	SR-125-028	
	.0300	.040	68-1555	SR-125-030	
	.0312 (1/32)	.040	68-1560	SR-125-031	
	.0315 (0.8 MM)	.040	68-1565	SR-125-032	
.0354 (0.9 MM)	.040	68-1570	SR-125-035		
.0394 (1.0 MM)	.040	68-1575	SR-125-040		
3/16	.0469 (3/64)	.040	68-1580	SR-187-047	2"
	.0500	.040	68-1585	SR-187-050	
	.0591 (1.5MM)	.040	68-1590	SR-187-059	
	.0600	.040	68-1595	SR-187-060	
1/4	.0625 (1/16)	.040	68-1600	SR-187-063	2-1/2"
	.0781 (5/64)	.040	68-1605	SR-250-078	
	.0787 (2.0 MM)	.040	68-1610	SR-250-079	
	.0938 (3/32)	.040	68-1615	SR-250-094	
5/16	.0984 (2.5 MM)	.040	68-1620	SR-250-098	2-1/2"
	.1094 (7/64)	.055	68-1625	SR-312-109	
	.1181 (3.0 MM)	.055	68-1630	SR-312-118	
3/8	.1250 (1/8)	.055	68-1635	SR-312-125	2-1/2"
	.1378 (3.5 MM)	.055	68-1640	SR-375-138	
	.1406 (9/64)	.055	68-1645	SR-375-140	
	.1562 (5/32)	.055	68-1650	SR-375-156	
	.1575 (4.0 MM)	.055	68-1655	SR-375-158	
1/2	.1719 (11/64)	.055	68-1660	SR-500-172	3"
	.1772 (4.5 MM)	.055	68-1665	SR-500-177	
	.1875 (3/16)	.055	68-1670	SR-500-188	
	.1969 (5.0 MM)	.055	68-1675	SR-500-197	
	.2031 (13/64)	.055	68-1680	SR-500-203	
	.2165 (5.5 MM)	.055	68-1685	SR-500-216	
	.2188 (7/32)	.055	68-1690	SR-500-219	
5/8	.2344 (15/64)	.105	68-1695	SR-625-235	3-1/2"
	.2362 (6.0 MM)	.105	68-1700	SR-625-236	
	.2500 (1/4)	.105	68-1705	SR-625-250	

RADIUS HAS A 2° FLARE ON TIP AND SIDES TO KEEP FROM GOUGING YOUR PART



**3 FLUTE
CORNER ROUNDING ENDMILLS**

APPLICATION: **USE IN STEEL OR TOUGHER MATERIALS ALSO AVAILABLE ALTiN COATED**

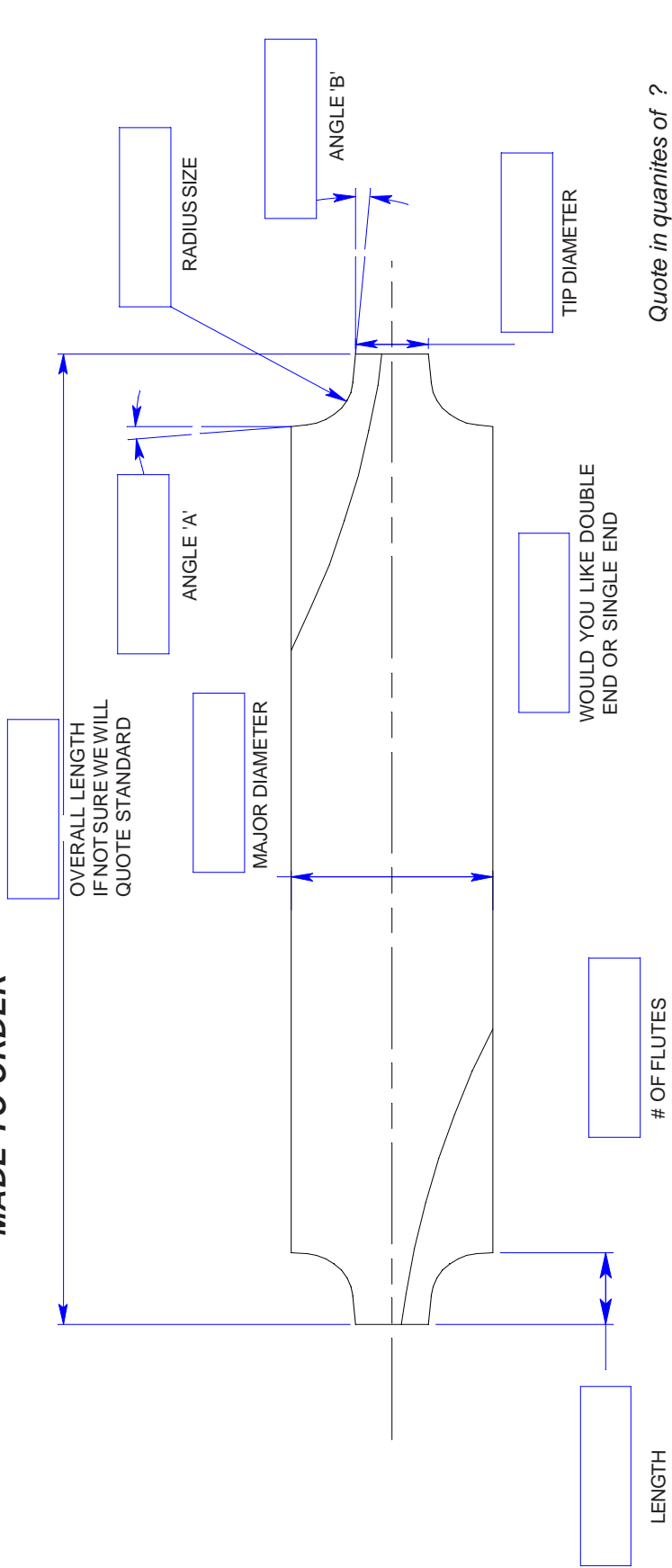
SHANK DIA.	RADIUS SIZE	MINOR DIAMETER	ORDER EDP#	ALTiN COATED EDP#	O.A.L.
1/8	.010	.100	68-1200	68-1200-C	2"
	.0156 (1/64)	.090	68-1205	68-1205-C	
	.020	.080	68-1210	68-1210-C	
	.025	.070	68-1215	68-1215-C	
	.0312 (1/32)	.060	68-1220	68-1220-C	
3/16	.0156 (1/64)	.040	68-1221	68-1221-C	2"
	.0312 (1/32)	.040	68-1222	68-1222-C	
	.0625 (1/16)	.060	68-1223	68-1223-C	
1/4	.010	.140	68-1225	68-1225-C	2-1/2"
	.0156 (1/64)	.140	68-1230	68-1230-C	
	.020	.140	68-1235	68-1235-C	
	.025	.140	68-1240	68-1240-C	
	.0312 (1/32)	.140	68-1245	68-1245-C	
	.035	.140	68-1250	68-1250-C	
	.0394 (1MM)	.140	68-1255	68-1255-C	
	.0469 (3/64)	.140	68-1260	68-1260-C	
	.050	.140	68-1265	68-1265-C	
	.055	.090	68-1270	68-1270-C	
	.0591 (1.5MM)	.090	68-1275	68-1275-C	
	.0625 (1/16)	.090	68-1280	68-1280-C	
	.070	.090	68-1285	68-1285-C	
	.075	.090	68-1290	68-1290-C	
3/8	.0781 (5/64)	.115	68-1295	68-1295-C	2-1/2"
	.0787 (2MM)	.115	68-1297	68-1297-C	
	.0938 (3/32)	.115	68-1300	68-1300-C	
	.0984 (2.5MM)	.115	68-1302	68-1302-C	
	.1094 (7/64)	.115	68-1305	68-1305-C	
	.1181 (3MM)	.115	68-1307	68-1307-C	
1/2	.125 (1/8)	.115	68-1310	68-1310-C	3"
	.140 (9/64)	.120	68-1312	68-1312-C	
	.1562 (5/32)	.120	68-1315	68-1315-C	
	.1718 (11/64)	.120	68-1320	68-1320-C	
	.1875 (3/16)	.120	68-1325	68-1325-C	
5/8	.1969 (5MM)	.120	68-1327	68-1327-C	3-1/2"
	.2031 (13/64)	.120	68-1330	68-1330-C	
	.2188 (7/32)	.120	68-1335	68-1335-C	
	.2344 (15/64)	.120	68-1340	68-1340-C	
	.2362 (6MM)	.120	68-1342	68-1342-C	
	.250 (1/4)	.120	68-1345	68-1345-C	
	3/4	.2812 (9/32)	.120	68-1350	
.2969 (19/64)		.120	68-1352	68-1352-C	
.3125 (5/16)		.120	68-1355	68-1355-C	
1"	.3281 (21/64)	.240	68-1360	68-1360-C	4"
	.3438 (11/32)	.240	68-1365	68-1365-C	
	.375 (3/8)	.240	68-1370	68-1370-C	



REVISIONS:

Simply make a copy
fill in the information below and fax or email to us. fax # 909-392-2627
we will quote as soon as possible. INFO@internaltool.com
Any dimension your not sure of leave blank we will quote standard.
fill in sheet is Also available at Internaltool.com

**CORNER ROUNDERS
MADE TO ORDER**



Quote in quarites of ?
THE MORE YOU BUY
THE CHEAPER THEY GET

Company name _____
Contact _____
Phone _____
Fax _____
Your distributor _____

INTERNAL TOOL DRAWN BY: _____ DATE: _____ TOOL NUMBER: _____		ITI CARBIDE TOLERANCE UNLESS OTHERWISE SPECIFIED .X = +/- 1/32 .XX = +/- .010 .XXX = +/- .002 .XXXX = +/- .0005 ANGLES +/- 0.15°	
		REV: _____	_____

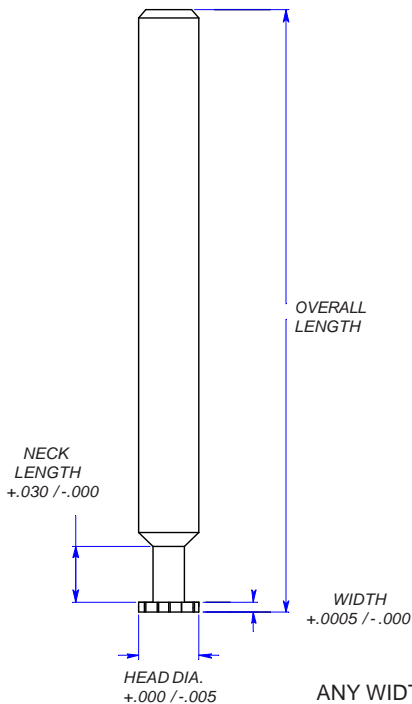
SERIES 76 *made from* **ITI CARBIDE**

APPLICATION: **ALL CLEARANCE ANGLES, RAKE ANGLES AND DISH CLEARANCE SPECIFICALLY ENGINEERED AND DESIGNED FOR CUTTING SOFTER MATERIALS ALUMINUM, PLASTICS, ETC.**

SOFT MATERIAL CUTTING SOLID CARBIDE KEY CUTTERS

KEY CUTTERS

	CUTTER DIAMETER +0.00 / -.005	WIDTH	ORDER EDP#	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
1/4	.250	.0150	76-1400	.125	1/4	1/4	4	2-1/2
		.0312	76-1435					
		.0625	76-1455					
5/16	.312	.0150	76-1460	.150	5/16	5/16	4	2-1/2
		.0312	76-1470					
		.0625	76-1480					
		.0938	76-1485					
3/8	.375	.0312	76-1500	.200	3/8	3/8	4	2-1/2
		.0625	76-1510					
		.0938	76-1515					
		.1250	76-1520					
1/2	.500	.1875	76-1530	.250	3/8	1/2	6	3"
		.0312	76-1535					
		.0625	76-1545					
		.0938	76-1550					
		.1250	76-1555					
		.1562	76-1560					
.1875	76-1565							
		.2500	76-1570					



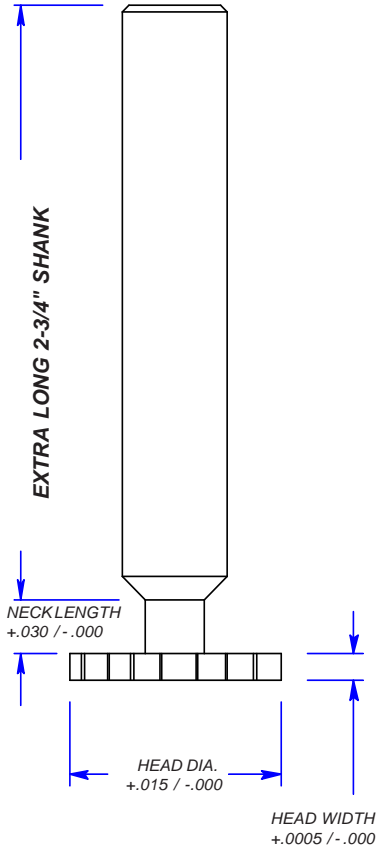
ANY WIDTH
CAN BE REDUCED
TO YOUR
SPECIFICATIONS.

KEY CUTTERS FOR SOFTER MATERIALS

SERIES 78 *made from* **ITI CARBIDE**

APPLICATION: **ALL CLEARANCE ANGLES, RAKE ANGLES AND DISH CLEARANCE SPECIFICALLY ENGINEERED AND DESIGNED FOR CUTTING SOFTER MATERIALS ALUMINUM, PLASTICS, ETC.**

SOFT MATERIAL CUTTING CARBIDE HEAD / STEEL SHANK KEY CUTTERS



ANY WIDTH
CAN BE REDUCED
TO YOUR
SPECIFICATIONS.

KEY CUTTERS FOR SOFTER MATERIALS

	CUTTER DIAMETER +.015 / -.000	WIDTH	ORDER EDP#	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
5/8	.625	.0312	78-1660	.280	1/4	1/2	6	2-3/4"
		.0625	78-1670	.280				
		.0938	78-1680	.280				
		.1250	78-1690	.280				
		.1562	78-1700	.280				
		.1875	78-1705	.280				
		.2500	78-1720	.280				
3/4	.750	.0312	78-1728	.280	1/4	1/2	6	2-3/4"
		.0625	78-1730	.280				
		.0938	78-1740	.280				
		.1250	78-1750	.280				
		.1562	78-1760	.280				
		.1875	78-1765	.280				
		.2500	78-1785	.280				
7/8	.875	.3125	78-1800	.490	1/4	1/2	6	2-3/4"
		.3750	78-1810	.490				
		.0625	78-1813	.280				
		.1250	78-1815	.280				
1"	1.000	.1875	78-1825	.280	1/4	1/2	6	2-3/4"
		.2500	78-1835	.280				
		.0312	78-1846	.280				
		.0625	78-1850	.280				
		.0938	78-1855	.280				
		.1250	78-1860	.280				
		.1562	78-1862	.280				
1-1/4"	1.250	.1875	78-1865	.490	1/4	1/2	6	2-3/4"
		.2500	78-1875	.490				
		.3125	78-1885	.490				
		.3750	78-1890	.490				
		.0312	78-1912	.280				
		.0625	78-1915	.280				
		.0938	78-1920	.280				
1-1/4"	1.250	.1250	78-1925	.280	1/4	1/2	6	2-3/4"
		.1875	78-1932	.490				
		.2500	78-1940	.490				
		.3125	78-1945	.490				
		.3750	78-1950	.490				



SERIES 76

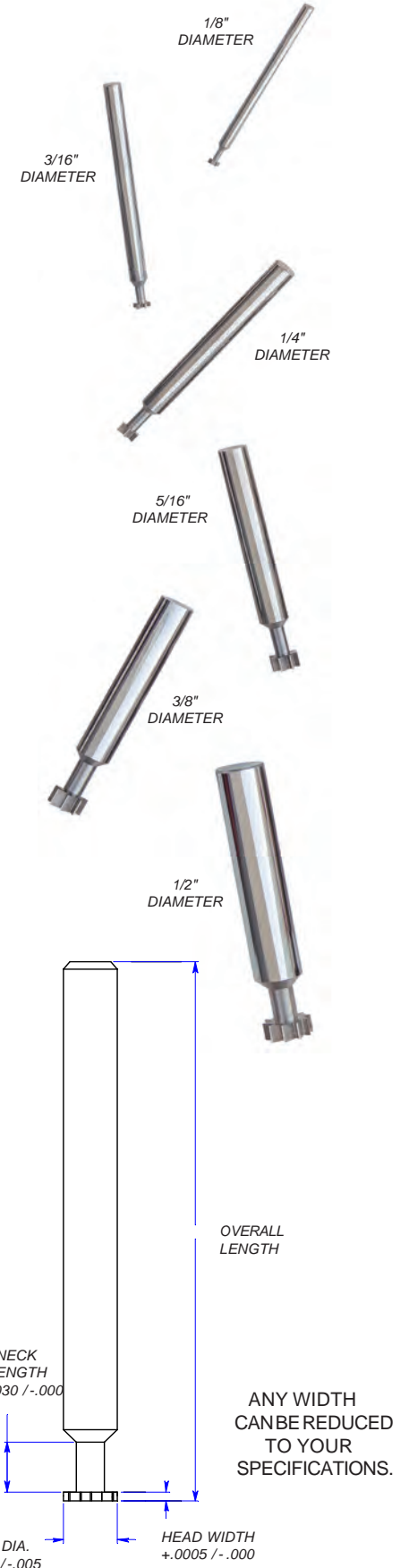
made from **ITI CARBIDE**

ONE PIECE SOLID CONSTRUCTION

SOLID CARBIDE KEY CUTTERS

KEY CUTTERS

CUTTER DIAMETER +0.00 / -.005	CUTTER WIDTH	ORDER EDP#	ALTiN COATED EDP#	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
3/32	.010	76-0795	76-0795-C	.046	1/8	1/8	4	2"
	.015	76-0800	76-0800-C					
	.020	76-0802	76-0802-C					
	.025	76-0804	76-0804-C					
	.0312 (1/32)	76-0810	76-0810-C					
	.0394 (1 MM)	76-0812	76-0812-C					
	.0469 (3/64)	76-0815	76-0815-C					
	.0625 (1/16)	76-0820	76-0820-C					
1/8	.010	76-0825	76-0825-C	.060	1/8	1/8	6	2"
	.015	76-0900	76-0900-C					
	.020	76-0902	76-0902-C					
	.025	76-0904	76-0904-C					
	.030	76-0906	76-0906-C					
	.0312 (1/32)	76-0910	76-0910-C					
	.035	76-0912	76-0912-C					
	.0394 (1MM)	76-0914	76-0914-C					
	.0469 (3/64)	76-0920	76-0920-C					
	.050	76-0922	76-0922-C					
	.055	76-0924	76-0924-C					
	.0625 (1/16)	76-0926	76-0926-C					
.0781 (5/64)	76-0928	76-0928-C						
.0938 (3/32)	76-0930	76-0930-C						
5/32	.010	76-0932	76-0932-C	.078	3/16	3/16	6	2-1/2
	.015	76-0950	76-0950-C					
	.020	76-0952	76-0952-C					
	.025	76-0954	76-0954-C					
	.0312 (1/32)	76-0955	76-0955-C					
	.0394 (1MM)	76-0957	76-0957-C					
	.0469 (3/64)	76-0960	76-0960-C					
	.0625 (1/16)	76-0962	76-0962-C					
	.0781 (5/64)	76-0963	76-0963-C					
.0938 (3/32)	76-0964	76-0964-C						
3/16	.010	76-0965	76-0965-C	.094	3/16	3/16	6	2-1/2
	.015	76-1050	76-1050-C					
	.020	76-1052	76-1052-C					
	.030	76-1054	76-1054-C					
	.0312 (1/32)	76-1055	76-1055-C					
	.0394 (1MM)	76-1057	76-1057-C					
	.040	76-1059	76-1059-C					
	.0469 (3/64)	76-1060	76-1060-C					
	.050	76-1062	76-1062-C					
	.0625 (1/16)	76-1065	76-1065-C					
	.0781 (5/64)	76-1067	76-1067-C					
	.0787 (2MM)	76-1068	76-1068-C					
	.0934 (3/32)	76-1069	76-1069-C					
	.1250 (1/8)	76-1075	76-1075-C					
1/4	.010	76-1095	76-1095-C	.125	1/4	1/4	6	2-1/2
	.015	76-1100	76-1100-C					
	.018	76-1105	76-1105-C					
	.020	76-1110	76-1110-C					
	.023	76-1115	76-1115-C					
	.025	76-1120	76-1120-C					
	.028	76-1125	76-1125-C					
	.030	76-1130	76-1130-C					
	.0312 (1/32)	76-1135	76-1135-C					



ANY WIDTH REDUCED TO YOUR SPECIFICATIONS.
SPECIALS, CORNER RADIUS, STAGGER TOOTH AND LEFT HAND AVAILABLE.

SERIES 76

 made from **ITI CARBIDE**

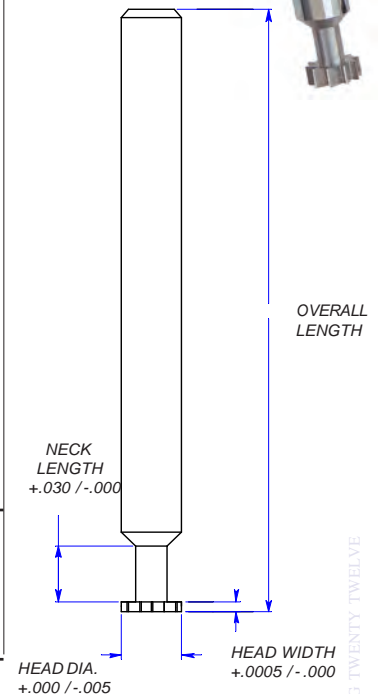
ONE PIECE SOLID CONSTRUCTION

SOLID CARBIDE KEY CUTTERS

CUTTER DIAMETER	CUTTER WIDTH	ORDER EDP#	ALTN COATED EDP#	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
1/4 CONT.	.0350	76-1140	76-1140-C	.125	1/4	1/4	6	2-1/2
	.0380	76-1145	76-1145-C					
	.0394 (1MM)	76-1147	76-1147-C					
	.0400	76-1150	76-1150-C					
	.0469 (3/64)	76-1151	76-1151-C					
	.0500	76-1153	76-1153-C					
	.0600	76-1154	76-1154-C					
	.0625 (1/16)	76-1155	76-1155-C					
	.0781 (5/64)	76-1157	76-1157-C					
	.0787 (2MM)	76-1158	76-1158-C					
.0937 (3/32)	76-1159	76-1159-C						
5/16	.0150	76-1160	76-1160-C	.150	5/16	5/16	8	2-1/2
	.0200	76-1165	76-1165-C					
	.0312 (1/32)	76-1170	76-1170-C					
	.0394 (1MM)	76-1172	76-1172-C					
	.0469 (3/64)	76-1175	76-1175-C					
	.0625 (1/16)	76-1180	76-1180-C					
	.0781 (5/64)	76-1182	76-1182-C					
	.0787 (2MM)	76-1184	76-1184-C					
	.0938 (3/32)	76-1185	76-1185-C					
	.1250 (1/8)	76-1190	76-1190-C					
.1562 (5/32)	76-1195	76-1195-C						
3/8	.010	76-1197	76-1197-C	.200	3/8	3/8	8	2-1/2
	.015	76-1198	76-1198-C					
	.020	76-1199	76-1199-C					
	.0312 (1/32)	76-1200	76-1200-C					
	.0394 (1MM)	76-1202	76-1202-C					
	.0469 (3/64)	76-1205	76-1205-C					
	.0625 (1/16)	76-1210	76-1210-C					
	.0781 (5/64)	76-1212	76-1212-C					
	.0787 (2MM)	76-1213	76-1213-C					
	.0938 (3/32)	76-1215	76-1215-C					
.1250 (1/8)	76-1220	76-1220-C						
.1562 (5/32)	76-1225	76-1225-C						
.1875 (3/16)	76-1230	76-1230-C						
1/2	.015	76-1232	76-1232-C	.250	3/8	3/16	10	3"
	.0312 (1/32)	76-1235	76-1235-C					
	.0394 (1MM)	76-1237	76-1237-C					
	.0468 (3/64)	76-1240	76-1240-C					
	.0625 (1/16)	76-1245	76-1245-C					
	.0781 (5/64)	76-1247	76-1247-C					
	.0787 (2MM)	76-1248	76-1248-C					
	.0938 (3/32)	76-1250	76-1250-C					
	.1181 (3MM)	76-1252	76-1252-C					
	.1250 (1/8)	76-1255	76-1255-C					
	.1406 (9/64)	76-1257	76-1257-C					
	.1562 (5/32)	76-1260	76-1260-C					
	.1575 (4MM)	76-1262	76-1262-C					
	.1875 (3/16)	76-1265	76-1265-C					
	.1969 (5MM)	76-1267	76-1267-C					
.2344 (15/64)	76-1268	76-1268-C						
.2362 (6MM)	76-1269	76-1269-C						
.2500 (1/4)	76-1270	76-1270-C						
5/8	.0625 (1/16)	76-1280	76-1280-C	.300	1/2	5/8	10	3-1/2
	.0938 (3/32)	76-1290	76-1290-C					
	.1250 (1/8)	76-1300	76-1300-C					
	.1875 (3/16)	76-1310	76-1310-C					
	.2500 (1/4)	76-1320	76-1320-C					



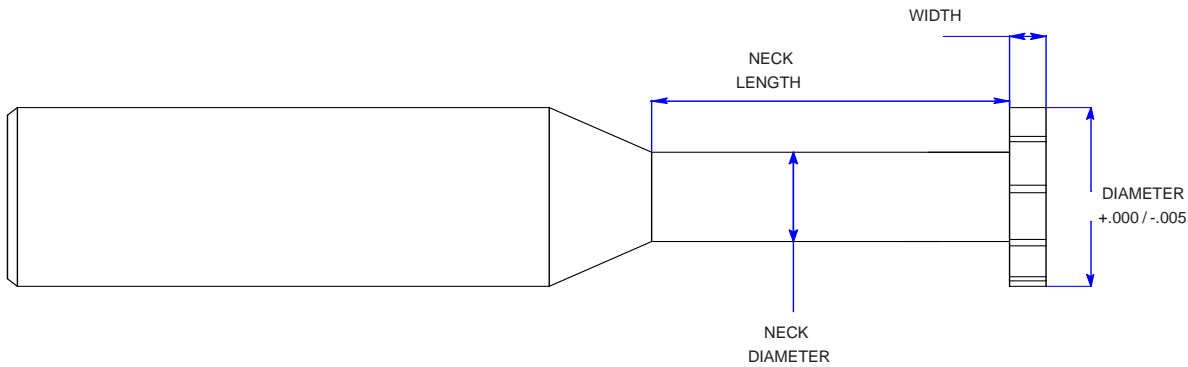
ANY WIDTH CANBEREDUCED TO YOUR SPECIFICATIONS.



KEY CUTTERS

SOLID CARBIDE LONG REACH KEY CUTTERS

ANY WIDTH
CAN BE REDUCED
TO YOUR
SPECIFICATIONS.

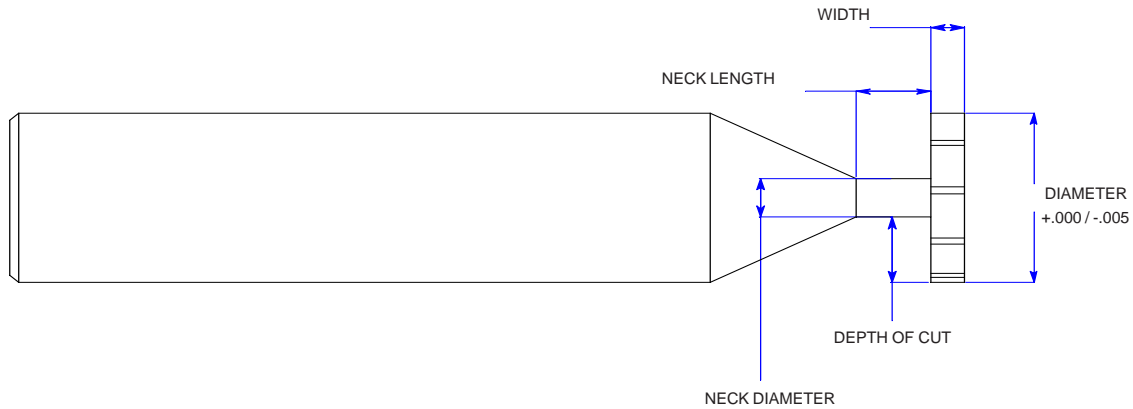


KEY CUTTERS

CUTTER DIAMETER	WIDTH	ORDER EDP#	ALTN COATED EDP#	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
3/16	.0156 (1/64)	83-1000	83-1000-C	.093	9/16	3/16	6	2-1/2
	.0312 (1/32)	83-1010	83-1010-C					
	.0469 (3/64)	83-1020	83-1020-C					
	.0625 (1/16)	83-1030	83-1030-C					
	.0781 (5/64)	83-1040	83-1040-C					
	.0938 (3/32)	83-1050	83-1050-C					
	.1250 (1/8)	83-1060	83-1060-C					
1/4	.0156 (1/64)	83-1070	83-1070-C	.125	3/4	1/4	6	2-1/2
	.0312 (1/32)	83-1080	83-1080-C					
	.0469 (3/64)	83-1090	83-1090-C					
	.0625 (1/16)	83-1100	83-1100-C					
	.0781 (5/64)	83-1110	83-1110-C					
	.0938 (3/32)	83-1120	83-1120-C					
	.1250 (1/8)	83-1130	83-1130-C					
5/16	.0156 (1/64)	83-1140	83-1140-C	.156	1"	5/16	8	2-1/2
	.0312 (1/32)	83-1150	83-1150-C					
	.0469 (3/64)	83-1160	83-1160-C					
	.0625 (1/16)	83-1170	83-1170-C					
	.0781 (5/64)	83-1180	83-1180-C					
	.0938 (3/32)	83-1190	83-1190-C					
	.1250 (1/8)	83-1200	83-1200-C					
3/8	.0156 (1/64)	83-1210	83-1210-C	.187	1-1/8	3/8	8	2-1/2
	.0312 (1/32)	83-1220	83-1220-C					
	.0469 (3/64)	83-1230	83-1230-C					
	.0625 (1/16)	83-1240	83-1240-C					
	.0781 (5/64)	83-1250	83-1250-C					
	.0938 (3/32)	83-1260	83-1260-C					
	.1250 (1/8)	83-1270	83-1270-C					
1/2	.0156 (1/64)	83-1280	83-1280-C	.250	1-1/2	1/2	10	3"
	.0312 (1/32)	83-1290	83-1290-C					
	.0469 (3/64)	83-1300	83-1300-C					
	.0625 (1/16)	83-1310	83-1310-C					
	.0781 (5/64)	83-1320	83-1320-C					
	.0938 (3/32)	83-1330	83-1330-C					
	.1250 (1/8)	83-1340	83-1340-C					
5/8	.0625 (1/16)	83-1350	83-1350-C	.300	1-5/8	5/8	10	3-1/2
	.0938 (3/32)	83-1360	83-1360-C					
	.1250 (1/8)	83-1370	83-1370-C					
	.1875 (3/16)	83-1380	83-1380-C					

SOLID CARBIDE DEEP SLOTTING KEY CUTTERS

ANY WIDTH
CAN BE REDUCED
TO YOUR
SPECIFICATIONS.



CUTTER DIAMETER	WIDTH	ORDER EDP#	ALTIM COATED EDP#	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
1/4	.0156 (1/64)	57-1000	57-1000-C	.070 NECK DIAMETER .090 DEPTH OF CUT	1/8	1/4	6	2-1/2
	.0312 (1/32)	57-1010	57-1010-C					
	.0469 (3/64)	57-1020	57-1020-C					
	.0625 (1/16)	57-1030	57-1030-C					
	.0781 (5/64)	57-1040	57-1040-C					
	.0938 (3/32)	57-1050	57-1050-C					
.1250 (1/8)	57-1060	57-1060-C						
5/16	.0156 (1/64)	57-1070	57-1070-C	.090 NECK DIAMETER .110 DEPTH OF CUT	1/8	5/16	8	2-1/2
	.0312 (1/32)	57-1080	57-1080-C					
	.0469 (3/64)	57-1090	57-1090-C					
	.0625 (1/16)	57-1100	57-1100-C					
	.0781 (5/64)	57-1110	57-1110-C					
	.0938 (3/32)	57-1120	57-1120-C					
.1250 (1/8)	57-1130	57-1130-C						
3/8	.0156 (1/64)	57-1140	57-1140-C	.120 NECK DIAMETER .125 DEPTH OF CUT	3/16	3/8	8	2-1/2
	.0312 (1/32)	57-1150	57-1150-C					
	.0469 (3/64)	57-1160	57-1160-C					
	.0625 (1/16)	57-1170	57-1170-C					
	.0781 (5/64)	57-1180	57-1180-C					
	.0938 (3/32)	57-1190	57-1190-C					
.1250 (1/8)	57-1200	57-1200-C						
1/2	.0156 (1/64)	57-1210	57-1210-C	.150 NECK DIAMETER .175 DEPTH OF CUT	1/4	1/2	10	3"
	.0312 (1/32)	57-1220	57-1220-C					
	.0469 (3/64)	57-1230	57-1230-C					
	.0625 (1/16)	57-1240	57-1240-C					
	.0781 (5/64)	57-1250	57-1250-C					
	.0938 (3/32)	57-1260	57-1260-C					
.1250 (1/8)	57-1270	57-1270-C						
5/8	.0625 (1/16)	57-1280	57-1280-C	.180 NECK DIAMETER .220 DEPTH OF CUT	1/4	5/8	10	3-1/2
	.0938 (3/32)	57-1290	57-1290-C					
	.1250 (1/8)	57-1300	57-1300-C					
	.1875 (3/16)	57-1310	57-1310-C					

KEY CUTTERS

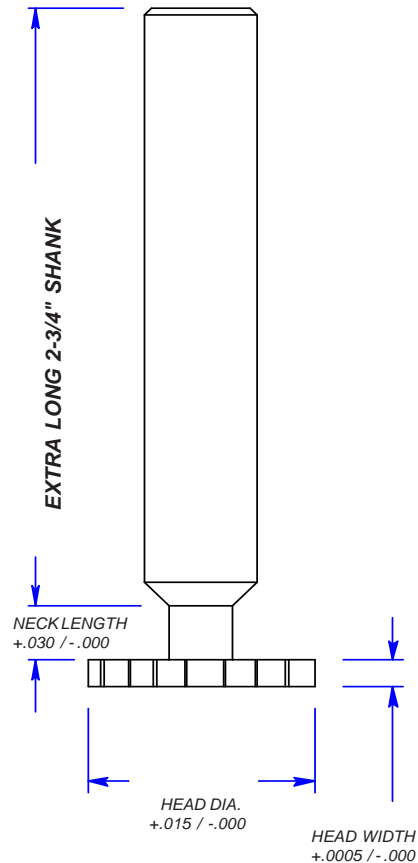
SERIES 78 *made from* **ITI CARBIDE**

CARBIDE HEAD STEEL SHANK KEY CUTTERS

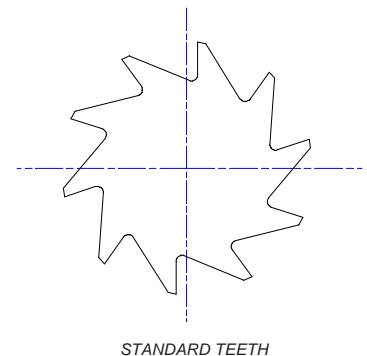
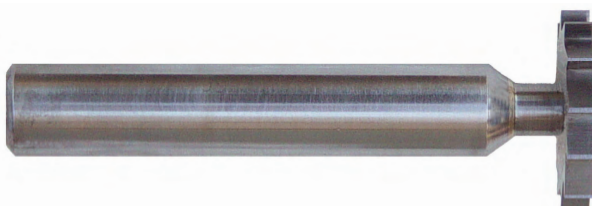
KEY CUTTERS

HEAD DIAMETER <small>+0.015 / -.000</small>	WIDTH	STD.#	ORDER EDP #	ALTN COATED EDP#	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
3/8	.0156 (1/64)		78-1090	78-1090-C	.200	1/4	1/2	8	2-3/4
	.0312 (1/32)		78-1095	78-1095-C	.200	1/4			
	.0469 (3/64)		78-1100	78-1100-C	.200	1/4			
	.0625 (1/16)		78-1105	78-1105-C	.200	1/4			
	.0781 (5/64)		78-1106	78-1106-C	.200	1/4			
	.0938 (3/32)		78-1110	78-1110-C	.200	1/4			
	.1250 (1/8)		78-1115	78-1115-C	.200	1/4			
7/16	.0312 (1/32)		78-1116	78-1116-C	.250	1/4	1/2	8	2-3/4
	.0625 (1/16)		78-1117	78-1117-C	.250	1/4			
	.1250 (1/8)		78-1118	78-1118-C	.250	1/4			
1/2	.0156 (1/64)		78-1119	78-1119-C	.250	1/4	1/2	10	2-3/4
	.0312 (1/32)		78-1120	78-1120-C	.250	1/8			
	.0469 (3/64)		78-1125	78-1125-C	.250	1/4			
	.0625 (1/16)	# 204	78-1130	78-1130-C	.135	1/8			
	.0781 (5/64)		78-1135	78-1135-C	.250	1/4			
	.0938 (3/32)	# 304	78-1140	78-1140-C	.165	1/8			
	.1094 (7/64)		78-1145	78-1145-C	.250	1/4			
	.1250 (1/8)	# 404	78-1150	78-1150-C	.190	1/4			
.1562 (5/32)		78-1155	78-1155-C	.250	1/4				
9/16	.0312 (1/32)		78-1156	78-1156-C	.250	1/4	1/2	10	2-3/4
	.0625 (1/16)		78-1157	78-1157-C	.250	1/4			
	.1250 (1/8)		78-1158	78-1158-C	.250	1/4			
5/8	.0156 (1/64)		78-1159	78-1159-C	.280	1/4	1/2	10	2-3/4
	.0312 (1/32)		78-1160	78-1160-C	.280	1/4			
	.0469 (3/64)		78-1165	78-1165-C	.280	1/4			
	.0625 (1/16)		78-1170	78-1170-C	.280	1/8			
	.0781 (5/64)		78-1175	78-1175-C	.280	1/4			
	.0938 (3/32)	# 305	78-1180	78-1180-C	.195	1/4			
	.1094 (7/64)		78-1185	78-1185-C	.280	1/4			
	.1250 (1/8)	# 405	78-1190	78-1190-C	.225	1/4			
	.1406 (9/64)		78-1195	78-1195-C	.280	1/4			
	.1562 (5/32)	# 505	78-1200	78-1200-C	.250	1/4			
	.1875 (3/16)	# 605	78-1205	78-1205-C	.250	1/4			
	.2031 (13/64)		78-1210	78-1210-C	.280	1/4			
	.2188 (7/32)		78-1215	78-1215-C	.280	1/4			
	.2500 (1/4)		78-1220	78-1220-C	.280	1/4			
.2812 (9/32)		78-1225	78-1225-C	.280	1/4				
11/16	.0625 (1/16)		78-1226	78-1226-C	.280	1/4	1/2	10	2-3/4
	.1250 (1/8)		78-1227	78-1227-C	.280	1/4			

ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS.



CONTINUED ON NEXT PAGE.



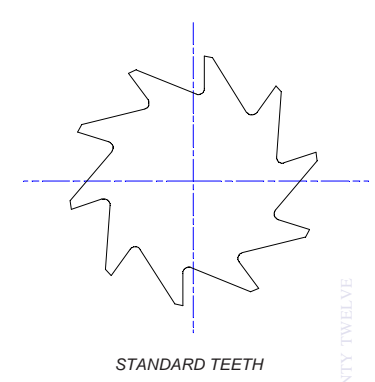
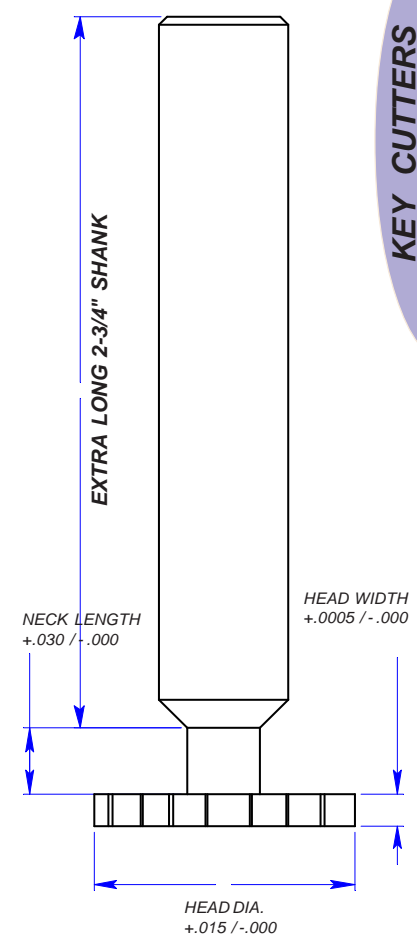
SERIES 78

made from **IT** CARBIDE

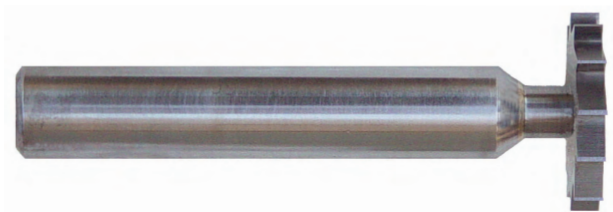
CARBIDE HEAD STEEL SHANK KEY CUTTERS

HEAD DIAMETER +.015 / -.000	WIDTH	STD.#	ORDER EDP #	ALTN COATED EDP#	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
3/4	.0312 (1/32)		78-1228	78-1228-C	.280	1/4	1/2	10	2-3/4
	.0469 (3/64)		78-1229	78-1229-C	.280	1/4			
	.0625 (1/16)		78-1230	78-1230-C	.280	1/4			
	.0781 (5/64)		78-1235	78-1235-C	.280	1/4			
	.0938 (3/32)		78-1240	78-1240-C	.280	1/4			
	.1094 (7/64)		78-1245	78-1245-C	.280	1/4			
	.1250 (1/8)	#406	78-1250	78-1250-C	.230	1/4			
	.1406 (9/64)		78-1255	78-1255-C	.280	1/4			
	.1562 (5/32)	#506	78-1260	78-1260-C	.250	1/4			
	.1875 (3/16)	#606	78-1265	78-1265-C	.280	1/4			
	.2031 (13/64)		78-1270	78-1270-C	.280	1/4			
	.2188 (7/32)		78-1275	78-1275-C	.280	1/4			
	.2344 (15/64)		78-1280	78-1280-C	.280	1/4			
	.2500 (1/4)	#806	78-1285	78-1285-C	.280	1/4			
	.2656 (17/64)		78-1290	78-1290-C	.490	1/4			
.2812 (9/32)		78-1295	78-1295-C	.490	1/4				
.3125 (5/16)		78-1300	78-1300-C	.490	1/4				
.3438 (11/32)		78-1305	78-1305-C	.490	1/4				
.3750 (3/8)		78-1310	78-1310-C	.490	1/4				
7/8	.0312 (1/32)		78-1311	78-1311-C	.280	1/4	1/2	12	2-3/4
	.0469 (3/64)		78-1312	78-1312-C	.280	1/4			
	.0625 (1/16)		78-1313	78-1313-C	.280	1/4			
	.0938 (3/32)		78-1314	78-1314-C	.280	1/4			
	.1250 (1/8)		78-1315	78-1315-C	.280	1/4			
	.1562 (5/32)	#507	78-1320	78-1320-C	.250	1/4			
	.1875 (3/16)	#607	78-1325	78-1325-C	.280	1/4			
	.2188 (7/32)	#707	78-1330	78-1330-C	.280	1/4			
	.2500 (1/4)	#807	78-1335	78-1335-C	.345	1/4			
	.3125 (5/16)		78-1340	78-1340-C	.490	1/4			
.3750 (3/8)		78-1345	78-1345-C	.490	1/4				
1"	.0312 (1/32)		78-1346	78-1346-C	.280	1/4	1/2	12	2-3/4
	.0469 (3/64)		78-1348	78-1348-C	.280	1/4			
	.0625 (1/16)		78-1350	78-1350-C	.280	1/4			
	.0781 (5/64)		78-1352	78-1352-C	.280	1/4			
	.0938 (3/32)		78-1355	78-1355-C	.280	1/4			
	.1250 (1/8)		78-1360	78-1360-C	.280	1/4			
	.1562 (5/32)		78-1362	78-1362-C	.280	1/4			
	.1875 (3/16)	#608	78-1365	78-1365-C	.280	1/4			
	.2188 (7/32)	#708	78-1370	78-1370-C	.340	1/4			
	.2500 (1/4)	#808	78-1375	78-1375-C	.345	1/4			
	.2812 (9/32)		78-1380	78-1380-C	.490	1/4			
	.3125 (5/16)	#1008	78-1385	78-1385-C	.400	1/4			
	.3750 (3/8)	#1208	78-1390	78-1390-C	.400	1/4			

ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS.



CONTINUED ON NEXT PAGE.



KEY CUTTERS

ATALOG TWENTY TWELVE

SERIES 78

made from **ITI CARBIDE**

CARBIDE HEAD STEEL SHANK KEY CUTTERS

KEY CUTTERS

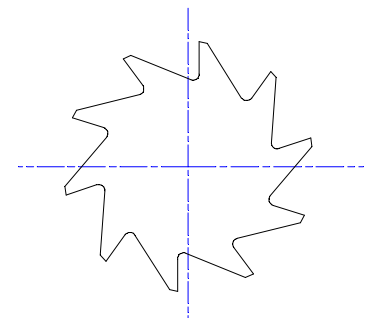
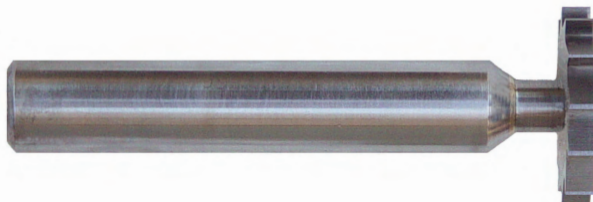
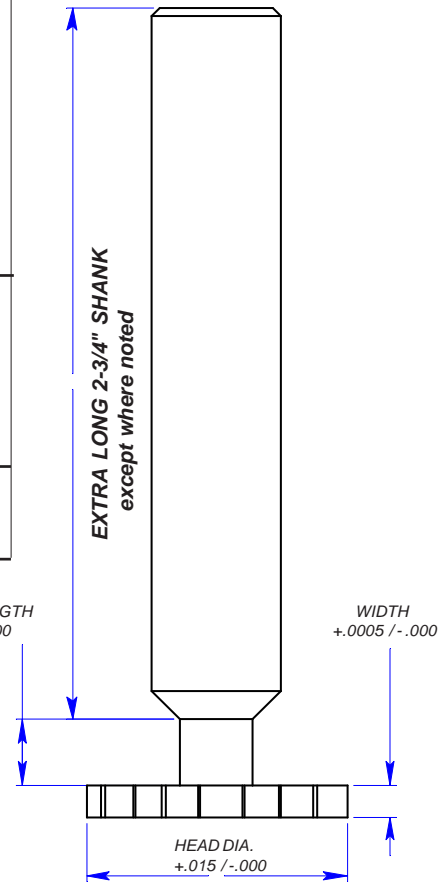
HEAD DIAMETER +.015 / -.000	WIDTH	STD.#	ORDER EDP #	ALTiN COATED EDP#	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
1-1/8	.0625 (1/16)		78-1392	78-1392-C	.280	1/4	1/2	12	2-3/4
	.0938 (3/32)		78-1394	78-1394-C	.280	1/4			
	.1250 (1/8)		78-1395	78-1395-C	.280	1/4			
	.1875 (3/16)		78-1400	78-1400-C	.280	1/4			
	.2188 (7/32)		78-1405	78-1405-C	.490	1/4			
	.2500 (1/4)		78-1410	78-1410-C	.490	1/4			
1-1/4	.0312 (1/32)		78-1412	78-1412-C	.280	1/4	1/2	14	2-3/4
	.0469 (3/64)		78-1413	78-1413-C	.280	1/4			
	.0625 (1/16)		78-1415	78-1415-C	.280	1/4			
	.0781 (5/64)		78-1417	78-1417-C	.280	1/4			
	.0938 (3/32)		78-1420	78-1420-C	.280	1/4			
	.1250 (1/8)		78-1425	78-1425-C	.280	1/4			
	.1562 (5/32)		78-1427	78-1427-C	.280	1/4			
	.1875 (3/16)	#610	78-1430	78-1430-C	.320	1/4			
	.2188 (7/32)	#710	78-1435	78-1435-C	.380	1/4			
	.2500 (1/4)	#810	78-1440	78-1440-C	.379	1/4			
	.3125 (5/16)	#1010	78-1445	78-1445-C	.437	1/4			
	.3750 (3/8)	#1210	78-1450	78-1450-C	.430	1/4			
1-3/8	.0625 (1/16)		78-1555	78-1555-C	.280	1/4	1/2	14	2-3/4
	.0781 (5/64)		78-1557	78-1557-C	.280	1/4			
	.0938 (3/32)		78-1560	78-1560-C	.280	1/4			
	.1250 (1/8)		78-1565	78-1565-C	.280	1/4			
	.1562 (5/32)		78-1570	78-1570-C	.280	1/4			
	.1875 (3/16)		78-1572	78-1572-C	.490	1/4			
	.2500 (1/4)	#811	78-1475	78-1475-C	.400	1/4	1/2	14	2" solid carbide
	.3125 (5/16)	#1011	78-1480	78-1480-C	.470	1/4			
.3750 (3/8)	#1211	78-1485	78-1485-C	.470	1/4				

ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS.

CONTINUED ON NEXT PAGE.

NECK LENGTH
+.030 / -.000

WIDTH
+.0005 / -.000



STANDARD TEETH

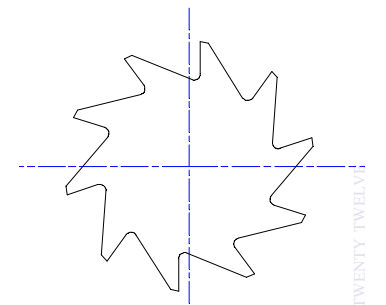
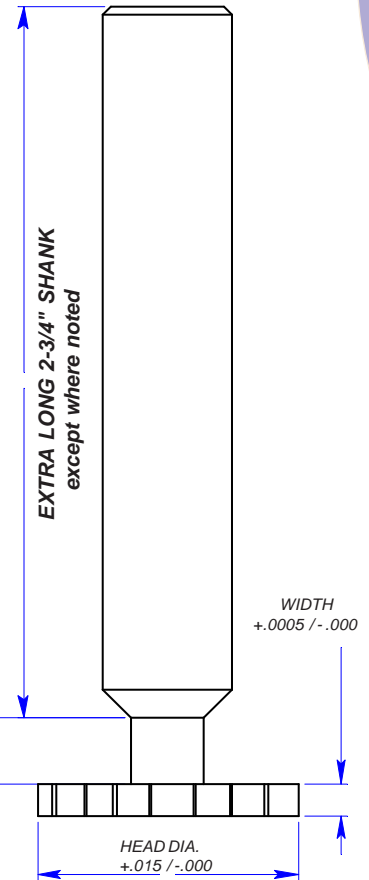
SERIES 78

made from **ITII CARBIDE**

CARBIDE HEAD STEEL SHANK KEY CUTTERS

HEAD DIAMETER <small>+0.015 / -.000</small>	WIDTH	STD.#	ORDER EDP #	ALTN COATED EDP#	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
1-1/2	.0312 (1/32)		78-1452	78-1452-C	.280	1/4	1/2	16	2-3/4
	.0469 (3/64)		78-1453	78-1453-C	.280	1/4			
	.0625 (1/16)		78-1455	78-1455-C	.280	1/4			
	.0781 (5/64)		78-1457	78-1457-C	.280	1/4			
	.0938 (3/32)		78-1460	78-1460-C	.280	1/4			
	.1250 (1/8)		78-1465	78-1465-C	.280	1/4			
	.1875 (3/16)		78-1470	78-1470-C	.490	1/4			
1-3/4	.0625 (1/16)	#812	78-1490	78-1490-C	.430	1/4	1/2	16	2" <i>solid carbide</i>
	.0781 (5/64)		78-1495	78-1495-C	.460	1/4			
	.0938 (3/32)	#1012	78-1500	78-1500-C	.490	1/4			
	.1250 (1/8)		78-1505	78-1505-C	.490	1/4			
	.1562 (5/32)		78-1507	78-1507-C	.490	1/4			
2"	.0625 (1/16)		78-1510	78-1510-C	.490	1/4	1/2	18	2-3/4
	.0781 (5/64)		78-1512	78-1512-C	.490	1/4			
	.0938 (3/32)		78-1515	78-1515-C	.490	1/4			
	.1250 (1/8)		78-1520	78-1520-C	.490	1/4			
	.1562 (5/32)		78-1522	78-1522-C	.490	1/4			
	.1875 (3/16)		78-1523	78-1523-C	.490	1/4			

ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS.



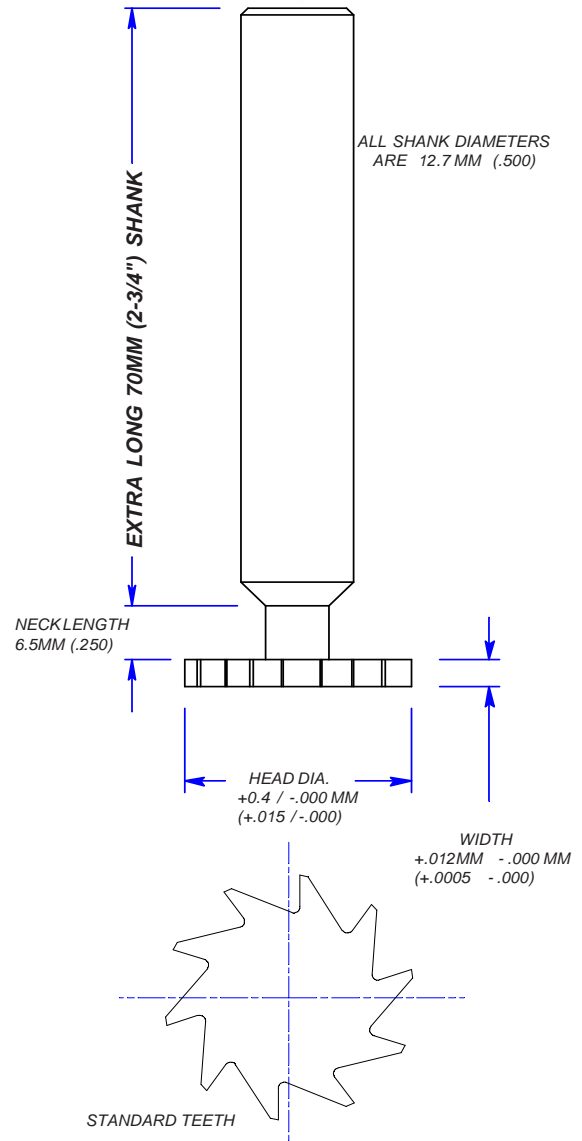
STANDARD TEETH

SERIES 79 *made from* **ITI CARBIDE**

METRIC CARBIDE HEAD STEEL SHANK KEY CUTTERS

KEY CUTTERS

HEAD DIAMETER	WIDTH	ORDER EDP #	ALTiN COATED EDP #	NECK DIA	# OF TEETH
10MM (.394)	1.0 (.0394)	79-1800	79-1800-C	5MM (.196)	8
	2.0 (.0787)	79-1805	79-1805-C		
	3.0 (.1181)	79-1810	79-1810-C		
12MM (.472)	1.0 (.0394)	79-1815	79-1815-C	5MM (.196)	8
	2.0 (.0787)	79-1820	79-1820-C		
	3.0 (.1181)	79-1825	79-1825-C		
14MM (.551)	1.0 (.0394)	79-1830	79-1830-C	6MM (.236)	10
	2.0 (.0787)	79-1835	79-1835-C		
	3.0 (.1181)	79-1840	79-1840-C		
16MM (.629)	1.0 (.0394)	79-1850	79-1850-C	7MM (.275)	10
	2.0 (.0787)	79-1855	79-1855-C		
	3.0 (.1181)	79-1860	79-1860-C		
18MM (.708)	1.0 (.0394)	79-1870	79-1870-C	7MM (.275)	10
	2.0 (.0787)	79-1875	79-1875-C		
	3.0 (.1181)	79-1880	79-1880-C		
20MM (.787)	1.0 (.0394)	79-1895	79-1895-C	7MM (.275)	10
	2.0 (.0787)	79-1900	79-1900-C		
	3.0 (.1181)	79-1905	79-1905-C		
24MM (.944)	1.0 (.0394)	79-1920	79-1920-C	7MM (.275)	12
	2.0 (.0787)	79-1925	79-1925-C		
	3.0 (.1181)	79-1930	79-1930-C		
30MM (1.182)	1.0 (.0394)	79-1945	79-1945-C	7MM (.275)	12
	2.0 (.0787)	79-1950	79-1950-C		
	3.0 (.1181)	79-1955	79-1955-C		
32MM (1.260)	1.0 (.0394)	79-1970	79-1970-C	7MM (.275)	14
	2.0 (.0787)	79-1975	79-1975-C		
	3.0 (.1181)	79-1980	79-1980-C		
38MM (1.497)	1.0 (.0394)	79-1995	79-1995-C	7MM (.275)	16
	2.0 (.0787)	79-2000	79-2000-C		
	3.0 (.1181)	79-2005	79-2005-C		
	4.0 (.1575)	79-2010	79-2010-C		
	5.0 (.1969)	79-2015	79-2015-C	(.490)	16



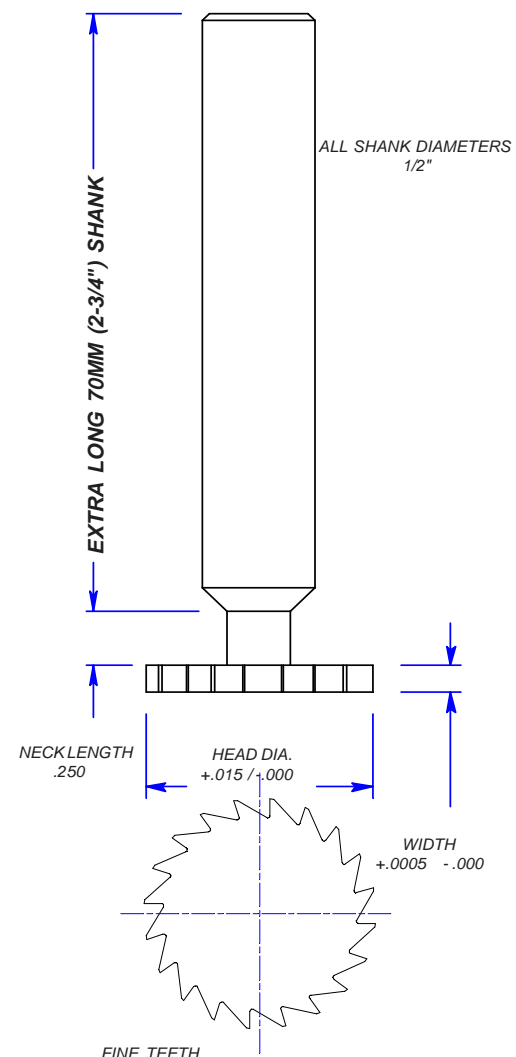
ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS. SPECIALS, CORNER RADIUS, STAGGER TOOTH AND LEFT HAND ARE AVAILABLE ON REQUEST.

SERIES 107 *made from* **ITI CARBIDE**

FINE TOOTH CARBIDE HEAD STEEL SHANK KEY CUTTERS

HEAD DIAMETER	WIDTH	ORDER EDP #	ALTiN COATED EDP #	NECK DIA	# OF TEETH
1/2	.0312 (1/32)	107-1000	107-1000-C	.250	14
	.0625 (1/16)	107-1010	107-1010-C		
	.0938 (3/32)	107-1020	107-1020-C		
	.1250 (1/8)	107-1030	107-1030-C		
5/8	.0312 (1/32)	107-1040	107-1040-C	.280	16
	.0625 (1/16)	107-1050	107-1050-C		
	.0938 (3/32)	107-1060	107-1060-C		
	.1250 (1/8)	107-1070	107-1070-C		
3/4	.0312 (1/32)	107-1080	107-1080-C	.280	20
	.0625 (1/16)	107-1090	107-1090-C		
	.0938 (3/32)	107-1100	107-1100-C		
	.1250 (1/8)	107-1110	107-1110-C		
	.1875 (3/16)	107-1120	107-1120-C		
7/8	.2500 (1/4)	107-1130	107-1130-C	.280	22
	.0625 (1/16)	107-1140	107-1140-C		
	.0938 (3/32)	107-1150	107-1150-C		
	.1250 (1/8)	107-1160	107-1160-C		
1"	.1875 (3/16)	107-1170	107-1170-C	.280	24
	.0312 (1/32)	107-1180	107-1180-C		
	.0625 (1/16)	107-1190	107-1190-C		
	.0938 (3/32)	107-1200	107-1200-C		
	.1250 (1/8)	107-1210	107-1210-C		
1-1/8	.1875 (3/16)	107-1220	107-1220-C	.280	28
	.2500 (1/4)	107-1230	107-1230-C		
	.0625 (1/16)	107-1240	107-1240-C		
	.0938 (3/32)	107-1250	107-1250-C		
1-1/4	.1250 (1/8)	107-1260	107-1260-C	.280	36
	.1875 (3/16)	107-1270	107-1270-C		
	.0625 (1/16)	107-1280	107-1280-C		
	.0938 (3/32)	107-1290	107-1290-C		
	.1250 (1/8)	107-1300	107-1300-C		
1-1/2	.1562 (5/32)	107-1310	107-1310-C	.490	36
	.1875 (3/16)	107-1320	107-1320-C		
	.2500 (1/4)	107-1330	107-1330-C		
	.0625 (1/16)	107-1340	107-1340-C		
1-1/2	.0938 (3/32)	107-1350	107-1350-C	.280	36
	.1250 (1/8)	107-1360	107-1360-C		
	.1562 (5/32)	107-1370	107-1370-C		
	.1875 (3/16)	107-1380	107-1380-C		

ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS.



KEY CUTTERS

SERIES 23 *made from* **ITI CARBIDE**

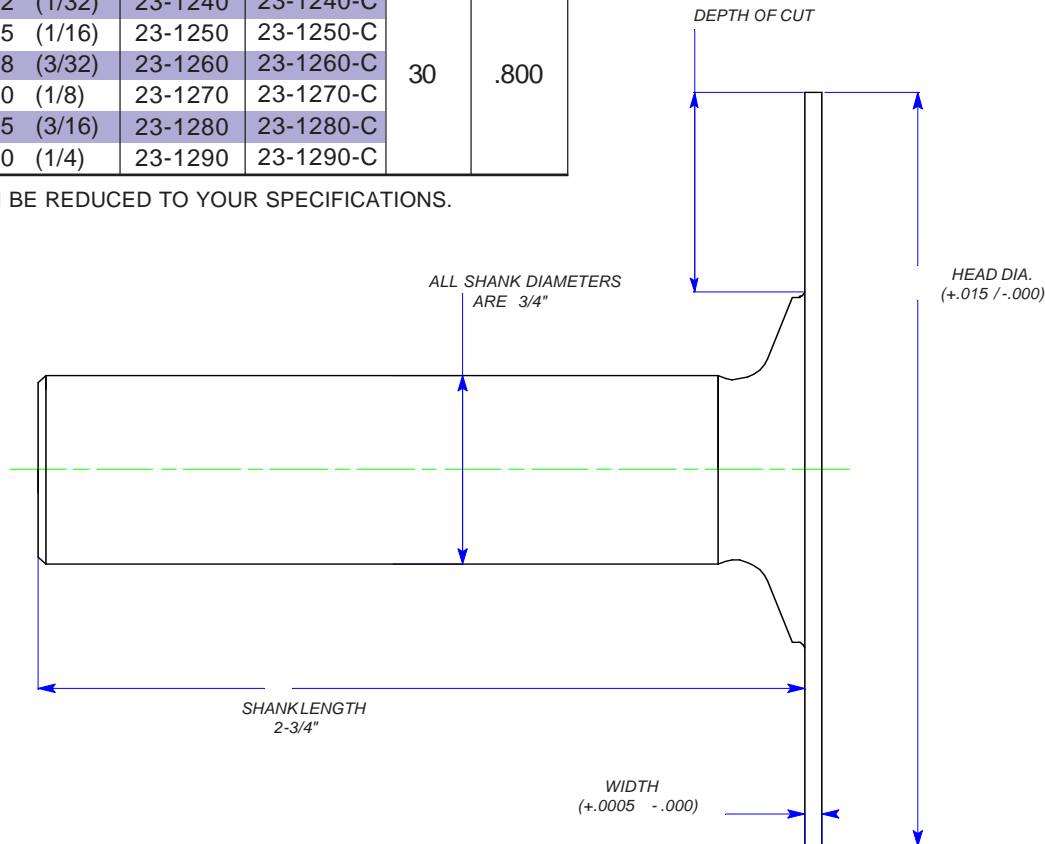
LARGE DIAMETER CARBIDE HEAD STEEL SHANK KEY CUTTERS

New!

KEY CUTTERS

HEAD DIAMETER	WIDTH	ORDER EDP #	ALTiN COATED EDP #	# OF TEETH	DEPTH OF CUT
2"	.0312 (1/32)	23-1000	23-1000-C	24	.550
	.0625 (1/16)	23-1010	23-1010-C		
	.0938 (3/32)	23-1020	23-1020-C		
	.1250 (1/8)	23-1030	23-1030-C		
	.1875 (3/16)	23-1040	23-1040-C		
	.2500 (1/4)	23-1050	23-1050-C		
2-1/4"	.0312 (1/32)	23-1060	23-1060-C	28	.600
	.0625 (1/16)	23-1070	23-1070-C		
	.0938 (3/32)	23-1080	23-1080-C		
	.1250 (1/8)	23-1090	23-1090-C		
	.1875 (3/16)	23-1100	23-1100-C		
	.2500 (1/4)	23-1110	23-1110-C		
2-1/2"	.0312 (1/32)	23-1120	23-1120-C	28	.550
	.0625 (1/16)	23-1130	23-1130-C		
	.0938 (3/32)	23-1140	23-1140-C		
	.1250 (1/8)	23-1150	23-1150-C		
	.1875 (3/16)	23-1160	23-1160-C		
	.2500 (1/4)	23-1170	23-1170-C		
2-3/4"	.0312 (1/32)	23-1180	23-1180-C	30	.650
	.0625 (1/16)	23-1190	23-1190-C		
	.0938 (3/32)	23-1200	23-1200-C		
	.1250 (1/8)	23-1210	23-1210-C		
	.1875 (3/16)	23-1220	23-1220-C		
	.2500 (1/4)	23-1230	23-1230-C		
3"	.0312 (1/32)	23-1240	23-1240-C	30	.800
	.0625 (1/16)	23-1250	23-1250-C		
	.0938 (3/32)	23-1260	23-1260-C		
	.1250 (1/8)	23-1270	23-1270-C		
	.1875 (3/16)	23-1280	23-1280-C		
	.2500 (1/4)	23-1290	23-1290-C		

ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS.



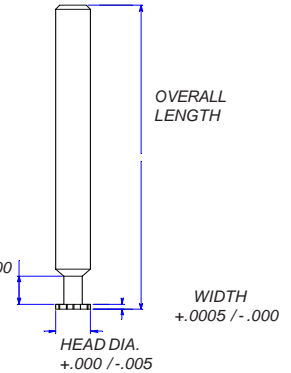
SERIES 77

made from **ITI CARBIDE**

RETAINING RING CARBIDE KEY CUTTERS

APPLICATION: ALL CLEARANCE ANGLES, RAKE ANGLES AND DISH CLEARANCE'S ARE SPECIFICALLY ENGINEERED AND DESIGNED FOR CUTTING RETAINING RING GROOVES

HEAD DIAMETER	WIDTH	NECK DIAMETER	NECK LENGTH	ORDER EDP#	ALTIM COATED EDP #	SHANK DIA.	# OF TEETH	OVERALL LENGTH
.187	.018	.094	3/16	77-1900	77-1900-C	3/16	6	2-1/2
	.029	.125	3/16	77-1910	77-1910-C			
.250	.039	.125	1/4	77-1920	77-1920-C	1/4	6	2-1/2
	.046	.125	1/4	77-1930	77-1930-C			
.312	.056	.150	5/16	77-1940	77-1940-C	5/16	8	2-1/2
.375	.068	.200	3/8	77-1950	77-1950-C	3/8	8	2-1/2
	.086	.200	3/8	77-1960	77-1960-C			
.500	.103	.250	3/8	77-1970	77-1970-C	1/2	10	3"
	.120	.250	3/8	77-1980	77-1980-C			



SERIES 74

made from **ITI CARBIDE**

LONG SHANK SOLID CARBIDE KEY CUTTERS

HEAD DIAMETER	WIDTH	NECK DIAMETER	NECK LENGTH	ORDER EDP#	TOOL ID	SHANK DIA.	# OF TEETH	OVERALL LENGTH
.187	.0469	.094	1/4	74-0100	EK-187-046	3/16	6	4"
	.0938	.094	1/4	74-0105	EK-187-094			
.250	.0625	.125	3/8	74-0110	EK-250-062	1/4	6	4"
	.1250	.125	3/8	74-0115	EK-250-125			
.312	.0625	.150	1/2	74-0120	EK-312-062	5/16	8	4"
	.1250	.150	1/2	74-0125	EK-312-125			
.375	.0625	.200	5/8	74-0130	EK-375-062	3/8	8	4"
	.1250	.200	5/8	74-0135	EK-375-125			
.500	.0625	.250	3/4	74-0140	EK-500-062	1/2	10	6"
	.1250	.250	3/4	74-0145	EK-500-125			

SPECIAL WIDTHS, CORNER RADIUS, STAGGER TOOTH AND LEFT HAND ARE AVAILABLE ON REQUEST.



LONG SHANK CARBIDE HEAD KEY CUTTERS

SERIES 74

made from **ITI CARBIDE**

HEAD DIAMETER	WIDTH	NECK DIAMETER	NECK LENGTH	ORDER EDP#	TOOL ID	SHANK DIA.	# OF TEETH	OVERALL LENGTH
.625	.0625	.280	1/4	74-0200	EK-625-062	1/2	10	6"
	.1250	.280	1/4	74-0205	EK-625-125			
.750	.0625	.250	1/4	74-0210	EK-750-062	1/2	10	6"
	.1250	.250	1/4	74-0215	EK-750-125			
.875	.0625	.280	1/4	74-0220	EK-875-062	1/2	12	6"
	.1250	.280	1/4	74-0225	EK-875-125			
1.000	.0625	.280	1/4	74-0230	EK-100-062	1/2	12	6"
	.1250	.280	1/4	74-0235	EK-100-125			
1.250	.0625	.280	1/4	74-0240	EK-125-062	1/2	14	6"
	.1250	.280	1/4	74-0245	EK-125-125			

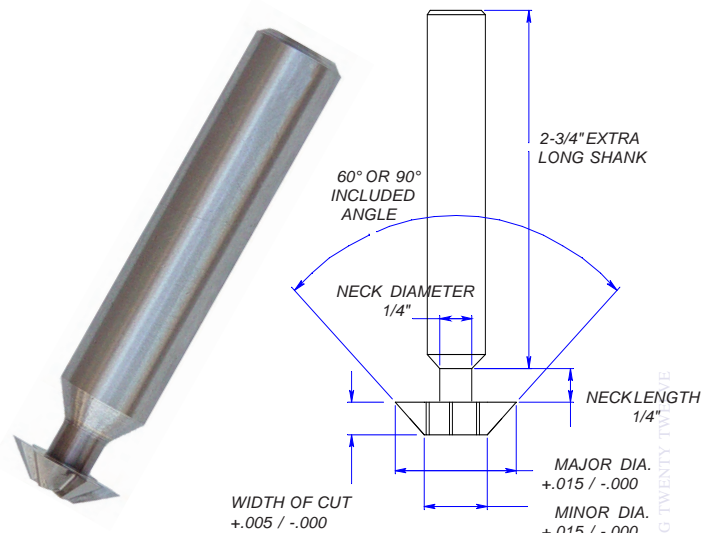
SERIES 90

made from **ITI CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

SINGLE ANGLE CUTTERS

INCLUDED ANGLE	MAJOR DIA.	MINOR DIA.	WIDTH OF CUT	ORDER EDP#	TOOL IDENTIFICATION	# OF TEETH
60°	1/2	.356	.125	90-1100	SA-500-60	4
	5/8	.408	.187	90-1105	SA-625-60	6
	3/4	.461	.250	90-1110	SA-750-60	6
90°	1/2	.250	.125	90-1115	SA-500-90	4
	5/8	.250	.187	90-1120	SA-625-90	6
	3/4	.250	.250	90-1125	SA-750-90	6



SERIES 76

made from **ITICARBIDE**

APPLICATION : **DESIGNED TO BE USED IN SMALL MILLS OR AS LIVE TOOLING**

SOLID CARBIDE 1/4" SHANK KEY CUTTERS

HEAD DIAMETER	WIDTH	NECK DIA.	NECK LENGTH	ORDER EDP #	TOOL IDENTIFICATION	CUTTER DIA. +.010 / -.000	SHANK DIA.	# OF TEETH	SHANK LENGTH
3/8	.0312	.240	1/4	76-9000	SC-375-031	.375	1/4	8	2"
	.0625	.240	1/4	76-9010	SC-375-063				
	.0938	.240	1/4	76-9015	SC-375-094				
	.1250	.240	1/4	76-9020	SC-375-125				
1/2	.0312	.240	1/4	76-9025	SC-500-031	.500	1/4	10	2"
	.0625	.240	1/4	76-9030	SC-500-063				
	.0938	.240	1/4	76-9035	SC-500-094				
	.1250	.240	1/4	76-9040	SC-500-125				
5/8	.0312	.240	1/4	76-9045	SC-625-031	.625	1/4	10	2"
	.0625	.240	1/4	76-9050	SC-625-063				
	.0938	.240	1/4	76-9055	SC-625-094				
	.1250	.240	1/4	76-9060	SC-625-125				



SPECIAL WIDTHS, CORNER RADIUS, STAGGER TOOTH AND LEFT HAND ARE AVAILABLE ON REQUEST.

SERIES 78

made from **ITICARBIDE**

APPLICATION : **DESIGNED TO BE USED IN SMALL MILLS OR AS LIVE TOOLING**

CARBIDE HEAD 3/8" STEEL SHANK KEY CUTTERS

HEAD DIAMETER +.015 / -.000	WIDTH	ORDER EDP #	ALTiN COATED EDP #	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
1/2	.0312	78-0870	78-0870-C	.250	1/4	3/8	10	2-3/4
	.0469	78-0875	78-0875-C					
	.0625	78-0880	78-0880-C					
	.0781	78-0885	78-0885-C					
	.0938	78-0890	78-0890-C					
	.1250	78-0895	78-0895-C					
5/8	.0312	78-0900	78-0900-C	.250	1/4	3/8	10	2-3/4
	.0469	78-0902	78-0902-C					
	.0625	78-0905	78-0905-C					
	.0781	78-0907	78-0907-C					
	.0938	78-0910	78-0910-C					
	.1250	78-0915	78-0915-C					
	.1562	78-0917	78-0917-C					
	.1875	78-0918	78-0918-C					
3/4	.0312	78-0920	78-0920-C	.250	1/4	3/8	10	2-3/4
	.0469	78-0922	78-0922-C					
	.0625	78-0925	78-0925-C					
	.0781	78-0927	78-0927-C					
	.0938	78-0930	78-0930-C					
	.1250	78-0935	78-0935-C					
	.1562	78-0937	78-0937-C					
	.1875	78-0939	78-0939-C					
1"	.0312	78-0945	78-0945-C	.250	1/4	3/8	12	2-3/4
	.0469	78-0950	78-0950-C					
	.0625	78-0955	78-0955-C					
	.0781	78-0960	78-0960-C					
	.0938	78-0965	78-0965-C					
	.1250	78-0970	78-0970-C					



SPECIAL WIDTHS ARE AVAILABLE ON REQUEST.

KEY CUTTERS

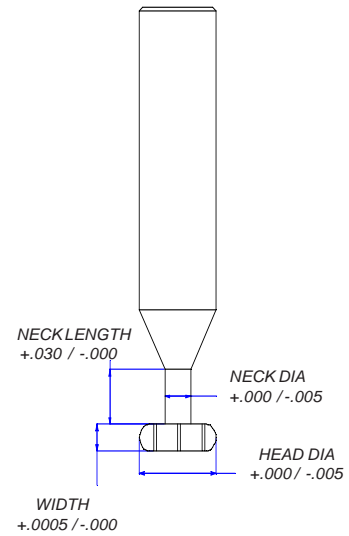
SERIES 80

made from **ITI CARBIDE**

**SOLID CARBIDE
FULL RADIUS KEY CUTTERS**

HEAD DIA.	WIDTH	RADIUS SIZE	ORDER EDP#	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
3/16	.0312 (1/32)	.0156	80-5000	.094	3/16	3/16	4	2-1/2
	.0469 (3/64)	.0234	80-5010					
	.0625 (1/16)	.0312	80-5020					
1/4	.0312 (1/32)	.0156	80-5030	.125	1/4	1/4	4	2-1/2
	.0469 (3/64)	.0234	80-5040					
	.0625 (1/16)	.0312	80-5050					
	.0781 (5/64)	.0390	80-5060					
	.0938 (3/32)	.0469	80-5070					
5/16	.0312 (1/32)	.0156	80-5080	.150	5/16	5/16	6	2-1/2
	.0469 (3/64)	.0234	80-5090					
	.0625 (1/16)	.0312	80-6000					
	.0781 (5/64)	.0390	80-6010					
	.0938 (3/32)	.0469	80-6020					
	.1250 (1/8)	.0625	80-6030					
3/8	.0312 (1/32)	.0156	80-6040	.200	3/8	3/8	6	2-1/2
	.0469 (3/64)	.0234	80-6050					
	.0625 (1/16)	.0312	80-6060					
	.0938 (3/32)	.0469	80-6070					
	.1250 (1/8)	.0625	80-6080					
1/2	.0625 (1/16)	.0312	80-6090	.250	3/8	1/2	6	3"
	.0938 (3/32)	.0469	80-7000					
	.1250 (1/8)	.0625	80-7010					

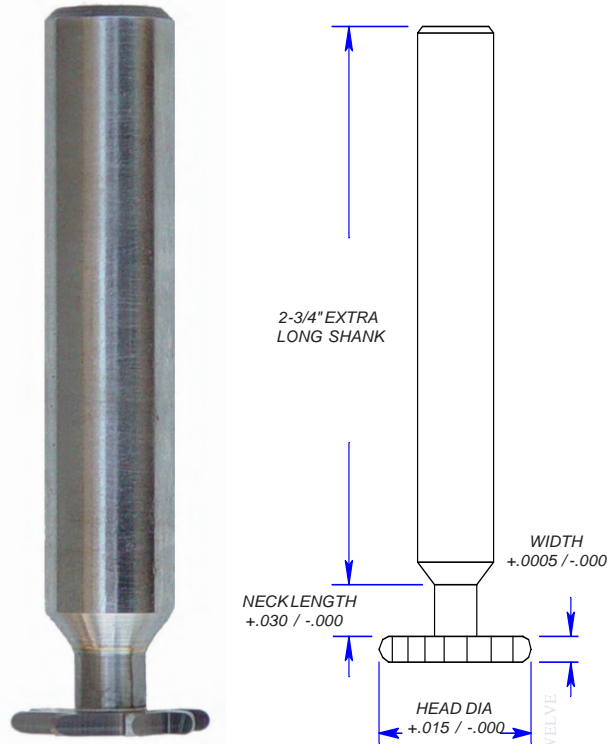
SPECIAL WIDTHS ARE AVAILABLE ON REQUEST.



**CARBIDE HEAD ON HARDENED STEEL SHANK
FULL RADIUS KEY CUTTERS**

HEAD DIA.	WIDTH	RADIUS SIZE	ORDER EDP#	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
1/2	.0312 (1/32)	.0156	80-1090	.250	1/4	1/2	6	2-3/4
	.0469 (3/64)	.0234	80-1095					
	.0625 (1/16)	.0312	80-1100					
	.0781 (5/64)	.0395	80-1104					
	.0938 (3/32)	.0469	80-1105					
.1250 (1/8)	.0625	80-1110						
5/8	.0312 (1/32)	.0156	80-1112	.280	1/4	1/2	6	2-3/4
	.0469 (3/64)	.0234	80-1114					
	.0625 (1/16)	.0312	80-1115					
	.0781 (5/64)	.0395	80-1117					
	.0938 (3/32)	.0469	80-1120					
	.1250 (1/8)	.0625	80-1125					
3/4	.0312 (1/32)	.0156	80-1127	.280	1/4	1/2	8	2-3/4
	.0469 (3/64)	.0234	80-1128					
	.0625 (1/16)	.0312	80-1130					
	.0781 (5/64)	.0395	80-1132					
	.0938 (3/32)	.0469	80-1135					
	.1250 (1/8)	.0625	80-1140					
1"	.0312 (1/32)	.0156	80-1142	.280	1/4	1/2	8	2-3/4
	.0469 (3/64)	.0234	80-1144					
	.0625 (1/16)	.0312	80-1145					
	.0938 (3/32)	.0469	80-1150					
	.1250 (1/8)	.0625	80-1155					
1-1/4	.0625 (1/16)	.0312	80-1160	.280	1/4	1/2	10	2-3/4
	.0938 (3/32)	.0469	80-1165					
	.1250 (1/8)	.0625	80-1170					

SPECIAL WIDTHS ARE AVAILABLE ON REQUEST.



THEIR SPECIAL IS OUR STANDARD

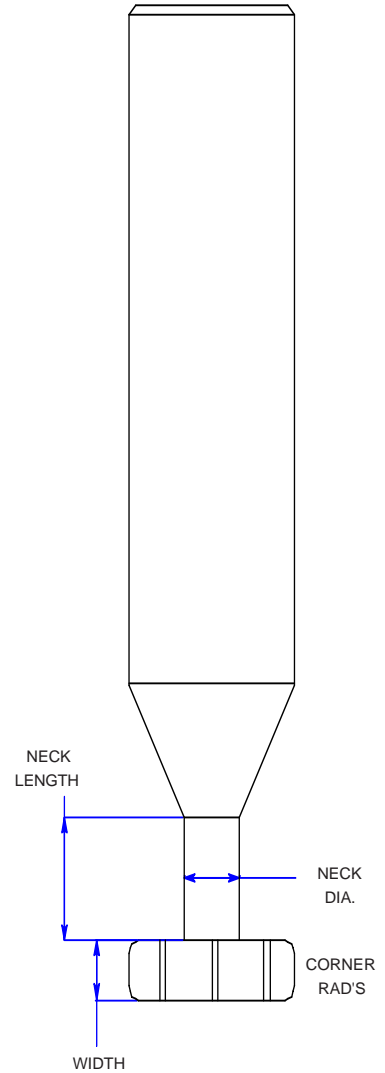
KEY CUTTERS

2012 OCTOBER TWENTY TWELVE

**SOLID CARBIDE
CORNER RADIUS KEY CUTTERS**

KEY CUTTERS

HEAD DIA.	WIDTH	RADIUS SIZE	ORDER EDP#	ALTN COATED EDP #	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
1/4	.0625 (1/16)	.005	101-1000	101-1000-C	.125	1/4	1/4	6	2-1/2
		.010	101-1020	101-1020-C					
		.015	101-1030	101-1030-C					
	.0938 (3/32)	.005	101-1040	101-1040-C					
		.010	101-1050	101-1050-C					
		.015	101-1060	101-1060-C					
	.1250 (1/8)	.005	101-1070	101-1070-C					
		.010	101-1080	101-1080-C					
		.015	101-1090	101-1090-C					
5/16	.0625 (1/16)	.005	101-1110	101-1110-C	.150	5/16	5/16	8	2-1/2
		.010	101-1120	101-1120-C					
		.015	101-1130	101-1130-C					
	.0938 (3/32)	.005	101-1140	101-1140-C					
		.010	101-1150	101-1150-C					
		.015	101-1160	101-1160-C					
	.1250 (1/8)	.005	101-1170	101-1170-C					
		.010	101-1180	101-1180-C					
		.015	101-1190	101-1190-C					
3/8	.0625 (1/16)	.005	101-1210	101-1210-C	.200	3/8	3/8	8	2-1/2
		.010	101-1220	101-1220-C					
		.015	101-1230	101-1230-C					
	.0938 (3/32)	.005	101-1240	101-1240-C					
		.010	101-1250	101-1250-C					
		.015	101-1260	101-1260-C					
	.1250 (1/8)	.005	101-1270	101-1270-C					
		.010	101-1280	101-1280-C					
		.015	101-1290	101-1290-C					
1/2	.0625 (1/16)	.005	101-1310	101-1310-C	.250	3/8	1/2	10	3"
		.010	101-1320	101-1320-C					
		.015	101-1330	101-1330-C					
	.0938 (3/32)	.005	101-1340	101-1340-C					
		.010	101-1350	101-1350-C					
		.015	101-1360	101-1360-C					
	.1250 (1/8)	.005	101-1370	101-1370-C					
		.010	101-1380	101-1380-C					
		.015	101-1390	101-1390-C					
.250 (1/4)	.005	101-1400	101-1400-C						
	.010	101-1410	101-1410-C						
	.015	101-1420	101-1420-C						
		.015	101-1430	101-1430-C					
		.030	101-1440	101-1440-C					



SPECIAL WIDTHS ARE AVAILABLE ON REQUEST.

CARBIDE HEAD STEEL SHANK
CORNER RADIUS KEY CUTTERS

HEAD DIA.	WIDTH	RADIUS SIZE	ORDER EDP#	ALTN COATED EDP #	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
5/8	.0625 (1/16)	.005	102-1000	102-1000-C	.280	1/4	1/2	10	2-3/4
		.010	102-1020	102-1020-C					
		.015	102-1030	102-1030-C					
	.0938 (3/32)	.005	102-1040	102-1040-C					
		.010	102-1050	102-1050-C					
		.015	102-1060	102-1060-C					
	.1250 (1/8)	.005	102-1070	102-1070-C					
		.010	102-1080	102-1080-C					
		.015	102-1090	102-1090-C					
3/4	.0625 (1/16)	.030	102-1100	102-1100-C	.280	1/4	1/2	10	2-3/4
		.005	102-1110	102-1110-C					
		.010	102-1120	102-1120-C					
	.0938 (3/32)	.015	102-1130	102-1130-C					
		.005	102-1140	102-1140-C					
		.010	102-1150	102-1150-C					
	.1250 (1/8)	.015	102-1160	102-1160-C					
		.005	102-1170	102-1170-C					
		.010	102-1180	102-1180-C					
1"	.0625 (1/16)	.015	102-1190	102-1190-C	.280	1/4	1/2	12	2-3/4
		.030	102-1200	102-1200-C					
		.005	102-1210	102-1210-C					
	.0938 (3/32)	.010	102-1220	102-1220-C					
		.015	102-1230	102-1230-C					
		.005	102-1240	102-1240-C					
	.1250 (1/8)	.010	102-1250	102-1250-C					
		.015	102-1260	102-1260-C					
		.005	102-1270	102-1270-C					
1-1/4	.0625 (1/16)	.010	102-1280	102-1280-C	.280	1/4	1/2	14	2-3/4
		.015	102-1290	102-1290-C					
		.030	102-1300	102-1300-C					
	.0938 (3/32)	.005	102-1310	102-1310-C					
		.010	102-1320	102-1320-C					
		.015	102-1330	102-1330-C					
	.1250 (1/8)	.005	102-1340	102-1340-C					
		.010	102-1350	102-1350-C					
		.015	102-1360	102-1360-C					
.250 (1/4)	.005	102-1370	102-1370-C						
	.010	102-1380	102-1380-C						
	.015	102-1390	102-1390-C						
		.030	102-1400	102-1400-C	.380	1/4	1/2	14	2-3/4
		.005	102-1410	102-1410-C					
		.010	102-1420	102-1420-C					
		.015	102-1430	102-1430-C					
		.030	102-1440	102-1440-C					

SPECIAL WIDTHS ARE AVAILABLE ON REQUEST.

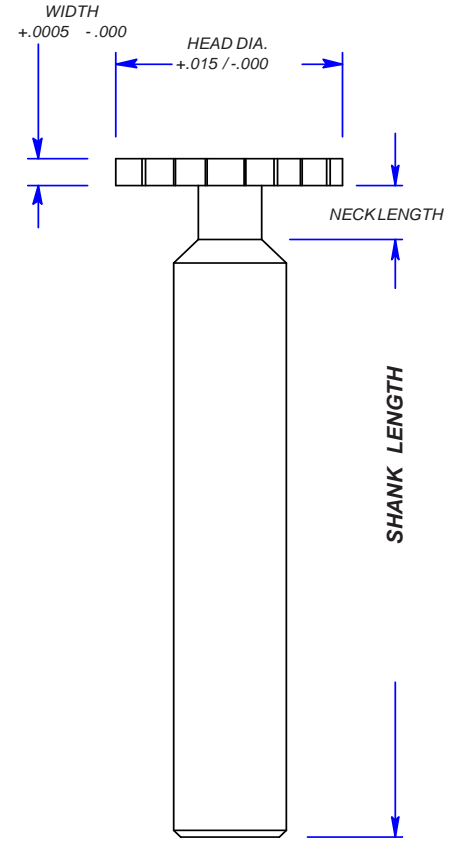
KEY CUTTERS

New!

STAGGERD TOOTH CARBIDE HEAD STEEL SHANK KEY CUTTERS

KEY CUTTERS

HEAD DIAMETER	WIDTH	STD #	ORDER EDP #	ALTiN COATED EDP #	NECK DIA	NECK LENGTH	# OF TEETH	SHANK LENGTH
1/2	.0625 (1/16)	#204	103-1000	103-1000-C	.135	1/8	8	2-3/4
	.0938 (3/32)	#304	103-1010	103-1010-C	.165	1/8		
	.1250 (1/8)	#404	103-1020	103-1020-C	.190	1/8		
5/8	.0938 (3/32)	#305	103-1030	103-1030-C	.195	1/8	8	2-3/4
	.1250 (1/8)	#405	103-1040	103-1040-C	.225	1/4		
	.1562 (5/32)	#505	103-1050	103-1050-C	.250	1/4		
	.1875 (3/16)	#605	103-1060	103-1060-C	.250	1/4		
	.2500 (1/4)		103-1070	103-1070-C	.280	1/4		
3/4	.1250 (1/8)	#406	103-1080	103-1080-C	.230	1/4	8	2-3/4
	.1562 (5/32)	#506	103-1090	103-1090-C	.250	1/4		
	.1875 (3/16)	#606	103-1100	103-1100-C	.280	1/4		
	.2500 (1/4)	#806	103-1110	103-1110-C	.280	1/4		
	.3125 (5/16)		103-1120	103-1120-C	.490	1/4		
7/8	.1250 (1/8)		103-1130	103-1130-C	.280	1/4	10	2-3/4
	.1562 (5/32)	#507	103-1140	103-1140-C	.250	1/4		
	.1875 (3/16)	#607	103-1150	103-1150-C	.280	1/4		
	.2188 (7/32)	#707	103-1160	103-1160-C	.280	1/4		
	.2500 (1/4)	#807	103-1170	103-1170-C	.345	1/4		
	.3125 (5/16)		103-1180	103-1180-C	.490	1/4		
1"	.1250 (1/8)		103-1200	103-1200-C	.280	1/4	10	2-3/4
	.1875 (3/16)	#608	103-1210	103-1210-C	.280	1/4		
	.2188 (7/32)	#708	103-1220	103-1220-C	.340	1/4		
	.2500 (1/4)	#808	103-1230	103-1230-C	.345	1/4		
	.3125 (5/16)	#1008	103-1240	103-1240-C	.400	1/4		
	.3750 (3/8)	#1208	103-1250	103-1250-C	.400	1/4		
1-1/8	.1250 (1/8)		103-1260	103-1260-C	.280	1/4	10	2-3/4
	.1875 (3/16)	#609	103-1270	103-1270-C	.280	1/4		
	.2500 (1/4)		103-1280	103-1280-C	.490	1/4		
	.3125 (5/16)		103-1290	103-1290-C	.490	1/4		
	.3750 (3/8)		103-1300	103-1300-C	.490	1/4		
1-1/4	.1250 (1/8)		103-1310	103-1310-C	.280	1/4	12	2-3/4
	.1875 (3/16)	#610	103-1320	103-1320-C	.320	1/4		
	.2188 (7/32)	#710	103-1330	103-1330-C	.380	1/4		
	.2500 (1/4)	#810	103-1340	103-1340-C	.379	1/4		
	.3125 (5/16)	#1010	103-1350	103-1350-C	.437	1/4		
	.3750 (3/8)	#1210	103-1360	103-1360-C	.430	1/4		
1-3/8	.1250 (1/8)		103-1370	103-1370-C	.280	1/4	12	2-3/4
	.1875 (3/16)		103-1380	103-1380-C	.400	1/4		
	.2500 (1/4)	#811	103-1390	103-1390-C	.400	1/4		
	.3125 (5/16)	#1011	103-1400	103-1400-C	.470	1/4		
1-1/2	.2500 (1/4)	#812	103-1420	103-1420-C	.430	1/4	14	2" SOLID CARBIDE
	.3125 (5/16)	#1012	103-1430	103-1430-C	.460	1/4		
	.3750 (3/8)	#1212	103-1440	103-1430-C	.490	1/4		

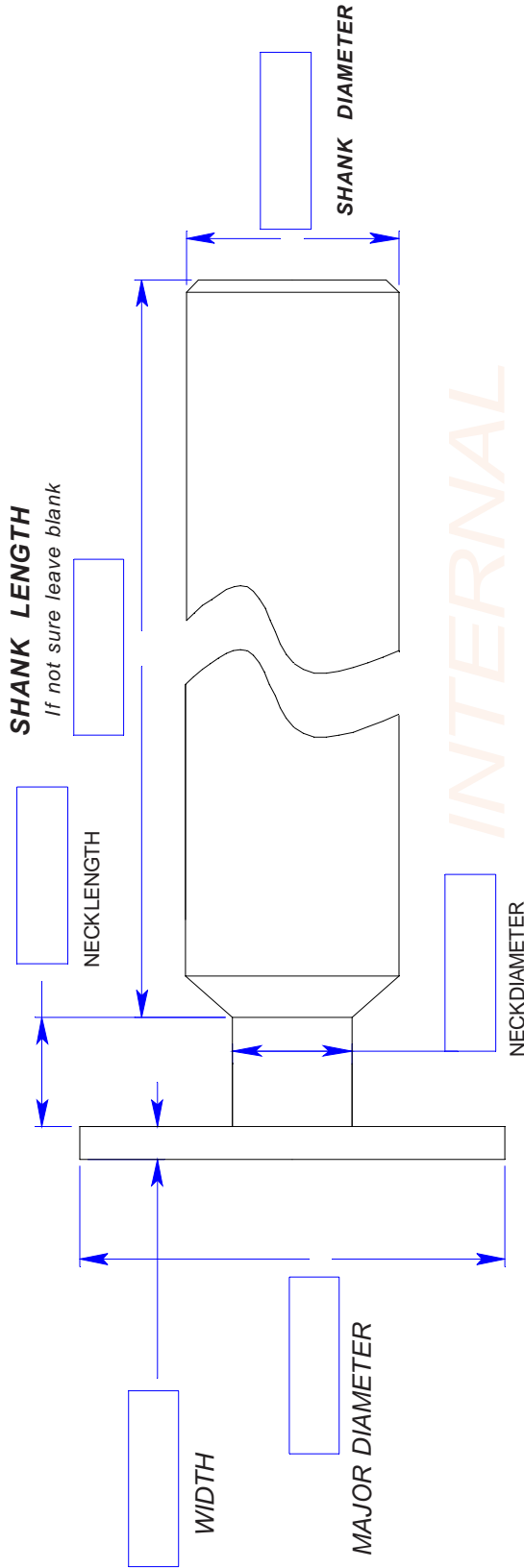


SPECIAL WIDTHS ARE AVAILABLE ON REQUEST.

ALL SHANK DIAMETERS 1/2"

Simply make a copy fill in the information below and fax or email to us. fax # 909-392-2627 we will quote as soon as possible. INFO@internaltool.com Any dimension your not sure of leave blank we will quote standard.

REVISIONS:



INTERNAL

Quote in quantities of ? QUANTITY: _____
 THE MORE YOU BUY THE CHEAPER THEY GET

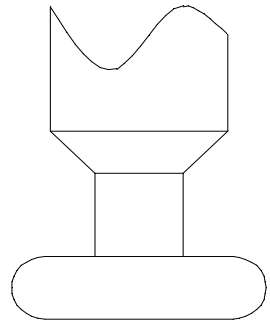
YOUR COMPANY NAME: _____

CONTACT: _____

PHONE: _____

FAX: _____

YOUR DISTRIBUTOR: _____



CORNER RADIUS OUTSIDE - SIZE?

CORNER RADIUS INSIDE - SIZE?

FULL RADIUS?

INTERNAL TOOL		TOLERANCE UNLESS OTHERWISE SPECIFIED	
DRAWN BY:	DATE:	REV:	.X = +/- 1/32 .XX = +/- .010 .XXX = +/- .002 .XXXX = +/- .0005 ANGLES +/- 0.15°
TOOL NUMBER:			

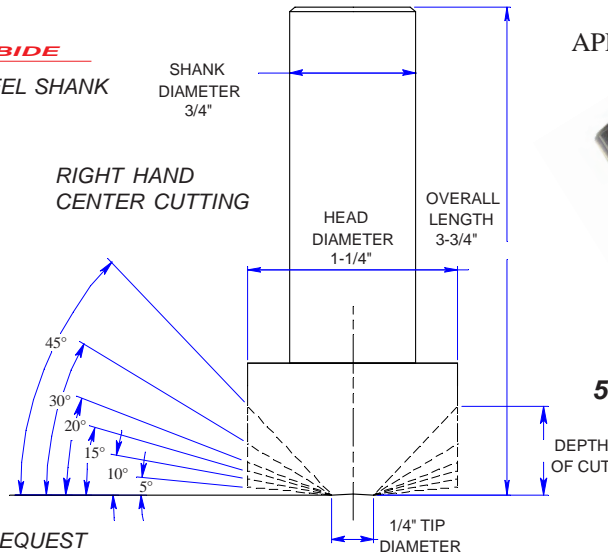
SERIES 81

made from **ITI CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

ANGLERS

ANGLE per side	EDP NUMBER	DEPTH OF CUT
5°	81-1050	.044
10°	81-1060	.088
15°	81-1070	.134
20°	81-1080	.182
30°	81-1090	.289
45°	81-1100	.500



APPLICATION : **MILLING ANGLES**



5 FLUTE

SPECIAL ANGLES AVAILABLE ON REQUEST

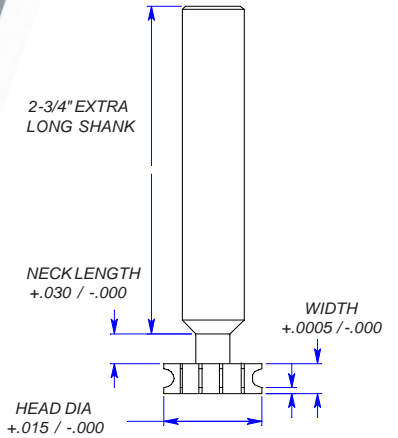
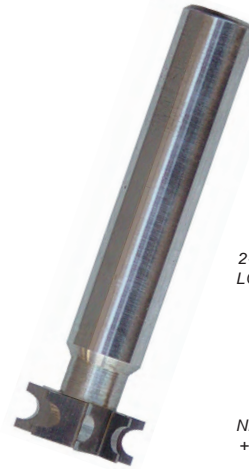
SERIES 82

made from **ITI CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

CONCAVE RADIUS KEY CUTTERS

HEAD DIA.	RADIUS SIZE	HEAD WIDTH	ORDER EDP#	TOOL IDENTIFICATION	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
1/2	.031	3/16	82-1100	CO-500-031	.280	1/4	1/2	6	2-3/4
5/8	.046	7/32	82-1120	CO-625-046	.280	1/4	1/2	6	2-3/4
	.062	1/4	82-1130	CO-625-062					
3/4	.093	5/16	82-1140	CO-750-094	.380	1/4	1/2	8	2-3/4
	.125	3/8	82-1150	CO-750-125					



SPECIAL SIZES AVAILABLE ON REQUEST

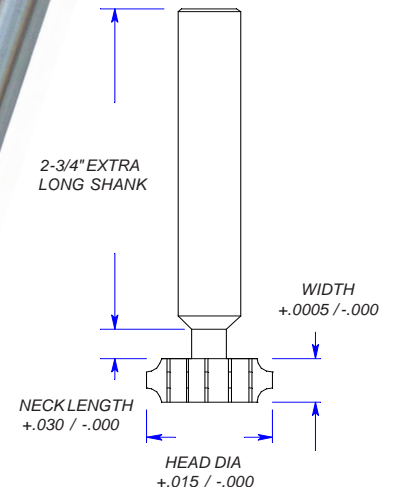
SERIES 84

made from **ITI CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

DOUBLE CONCAVE RADIUS CUTTERS

HEAD DIA.	RADIUS SIZE	HEAD WIDTH	ORDER EDP#	TOOL IDENTIFICATION	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
1/2	.010	.115	84-1100	DR-500-010	.280	1/4	1/2	6	2-3/4
	.015	.125	84-1105	DR-500-015					
	.020	.135	84-1110	DR-500-020					
5/8	.031	.155	84-1115	DR-625-031	.280	1/4	1/2	6	2-3/4
	.046	.185	84-1120	DR-625-046					
	.062	.215	84-1125	DR-625-062					
3/4	.080	.255	84-1130	DR-750-080	.280	1/4	1/2	8	2-3/4
	.093	.280	84-1135	DR-750-094					
	.125	.345	84-1140	DR-750-125					



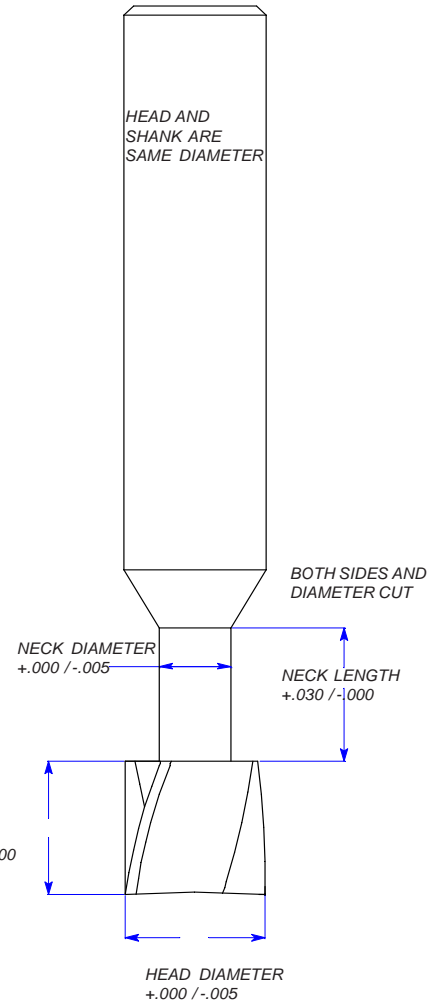
SERIES 106

made from **ITI CARBIDE**

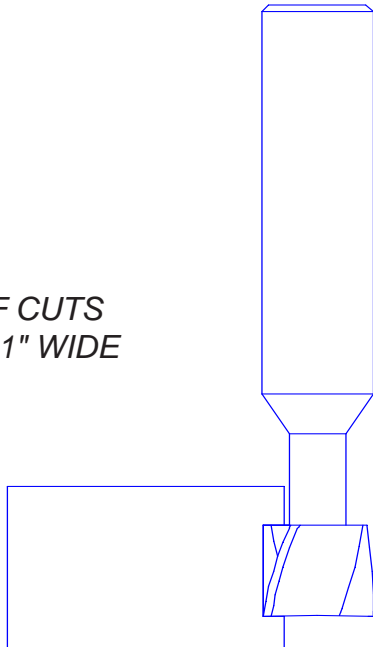
APPLICATION : **CUTS ON BOTH SIDES AND DIAMETER**

PUSH-PULL SOLID CARBIDE CUTTERS

HEAD DIAMETER	WIDTH	ORDER EDP #	ALTN COATED EDP #	NECK DIA	NECK LENGTH	# OF TEETH	OVERALL LENGTH
1/2	.250 (1/4)	106-1000	106-1000-C	.250	1/2	4	4"
	.375 (3/8)	106-1020	106-1020-C				
	.500 (1/2)	106-1040	106-1040-C				
	.625 (5/8)	106-1060	106-1060-C				
	.750 (3/4)	106-1080	106-1080-C				
5/8	.250 (1/4)	106-1100	106-1100-C	.312	1/2	4	4"
	.375 (3/8)	106-1120	106-1120-C				
	.500 (1/2)	106-1140	106-1140-C				
	.625 (5/8)	106-1160	106-1160-C				
	.750 (3/4)	106-1180	106-1180-C				
3/4	.250 (1/4)	106-1200	106-1200-C	.375	3/4	4	4"
	.375 (3/8)	106-1220	106-1220-C				
	.500 (1/2)	106-1240	106-1240-C				
	.625 (5/8)	106-1260	106-1260-C				
	.750 (3/4)	106-1280	106-1280-C				
1"	.250 (1/4)	106-1300	106-1300-C	.500	3/4	6	6"
	.375 (3/8)	106-1320	106-1320-C				
	.500 (1/2)	106-1340	106-1340-C				
	.625 (5/8)	106-1360	106-1360-C				
	.750 (3/4)	106-1380	106-1380-C				
	1.00 (1")	106-1400	106-1400-C				

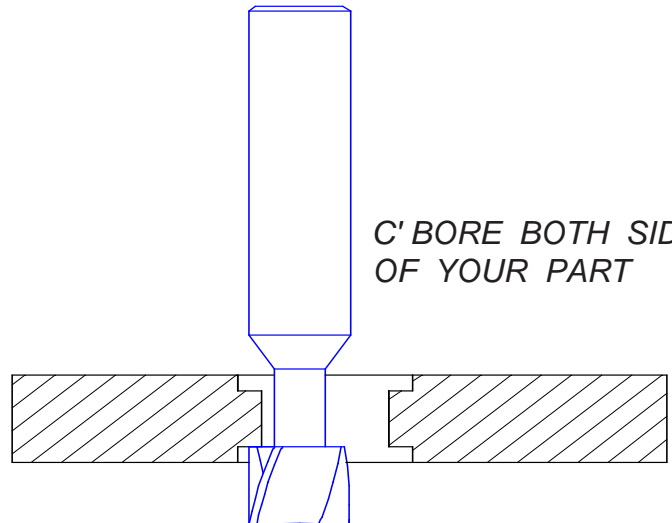


RELIEF CUTS UP TO 1" WIDE



SPIRAL FLUTE 30° HELIX

C' BORE BOTH SIDES OF YOUR PART

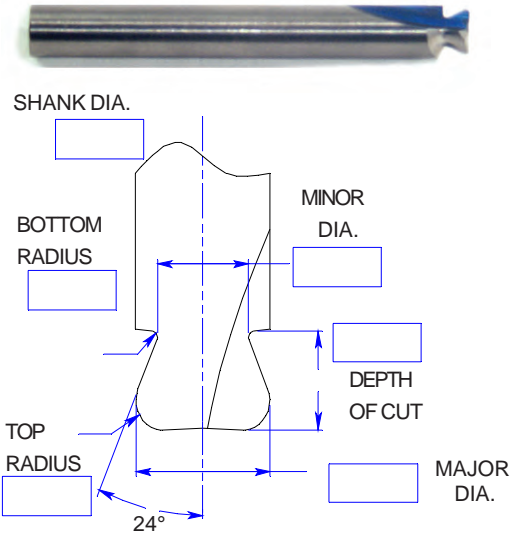


SERIES 51 *made from ITI CARBIDE*

APPLICATION: **USED TO CUT-MILL 24° O-RING DOVETAILES. THEY CUT WITH BOTH TOP & BOTTOM RADIUS.**

24° O-RING DOVETAIL CUTTERS

O-RING SIZE	MINOR DIA.	MAJOR DIA.	EDP NUMBER	DEPTH OF CUT	BOTTOM RADIUS	TOP RADIUS	SHANK DIA.x LGTH
.070	.062	.086	51-8000	.051	.005	.015	3/16 x 2.5
.093	.086	.126	51-8005	.075	.010	.015	3/16 x 2.5
.103	.094	.140	51-8010	.082	.010	.015	3/16 x 2.5
.125	.130	.177	51-8015	.102	.010	.031	1/4 x 2.5
.139	.125	.180	51-8020	.112	.010	.031	1/4 x 2.5
.187	.190	.279	51-8025	.154	.015	.031	5/16 x 2.5
.210	.189	.293	51-8030	.172	.015	.031	5/16 x 2.5
.250	.250	.356	51-8035	.212	.015	.062	3/8 x 2.5
.275	.249	.374	51-8040	.232	.015	.062	3/8 x 2.5
.375	.338	.497	51-8045	.317	.020	.094	1/2 x 3.0



TURNING STYLE O'RING TOOLS ARE ON PAGE 23

NEED A SPECIAL SIZE ?
MAKE A COPY, FILL IN THE INFORMATION,
AND FAX IT TO US FOR A QUOTE .

DOVETAIL CUTTERS

SERIES 86 *made from ITI CARBIDE*

CARBIDE HEAD ON HARDENED STEEL SHANK

DOVETAIL CUTTERS WITH STEEL SHANK

HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTIM COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH	ANGLE PER SIDE
3/8	.187	.160	86-1200	86-1200-C	1/2	5	3-1/8	1/4	30°
1/2	.250	.210	86-1205	86-1205-C	1/2	6	3-1/8	1/4	
3/4	.312	.350	86-1210	86-1210-C	1/2	5	3-1/8	1/4	
3/8	.125	.125	86-1215	86-1215-C	1/2	4	3-1/8	1/4	45°
1/2	.156	.185	86-1220	86-1220-C	1/2	4	3-1/8	1/4	
3/4	.250	.250	86-1225	86-1225-C	1/2	5	3-1/8	1/4	

HEAD DIA
+.015 / -.000

EXTRA LONG 2-3/4" SHANK

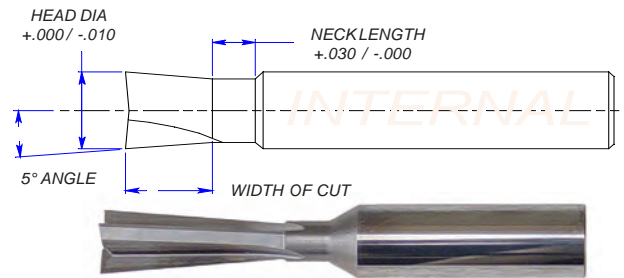


SERIES 86 *made from ITI CARBIDE*

SOLID CARBIDE DOVETAIL CUTTERS

DOVETAIL CUTTERS 5° PER SIDE 10° INCLUDED

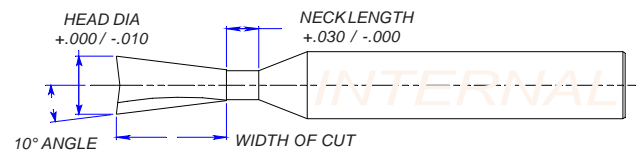
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTIM COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.500	.100	86-0100	86-0100-C	3/16	4	2-1/2	1/4
1/4	.625	.135	86-0105	86-0105-C	1/4	4	2-1/2	1/4
5/16	.750	.175	86-0110	86-0110-C	5/16	4	2-1/2	1/4
3/8	.875	.210	86-0115	86-0115-C	3/8	4	2-1/2	1/4
1/2	1.000	.300	86-0120	86-0120-C	1/2	6	3"	1/4
5/8	1.250	.405	86-0125	86-0125-C	5/8	6	3-1/2	1/4



SERIES 86 *made from ITI CARBIDE*

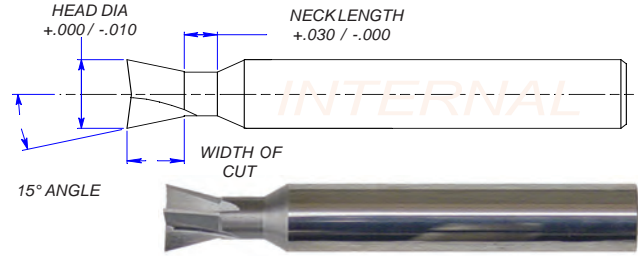
DOVETAIL CUTTERS 10° PER SIDE 20° INCLUDED

HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTIM COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.250	.090	86-0200	86-0200-C	3/16	4	2-1/2	1/4
1/4	.350	.120	86-0205	86-0205-C	1/4	4	2-1/2	1/4
5/16	.450	.140	86-0210	86-0210-C	5/16	4	2-1/2	1/4
3/8	.550	.175	86-0215	86-0215-C	3/8	4	2-1/2	1/4
1/2	.650	.250	86-0220	86-0220-C	1/2	6	3"	1/4
5/8	.750	.350	86-0225	86-0225-C	5/8	6	3-1/2	1/4



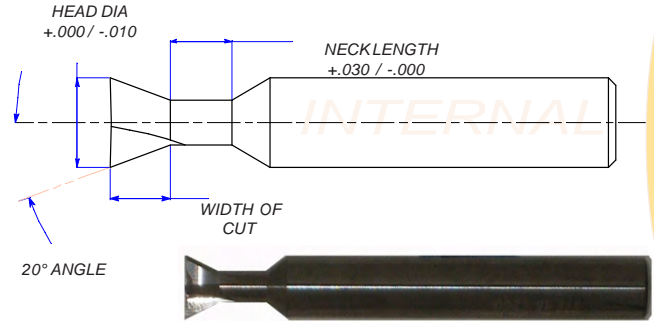
SERIES 86 *made from ITI CARBIDE* **SOLID CARBIDE DOVETAIL CUTTERS**
DOVETAIL CUTTERS 15° PER SIDE 30° INCLUDED

HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.125	.110	86-1000	86-1000-C	3/16	4	2-1/2	1/4
1/4	.160	.150	86-1005	86-1005-C	1/4	4	2-1/2	1/4
5/16	.190	.200	86-1010	86-1010-C	5/16	4	2-1/2	1/4
3/8	.250	.230	86-1015	86-1015-C	3/8	4	2-1/2	1/4
1/2	.320	.320	86-1020	86-1020-C	1/2	6	3"	1/4
5/8	.500	.345	86-1025	86-1025-C	5/8	6	3-1/2	1/4



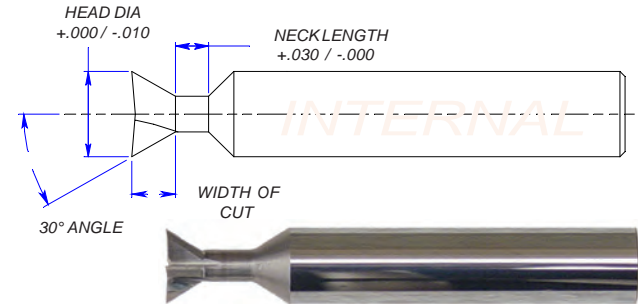
SERIES 86 *made from ITI CARBIDE* **DOVETAIL CUTTERS 20° PER SIDE 40° INCLUDED**

HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.085	.062	86-1250	86-1250-C	1/8	3	2"	3/16
3/16	.130	.090	86-1255	86-1255-C	3/16	3	2-1/2	1/4
1/4	.170	.125	86-1260	86-1260-C	1/4	3	2-1/2	1/4
5/16	.255	.125	86-1265	86-1265-C	5/16	4	2-1/2	1/4
3/8	.305	.160	86-1270	86-1270-C	3/8	5	2-1/2	1/4
1/2	.405	.200	86-1275	86-1275-C	1/2	6	3"	1/4
5/8	.500	.260	86-1280	86-1280-C	5/8	6	3-1/2	1/4



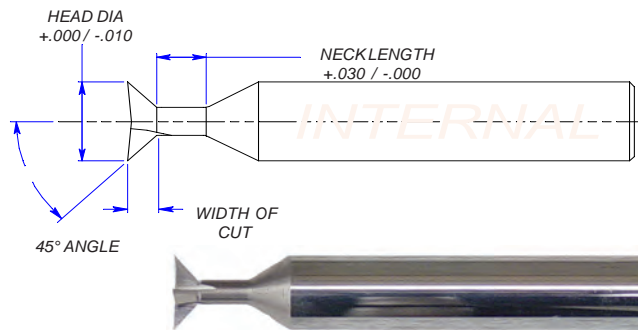
SERIES 86 *made from ITI CARBIDE* **DOVETAIL CUTTERS 30° PER SIDE 60° INCLUDED**

HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.054	.062	86-1095	86-1095-C	1/8	3	2"	3/16
3/16	.080	.090	86-1100	86-1100-C	3/16	3	2-1/2	1/4
1/4	.100	.125	86-1105	86-1105-C	1/4	4	2-1/2	1/4
5/16	.160	.125	86-1107	86-1107-C	5/16	4	2-1/2	1/4
3/8	.180	.160	86-1110	86-1110-C	3/8	5	2-1/2	1/4
1/2	.250	.200	86-1115	86-1115-C	1/2	6	3"	1/4
5/8	.315	.260	86-1117	86-1117-C	5/8	6	3-1/2	1/4
3/4	.380	.311	86-1118	86-1118-C	3/4	6	4"	1/4



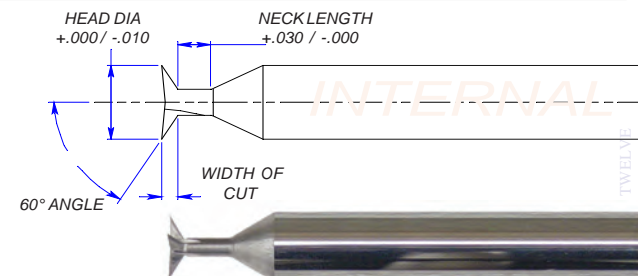
SERIES 86 *made from ITI CARBIDE* **DOVETAIL CUTTERS 45° PER SIDE 90° INCLUDED**

HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.032	.062	86-1119	86-1119-C	1/8	3	2"	3/16
3/16	.045	.090	86-1120	86-1120-C	3/16	3	2-1/2	1/4
1/4	.062	.115	86-1125	86-1125-C	1/4	3	2-1/2	1/4
5/16	.080	.150	86-1127	86-1127-C	5/16	4	2-1/2	1/4
3/8	.120	.125	86-1130	86-1130-C	3/8	4	2-1/2	1/4
1/2	.150	.185	86-1135	86-1135-C	1/2	4	3"	1/4
5/8	.190	.245	86-1137	86-1137-C	5/8	6	3-1/2	1/4
3/4	.230	.290	86-1139	86-1139-C	3/4	6	4"	1/4
7/8	.270	.335	86-1142	86-1142-C	7/8	6	4"	1/4
1"	.320	.360	86-1144	86-1144-C	1"	6	4"	1/4



SERIES 86 *made from ITI CARBIDE* **DOVETAIL CUTTERS 60° PER SIDE 120° INCLUDED**

HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.032	.070	86-1160	86-1160-C	3/16	3	2-1/2	1/4
1/4	.048	.080	86-1165	86-1165-C	1/4	3	2-1/2	1/4
5/16	.062	.095	86-1170	86-1170-C	5/16	4	2-1/2	1/4
3/8	.078	.100	86-1175	86-1175-C	3/8	4	2-1/2	1/4
1/2	.094	.170	86-1180	86-1180-C	1/2	4	3"	1/4
5/8	.125	.180	86-1185	86-1185-C	5/8	5	3-1/2	1/4



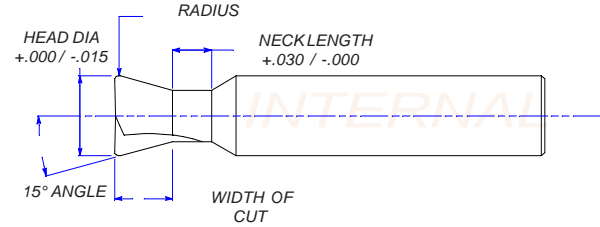
SERIES 86

made from **ITI CARBIDE**

SOLID CARBIDE DOVETAIL CUTTERS

DOVETAIL CUTTERS WITH A TIP RADIUS 15° PER SIDE 30° INCLUDED

HEAD DIAMETER	RADIUS SIZE	ORDER EDP#	ALTIM COATED EDP#	WIDTH OF CUT	NECK DIAMETER	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.005	86-2500	86-2500-C	.125	.110	3/16	4	2-1/2	1/4
	.010	86-2505	86-2505-C						
	.015	86-2510	86-2510-C						
1/4	.005	86-2515	86-2515-C	.160	.150	1/4	4	2-1/2	1/4
	.010	86-2520	86-2520-C						
	.015	86-2530	86-2530-C						
5/16	.005	86-2535	86-2535-C	.190	.200	5/16	4	2-1/2	1/4
	.010	86-2540	86-2540-C						
	.015	86-2545	86-2545-C						
3/8	.005	86-2550	86-2550-C	.250	.230	3/8	4	2-1/2	1/4
	.010	86-2555	86-2555-C						
	.015	86-2560	86-2560-C						
1/2	.005	86-2565	86-2565-C	.320	.320	1/2	6	3"	1/4
	.010	86-2570	86-2570-C						
	.015	86-2575	86-2575-C						
	.030	86-2580	86-2580-C						
5/8	.005	86-2585	86-2585-C	.500	.345	5/8	6	3-1/2	1/4
	.010	86-2590	86-2590-C						
	.015	86-2595	86-2595-C						
	.030	86-2600	86-2600-C						



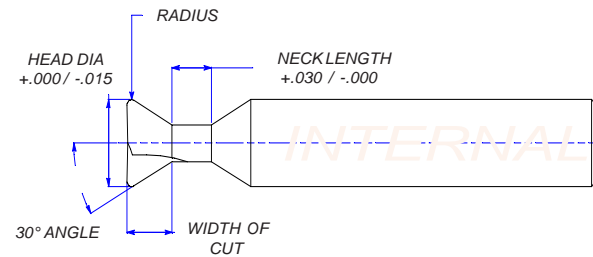
DOVETAIL CUTTERS

SERIES 86

made from **ITI CARBIDE**

DOVETAIL CUTTERS WITH A TIP RADIUS 30° PER SIDE 60° INCLUDED

HEAD DIAMETER	RADIUS SIZE	ORDER EDP#	ALTIM COATED EDP#	WIDTH OF CUT	NECK DIAMETER	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.005	86-3000	86-3000-C	.054	.062	1/8	3	2"	3/16
	.010	86-3005	86-3005-C						
	.015	86-3010	86-3010-C						
3/16	.005	86-3015	86-3015-C	.080	.090	3/16	3	2-1/2	1/4
	.010	86-3020	86-3020-C						
	.015	86-3025	86-3025-C						
1/4	.005	86-3030	86-3030-C	.100	.125	1/4	4	2-1/2	1/4
	.010	86-3035	86-3035-C						
	.015	86-3040	86-3040-C						
5/16	.005	86-3045	86-3045-C	.160	.125	5/16	4	2-1/2	1/4
	.010	86-3050	86-3050-C						
	.015	86-3055	86-3055-C						
3/8	.005	86-3060	86-3060-C	.180	.160	3/8	5	2-1/2	1/4
	.010	86-3065	86-3065-C						
	.015	86-3070	86-3070-C						
	.030	86-3075	86-3075-C						
1/2	.005	86-3080	86-3080-C	.250	.200	1/2	6	3"	1/4
	.010	86-3085	86-3085-C						
	.015	86-3090	86-3090-C						
	.030	86-3095	86-3095-C						
5/8	.005	86-4000	86-4000-C	.315	.260	5/8	6	3-1/2	1/4
	.010	86-4005	86-4005-C						
	.015	86-4010	86-4010-C						
	.030	86-4015	86-4015-C						
3/4	.005	86-4020	86-4020-C	.380	.311	3/4	6	4"	1/4
	.010	86-4025	86-4025-C						
	.015	86-4030	86-4030-C						
	.030	86-4035	86-4035-C						



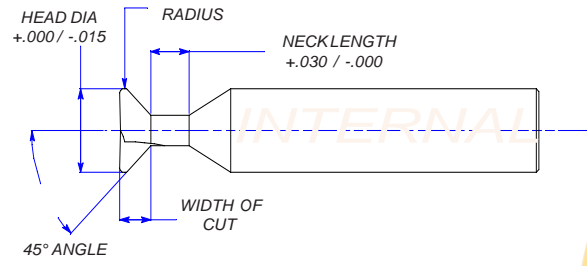
SERIES 86

made from **ITI CARBIDE**

SOLID CARBIDE DOVETAIL CUTTERS

DOVETAIL CUTTERS WITH A TIP RADIUS 45° PER SIDE 90° INCLUDED

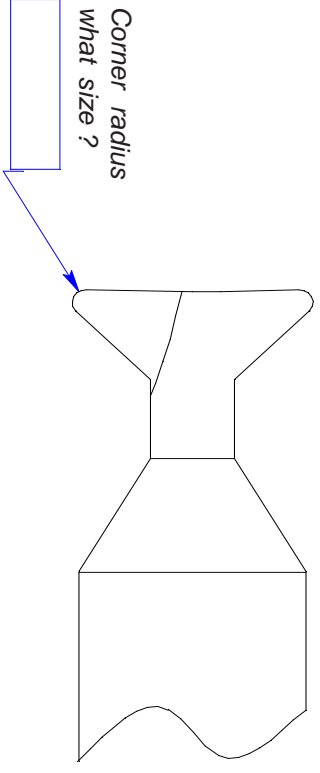
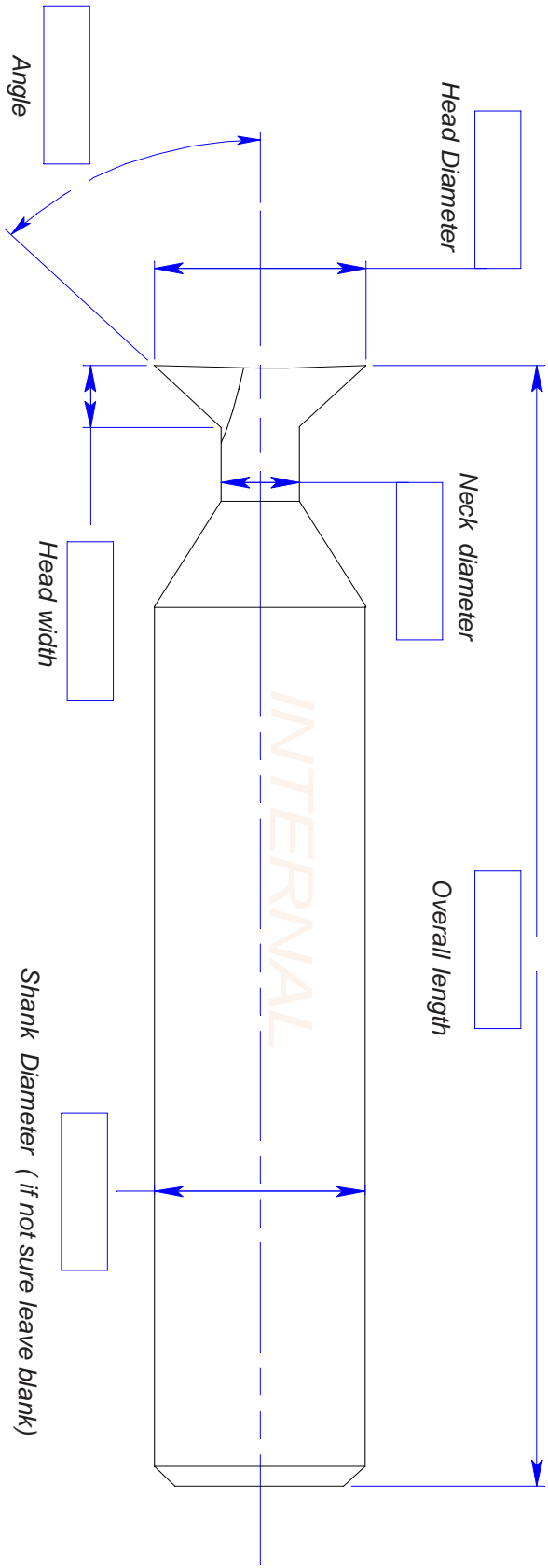
HEAD DIAMETER	RADIUS SIZE	ORDER EDP#	ALTIN COATED EDP#	WIDTH OF CUT	NECK DIAMETER	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.005	86-5000	86-5000-C	.032	.062	1/8	3	2"	3/16
	.010	86-5005	86-5005-C						
	.015	86-5010	86-5010-C						
3/16	.005	86-5015	86-5015-C	.045	.090	3/16	3	2-1/2"	1/4
	.010	86-5020	86-5020-C						
	.015	86-5025	86-5025-C						
1/4	.005	86-5030	86-5030-C	.062	.115	1/4	3	2-1/2"	1/4
	.010	86-5035	86-5035-C						
	.015	86-5040	86-5040-C						
5/16	.005	86-5050	86-5050-C	.080	.150	5/16	4	2-1/2"	1/4
	.010	86-5055	86-5055-C						
	.015	86-5060	86-5060-C						
3/8	.005	86-5070	86-5070-C	.120	.125	3/8	4	2-1/2"	1/4
	.010	86-5075	86-5075-C						
	.015	86-5080	86-5080-C						
1/2	.005	86-5090	86-5090-C	.150	.185	1/2	4	3"	1/4
	.010	86-5095	86-5095-C						
	.015	86-6000	86-6000-C						
5/8	.005	86-6015	86-6015-C	.190	.245	5/8	6	3-1/2"	1/4
	.010	86-6020	86-6020-C						
	.015	86-6025	86-6025-C						
3/4	.005	86-6040	86-6040-C	.230	.290	3/4	6	4"	1/4
	.010	86-6045	86-6045-C						
	.015	86-6050	86-6050-C						
7/8	.005	86-6065	86-6065-C	.270	.335	7/8	6	4"	1/4
	.010	86-6070	86-6070-C						
	.015	86-6075	86-6075-C						
1"	.005	86-6090	86-6090-C	.320	.360	1"	6	4"	1/4
	.010	86-6095	86-6095-C						
	.015	86-7000	86-7000-C						
	.030	86-7005	86-7005-C						
	.060	86-7010	86-7010-C						



**CARBIDE DOVETAIL CUTTERS
MADE TO YOUR SPECIFICATIONS**

Simply make a copy
fill in the information below and fax or email to us. fax # 909-392-2627
we will quote as soon as possible. INFO@internaltool.com
Any dimension your not sure of leave blank we will quote standard

REVISIONS:	



ITI INTERNAL TOOL

DRAWN BY: _____ DATE: _____ REV: _____

TOOL NUMBER: _____

TOLERANCE UNLESS OTHERWISE SPECIFIED

- .X = +/- .1/32
- .XX = +/- .010
- .XXX = +/- .002
- .XXXX = +/- .0005
- ANGLES +/- 0.15°

Quote in quantities of ? _____
THE MORE YOU BUY
THE CHEAPER THEY GET

Company name _____

Contact _____

Phone _____

Fax _____

Your distributor _____

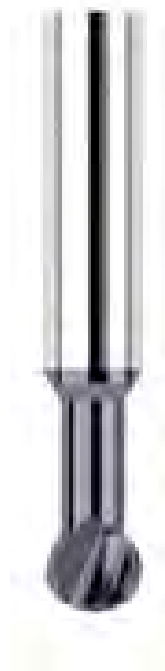
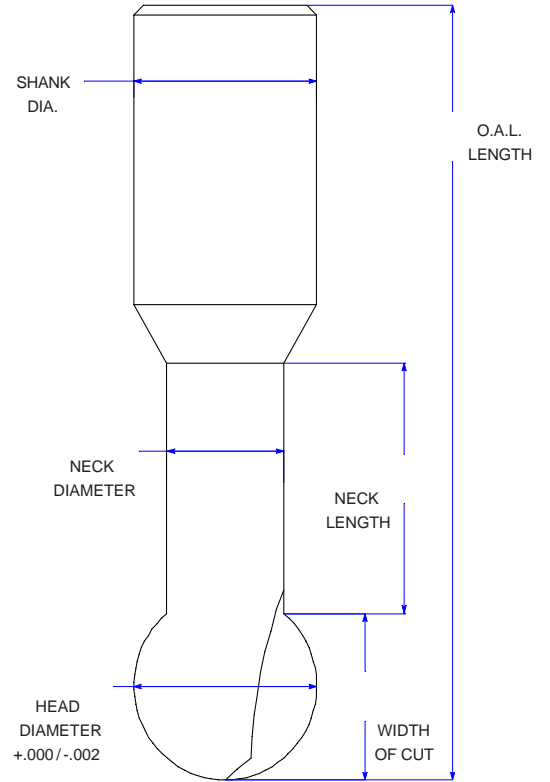
SERIES 29 *made from* **ITI CARBIDE**
LOLLI POPSUNDERCUTTING ENDMILLS 270° CUT 10° HELIX

New!

HEAD DIAMETER +.000/-0.002	WIDTH OF CUT +.015	NECK DIAMETER +.000/-0.005	NECK LENGTH +.030	ORDER EDP#	ALTIN COATED EDP#	SHANK DIA.	O.A.L. LENGTH
1/8	.107	.075	.250	29-4000	29-4000-C	1/8	2-1/2
			.375	29-4005	29-4005-C		
			.500	29-4010	29-4010-C		
			.750	29-4015	29-4015-C		
			1.000	29-4020	29-4020-C		
			1.250	29-4025	29-4025-C		
			1.500	29-4030	29-4030-C		
3/16	.160	.115	.250	29-4035	29-4035-C	3/16	2-1/2
			.375	29-4040	29-4040-C		
			.500	29-4045	29-4045-C		
			.750	29-4050	29-4050-C		
			1.000	29-4055	29-4055-C		
			1.250	29-4060	29-4060-C		
			1.500	29-4065	29-4065-C		
1/4	.213	.155	.250	29-4070	29-4070-C	1/4	3"
			.375	29-4075	29-4075-C		
			.500	29-4080	29-4080-C		
			.750	29-4085	29-4085-C		
			1.000	29-4090	29-4090-C		
			1.250	29-4095	29-4095-C		
			1.500	29-4100	29-4100-C		
			2.000	29-4105	29-4105-C		
5/16	.266	.200	.250	29-4110	29-4110-C	5/16	3"
			.375	29-4115	29-4115-C		
			.500	29-4120	29-4120-C		
			1.000	29-4125	29-4125-C		
			1.250	29-4130	29-4130-C		
			1.500	29-4135	29-4135-C		
			2.000	29-4140	29-4140-C		
3/8	.325	.240	.250	29-4145	29-4145-C	3/8	3"
			.375	29-4150	29-4150-C		
			.500	29-4155	29-4155-C		
			.750	29-4160	29-4160-C		
			1.000	29-4165	29-4165-C		
			1.250	29-4170	29-4170-C		
			1.500	29-4175	29-4175-C		
			2.000	29-4180	29-4180-C		
1/2	.425	.320	.375	29-4185	29-4185-C	1/2	3"
			.500	29-4190	29-4190-C		
			1.000	29-4195	29-4195-C		
			1.250	29-4200	29-4200-C	1/2	4"
			1.500	29-4205	29-4205-C		
2.000	29-4210	29-4210-C					

APPLICATION :

4 FLUTE

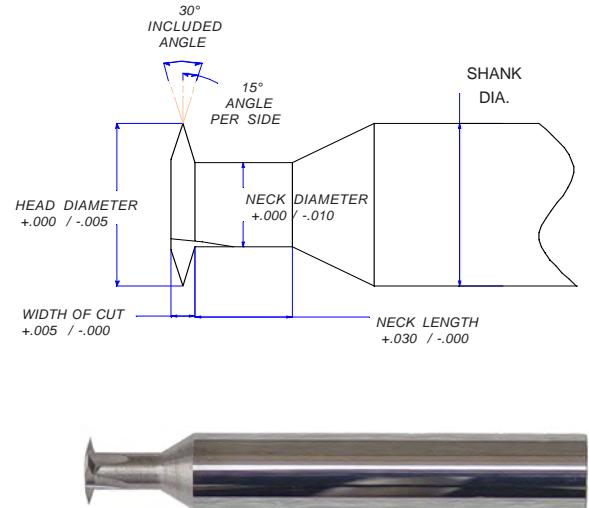


**AVAILABLE IN UN-COATED OR ALTIN COATED
 NECK LENGTH'S EVERY 1/4"**

SERIES 92 *made from ITI CARBIDE*
30° INC. DOUBLE ANGLE CUTTERS

HEAD DIAMETER	WIDTH OF CUT	ORDER EDP#	ALTiN COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH	SHANK DIAMETER	OVERALL LENGTH
1/8	.020	92-0880	92-0880-C	.188	.050	4	1/8	2"
		92-0885	92-0885-C	.375				
3/16	.026	92-0890	92-0890-C	.250	.080	4	3/16	2-1/2"
		92-0895	92-0895-C	.750				
1/4	.032	92-0900	92-0900-C	.250	.125	4	1/4	2-1/2"
		92-0905	92-0905-C	.750				
5/16	.040	92-0902	92-0902-C	.312	.160	4	5/16	2-1/2"
		92-0904	92-0904-C	1.000				
3/8	.050	92-0907	92-0907-C	.312	.250	4	3/8	2-1/2"
		92-0910	92-0910-C	1.000				
1/2	.067	92-0912	92-0912-C	.375	.250	4	1/2	3"
		92-0920	92-0920-C	1.250				
5/8*	.070	92-0925	92-0925-C	.250	.250	6	1/2	3"
3/4*	.100	92-0930	92-0930-C	.250	.250	5	1/2	3"

* CARBIDE HEAD WITH STEEL SHANK

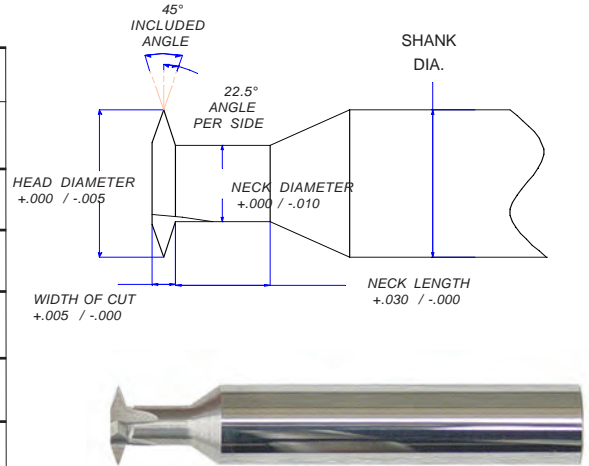


DOUBLE ANGLE

45° INC. DOUBLE ANGLE CUTTERS

HEAD DIAMETER	WIDTH OF CUT	ORDER EDP#	ALTiN COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH	SHANK DIAMETER	OVERALL LENGTH
1/8	.030	92-1500	92-1500-C	.188	.050	4	1/8	2"
		92-1505	92-1505-C	.375				
3/16	.044	92-1510	92-1510-C	.250	.080	4	3/16	2-1/2"
		92-1515	92-1515-C	.750				
1/4	.050	92-1520	92-1520-C	.250	.125	4	1/4	2-1/2"
		92-1525	92-1525-C	.750				
5/16	.062	92-1530	92-1530-C	.312	.160	4	5/16	2-1/2"
		92-1535	92-1535-C	1.000				
3/8	.075	92-1540	92-1540-C	.312	.187	4	3/8	2-1/2"
		92-1545	92-1545-C	1.000				
1/2	.100	92-1550	92-1550-C	.375	.250	4	1/2	3"
		92-1555	92-1555-C	1.250				
5/8*	.125	92-1560	92-1560-C	.250	.250	5	1/2	3"
3/4*	.150	92-1565	92-1565-C	.250	.250	5	1/2	3"

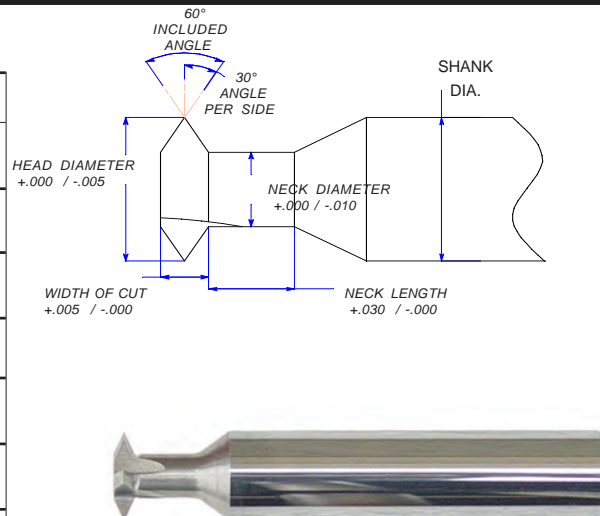
* CARBIDE HEAD WITH STEEL SHANK



60° INC. DOUBLE ANGLE CUTTERS

HEAD DIAMETER	WIDTH OF CUT	ORDER EDP#	ALTiN COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH	SHANK DIAMETER	OVERALL LENGTH
1/8	.062	92-1180	92-1180-C	.188	.062	4	1/8	2"
		92-1185	92-1185-C	.375				
3/16	.093	92-1190	92-1190-C	.250	.093	4	3/16	2-1/2"
		92-1195	92-1195-C	.750				
1/4	.125	92-1200	92-1200-C	.250	.125	4	1/4	2-1/2"
		92-1205	92-1205-C	.750				
5/16	.088	92-1207	92-1207-C	.312	.160	4	5/16	2-1/2"
		92-1208	92-1208-C	1.000				
3/8	.109	92-1210	92-1210-C	.312	.188	4	3/8	2-1/2"
		92-1215	92-1215-C	1.000				
1/2	.140	92-1220	92-1220-C	.375	.250	4	1/2	3"
		92-1225	92-1225-C	1.250				
5/8*	.144	92-1230	92-1230-C	.250	.250	5	1/2	3"
3/4*	.217	92-1235	92-1235-C	.250	.250	5	1/2	3"

* CARBIDE HEAD WITH STEEL SHANK



DOUBLE ANGLE CUTTERS

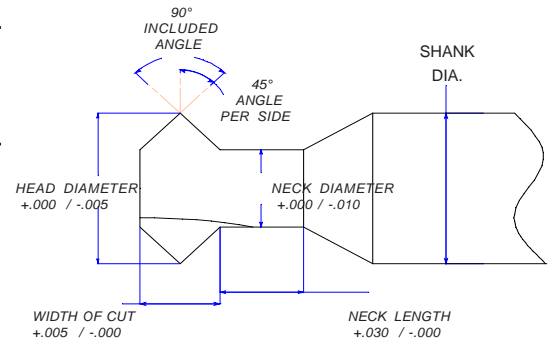
SERIES 92 *made from ITI CARBIDE*

APPLICATION: **FOR CUTTING CHAMFERS, SERRATIONS, ANGLES ETC.**

90° INC. DOUBLE ANGLE CUTTERS

HEAD DIAMETER	WIDTH OF CUT	ORDER EDP#	ALTN COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH	SHANK DIAMETER	OVERALL LENGTH
3/32	.047	92-0955	92-0955-C	.125	.045	2	1/8	2"
		92-0960	92-0960-C	.250				
1/8	.062	92-0965	92-0965-C	.188	.062	4	1/8	2"
		92-0970	92-0970-C	.500				
3/16	.093	92-0975	92-0975-C	.250	.093	4	3/16	2-1/2"
		92-0980	92-0980-C	.500				
		92-0985	92-0985-C	.750				
		92-0990	92-0990-C	1.000				
1/4	.120	92-1000	92-1000-C	.250	1/8	4	1/4	2-1/2"
		92-1002	92-1002-C	.500				
		92-1005	92-1005-C	.750				
		92-1006	92-1006-C	1.000				
5/16	.125	92-1007	92-1007-C	.500	3/16	4	5/16	2-1/2"
		92-1008	92-1008-C	.750				
		92-1009	92-1009-C	1.000				
3/8	.185	92-1010	92-1010-C	.312	3/16	4	3/8	2-1/2"
		92-1011	92-1011-C	.500				
		92-1012	92-1012-C	.750				
		92-1015	92-1015-C	1.000				
1/2	.250	92-1020	92-1020-C	.375	1/4	4	1/2	3"
		92-1022	92-1022-C	.625				
		92-1023	92-1023-C	.875				
		92-1025	92-1025-C	1.250				
1/2 *	.125	92-1100	92-1100-C	.250	1/4	6	1/2	3-1/8"
	.187	92-1105	92-1105-C	.250				
5/8	.312	92-1106	92-1106-C	.500	.300	4	5/8	3-1/2"
		92-1107	92-1107-C	.750				
		92-1108	92-1108-C	1.250				
5/8*	.187	92-1110	92-1110-C	.250	.250	6	1/2	3-1/8"
	.250	92-1115	92-1115-C	.250	.280	6		
3/4 *	.125	92-1117	92-1117-C	.250	.250	8	1/2	3-1/8"
	.250	92-1120	92-1120-C	.250	.280	8		
1" *	.125	92-1125	92-1125-C	.250	.250	8	1/2	3-1/8"
	.250	92-1130	92-1130-C	.250	.490	8		

* CARBIDE HEAD WITH STEEL SHANK

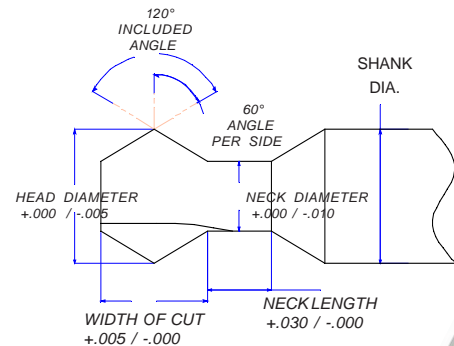


DOUBLE ANGLE

SERIES 92 *made from ITI CARBIDE*

120° INC. DOUBLE ANGLE CUTTERS

HEAD & SHANK DIA.	WIDTH OF CUT	ORDER EDP#	ALTN COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH	SHANK DIAMETER	OVERALL LENGTH
1/8	.109	92-1280	92-1280-C	.188	.062	4	1/8	2"
		92-1285	92-1285-C	.500				
3/16	.163	92-1290	92-1290-C	.250	.094	4	3/16	2-1/2"
		92-1295	92-1295-C	.750				
1/4	.215	92-1300	92-1300-C	.250	.125	4	1/4	2-1/2"
		92-1302	92-1302-C	.750				
5/16	.281	92-1304	92-1304-C	.312	.150	4	5/16	2-1/2"
		92-1306	92-1306-C	1.000				
3/8	.320	92-1310	92-1310-C	.312	.188	4	3/8	2-1/2"
		92-1315	92-1315-C	1.000				
1/2	.430	92-1320	92-1320-C	.375	.250	4	1/2	3"
		92-1325	92-1325-C	1.250				

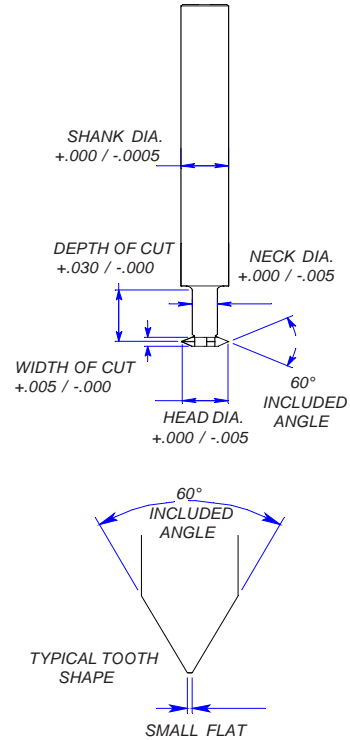


SOLID CARBIDE *made from* **ITI CARBIDE**
SERIES 88 MINI THREAD MILLS

QUICK SELECTOR FOR
 STANDARD I.D. THREADS

INCH	METRIC	TOOL TO USE
5-40		88-0870
5-44	M3.0 X .5	88-0880
6-32	M3.5 X .6	88-0890
6-40	M4.0 X .7	88-0900
8-32	M4.5 X .75	88-0910
8-36	M5.0 X .8	88-0915
10-32		
10-24	M6.0 X 1.0	88-1000
12-24	M7.0 X 1.0	88-1005
12-28		
1/4-20		
1/4-28		
1/4-18	M8.0 X 1.5	88-1010
5/16-18	M8.0 X 1.0	88-1020
5/16-24	M8.0 X 1.25	88-1025
3/8-16	M10.0 X 1.0	88-1027
3/8-24	M10.0 X 1.25	
7/16-14		88-1030
7/16-20		88-1035
1/2-13	M12.0 X 1.25	88-1040
1/2-20	M12.0 X 1.75	88-1045
9/16-12	M14.0 X 1.5	88-1050
9/16-18	M14.0 X 2.0	88-1055
5/8-11	M16 X 2.0	88-1060
5/8-18	M16 X 5.0	88-1065
3/4-10		88-1070
3/4-16		

HEAD DIAMETER	WIDTH OF CUT	NECK DIA.	ORDER EDP#	ALTiN COATED EDP#	DEPTH OF CUT	SHANK DIA.	# OF TEETH	PITCH RANGE
.098	.030	.050	88-0870	88-0870-C	1/4	1/8	3	32-64
			88-0880	88-0880-C	3/8	1/8	3	
			88-0890	88-0890-C	1/2	1/8	3	
.125	.035	.060	88-0900	88-0900-C	1/4	1/8	3	30-56
			88-0910	88-0910-C	3/8	1/8	3	
			88-0915	88-0915-C	1/2	1/8	3	
.148	.046	.070	88-1000	88-1000-C	1/4	3/16	3	24-56
			88-1005	88-1005-C	1/2	3/16	3	
			88-1010	88-1010-C	3/8	3/16	3	
3/16	.055	.090	88-1015	88-1015-C	3/4	3/16	3	18-56
			88-1017	88-1017-C	1"	3/16	3	
			88-1020	88-1020-C	3/8	1/4	4	
1/4	.065	.130	88-1025	88-1025-C	3/4	1/4	4	16-48
			88-1027	88-1027-C	1"	1/4	4	
			88-1030	88-1030-C	1/2	5/16	4	
5/16	.078	.180	88-1035	88-1035-C	1"	5/16	4	14-40
			88-1040	88-1040-C	1/2	3/8	6	
			88-1045	88-1045-C	3/4	3/8	6	
3/8	.095	.200	88-1050	88-1050-C	1"	3/8	6	12-32
			88-1055	88-1055-C	1-1/4	3/8	6	
			88-1060	88-1060-C	1"	1/2	5	
1/2	.100	.300	88-1065	88-1065-C	1-1/4	1/2	5	11-32
			88-1070	88-1070-C	1-1/2	1/2	5	



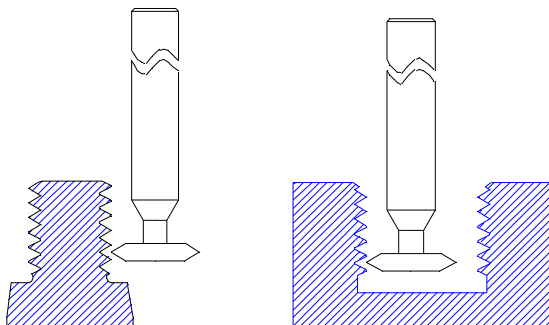
TYPICAL TOOTH SHAPE
 THREAD MILLS HAVE A SMALL FLAT ON THE TIP. SIZE DEPENDS ON PITCH. IF YOUR APPLICATION DOESN'T REQUIRE A FLAT, TRY OUR DOUBLE ANGLE CUTTERS ON PAGE 88.

SERIES 88 *made from* **ITI CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

THREAD MILLS

HEAD DIAMETER	PITCH RANGE	WIDTH OF CUT	ORDER EDP#	ALTiN COATED EDP#	# OF TEETH
1/2	16 - 32	.062	88-1100	88-1100-C	6
5/8	16 - 32	.062	88-1105	88-1105-C	
	11 - 28	.094	88-1110	88-1110-C	
3/4	8 - 28	.135	88-1112	88-1112-C	
	11 - 24	.094	88-1115	88-1115-C	
	7 - 24	.156	88-1120	88-1120-C	
1"	7 - 20	.156	88-1125	88-1125-C	8
	4 - 18	.250	88-1130	88-1130-C	



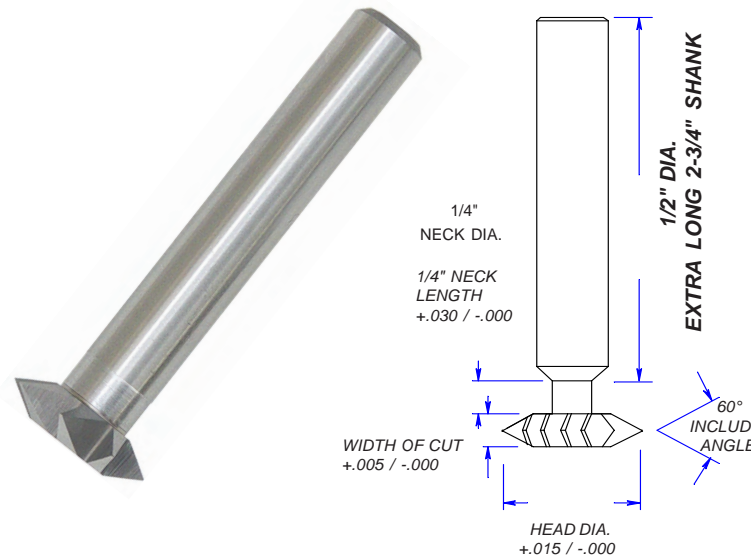
MILL EXTERNAL THREADS

MILL INTERNAL THREADS

APPLICATION:

1. THREAD MILLING ELIMINATES THE NEED FOR SPECIAL TAPS. CUT ANY SIZE THREAD YOU WANT. UNDER SIZE, OVER SIZE, ANY PITCH, EVEN A TAPERED THREAD.

2. THREAD BLIND HOLES ALL THE WAY DOWN TO THE BOTTOM WITH MINIMUM LEAD.



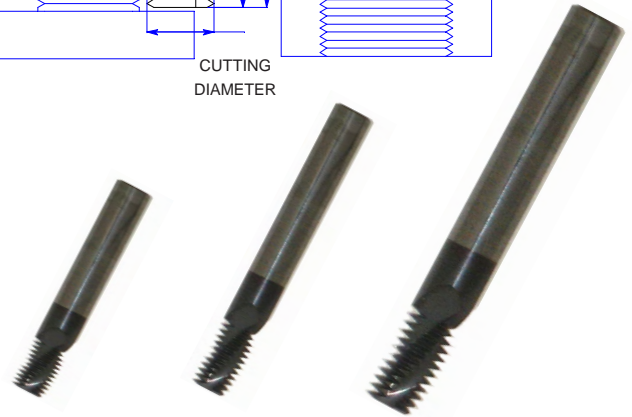
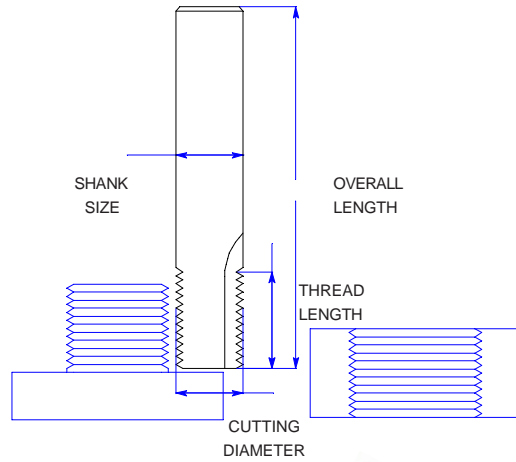
SERIES 89

made from **ITI CARBIDE**

MULTIPLE THREAD INTERNAL / EXTERNAL
THREAD MILLS ALTiN COATED

SIZE	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	SHANK SIZE	ALTiN COATED EDP#
6-32	.115	.218	2"	3	1/8	89-1200
8-32	.115	.250	2"	3	1/8	89-1205
8-36	.115	.250	2"	3	1/8	89-1210
10-24	.120	.312	2"	3	3/16	89-1215
10-32	.120	.312	2"	3	3/16	89-1220
1/4-20	.180	.500	2-1/2"	3	3/16	89-1225
1/4-28	.180	.500	2-1/2"	3	3/16	89-1230
5/16-18	.240	.625	2-1/2"	3	1/4	89-1235
5/16-24	.240	.625	2-1/2"	3	1/4	89-1240
3/8-16	.290	.750	3"	4	5/16	89-1245
3/8-24	.290	.750	3"	4	5/16	89-1250
7/16-14	.340	.875	3"	4	3/8	89-1255
7/16-20	.340	.875	3"	4	3/8	89-1260
1/2-13	.350	.875	3-1/2"	4	3/8	89-1265
1/2-20	.350	.875	3-1/2"	4	3/8	89-1270
9/16-12	.370	.875	3-1/2"	4	1/2	89-1275
9/16-18	.370	.875	3-1/2"	4	1/2	89-1280
5/8-11	.470	1.250	3-1/2"	5	1/2	89-1285
5/8-18	.470	1.250	3-1/2"	5	1/2	89-1290
3/4-10	.495	1.250	3-1/2"	5	1/2	89-1295
3/4-16	.495	1.250	3-1/2"	5	1/2	89-1300
7/8-9	.620	1.250	3-1/2"	5	5/8	89-1305
7/8-14	.620	1.250	3-1/2"	5	5/8	89-1310
1"-8	.620	1.375	4"	5	3/4	89-1315
1"-12	.620	1.375	4"	5	3/4	89-1320

MILL INTERNAL OR EXTERNAL THREADS IN ONE PASS

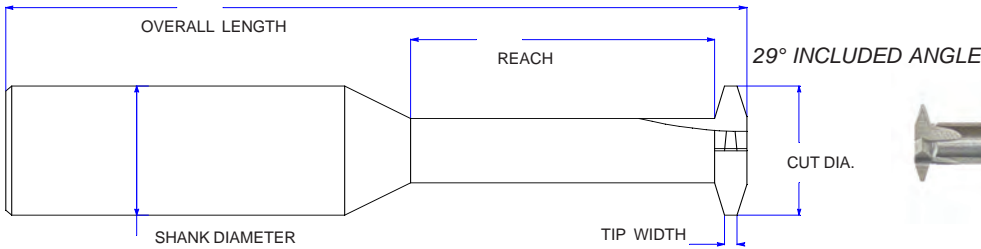


SERIES 35

made from **ITI CARBIDE**

ACME THREAD INTERNAL / EXTERNAL

New!



STUB ACME THREAD MILLS

THREAD SIZE	CUT DIA.	OVERALL LENGTH	SHANK DIA.	TIP WIDTH	# OF TEETH	REACH	EDP#	ALTiN COATED EDP#
1/4-16	.170	2-1/2	1/4	.024	3	.375	35-1000	35-1000-C
5/16-14	.220	2-1/2	1/4	.028	3	.500	35-1005	35-1005-C
3/8-12	.270	2-1/2	5/16	.033	4	.750	35-1010	35-1010-C
1/2-10	.370	2-1/2	3/8	.037	4	.750	35-1015	35-1015-C
5/8-8	.500	3"	1/2	.048	4	1.00	35-1020	35-1020-C
3/4-6	.580	3-1/8"	1/2	.065	4	1.00	35-1025	35-1025-C
7/8-6	.580	3-1/8"	1/2	.065	4	1.00	35-1025	35-1025-C
1"-5	.800	3-1/8"	1/2*	.079	6	2.00	35-1030	35-1030-C
1-1/8-5	.800	3-1/8"	1/2*	.079	6	2.00	35-1030	35-1030-C
1-1/4-5	.800	3-1/8"	1/2*	.079	6	2.00	35-1030	35-1030-C
1-3/8-4	1.120	3-1/8"	1/2*	.100	8	2.00	35-1035	35-1035-C
1-1/2-4	1.120	3-1/8"	1/2*	.100	8	2.00	35-1035	35-1035-C
1-3/4-4	1.120	3-1/8"	1/2*	.100	8	2.00	35-1035	35-1035-C

* CARBIDE HEAD ON HARDENED STEEL SHANK

ACME THREAD MILLS

THREAD SIZE	CUT DIA.	OVERALL LENGTH	SHANK SIZE	TIP WIDTH	# OF TEETH	REACH	EDP#	ALTiN COATED EDP#
1/4-16	.170	2-1/2	1/4	.021	3	.375	35-2000	35-2000-C
5/16-14	.220	2-1/2	1/4	.024	3	.500	35-2005	35-2005-C
3/8-12	.270	2-1/2	5/16	.028	4	.750	35-2010	35-2010-C
1/2-10	.370	2-1/2	3/8	.032	4	.750	35-2015	35-2015-C
5/8-8	.500	3"	1/2	.041	4	1.00	35-2020	35-2020-C
3/4-6	.580	3-1/8"	1/2	.057	6	1.00	35-2025	35-2025-C
7/8-6	.580	3-1/8"	1/2	.057	6	1.00	35-2025	35-2025-C
1"-5	.800	3-1/8"	1/2*	.069	6	2.00	35-2030	35-2030-C
1-1/8-5	.800	3-1/8"	1/2*	.069	6	2.00	35-2030	35-2030-C
1-1/4-5	.800	3-1/8"	1/2*	.069	6	2.00	35-2030	35-2030-C
1-3/8-4	1.120	3-1/8"	1/2*	.088	8	2.00	35-2035	35-2035-C
1-1/2-4	1.120	3-1/8"	1/2*	.088	8	2.00	35-2035	35-2035-C
1-3/4-4	1.120	3-1/8"	1/2*	.088	8	2.00	35-2035	35-2035-C

SERIES 93

made from **ITI CARBIDE**

CARBIDE REAMERS



STRAIGHT FLUTE RIGHT HAND CUT



CUTTING DIAMETER	FLUTE LENGTH	OVERALL LENGTH	SHANK SIZE	NUMBER OF FLUTES	ORDER EDP#
.0620		1-1/2"	.0620		93-0620
.0625		1-1/2"	.0625		93-0625
.0630		1-1/2"	.0630		93-0630
.0635		1-1/2"	.0635		93-0635
.0930		2"	.0930		93-0930
.0935		2"	.0935		93-0935
.0938		2"	.0938		93-0938
.0940		2"	.0940		93-0940
.0945		2"	.0945		93-0945
.1090		2-1/4"	.1090		93-1090
.1094		2-1/4"	.1094		93-1094
.1100		2-1/4"	.1100		93-1100
.1240		2-1/4"	.1240		93-1240
.1245		2-1/4"	.1245		93-1245
.1250		2-1/4"	.1250		93-1250
.1255		2-1/4"	.1255		93-1255
.1700		2-3/4"	.1700		93-1700
.1719		2-3/4"	.1719		93-1719
.1725		2-3/4"	.1725		93-1725
.1860		2-3/4"	.1860		93-1860
.1865		2-3/4"	.1865		93-1865
.1870		2-3/4"	.1870		93-1870
.1875		2-3/4"	.1875		93-1875
.1880		2-3/4"	.1880		93-1880
.1885		2-3/4"	.1885		93-1885
.2025		3"	.2025		93-2025
.2031		3"	.2031		93-2031
.2035		3"	.2035		93-2035
.2330		3"	.2330		93-2330
.2340		3"	.2340		93-2340
.2344		3"	.2344		93-2344
.2350		3"	.2350		93-2350
.2470		3"	.2470		93-2470
.2475		3"	.2475		93-2475
.2480		3"	.2480		93-2480
.2485		3"	.2485		93-2485
.2490		3"	.2490		93-2490
.2495		3"	.2495		93-2495
.2500		3"	.2500		93-2500
.2505		3"	.2505		93-2505
.2510		3"	.2510		93-2510
.2515		3"	.2515		93-2515
.2520		3"	.2520		93-2520
.2650		3-1/4"	.2650		93-2650
.2656		3-1/4"	.2656		93-2656
.2660		3-1/4"	.2660		93-2660
.2800		3-1/4"	.2800		93-2800
.2812		3-1/4"	.2812		93-2812
.2820		3-1/4"	.2820		93-2820
.2960		3-1/4"	.2960		93-2960
.2965		3-1/4"	.2965		93-2965
.2969		3-1/4"	.2969		93-2969
.2975		3-1/4"	.2975		93-2975

CUTTING DIAMETER	FLUTE LENGTH	OVERALL LENGTH	SHANK SIZE	NUMBER OF FLUTES	ORDER EDP#
.3115	1-1/8"	3-1/4"	.3115	6	93-3115
.3120	1-1/8"	3-1/4"	.3120	6	93-3120
.3125	1-1/8"	3-1/4"	.3125	6	93-3125
.3130	1-1/8"	3-1/4"	.3130	6	93-3130
.3135	1-1/8"	3-1/4"	.3135	6	93-3135
.3275	1-1/4"	3-1/2"	.3275	6	93-3275
.3281	1-1/4"	3-1/2"	.3281	6	93-3281
.3285	1-1/4"	3-1/2"	.3285	6	93-3285
.3430	1-1/4"	3-1/2"	.3430	6	93-3430
.3435	1-1/4"	3-1/2"	.3435	6	93-3435
.3438	1-1/4"	3-1/2"	.3438	6	93-3438
.3445	1-1/4"	3-1/2"	.3445	6	93-3445
.3590	1-1/4"	3-1/2"	.3590	6	93-3590
.3594	1-1/4"	3-1/2"	.3594	6	93-3594
.3600	1-1/4"	3-1/2"	.3600	6	93-3600
.3730	1-1/4"	3-1/2"	.3730	6	93-3730
.3735	1-1/4"	3-1/2"	.3735	6	93-3735
.3740	1-1/4"	3-1/2"	.3740	6	93-3740
.3745	1-1/4"	3-1/2"	.3745	6	93-3745
.3750	1-1/4"	3-1/2"	.3750	6	93-3750
.3755	1-1/4"	3-1/2"	.3755	6	93-3755
.3760	1-1/4"	3-1/2"	.3760	6	93-3760
.3900	1-1/4"	3-1/2"	.3900	6	93-3900
.3906	1-1/4"	3-1/2"	.3906	6	93-3906
.3910	1-1/4"	3-1/2"	.3910	6	93-3910
.4060	1-1/4"	3-1/2"	.4060	6	93-4060
.4062	1-1/4"	3-1/2"	.4062	6	93-4062
.4070	1-1/4"	3-1/2"	.4070	6	93-4070
.4210	1-3/8"	4"	.4210	6	93-4210
.4219	1-3/8"	4"	.4219	6	93-4219
.4225	1-3/8"	4"	.4225	6	93-4225
.4365	1-3/8"	4"	.4365	6	93-4365
.4370	1-3/8"	4"	.4370	6	93-4370
.4375	1-3/8"	4"	.4375	6	93-4375
.4380	1-3/8"	4"	.4380	6	93-4380
.4525	1-3/8"	4"	.4525	6	93-4525
.4531	1-3/8"	4"	.4531	6	93-4531
.4540	1-3/8"	4"	.4540	6	93-4540
.4680	1-3/8"	4"	.4680	6	93-4680
.4688	1-3/8"	4"	.4688	6	93-4688
.4695	1-3/8"	4"	.4695	6	93-4695
.4840	1-1/2"	4"	.4840	6	93-4840
.4844	1-1/2"	4"	.4844	6	93-4844
.4850	1-1/2"	4"	.4850	6	93-4850
.4980	1-1/2"	4"	.4980	6	93-4980
.4985	1-1/2"	4"	.4985	6	93-4985
.4990	1-1/2"	4"	.4990	6	93-4990
.4995	1-1/2"	4"	.4995	6	93-4995
.5000	1-1/2"	4"	.5000	6	93-5000
.5005	1-1/2"	4"	.5005	6	93-5005
.5010	1-1/2"	4"	.5010	6	93-5010



SERIES 85 *made from* **ITI CARBIDE**

N/C COUNTERBORES

DIAMETER +.000 / -.001	EDP NUMBER	LENGTH OF FLUTE	OVERALL LENGTH	SHANK DIAMETER	
3/32	.094	85-0941	3/8	2"	1/8
1/8	.125	85-1251	3/8	2"	1/8
9/64	.140	85-1401	1/2	2-1/2	3/16
5/32	.156	85-1561	1/2	2-1/2	3/16
11/64	.171	85-1711	1/2	2-1/2	3/16
3/16	.187	85-1871	1/2	2-1/2	3/16
13/64	.203	85-2031	5/8	2-1/2	1/4
7/32	.219	85-2191	5/8	2-1/2	1/4
15/64	.234	85-2341	5/8	2-1/2	1/4
1/4	.250	85-2501	5/8	2-1/2	1/4
17/64	.265	85-2651	11/16	2-1/2	5/16
9/32	.281	85-2811	11/16	2-1/2	5/16
19/64	.297	85-2971	11/16	2-1/2	5/16
5/16	.312	85-3121	11/16	2-1/2	5/16
21/64	.328	85-3281	3/4	2-1/2	3/8
11/32	.343	85-3431	3/4	2-1/2	3/8
23/64	.359	85-3591	3/4	2-1/2	3/8
3/8	.375	85-3751	3/4	2-1/2	3/8
25/64	.390	85-3901	7/8	3"	7/16
13/32	.406	85-4061	7/8	3"	7/16
27/64	.421	85-4211	7/8	3"	7/16
7/16	.437	85-4371	7/8	3"	7/16
29/64	.453	85-4531	1"	3"	1/2
15/32	.469	85-4691	1"	3"	1/2
31/64	.484	85-4841	1"	3"	1/2
1/2	.500	85-5001	1"	3"	1/2
33/64	.515	85-5151	1-1/8	3"	9/16
17/32	.531	85-5311	1-1/8	3"	9/16
35/64	.547	85-5471	1-1/8	3"	9/16
9/16	.562	85-5621	1-1/8	3"	9/16
37/64	.578	85-5781	1-3/16	3-1/2	5/8
19/32	.594	85-5941	1-3/16	3-1/2	5/8
39/64	.609	85-6091	1-3/16	3-1/2	5/8
5/8	.625	85-6251	1-3/16	3-1/2	5/8
41/64	.641	85-6411	1-1/4	4"	3/4
21/32	.656	85-6561	1-1/4	4"	3/4
43/64	.672	85-6721	1-1/4	4"	3/4
11/16	.687	85-6871	1-1/4	4"	3/4
45/64	.703	85-7031	1-1/2	4"	3/4
23/32	.719	85-7191	1-1/2	4"	3/4
47/64	.734	85-7341	1-1/2	4"	3/4
3/4	.750	85-7501	1-1/2	4"	3/4

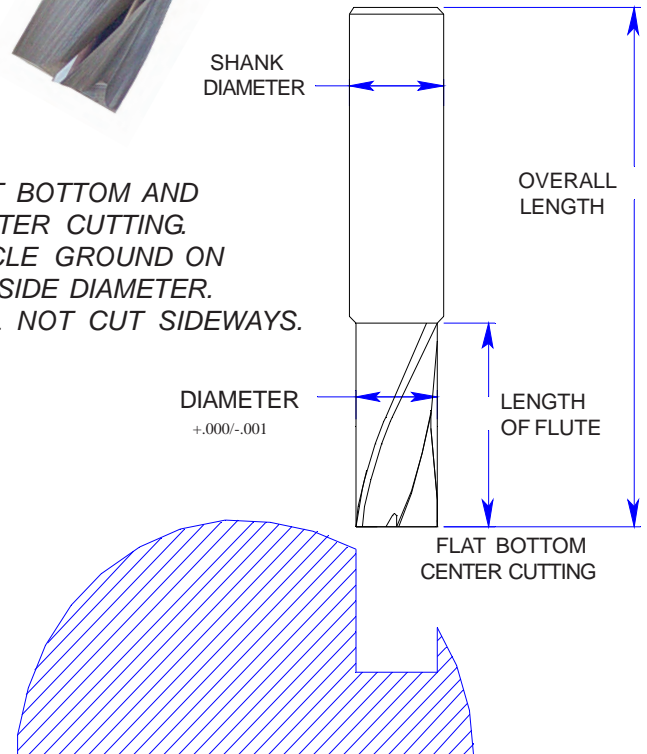
FLAT BOTTOM CENTER CUTTING
15° RIGHT HAND HELIX, RIGHT HAND CUT
DIAMETER TOLERANCE +.000 / -.001

APPLICATION :

1. SPOTTING ON IRREGULAR OR ROUND SURFACES
2. COUNTER BORING
3. FLAT BOTTOM REAMING
4. STRAIGHTENING MISALIGNED OR OUT OF ROUND HOLES



FLAT BOTTOM AND CENTER CUTTING. CIRCLE GROUND ON OUTSIDE DIAMETER. WILL NOT CUT SIDEWAYS.



THESE COUNTERBORES ARE DESIGNED FOR USE ON A CNC THEY DONT HAVE A PILOT OR A PILOT HOLE.

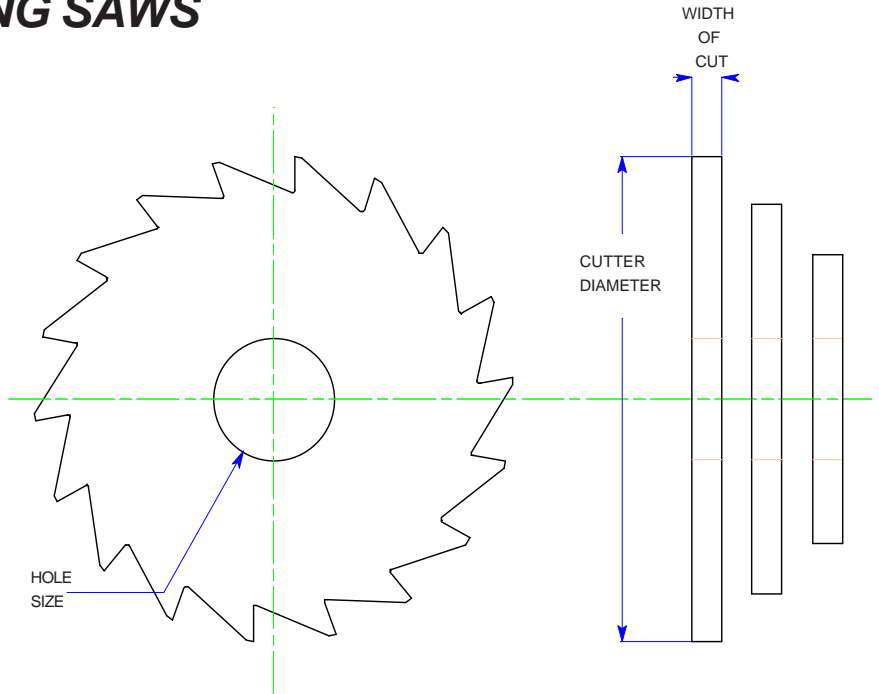
SPECIAL SIZES AVAILABLE ON REQUEST

SERIES 95

ITI CARBIDE

SOLID CARBIDE SLITTING SAWS

DIAMETER	WIDTH OF CUT	# OF TEETH	ORDER EDP#	# OF TEETH	ORDER EDP#
3/4" WITH 1/4" HOLE	.0312	10	95-2000	20	95-7000
	.0625	10	95-2010	20	95-7010
	.0938	10	95-2020	20	95-7020
	.1250	10	95-2030	20	95-7030
	.1875	10	95-2040	20	95-7040
	.2500	10	95-2050	20	95-7050
1" WITH 3/8" HOLE	.0312	12	95-2060	24	95-7060
	.0625	12	95-2070	24	95-7070
	.0938	12	95-2080	24	95-7080
	.1250	12	95-2090	24	95-7090
	.1875	12	95-2100	24	95-7100
	.2500	12	95-2110	24	95-7110
1-1/4" WITH 1/2" HOLE	.0312	16	95-2120	36	95-7120
	.0625	16	95-2130	36	95-7130
	.0938	16	95-2140	36	95-7140
	.1250	16	95-2150	36	95-7150
	.1875	16	95-2160	36	95-7160
	.2500	16	95-2170	36	95-7170
1-1/2" WITH 1/2" HOLE	.0312	16	95-2180	36	95-7180
	.0625	16	95-2190	36	95-7190
	.0938	16	95-2200	36	95-7200
	.1250	16	95-2210	36	95-7210
	.1875	16	95-2220	36	95-7220
	.2500	16	95-2230	36	95-7230
1-3/4" WITH 1/2" HOLE	.0312	24	95-2240	36	95-7240
	.0625	24	95-2250	36	95-7250
	.0938	24	95-2260	36	95-7260
	.1250	24	95-2270	36	95-7270
	.1875	24	95-2280	36	95-7280
	.2500	24	95-2290	36	95-7290
2" WITH 1/2" HOLE	.0312	24	95-2300	48	95-7300
	.0625	24	95-2310	48	95-7310
	.0938	24	95-2320	48	95-7320
	.1250	24	95-2330	48	95-7330
	.1875	24	95-2340	48	95-7340
	.2500	24	95-2350	48	95-7350
2-1/4" WITH 5/8" HOLE	.0312	28	95-2360	56	95-7360
	.0625	28	95-2370	56	95-7370
	.0938	28	95-2380	56	95-7380
	.1250	28	95-2390	56	95-7390
	.1875	28	95-2400	56	95-7400
	.2500	28	95-2410	56	95-7410
2-1/2" WITH 1" HOLE	.0312	28	95-2420	56	95-7420
	.0625	28	95-2430	56	95-7430
	.0938	28	95-2440	56	95-7440
	.1250	28	95-2450	56	95-7450
	.1875	28	95-2460	56	95-7460
	.2500	28	95-2470	56	95-7470



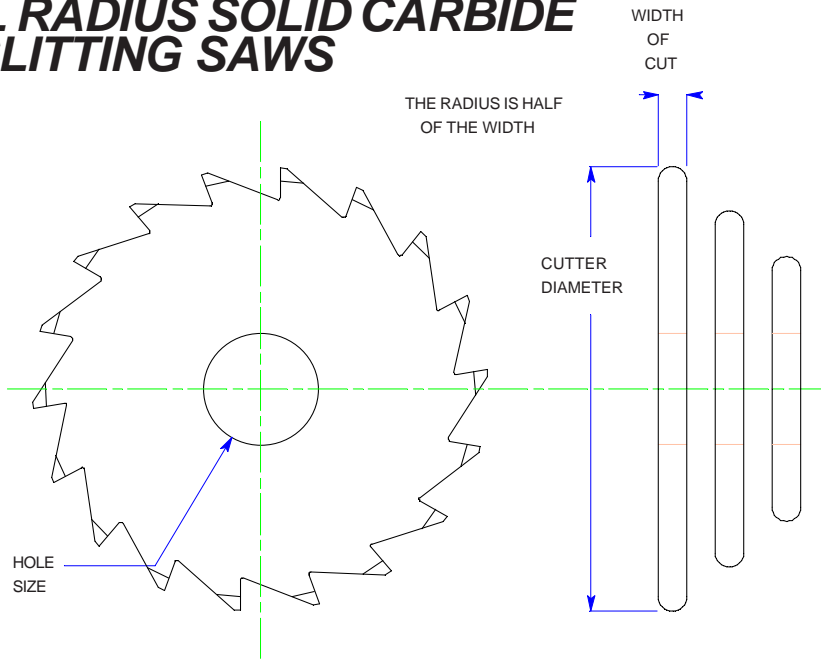
DIAMETER	WIDTH OF CUT	# OF TEETH	ORDER EDP#	# OF TEETH	ORDER EDP#
2-3/4" WITH 1" HOLE	.0312	28	95-2480	56	95-7480
	.0625	28	95-2490	56	95-7490
	.0938	28	95-2500	56	95-7500
	.1250	28	95-2510	56	95-7510
	.1875	28	95-2520	56	95-7520
	.2500	28	95-2530	56	95-7530
3" WITH 1" HOLE	.0312	30	95-2540	60	95-7540
	.0625	30	95-2550	60	95-7550
	.0938	30	95-2560	60	95-7560
	.1250	30	95-2570	60	95-7570
	.1875	30	95-2580	60	95-7580
	.2500	30	95-2590	60	95-7590
4" WITH 1" HOLE	.0312	30	95-2600	60	95-7600
	.0625	30	95-2610	60	95-7610
	.0938	30	95-2620	60	95-7620
	.1250	30	95-2630	60	95-7630
	.1875	30	95-2640	60	95-7640
	.2500	30	95-2650	60	95-7650

SPECIALS, CORNER RADIUS, ETC., ARE AVAILABLE ON REQUEST.

SERIES 87

FULL RADIUS SOLID CARBIDE SLITTING SAWS

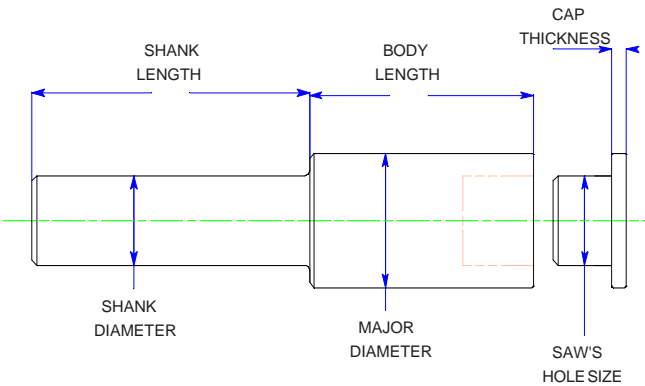
DIAMETER	WIDTH OF CUT	# OF TEETH	ORDER EDP#
1-1/2" WITH 1/2" HOLE	.0312	12	87-2000
	.0625	12	87-2010
	.0938	12	87-2020
	.1250	12	87-2030
2" WITH 1/2" HOLE	.0312	16	87-2050
	.0625	16	87-2060
	.0938	16	87-2070
	.1250	16	87-2080
3" WITH 1" HOLE	.0312	24	87-2100
	.0625	24	87-2110
	.0938	24	87-2120
	.1250	24	87-2130
4" WITH 1" HOLE	.1875	24	87-2140
	.0312	30	87-2150
	.0625	30	87-2160
	.0938	30	87-2170
4" WITH 1" HOLE	.1250	30	87-2180
	.1875	30	87-2190



SAW ARBORS

SERIES 97

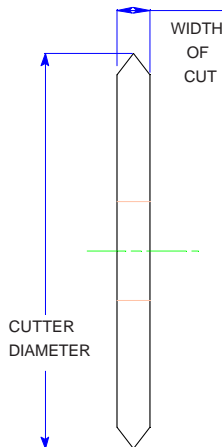
SAW'S HOLE SIZE	SHANK DIAMETER	SHANK LENGTH	BODY LENGTH	MAJOR DIAMETER	CAP THICKNESS	ORDER EDP#
1/4"	1/2"	1.700	1.000	.500	.080	97-1060
3/8"	1/2"	1.700	1.180	.620	.080	97-1070
1/2"	1/2"	1.700	1.370	.750	.090	97-1080
5/8"	3/4"	2.030	1.500	1.00	.120	97-1090
1"	3/4"	2.030	1.750	1.500	.160	97-2000



60° included DOUBLE ANGLE SOLID CARBIDE SLITTING SAWS

SERIES 95 60° included

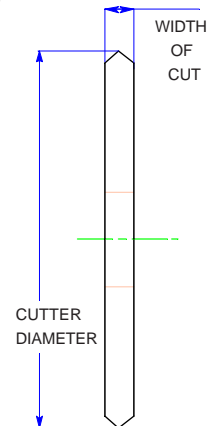
DIAMETER	WIDTH OF CUT	# OF TEETH	ORDER EDP#
2" WITH 1/2" HOLE	.1250	10	95-1000
	.1875	10	95-1010
	.2500	10	95-1020
3" WITH 1" HOLE	.1250	14	95-1030
	.1875	14	95-1040
	.2500	14	95-1050
4" WITH 1" HOLE	.1250	18	95-1060
	.1875	18	95-1070
	.2500	18	95-1080



90° included DOUBLE ANGLE SOLID CARBIDE SLITTING SAWS

SERIES 95 90° included

DIAMETER	WIDTH OF CUT	# OF TEETH	ORDER EDP#
2" WITH 1/2" HOLE	.1250	10	95-1100
	.1875	10	95-1110
	.2500	10	95-1120
3" WITH 1" HOLE	.1250	14	95-1130
	.1875	14	95-1140
	.2500	14	95-1150
4" WITH 1" HOLE	.1250	18	95-1160
	.1875	18	95-1170
	.2500	18	95-1180



SPEEDS AND FEEDS FOR CARBIDE ENDMILLS
ENDMILL DIAMETER FEED PER TOOTH (INCHES)

MATERIAL	SPEED SURFACE FEET PER MINUTE	ENDMILL DIAMETER FEED PER TOOTH (INCHES)		
		UP TO 1/4"	UP TO 1/2"	UP TO 1"
ALUMINUM / ALUMINUM ALLOYS	600-1300	.0002 - .002	.002 - .004	.004 - .008
BRASS / SOFT BRONZE	400-700	.0005 - .002	.002 - .003	.003 - .005
BRONZE / HIGH TENSILE	250-400	.001 - .002	.002 - .003	.004 - .006
COPPER / COPPER ALLOYS	350-900	.0005 - .002	0.002	.002 - .006
IRON-CAST (SOFT)	200-500	.0005 - .002	.002 - .003	.003 - .006
IRON-CAST (HARD)	100-450	.0003 - .001	.0008 - .002	.003 - .005
IRON-DUCTILE	80-400	.0002 - .001	.001 - .002	.002 - .006
IRON MALLEABLE	250-600	.001 - .002	.001 - .003	.003 - .008
MAGNESIUM / MAGNESIUM ALLOYS	800-1400	.0005 - .002	.002 - .004	.004 - .010
MOLYBDENUM	800-1100	.001 - .002	.002 - .004	.004 - .008
MONEL / HIGH NICKEL STEEL	150-300	.0002 - .001	.001 - .002	.002 - .004
NICKEL BASE HI-TEMP ALLOYS	20-130	.0003 - .0008	.0008 - .001	.001 - .002
PLASTICS	600-1200	.0006 - .003	.003 - .006	.006 - .015
PLASTICS-GLASS FILLED	300-800	.0006 - .003	.003 - .004	.004 - .012
REFRACTORY ALLOYS	80-400	.0002 - .001	0.001	.001 - .002
STEEL-LOW CARBON	250-550	.0002 - .001	.001 - .003	.003 - .007
STEEL-MEDIUM CARBON	100-250	.0004 - .0015	.0015 - .002	.002 - .005
STEEL-UP TO Rc35	150-250	.0005 - .001	.001 - .002	.002 - .003
STEEL-Rc35 - Rc50	80-150	.0003 - .0007	.0007 - .001	.002 - .003
STEEL-Rc50 - Rc60	25-120	.0002 - .0005	.0005 - .001	.001 - .003
STEEL-MOLD	200-350	.0002 - .001	.001 - .002	.002 - .006
STEEL-TOOL	100-300	.0002 - .001	.001 - .002	.002 - .006
STAINLESS STEEL-SOFT	250-400	.0002 - .001	.001 - .002	.002 - .006
STAINLESS STEEL-HARD	50-250	.0002 - .001	.001 - .002	.001 - .005
TITANIUM-SOFT	120-350	.0002 - .001	.001 - .002	.002 - .006
TITANIUM-HARD	30-150	.0002 - .0005	.0005 - .001	.001 - .004

PLUNGE OPERATIONS: REDUCE FEED PER TOOTH 50-65%

SLOTING APPLICATIONS: SURFACE SPEEDS (SFM) SHOULD BE REDUCED APPROXIMATELY 20% OF THE LOWEST VALUE

LIGHT RADIAL: DEPTHS OF CUT, THE HIGHER OF THE RECOMMENDED SURFACE SPEEDS (SFM) SHOULD BE USED

GREATER RADIAL: DEPTHS OF CUT (MORE THAN .5 X DIAMETER) THE LOWER RANGE OF SURFACE SPEEDS (SFM) SHOULD BE USED

AXIAL DEPTH OF CUT: RECOMMENDATIONS ARE NOT TO EXCEED 1-1/2 TIMES THE DIAMETER. IF THIS CONDITION EXISTS,

CONVENTIONAL MILLING SHOULD BE USED AND FEED PER TOOTH SHOULD BE REDUCED BY 50%

PLEASE NOTE: THE ABOVE RECOMMENDATIONS SHOULD BE CONSIDERED ONLY AS A STARTING POINT;
"FINE TUNING" MAY BE REQUIRED IN ORDER TO MAXIMIZE PERFORMANCE

SPEEDS AND FEEDS FOR BORING TOOLS
DEPTH OF CUT

MATERIAL	TYPE	SPEED SURFACE FEET PER MINUTE	FEED INCHES PER REVOLUTION	INSERT BARS	SOLID CARBIDE BARS	TIN COATED SOLID
				SERIES 16THRU 18 PAGE 45 THRU 48	OUR SERIES 10 PAGE 2	CARBIDE BARS OUR SERIES 11 PAGE 3
PLASTIC	TEFLON	500-600	.003 - .006	.007	.012	.016
	NYLON	700-800	.001 - .003	.007	.012	.016
	PHENOLIC	700-800	.001 - .003	.007	.012	.016
	GLASS FILLED	700-800	.001 - .003	.005	.012	.016
MAGNESIUM	AZ,AM,EZ,ZE,HK	750-1500	.005 - .012	.008	.012	.016
ALUMINUM	2021 THRU 6061	700-1400	.005 - .012	.008	.014	.018
COPPER	101-707	600-800	.003 - .005	.008	.014	.016
	834-978	600-800	.003 - .005	.008	.014	.016
BRASS		350-400	.001 - .003	.006	.011	.012
BRONZE		300-400	.001 - .002	.006	.011	.012
CAST IRON	GRAY	250-350	.004 - .010	.007	.007	.009
	DUCTILE	250-350	.004 - .010	.007	.007	.009
	MALLEABLE	250-350	.004 - .010	.007	.007	.009
STEEL	1005-1029	100-300	.003 - .007	.007	.014	.016
	1030-1055	100-300	.003 - .007	.007	.014	.016
	1060-1095	150-400	.003 - .005	.007	.014	.016
	10L45-10L50	300-500	.004 - .006	.007	.014	.016
	12L13-12L15	300-500	.003 - .005	.007	.014	.016
	41L30-41L50	200-400	.003 - .005	.007	.014	.016
	4140-4150	150-400	.003 - .005	.007	.014	.016
	4140 (35 HRC)	90-125	.001 - .004	.004	.007	.008
	8617-8622	100-300	.002 - .004	.007	.006	.007
	M1-M6	150-250	.003 - .008	.006	.005	.006
	H10-H19	150-250	.003 - .007	.006	.005	.006
	D2-D7	150-250	.004 - .010	.006	.005	.006
	A2-A9, 01-07	150-250	.003 - .008	.006	.005	.006
	W1, W2	150-250	.003 - .008	.006	.006	.007
M-50, 52100	300-400	.004 - .010	.007	.006	.007	
TITANIUM	TI-9Al-6V	90-250	.001 - .003	.005	.008	.011
STAINLESS	201-385	100-250	.001 - .004	.005	.008	.012
	405-446	100-250	.001 - .004	.005	.008	.012
	15-5PH, 16-6PH, 14-4PH	300-400	.002 - .004	.005	.008	.012
NICKEL	NICKEL 200-230	100-250	.002 - .005	.004	.007	.009
MONEL		80-120	.001 - .003	.004	.007	.009
INCONEL		80-120	.001 - .003	.004	.007	.009
WASPALLOY		80-120	.001 - .003	.004	.007	.009
HASTELLOY		80-120	.001 - .003	.004	.007	.009

NOTE: ALL SPEEDS AND FEEDS LISTED HERE ARE PROVIDED FOR REFERENCE ONLY.

$$\frac{RPM = SFM \times 12}{(1) \times DIAMETER}$$

SPEEDS AND FEEDS FOR GROOVING TOOLS

MATERIAL	TYPE	SPEED SURFACE FEET PER MINUTE	FEED	FEED	FEED
			Inches per revolution CARBIDE INSERT OUR SERIES 26 PAGE 53	Inches per revolution SOLID CARBIDE OUR SERIES 20 PAGE 10	Inches per revolution TIN COATED SOLID CARBIDE OUR SERIES 22 PAGE 11
PLASTIC	TEFLON	350-400	.003 - .006	.007	.012
	NYLON	350-600	.001 - .003	.007	.012
	PHENOLIC	500-600	.001 - .003	.007	.012
	GLASS FILLED	250-300	.001 - .003	.005	.012
MAGNESIUM	AZ,AM,EZ,ZE,HK	850-1000	.005 - .012	.008	.012
ALUMINUM	2021 THRU 6061	900-1000	.005 - .012	.008	.014
COPPER	101-707	150-170	.003 - .005	.008	.014
	834-978	500-600	.003 - .005	.008	.014
BRASS		200-250	.001 - .003	.006	.011
BRONZE		200-250	.001 - .002	.006	.011
CAST IRON	GRAY	120-350	.004 - .010	.007	.007
	DUCTILE	70-350	.004 - .010	.007	.007
	MALLEABLE	75-550	.004 - .010	.007	.007
STEEL	1005-1029	250-450	.003 - .007	.007	.014
	1030-1055	110-370	.003 - .007	.007	.014
	1060-1095	90-250	.003 - .005	.007	.014
	10L45-10L50	130-450	.004 - .006	.007	.014
	12L13-12L15	550-600	.003 - .005	.007	.014
	41L30-41L50	65-350	.003 - .005	.007	.014
	4140-4150	65-400	.003 - .005	.007	.014
	4140 (35 HRc)	190-200	.001 - .004	.004	.007
	8617-8622	100-400	.002 - .004	.007	.006
	M1-M6	150-200	.003 - .008	.006	.005
	H10-H19	65-250	.003 - .007	.006	.005
	D2-D7	150-200	.004 - .010	.006	.005
	A2-A9, 01-07	150-250	.003 - .008	.006	.005
	W1, W2	150-250	.003 - .008	.006	.006
M-50, 52100	60-300	.004 - .010	.007	.006	
TITANIUM	TI-9Al-6V	90-100	.001 - .003	.005	.008
STAINLESS	201-385	200-280	.001 - .004	.005	.008
	405-446	250-300	.001 - .004	.005	.008
	15-5PH,16-6PH,14-4PH	100-200	.002 - .004	.005	.008
NICKEL	NICKEL 200-230	200-250	.002 - .005	.004	.007
MONEL		100-150	.001 - .003	.004	.007
INCONEL		40-50	.001 - .003	.004	.007
WASPALLOY		70-100	.001 - .003	.004	.007
HASTELLOY		70-90	.001 - .003	.004	.007

NOTE: ALL SPEEDS AND FEEDS LISTED HERE ARE PROVIDED FOR REFERENCE ONLY.

RPM=SFMX12
(1)XDIAMETER

SPEEDS AND FEEDS FOR KEY CUTTERS

MATERIAL	TYPE	SPEED SURFACE FEET PER MINUTE
PLASTIC	TEFLON	200
	NYLON	200
	PHENOLIC	180
	GLASS FILLED	150
MAGNESIUM	AZ,AM,EZ,ZE,HK	300
ALUMINUM	2021 THRU 6061	300
COPPER	101-707	100
	834-978	200
BRASS		250
BRONZE		230
CAST IRON	GRAY	180
	DUCTILE	140
	MALLEABLE	100
STEEL	1005-1029	180
	1030-1055	180
	1060-1095	170
	10L45-10L50	165
	12L13-12L15	160
	41L30-41L50	150
	4140-4150	140
	4140 (35 HRC)	130
	8617-8622	120
	M1-M6	110
	H10-H19	100
	D2-D7	90
	A2-A9, 01-07	80
	W1, W2	70
M-50, 52100	60	
TITANIUM	TI-9Al-6V	90
STAINLESS	201-385	100
	405-446	110
	15-5PH,16-6PH,14-4PH	120
NICKEL	NICKEL 200-230	80
MONEL		80
INCONEL		80
WASPALLOY		80
HASTELLOY		80

FORMULA FOR COMPUTING SPINDLE SPEED IS.

SURFACE FEET PER MINUTE FACTOR X 4 = ?

? DIVIDED BY DIAMETER OF CUTTER = RPM

EXAMPLE CUTTING ALUMINUM
WITH A 3/4" KEY CUTTER

300 X 4 = 1200 divided by .750 = 1600 RPM

surface feet MULTIPLIER cutter diameter

FORMULA FOR COMPUTING TABLE SPEED IS.

.001 X NUMBER OF TEETH IN CUTTER X RPM

EXAMPLE CUTTING ALUMINUM
WITH A 3/4" KEY CUTTER

.001 X 10 X 1600 = 16

MULTIPLIER NUMBER OF TEETH RPM INCHES PER MINUTE

NOTE: ALL SPEEDS AND FEEDS LISTED HERE ARE PROVIDED FOR REFERENCE ONLY.

SPEEDS AND FEEDS FOR GROOVING TOOLS

MATERIAL	TYPE	SPEED SURFACE FEET PER MINUTE	FEED	FEED	FEED
			Inches per revolution CARBIDE INSERT OUR SERIES 26 PAGE 53	Inches per revolution SOLID CARBIDE OUR SERIES 20 PAGE 10	Inches per revolution TIN COATED SOLID CARBIDE OUR SERIES 22 PAGE 11
PLASTIC	TEFLON	350-400	.003 - .006	.007	.012
	NYLON	350-600	.001 - .003	.007	.012
	PHENOLIC	500-600	.001 - .003	.007	.012
	GLASS FILLED	250-300	.001 - .003	.005	.012
MAGNESIUM	AZ,AM,EZ,ZE,HK	850-1000	.005 - .012	.008	.012
ALUMINUM	2021 THRU 6061	900-1000	.005 - .012	.008	.014
COPPER	101-707	150-170	.003 - .005	.008	.014
	834-978	500-600	.003 - .005	.008	.014
BRASS		200-250	.001 - .003	.006	.011
BRONZE		200-250	.001 - .002	.006	.011
CAST IRON	GRAY	120-350	.004 - .010	.007	.007
	DUCTILE	70-350	.004 - .010	.007	.007
	MALLEABLE	75-550	.004 - .010	.007	.007
STEEL	1005-1029	250-450	.003 - .007	.007	.014
	1030-1055	110-370	.003 - .007	.007	.014
	1060-1095	90-250	.003 - .005	.007	.014
	10L45-10L50	130-450	.004 - .006	.007	.014
	12L13-12L15	550-600	.003 - .005	.007	.014
	41L30-41L50	65-350	.003 - .005	.007	.014
	4140-4150	65-400	.003 - .005	.007	.014
	4140 (35 HRC)	190-200	.001 - .004	.004	.007
	8617-8622	100-400	.002 - .004	.007	.006
	M1-M6	150-200	.003 - .008	.006	.005
	H10-H19	65-250	.003 - .007	.006	.005
	D2-D7	150-200	.004 - .010	.006	.005
	A2-A9, 01-07	150-250	.003 - .008	.006	.005
W1, W2	150-250	.003 - .008	.006	.006	
M-50, 52100	60-300	.004 - .010	.007	.006	
TITANIUM	TI-9Al-6V	90-100	.001 - .003	.005	.008
STAINLESS	201-385	200-280	.001 - .004	.005	.008
	405-446	250-300	.001 - .004	.005	.008
	15-5PH, 16-6PH, 14-4PH	100-200	.002 - .004	.005	.008
NICKEL	NICKEL 200-230	200-250	.002 - .005	.004	.007
MONEL		100-150	.001 - .003	.004	.007
INCONEL		40-50	.001 - .003	.004	.007
WASPALLOY		70-100	.001 - .003	.004	.007
HASTELLOY		70-90	.001 - .003	.004	.007

NOTE: ALL SPEEDS AND FEEDS LISTED HERE ARE PROVIDED FOR REFERENCE ONLY.

SPEEDS AND FEEDS FOR KEY CUTTERS

MATERIAL	TYPE	SPEED SURFACE FEET PER MINUTE
PLASTIC	TEFLON	200
	NYLON	200
	PHENOLIC	180
	GLASS FILLED	150
MAGNESIUM	AZ,AM,EZ,ZE,HK	300
ALUMINUM	2021 THRU 6061	300
COPPER	101-707	100
	834-978	200
BRASS		250
BRONZE		230
CAST IRON	GRAY	180
	DUCTILE	140
	MALLEABLE	100
STEEL	1005-1029	180
	1030-1055	180
	1060-1095	170
	10L45-10L50	165
	12L13-12L15	160
	41L30-41L50	150
	4140-4150	140
	4140 (35 HRc)	130
	8617-8622	120
	M1-M6	110
	H10-H19	100
	D2-D7	90
	A2-A9, 01-07	80
	W1, W2	70
M-50, 52100	60	
TITANIUM	TI-9Al-6V	90
STAINLESS	201-385	100
	405-446	110
	15-5PH,16-6PH,14-4PH	120
NICKEL	NICKEL 200-230	80
MONEL		80
INCONEL		80
WASPALOY		80
HASTELLOY		80

FORMULA FOR COMPUTING SPINDLE SPEED IS.

SURFACE FEET PER MINUTE FACTOR X 4 = ?

? DIVIDED BY DIAMETER OF CUTTER = ___ RPM

EXAMPLE CUTTING ALUMINUM WITH A 3/4" KEY CUTTER

300 X 4 = 1200 divided by .750 = 1600 RPM

surface feet MULTIPLIER cutter diameter

FORMULA FOR COMPUTING TABLE SPEED IS.

.001 X NUMBER OF TEETH IN CUTTER X RPM

EXAMPLE CUTTING ALUMINUM WITH A 3/4" KEY CUTTER

.001 X 10 X 1600 = 16

MULTIPLIER NUMBER OF TEETH RPM INCHES PER MINUTE

NOTE: ALL SPEEDS AND FEEDS LISTED HERE ARE PROVIDED FOR REFERENCE ONLY.

Technical Assistance

Any technical assistance or application suggestions made by Internal Tool, Inc. personnel are only to assist the customer and in all cases use of such information is solely the customer's responsibility.

Shipping Terms

All shipments are FOB Internal Tool, Inc. La Verne CA. unless otherwise specified. Normally terms of payment on open accounts are 1% 10 NET 30 days from the date of invoice.

Past Due Accounts

Net accounts are considered past due at 30 days from the date of invoice. Past due accounts are subject to shipment and production hold at the discretion of Internal Tool Inc. Internal Tool, Inc. reserves the right to place any past due account on hold until all past due invoices are paid.

Return Policy

Any discrepancies in shipments received by you must be reported immediately. Such merchandise will not be accepted by us for return unless assigned a return authorization number. Any merchandise returned must be accompanied by a copy of our invoice indicating our return authorization number. Any merchandise that has been misused, abused, or is otherwise in non-saleable condition, will not be accepted for return by Internal Tool, Inc. Merchandise returned that is found to be in compliance with the aforementioned policy will be refunded the full purchase price, subject to a reasonable restocking charge. Merchandise will not be accepted for return after 30 days from receipt.

Credit Policy

Internal Tool, Inc. will not honor any credit that has not been expressly issued by Internal Tool, Inc. Any payments received that are found to be short paid for any reason without a credit issued by Internal Tool, Inc. will be promptly returned to the customer. The customer will have their account put on hold, or their shipping status changed to COD, at the discretion of Internal Tool, Inc. until the invoice has been cleared.

Telephone Orders

Telephone orders are accepted at the risk of the purchaser and shipments made before receipt of confirmation are for the special convenience of the customer. Internal Tool Inc. is not responsible for any shipping errors incurred as a result of a telephone order.

Special Orders

Orders for items marked as "specials" or items not stocked by Internal Tool, Inc. are considered special orders. Special items are subject to minimum order quantities and/or special handling charges with allowable over/under-run of 10%. All special orders are non-cancelable and special orders manufactured per print or instruction are non returnable.

Backordered Items

All Backordered items will be shipped in the same manner as the items on the original purchase order, unless specified in writing by the customer.

Shortage or Error

All claims for shortages or shipment error must be made within 10 days after receipt of shipment. Invoice number and EDP number must be referenced. Our liability is limited to replacement of merchandise or refund of purchase price, at the discretion of Internal Tool Inc.

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