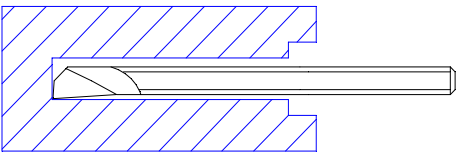
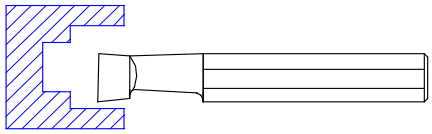
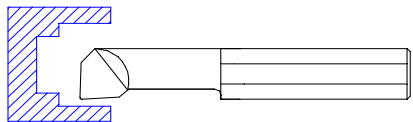
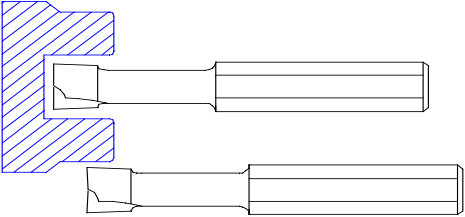
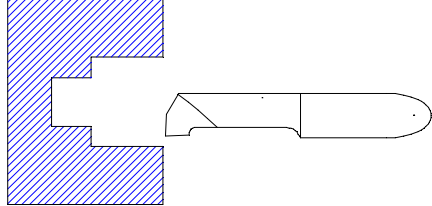
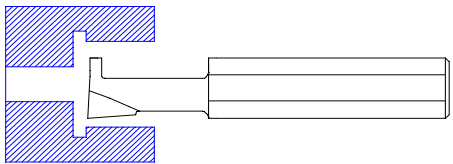
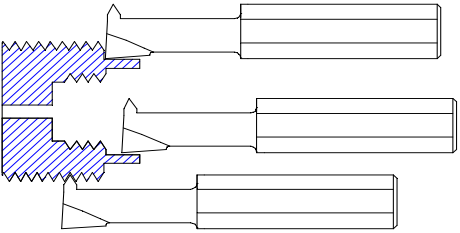
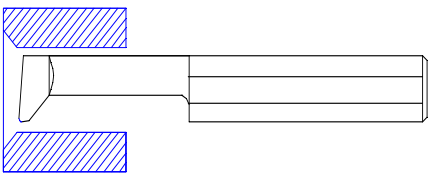
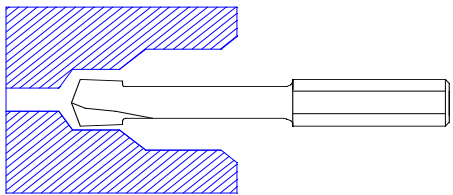
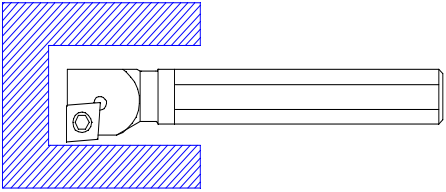
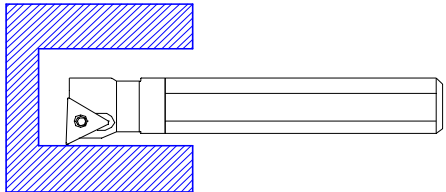
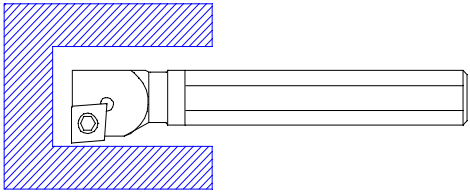
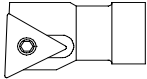
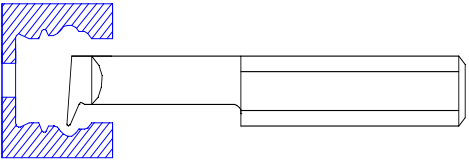
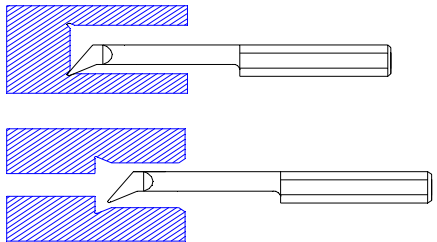
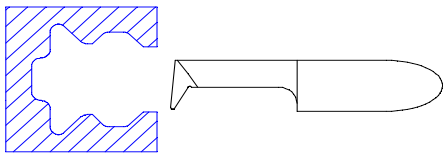


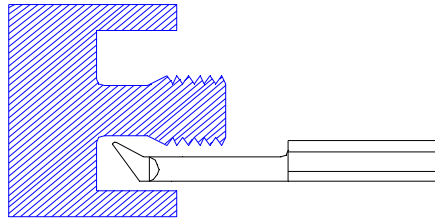
<p><u>SERIES 04 Multi-Reach boring tools</u></p>  <p>APPLICATION: DEEP HOLE BORING</p> <p style="text-align: right;"><i>page 7</i></p>	<p><u>SERIES 10 Standard boring tool</u></p>  <p>APPLICATION: BORING ALL TYPES OF MATERIALS</p> <p style="text-align: right;"><i>page 6</i></p>	<p><u>SERIES 11 ALTiN coated Max-Bore</u></p>  <p>APPLICATION: BORING TOUGH TO MACHINE MATERIALS. STAINLESS ETC.</p> <p style="text-align: right;"><i>page 7</i></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;"><i>page 18</i></p>	<p><u>SERIES 42 Quick Change boring tool</u></p>  <p>APPLICATION: BORING ALL TYPES OF MATERIALS</p> <p style="text-align: right;"><i>page 8</i></p>	<p><u>SERIES 48 Bore & Groove tools</u></p>  <p>APPLICATION: BORE & GROOVE WITH THE SAME TOOL</p> <p style="text-align: right;"><i>page 17</i></p>
<p><u>SERIES 50 Bore & Thread tools</u></p>  <p>APPLICATION: BORE & THREAD WITH THE SAME TOOL</p> <p style="text-align: right;"><i>page 17</i></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;"><i>page 17</i></p>	<p><u>SERIES 59 Drill & bore tools</u></p>  <p>APPLICATION: DRILL & BORE WITH THE SAME TOOL</p> <p style="text-align: right;"><i>page 18</i></p>
<p><u>SERIES 12 Diamond Insert Bars</u></p>  <p>APPLICATION: FOR BORING ALUMINUM</p> <p style="text-align: right;"><i>page 29-30</i></p>	<p><u>SERIES 14 Triangle Insert Bars</u></p>  <p>APPLICATION: ID BORING</p> <p style="text-align: right;"><i>page 24-26</i></p>	<p><u>SERIES 16 Diamond Insert Bars</u></p>  <p>APPLICATION: FOR BORING STEEL</p> <p style="text-align: right;"><i>page 27-28</i></p>
<p><u>SERIES 40 Replacment Heads</u></p>  <p>APPLICATION: HEADS & SCREWS</p> <p style="text-align: right;"><i>page 35</i></p>	<p><u>SERIES 56 Profile tools</u></p>  <p>APPLICATION: I.D. PROFILING</p> <p style="text-align: right;"><i>page 20</i></p>	<p><u>SERIES 56 R.H. offset profile tools</u></p>  <p>APPLICATION: PROFILING</p> <p style="text-align: right;"><i>page 21</i></p>

SERIES 42 Quick Change profile tool



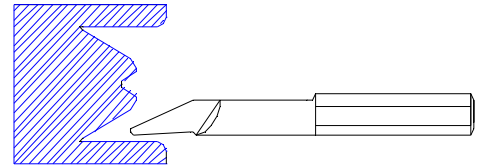
APPLICATION:
PROFILING ALL TYPES
OF MATERIALS *page 9*

SERIES 56 L.H.offset profile tools



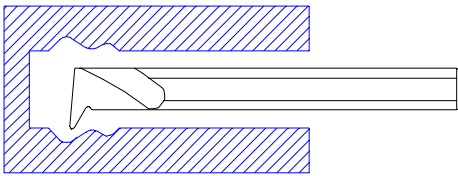
APPLICATION:
LEFT HAND OFFSET PROFILING *page 21*

SERIES 56 Fine point profile tools



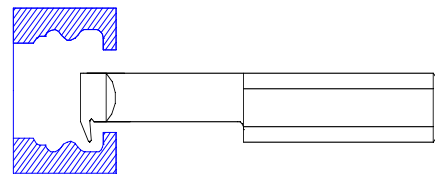
APPLICATION:
FINE POINT PROFILING *page 21*

SERIES 09 Multi-Reach Profile Tools



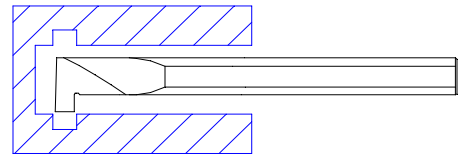
APPLICATION:
DEEP HOLE PROFILING *page 20*

SERIES 56 Reverse Profile tools



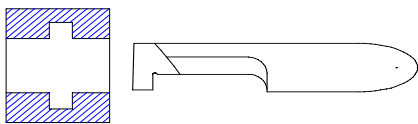
APPLICATION:
I.D. REVERSE PROFILING *page 20*

SERIES 06 Multi-Reach groove tools



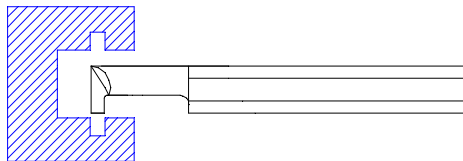
APPLICATION:
DEEP HOLE GROOVING *page 14*

SERIES 42 Quick Change groove tool



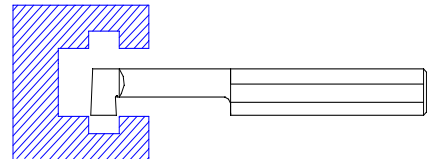
APPLICATION:
GROOVING ALL TYPES
OF MATERIALS *page 9*

SERIES 22 TiAlN coated Max Groove



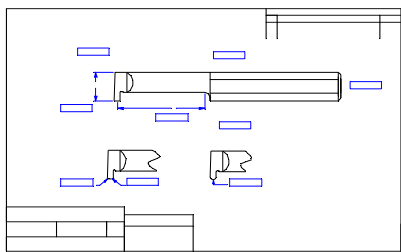
APPLICATION:
GROOVING TOUGH TO MACHINE
MATERIALS. STAINLESS ETC. *page 11*

SERIES 20 Standard grooving tools



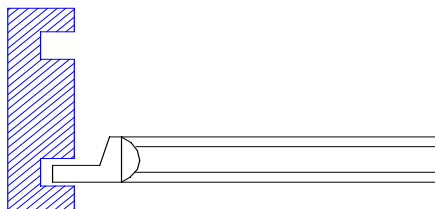
APPLICATION:
GROOVING ALL TYPES OF MATERIAL *page 10*

Groove Tools Made to Order



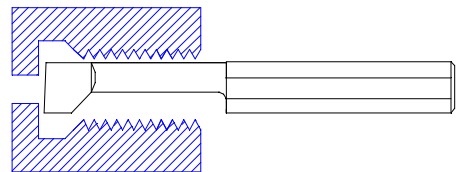
APPLICATION:
SPECIAL GROOVE TOOLS *page 13*

SERIES 73 Face Grooving Tools



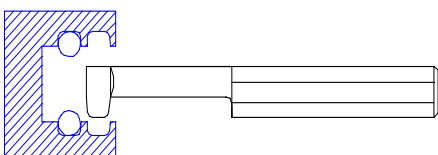
APPLICATION:
FACE GROOVING *page 23*

SERIES 46 Thread relief tools



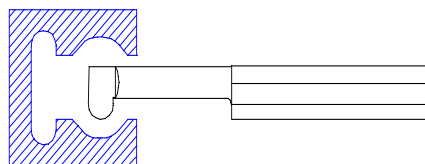
APPLICATION:
BORE A THREAD RELIEF *page 18*

SERIES 27 O-Ring groove tools



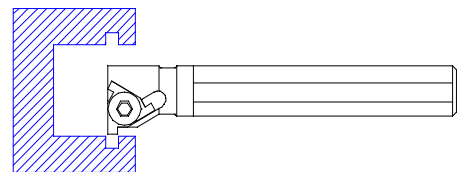
APPLICATION:
GROOVING FOR O'RINGS *page 14*

SERIES 24 Full radius groove tools

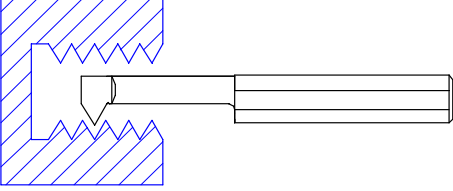
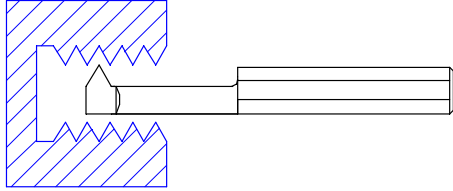
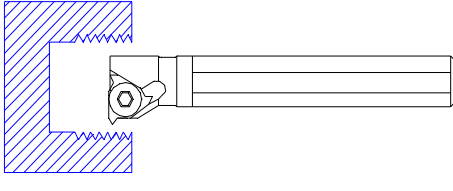
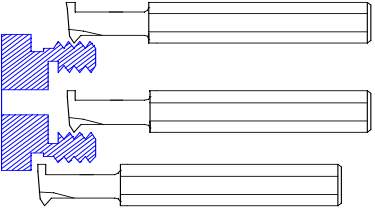
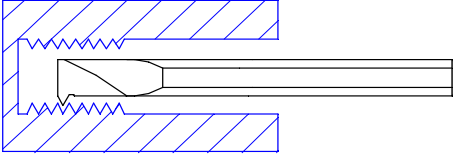
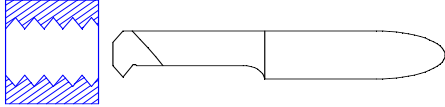
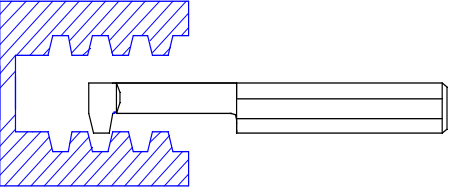


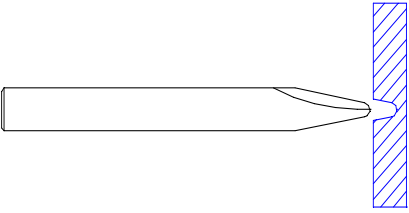
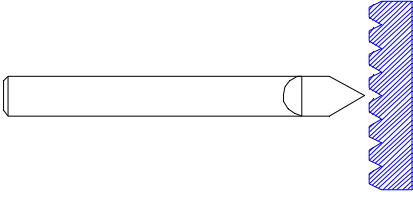
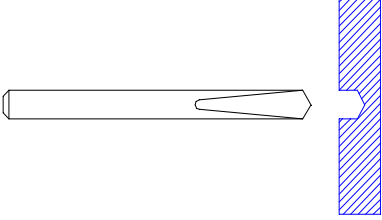
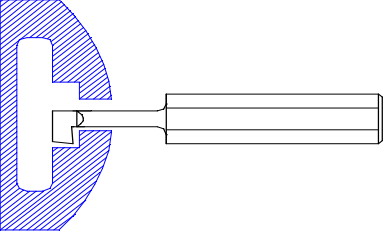
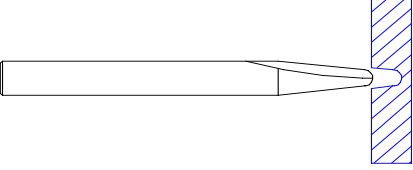




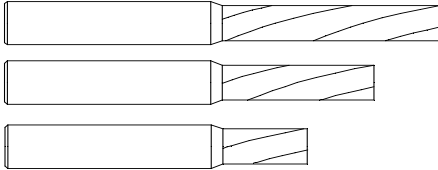
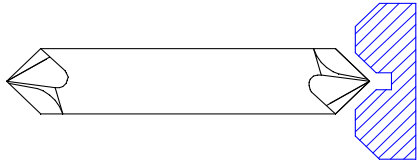
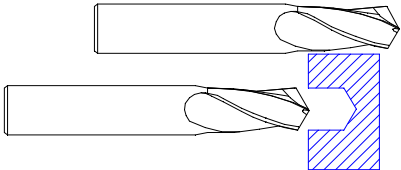
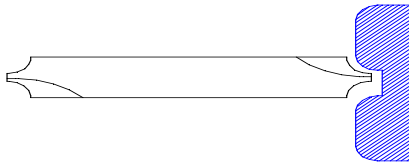
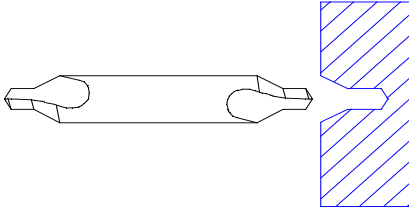
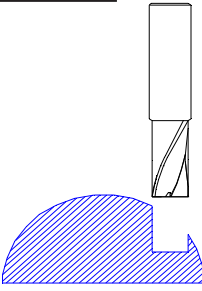
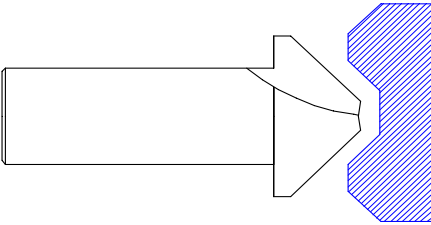
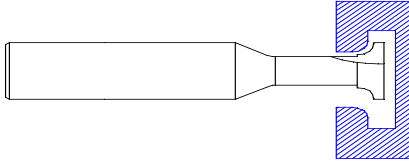
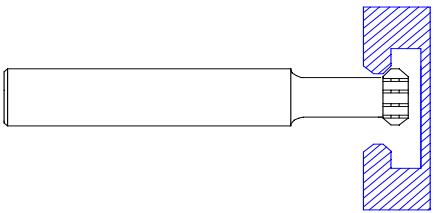
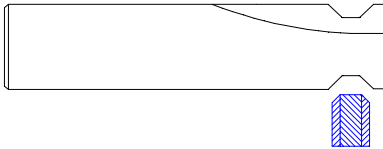
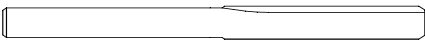
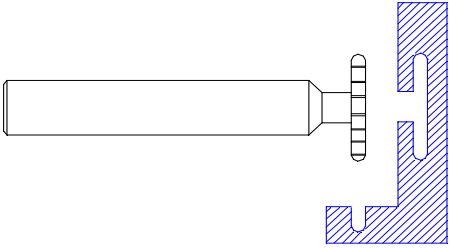
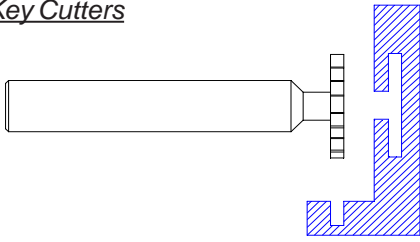
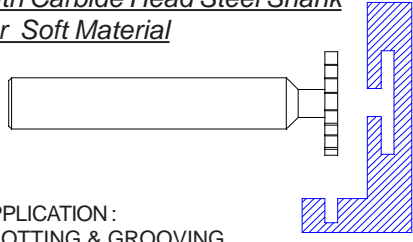
APPLICATION:
GROOVING - PROFILING *page 12*

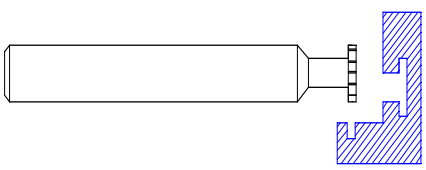
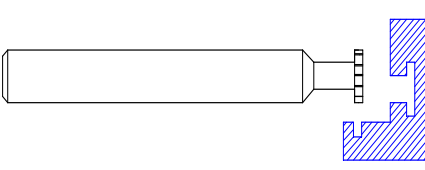
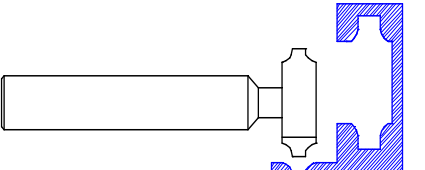
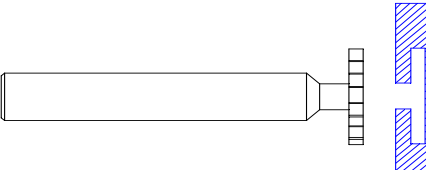
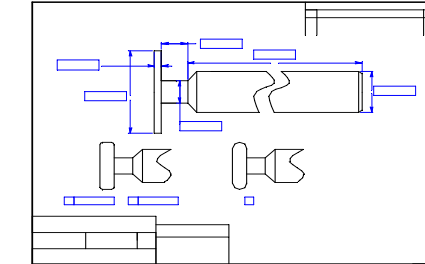
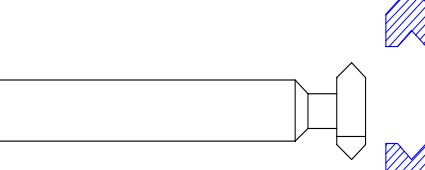
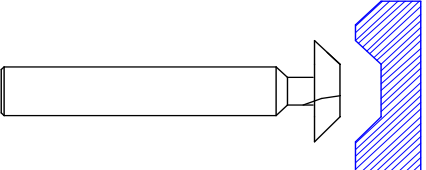
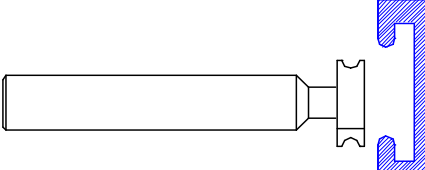
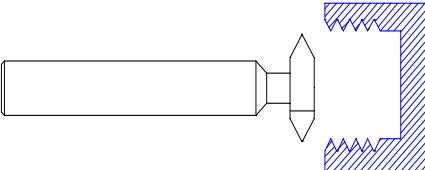
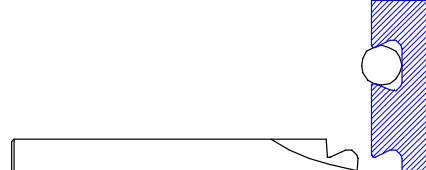
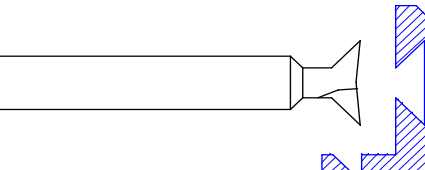
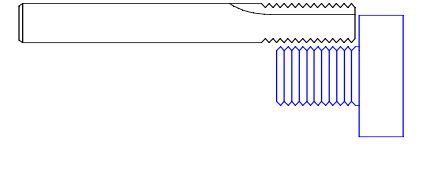
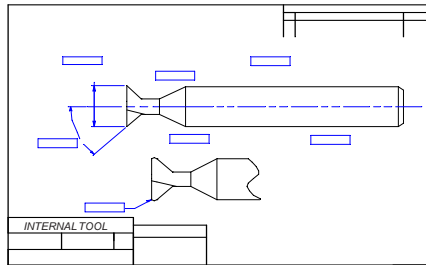
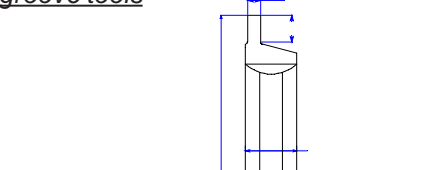
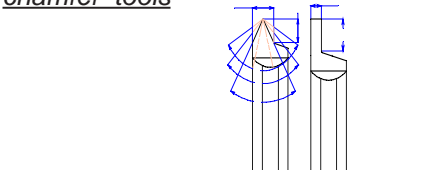
SERIES 26 Insert Grooving Tools



APPLICATION:
INSERT GROOVE TOOL *page 31*

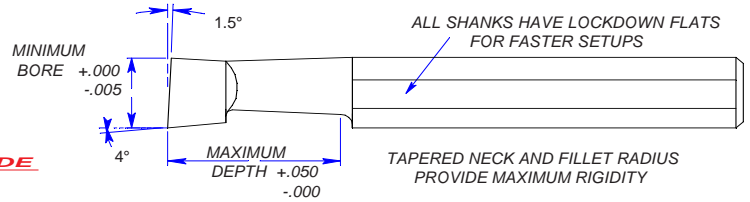
<p><u>SERIES 30 Threading tools</u></p>  <p>APPLICATION: STANDARD I.D. THREADING <i>page 15</i></p>	<p><u>SERIES 31 Left Hand threading tools</u></p>  <p>APPLICATION: LEFT HAND I.D. THREADING <i>page 15</i></p>	<p><u>SERIES 36 Insert Threading Tools</u></p>  <p>APPLICATION: ID INSERT THREADING <i>page 32-34</i></p>
<p><u>SERIES 52 Thread & groove tools</u></p>  <p>APPLICATION: THREAD & GROOVE WITH THE SAME TOOL <i>page 17</i></p>	<p><u>SERIES 08 Multi-Reach threading tools</u></p>  <p>APPLICATION: DEEP HOLE THREADING <i>page 14</i></p>	<p><u>SERIES 42 Quick Change thread tool</u></p>  <p>APPLICATION: THREADING ALL TYPES OF MATERIALS <i>page 8</i></p>
<p><u>SERIES 32 & 34 Acme threading tools</u></p>  <p>APPLICATION: ACME I.D. THREADING <i>page 16</i></p>	<p><u>SERIES 75 Spotting Drills</u></p>  <p>APPLICATION: CENTER DRILLING-C'SINK <i>page 47</i></p>	<p><u>SERIES 63 countersinks</u></p>  <p>APPLICATION: COUNTERSINKING <i>page 37</i></p>
<p><u>SERIES 61 Runner cutters</u></p>  <p>APPLICATION: MACHINING RUNNERS IN MOLDS <i>page 37</i></p>	<p><u>SERIES 62 Engraving tools</u></p>  <p>APPLICATION: ENGRAVING, CHAMFERING, C'SINKING <i>page 36</i></p>	<p><u>SERIES 58 Spade Drills</u></p>  <p>APPLICATION: DRILLING HARD MATERIALS <i>page 47</i></p>
<p><u>SERIES 66 CNC Backspot facers</u></p>  <p>APPLICATION: CNC BACK SPOT FACING <i>page 19</i></p>	<p><u>SERIES 60 Die Sinkers</u></p>  <p>APPLICATION: TAPERED BALL MILLING <i>page 37</i></p>	<p><u>SERIES 69 STUB TAPERS</u></p>  <p>APPLICATION: TAPERED MILLING <i>page 37</i></p>

<p><u>SERIES 21 & 41 micro endmills</u></p>  <p>APPLICATION: MILLING SMALL PARTS <i>page 44</i></p>	<p><u>SERIES 41 Endmills in special lengths and sizes</u></p>  <p>APPLICATION: MILLING SPECIAL PARTS <i>page 45</i></p>	<p><u>SERIES 64 Chamfer Mills</u></p>  <p>APPLICATION: MILLING ANGLES & CHAMFERS <i>page 38-39</i></p>
<p><u>SERIES 49 Drill-Mills</u></p>  <p>APPLICATION: DRILL & MILL WITH THE SAME TOOL <i>page 46</i></p>	<p><u>SERIES 68 Corner Rounders</u></p>  <p>APPLICATION: ROUNDING CORNERS <i>page 40-41</i></p>	<p><u>SERIES 71 Center Drills</u></p>  <p>APPLICATION: CENTER DRILLING <i>page 47</i></p>
<p><u>SERIES 85 N/C C'bores</u></p>  <p>APPLICATION: C'BORING <i>page 65</i></p>	<p><u>SERIES 81 Anglers</u></p>  <p>APPLICATION: MACHINING LARGE ANGLES <i>page 55</i></p>	<p><u>SERIES 67 Reverse Corner Rounders</u></p>  <p>APPLICATION: ROUNDING BACK OR INSIDE CORNERS <i>page 43</i></p>
<p><u>SERIES 65 Edge Breakers</u></p>  <p>APPLICATION: EDGE BREAKING / CHAMFERING <i>page 43</i></p>	<p><u>SERIES 72 double chamfer cutters</u></p>  <p>APPLICATION: chamfering both sides of a plate <i>page 43</i></p>	<p><u>SERIES 93 carbide reamers</u></p>  <p>APPLICATION: reaming <i>page 64</i></p>
<p><u>SERIES 80 Full Radius Key Cutters</u></p>  <p>APPLICATION: FULL RADIUS SLOTS <i>page 56</i></p>	<p><u>SERIES 78 Carbide Head Key Cutters</u></p>  <p>APPLICATION: SLOTTING & GROOVING <i>page 51-52</i></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 <i>page 49</i></p>

<p><u>SERIES 76 Solid Carbide Key Cutters</u></p>  <p>APPLICATION : SLOTTING & GROOVING page 50</p>	<p><u>SERIES 76 Carbide Key Cutters for Soft Material</u></p>  <p>APPLICATION : SLOTTING & GROOVING SOFT MATERIAL ALUMINUM BRASS PLASTIC ETC page 48</p>	<p><u>SERIES 84 Dbl Concave Cutters</u></p>  <p>APPLICATION : RADIUS WORK page 56</p>
<p><u>SERIES 78 3/8 Shank Key Cutters</u></p>  <p>APPLICATION : FOR LIVE TOOLING page 55</p>	<p><u>Carbide Key Cutters Made to Order</u></p>  <p>APPLICATION : SPECIAL CUTTERS page 57</p>	<p><u>SERIES 92 Double Angle Cutters</u></p>  <p>APPLICATION : ANGLES & CHAMFERS page 59</p>
<p><u>SERIES 90 Single Angle Cutters</u></p>  <p>APPLICATION : ANGLE CUTS & CHAMFERS page 55</p>	<p><u>SERIES 82 Concave Rad Key Cutters</u></p>  <p>APPLICATION : RADIUS WORK page 56</p>	<p><u>SERIES 88 Thread Mills</u></p>  <p>APPLICATION : ID & OD THREADING page 62</p>
<p><u>SERIES 51 O-ring Dovetail Cutters</u></p>  <p>APPLICATION : FACE GROOVE DOVETAILS page 58</p>	<p><u>SERIES 86 Dovetail Cutters</u></p>  <p>APPLICATION : DOVETAIL SLOTS & CHAMFERS page 58-59</p>	<p><u>SERIES 89 multiple thread threadmills</u></p>  <p>APPLICATION : MILL MULTIPLE THREADS IN ONE PASS page 63</p>
<p><u>Dovetail Cutters Made to Order</u></p>  <p>APPLICATION : SPECIAL DOVETAILS page 60</p>	<p><u>SERIES 39 external o'ring groove tools</u></p>  <p>APPLICATION : EXTERNAL GROOVE page 10</p>	<p><u>SERIES 39 external groove and chamfer tools</u></p>  <p>APPLICATION : EXTERNAL GROOVE AND CHAMFER page 15</p>

SERIES 10

APPLICATION : BORING ALL TYPES OF MATERIALS



BORING TOOLS made from **ITC 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	
.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	
.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	
	.800	10-1170	B-120-800	
.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	
.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	
	1.000	10-1240	B-160-1000	
.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	
.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	

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	5/16 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	
	1.750	10-1445	B-290-1750	
.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	
.320	1.600	10-1490	B-320-1600	3/8 X 4" O.A.L.
	1.800	10-1495	B-320-1800	
	2.000	10-1500	B-320-2000	
	2.500	10-1505	B-320-2500	
.360	3.000	10-1510	B-320-3000	3/8 X 2-1/2" O.A.L.
	.500	10-1515	B-360-500	
	.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	
.360	1.800	10-1560	B-360-1800	3/8 X 4" O.A.L.
	2.000	10-1565	B-360-2000	
	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	
	3.000	10-1615	B-490-3000	
.490	3.500	10-1620	B-490-3500	1/2 X 6" O.A.L.
	4.000	10-1625	B-490-4000	
	4.500	10-1630	B-490-4500	
	4.500	10-1630	B-490-4500	

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

LOOKING FOR SOMETHING DIFFERENT?

CHECK OUT QUICK CHANGE BORING TOOLS ON PAGE 8



SERIES 11

made from **ITC CARBIDE**

MAX-BORE BORING TOOLS

MINIMUM BORE	ORDER EDP#	TOOL IDENTIFICATION	MAXIMUM DEPTH	RADIUS	SHANK & OVERALL LENGTH
.090	11-1200	MB-090-375	.375	.007	1/8 X 2" O.A.L.
	11-1205	MB-090-500	.500		
.120	11-1300	MB-120-375	.375	.007	1/8 X 2" O.A.L.
	11-1305	MB-120-500	.500		
	11-1310	MB-120-750	.750		
.140	11-1311	MB-140-500	.500	.007	3/16 X 2-1/2" O.A.L.
	11-1312	MB-140-750	.750		
.160	11-1313	MB-160-500	.500	.007	3/16 X 2-1/2" O.A.L.
	11-1314	MB-160-750	.750		
	11-1316	MB-160-1000	1.000		
.180	11-1315	MB-180-375	.375	.007	3/16 X 2-1/2" O.A.L.
	11-1320	MB-180-500	.500		
	11-1325	MB-180-750	.750		
	11-1330	MB-180-1000	1.000		
.200	11-1331	MB-200-375	.375	.007	1/4 X 2-1/2" O.A.L.
	11-1332	MB-200-500	.500		
	11-1333	MB-200-750	.750		
	11-1334	MB-200-1000	1.000		
.240	11-1335	MB-240-500	.500	.007	1/4 X 2-1/2" O.A.L.
	11-1340	MB-240-750	.750		
	11-1345	MB-240-1000	1.000		
	11-1350	MB-240-1250	1.250		
.310	11-1355	MB-310-500	.500	.007	5/16 X 2-1/2" O.A.L.
	11-1360	MB-310-750	.750		
	11-1365	MB-310-1000	1.000		
	11-1370	MB-310-1250	1.250		
	11-1375	MB-310-1500	1.500		
.360	11-1380	MB-360-500	.500	.015	3/8 X 2-1/2" O.A.L.
	11-1385	MB-360-750	.750		
	11-1390	MB-360-1000	1.000		
	11-1395	MB-360-1250	1.250		
	11-1400	MB-360-1500	1.500		
.490	11-1410	MB-490-750	.750	.015	1/2 X 3" O.A.L.
	11-1415	MB-490-1000	1.000		
	11-1420	MB-490-1250	1.250		
	11-1425	MB-490-1500	1.500		

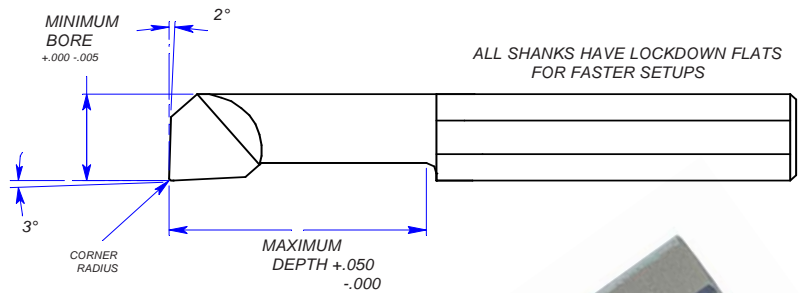
APPLICATION : **BORING TOUGH MATERIALS. STAINLESS, ETC.**

Max-Bore is the Ultimate in boring tools. Featuring an elliptical neck for greater strength. A special helical flute for maximum shearing action with a better finish, and a ALTIN coating for a longer life. Max-Bore outperforms and outlasts our competitors boring tools two to one.

ALTIN COATED

GROUND WITH HELICAL RAKE

ELLIPTICAL NECK FOR GREATER STRENGTH



ALTIN: THE VERY LATEST IN HIGH PERFORMANCE COATING

NEED A HOLDER ?
SEE OUR HOLDERS ON PAGE 19.

NEED A REDUCER BUSHING?
SEE OUR BUSHINGS FOR USE IN
HARDINGE OR CRITERION TYPE HOLDERS PAGE 22

SERIES 04 made from **ITC CARBIDE**

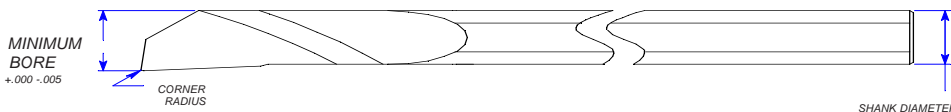
APPLICATION : **MULTI-REACH BORING**

MULTI-REACH BORING TOOLS

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

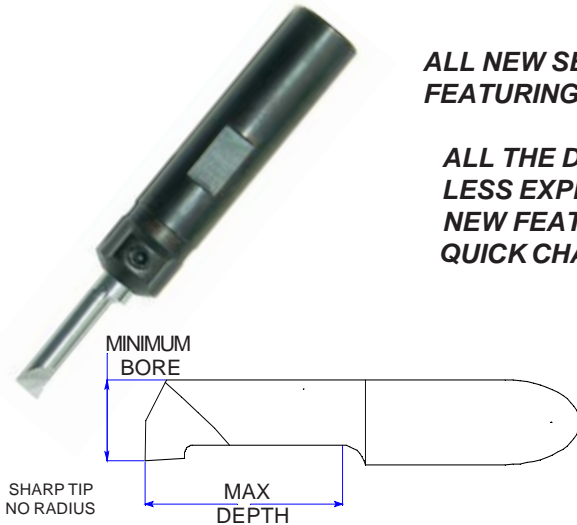
MINIMUM BORE	TOOL IDENTIFICATION	ORDER EDP#	ALTIN COATED ORDER EDP#	SHANK DIAMETER	CORNER RADIUS	SHANK LENGTH
.280	LB-280-4	04-1100	04-1100-C	1/4"	.007	4"
.350	LB-350-4	04-1110	04-1110-C	5/16"	.007	4"
.420	LB-420-6	04-1120	04-1120-C	3/8"	.010	6"
.560	LB-560-6	04-1130	04-1130-C	1/2"	.010	6"
.700	LB-700-6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

SOLID CARBIDE SHANKS PROVIDE MAXIMUM RIDGIDITY.



**ALL NEW SERIES OF TOOLS FROM INTERNAL TOOL
FEATURING A NUMBER OF IMPROVEMENTS ON OUR STANDARD LINES:**

**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**



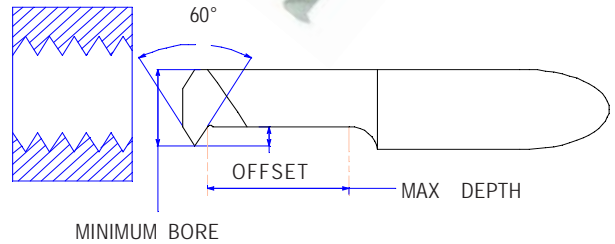
New!



SERIES 42 made from **ITC CARBIDE**

QUICK CHANGE BORING TOOLS

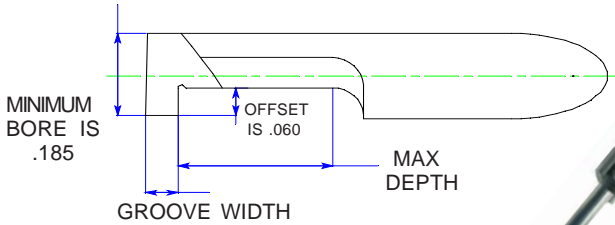
MINIMUM BORE	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#	TOOL IDENTIFICATION
.050	.200	42-1000	42-1000-C	QCBO-050-200
	.300	42-1005	42-1005-C	QCBO-050-300
	.400	42-1010	42-1010-C	QCBO-060-200
.060	.200	42-1015	42-1015-C	QCBO-060-300
	.300	42-1020	42-1020-C	QCBO-060-400
	.500	42-1025	42-1025-C	QCBO-060-500
.080	.200	42-1030	42-1030-C	QCBO-080-200
	.300	42-1035	42-1035-C	QCBO-080-300
	.400	42-1040	42-1040-C	QCBO-080-400
.100	.500	42-1045	42-1045-C	QCBO-080-500
	.200	42-1050	42-1050-C	QCBO-100-200
	.300	42-1055	42-1055-C	QCBO-100-300
.120	.400	42-1060	42-1060-C	QCBO-100-400
	.500	42-1065	42-1065-C	QCBO-100-500
	.600	42-1070	42-1070-C	QCBO-100-600
.140	.700	42-1075	42-1075-C	QCBO-100-700
	.200	42-1080	42-1080-C	QCBO-120-200
	.300	42-1085	42-1085-C	QCBO-120-300
.160	.400	42-1090	42-1090-C	QCBO-120-400
	.500	42-1095	42-1095-C	QCBO-120-500
	.600	42-1100	42-1100-C	QCBO-120-600
.180	.700	42-1105	42-1105-C	QCBO-120-700
	.200	42-1110	42-1110-C	QCBO-140-200
	.300	42-1115	42-1115-C	QCBO-140-300
.200	.400	42-1120	42-1120-C	QCBO-140-400
	.500	42-1125	42-1125-C	QCBO-140-500
	.600	42-1130	42-1130-C	QCBO-140-600
.220	.700	42-1135	42-1135-C	QCBO-140-700
	.200	42-1140	42-1140-C	QCBO-160-200
	.300	42-1145	42-1145-C	QCBO-160-300
.240	.400	42-1150	42-1150-C	QCBO-160-400
	.500	42-1155	42-1155-C	QCBO-160-500
	.600	42-1160	42-1160-C	QCBO-160-600
.260	.700	42-1165	42-1165-C	QCBO-160-700
	.800	42-1170	42-1170-C	QCBO-160-800
	.900	42-1175	42-1175-C	QCBO-160-900
.280	1.000	42-1180	42-1180-C	QCBO-160-1000
	1.100	42-1185	42-1185-C	QCBO-160-1100
	.200	42-1190	42-1190-C	QCBO-180-200
.300	.300	42-1195	42-1195-C	QCBO-180-300
	.400	42-1200	42-1200-C	QCBO-180-400
	.500	42-1205	42-1205-C	QCBO-180-500
.320	.600	42-1210	42-1210-C	QCBO-180-600
	.700	42-1215	42-1215-C	QCBO-180-700
	.800	42-1220	42-1220-C	QCBO-180-800
.340	.900	42-1225	42-1225-C	QCBO-180-900
	1.000	42-1230	42-1230-C	QCBO-180-1000
	1.100	42-1235	42-1235-C	QCBO-180-1100



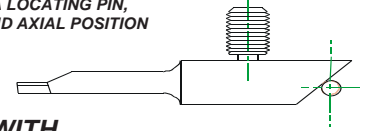
SERIES 42 made from **ITC CARBIDE**

QUICK CHANGE THREADING TOOLS

MINIMUM BORE	OFFSET	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#	TOOL IDENTIFICATION
.060	.025	.200	42-3000	42-3000-C	QCTH-060-200
		.300	42-3005	42-3005-C	QCTH-060-300
.080	.025	.200	42-3010	42-3010-C	QCTH-080-200
		.300	42-3015	42-3015-C	QCTH-080-300
		.400	42-3020	42-3020-C	QCTH-080-400
.100	.030	.500	42-3025	42-3025-C	QCTH-080-500
		.200	42-3030	42-3030-C	QCTH-100-200
		.300	42-3035	42-3035-C	QCTH-100-300
.120	.035	.400	42-3040	42-3040-C	QCTH-100-400
		.500	42-3045	42-3045-C	QCTH-100-500
		.200	42-3050	42-3050-C	QCTH-120-200
.140	.040	.300	42-3055	42-3055-C	QCTH-120-300
		.400	42-3060	42-3060-C	QCTH-120-400
		.500	42-3065	42-3065-C	QCTH-120-500
.160	.045	.200	42-3070	42-3070-C	QCTH-140-200
		.300	42-3075	42-3075-C	QCTH-140-300
		.400	42-3080	42-3080-C	QCTH-140-400
.180	.045	.500	42-3085	42-3085-C	QCTH-140-500
		.600	42-3090	42-3090-C	QCTH-140-600
		.700	42-3095	42-3095-C	QCTH-140-700
.200	.045	.200	42-3100	42-3100-C	QCTH-160-200
		.300	42-3105	42-3105-C	QCTH-160-300
		.400	42-3110	42-3110-C	QCTH-160-400
.220	.045	.500	42-3115	42-3115-C	QCTH-160-500
		.600	42-3120	42-3120-C	QCTH-160-600
		.700	42-3125	42-3125-C	QCTH-160-700
.240	.045	.200	42-3130	42-3130-C	QCTH-180-200
		.300	42-3135	42-3135-C	QCTH-180-300
		.400	42-3140	42-3140-C	QCTH-180-400
.260	.045	.500	42-3145	42-3145-C	QCTH-180-500
		.600	42-3150	42-3150-C	QCTH-180-600
		.700	42-3155	42-3155-C	QCTH-180-700



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



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

SERIES 42 made from **ITC CARBIDE**

QUICK CHANGE GROOVING TOOLS

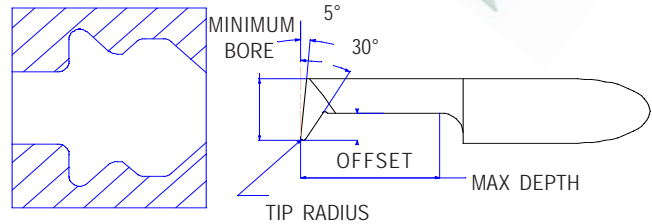
STANDARD STYLE

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

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**

EXTRA SCREW EDP# 42-8888



GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTiN COATED EDP#	TOOL IDENTIFICATION
.018	.200	42-7000	42-7000-C	QCGV-018-200
	.300	42-7005	42-7005-C	QCGV-018-300
	.400	42-7010	42-7010-C	QCGV-018-400
	.500	42-7015	42-7015-C	QCGV-018-500
	.600	42-7020	42-7020-C	QCGV-018-600
	.700	42-7025	42-7025-C	QCGV-018-700
.029	.200	42-7030	42-7030-C	QCGV-029-200
	.300	42-7035	42-7035-C	QCGV-029-300
	.400	42-7040	42-7040-C	QCGV-029-400
	.500	42-7045	42-7045-C	QCGV-029-500
	.600	42-7050	42-7050-C	QCGV-029-600
	.700	42-7055	42-7055-C	QCGV-029-700
.032	.200	42-7060	42-7060-C	QCGV-032-200
	.300	42-7065	42-7065-C	QCGV-032-300
	.400	42-7070	42-7070-C	QCGV-032-400
	.500	42-7075	42-7075-C	QCGV-032-500
	.600	42-7080	42-7080-C	QCGV-032-600
	.700	42-7085	42-7085-C	QCGV-032-700
.033	.200	42-7090	42-7090-C	QCGV-033-200
	.300	42-7095	42-7095-C	QCGV-033-300
	.400	42-7100	42-7100-C	QCGV-033-400
	.500	42-7105	42-7105-C	QCGV-033-500
	.600	42-7110	42-7110-C	QCGV-033-600
	.700	42-7115	42-7115-C	QCGV-033-700
.039	.200	42-7120	42-7120-C	QCGV-039-200
	.300	42-7125	42-7125-C	QCGV-039-300
	.400	42-7130	42-7130-C	QCGV-039-400
	.500	42-7135	42-7135-C	QCGV-039-500
	.600	42-7140	42-7140-C	QCGV-039-600
	.700	42-7145	42-7145-C	QCGV-039-700
.040	.200	42-7150	42-7150-C	QCGV-040-200
	.300	42-7155	42-7155-C	QCGV-040-300
	.400	42-7160	42-7160-C	QCGV-040-400
	.500	42-7165	42-7165-C	QCGV-040-500
	.600	42-7170	42-7170-C	QCGV-040-600
	.700	42-7175	42-7175-C	QCGV-040-700
.046	.200	42-7180	42-7180-C	QCGV-046-200
	.300	42-7185	42-7185-C	QCGV-046-300
	.400	42-7190	42-7190-C	QCGV-046-400
	.500	42-7195	42-7195-C	QCGV-046-500
	.600	42-7200	42-7200-C	QCGV-046-600
	.700	42-7205	42-7205-C	QCGV-046-700
.048	.200	42-7210	42-7210-C	QCGV-048-200
	.300	42-7215	42-7215-C	QCGV-048-300
	.400	42-7220	42-7220-C	QCGV-048-400
	.500	42-7225	42-7225-C	QCGV-048-500
	.600	42-7230	42-7230-C	QCGV-048-600
	.700	42-7235	42-7235-C	QCGV-048-700
.056	.200	42-7240	42-7240-C	QCGV-056-200
	.300	42-7245	42-7245-C	QCGV-056-300
	.400	42-7250	42-7250-C	QCGV-056-400
	.500	42-7255	42-7255-C	QCGV-056-500
	.600	42-7260	42-7260-C	QCGV-056-600
	.700	42-7265	42-7265-C	QCGV-056-700
.062	.200	42-7270	42-7270-C	QCGV-062-200
	.300	42-7275	42-7275-C	QCGV-062-300
	.400	42-7280	42-7280-C	QCGV-062-400
	.500	42-7285	42-7285-C	QCGV-062-500
	.600	42-7290	42-7290-C	QCGV-062-600
	.700	42-7295	42-7295-C	QCGV-062-700

SERIES 42 made from **ITC CARBIDE**

QUICK CHANGE PROFILE TOOLS

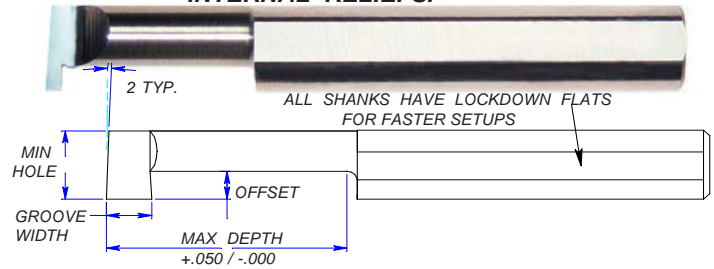
MINIMUM BORE	TIP RADIUS	OFFSET	MAX DEPTH	ORDER EDP#	ALTiN COATED EDP#	TOOL IDENTIFICATION
.080	.005	.040	.200	42-5000	42-5000-C	QCPR-080-200
			.300	42-5005	42-5005-C	QCPR-080-300
.100	.005	.040	.200	42-5010	42-5010-C	QCPR-100-200
			.300	42-5015	42-5015-C	QCPR-100-300
.120	.007	.050	.200	42-5020	42-5020-C	QCPR-120-200
			.300	42-5025	42-5025-C	QCPR-120-300
			.400	42-5030	42-5030-C	QCPR-120-400
			.500	42-5035	42-5035-C	QCPR-120-500
			.600	42-5040	42-5040-C	QCPR-120-600
			.700	42-5045	42-5045-C	QCPR-120-700
.140	.007	.050	.200	42-5050	42-5050-C	QCPR-140-200
			.300	42-5055	42-5055-C	QCPR-140-300
			.400	42-5060	42-5060-C	QCPR-140-400
			.500	42-5065	42-5065-C	QCPR-140-500
			.600	42-5070	42-5070-C	QCPR-140-600
			.700	42-5075	42-5075-C	QCPR-140-700
.160	.007	.060	.200	42-5080	42-5080-C	QCPR-160-200
			.300	42-5085	42-5085-C	QCPR-160-300
			.400	42-5090	42-5090-C	QCPR-160-400
			.500	42-5095	42-5095-C	QCPR-160-500
			.600	42-5100	42-5100-C	QCPR-160-600
			.700	42-5105	42-5105-C	QCPR-160-700
.180	.007	.080	.200	42-5110	42-5110-C	QCPR-180-200
			.300	42-5115	42-5115-C	QCPR-180-300
			.400	42-5120	42-5120-C	QCPR-180-400
			.500	42-5125	42-5125-C	QCPR-180-500
			.600	42-5130	42-5130-C	QCPR-180-600
			.700	42-5135	42-5135-C	QCPR-180-700

SERIES 20 made from **ITC CARBIDE**

GROOVING TOOLS

MIN BORE	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	
		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	X	
		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	O.A.L.	
		3/8	20-1205	G-064-6			
		1/2	20-1210	G-064-8			
		5/8	20-1215	G-064-10			
3/16	.017/.018	1/4	20-1220	G-018-4	.050	3/16	
		3/8	20-1225	G-018-6			
		1/2	20-1230	G-018-8			
		5/8	20-1235	G-018-10			
	.025/.026	1/4	20-1240	G-026-4			X
		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			2-1/2
		3/8	20-1265	G-031-6			
		1/2	20-1270	G-031-8			
		5/8	20-1275	G-031-10			
.062/.063	1/4	20-1280	G-061-4	O.A.L.			
	3/8	20-1285	G-061-6				
	1/2	20-1290	G-061-8				
	5/8	20-1295	G-061-10				
1/4	.017/.018	1/4	20-1300	G-017-4	.050	1/4	
		3/8	20-1305	G-017-6			
		1/2	20-1310	G-017-8			
		5/8	20-1315	G-017-10			
	.025/.026	1/4	20-1320	G-025-4			X
		3/8	20-1325	G-025-6			
		1/2	20-1330	G-025-8			
		5/8	20-1335	G-025-10			
	.030/.031	1/4	20-1340	G-030-4			2-1/2
		3/8	20-1345	G-030-6			
		1/2	20-1350	G-030-8			
		5/8	20-1355	G-030-10			
.062/.064	3/8	20-1356	G-060-6	O.A.L.			
	1/2	20-1357	G-060-8				
	5/8	20-1358	G-060-10				
5/16	.033/.034	1/4	20-1360	G-033-4	.100	5/16	
		3/8	20-1365	G-033-6			
		1/2	20-1370	G-033-8			
		3/4	20-1375	G-033-12			
	.038/.039	1/4	20-1380	G-038-4			X
		3/8	20-1385	G-038-6			
		1/2	20-1390	G-038-8			
		3/4	20-1395	G-038-12			
	.062/.064	1/2	20-1400	G-063-8			2-1/2
		3/4	20-1405	G-063-12			
		1"	20-1410	G-063-16			
.093/.095	1/2	20-1415	G-094-8	O.A.L.			
	3/4	20-1420	G-094-12				
	1"	20-1425	G-094-16				
3/8	.039/.041	1/4	20-1430	G-039-4	.100	3/8	
		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			
	.046/.048	1-1/4	20-1455	G-039-20			
		1/4	20-1460	G-046-4			X
		3/8	20-1465	G-046-6			
		1/2	20-1470	G-046-8			
		3/4	20-1475	G-046-12			
	.055/.057	1"	20-1480	G-046-16			
		1-1/4	20-1485	G-046-20			
1/4		20-1490	G-055-4	O.A.L.			
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					
.062/.064	1-1/4	20-1515	G-055-20				
	1/4	20-1520	G-062-4	.100			
	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					

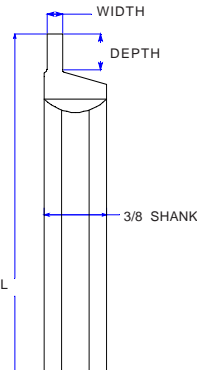
APPLICATION : **FOR RETAINING RING GROOVES & INTERNAL RELIEFS.**



MIN BORE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH	
3/8 CONT.	.069/.071	1/4	20-1550	G-069-4	.100	3/8	
		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			
	.087/.089	1/4	20-1580	G-087-4			X
		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	O.A.L.			
	3/4	20-1615	G-095-12				
	1"	20-1620	G-095-16				
.125/.127	1/2	20-1625	G-126-8	.150			
	3/4	20-1630	G-126-12				
	1"	20-1635	G-126-16				
1/2	.093/.095	1/2	20-1640	G-093-8	.150	1/2	
		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			X
		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"			
	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	O.A.L.			
	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	.150			
	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				

SERIES 39 EXTERNAL RETAINING RING 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



SEE HOLDERS ON PAGE 19

SERIES 22 made from **ITC CARBIDE**

APPLICATION: **FOR INTERNAL GROOVING AND RELIEVING**

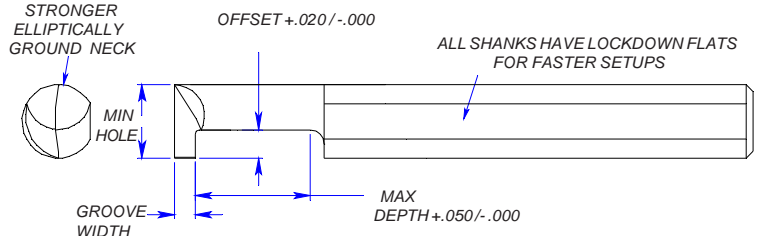
Max-groove is the Ultimate in grooving tools. Featuring an elliptical neck for greater strength, a special top rake for maximum shearing action with a better finish, and a **ALTIN** coating for a longer life. Max-Groove outperforms and outlasts our competitors groove tools two to one.

MAX-GROOVE GROOVING TOOLS

MIN BORE	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			
	5/8	22-1195	MG-25-094-625			
.125/.127	1/4	22-1200	MG-25-125-250			
	3/8	22-1205	MG-25-125-375			
	1/2	22-1210	MG-25-125-500			
	5/8	22-1215	MG-25-125-625			
	1"	22-1220	MG-25-125-750			
5/16	.033/.034	1/4	22-1220	MG-31-033-250	.100	5/16 X 2-1/2 O.A.L.
		3/8	22-1225	MG-31-033-375		
		1/2	22-1230	MG-31-033-500		
		5/8	22-1235	MG-31-033-625		
	.038/.039	1/4	22-1240	MG-31-038-250		
		3/8	22-1245	MG-31-038-375		
		1/2	22-1250	MG-31-038-500		
	.062/.064	1/2	22-1260	MG-31-063-500		
		3/4	22-1265	MG-31-063-750		
		1"	22-1270	MG-31-063-1000		
.093/.095	1/2	22-1275	MG-31-094-500			
	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			
	1/4	22-1305	MG-37-039-250			
	3/8	22-1310	MG-37-039-375			
3/8	.039/.041	1/2	22-1315	MG-37-039-500	.100	3/8 X 2-1/2 O.A.L.
		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			
.062/.064	1-1/4	22-1390	MG-37-055-1250			
	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			



ALTIN: THE VERY LATEST IN HIGH PERFORMANCE COATING



MIN BORE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	OFFSET	SHANK
3/8 CONT.	.069/.071	1/4	22-1425	MG-37-069-250	.100	3/8 X 2-1/2 O.A.L.
		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		
.093/.095	1"	22-1475	MG-37-087-1000			
	1-1/4	22-1480	MG-37-087-1250			
	1/2	22-1485	MG-37-094-500			
.125/.127	3/4	22-1490	MG-37-094-750			
	1"	22-1495	MG-37-094-1000			
	1/2	22-1500	MG-37-125-500			
1/2	.062/.064	3/4	22-1505	MG-37-125-750	.150	1/2 X 3" O.A.L.
		1"	22-1510	MG-37-125-1000		
		1/2	22-1515	MG-50-063-500		
		3/4	22-1520	MG-50-063-750		
		1"	22-1525	MG-50-063-1000		
	.093/.095	1-1/4	22-1530	MG-50-063-1250		
		1-1/2	22-1535	MG-50-063-1500		
		1/2	22-1540	MG-50-094-500		
		3/4	22-1545	MG-50-094-750		
		1"	22-1550	MG-50-094-1000		
.125/.127	1-1/4	22-1555	MG-50-094-1250			
	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			
	1"	22-1600	MG-50-156-1000			
.187/.189	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			
	3/4	22-1620	MG-50-187-750			
	1"	22-1625	MG-50-187-1000			
.250/.252	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			

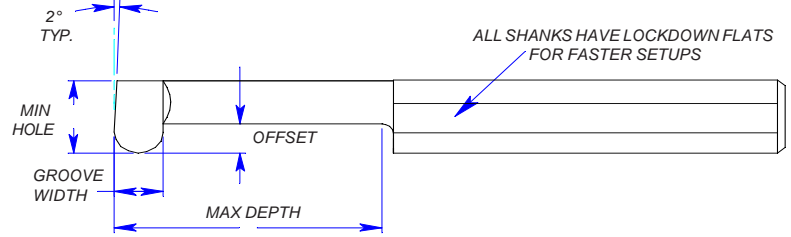
SERIES 24 made from **ITC CARBIDE**



FULL RADIUS GROOVING TOOLS

MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTN 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			
		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			
		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			
		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			
		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			
		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
3/8	.039	3/4	24-1420	24-1420-C	R-094-12	.100	3/8 X 2-1/2 O.A.L.	
		1"	24-1425	24-1425-C	R-094-16			
		1/4	24-1430	24-1430-C	R-039-4			
		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			
		3/4	24-1445	24-1445-C	R-039-12			
		1"	24-1450	24-1450-C	R-039-16			
	.046	1-1/4	24-1455	24-1455-C	R-039-2			
		1/4	24-1460	24-1460-C	R-046-4			
		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				
	1-1/4	24-1485	24-1485-C	R-046-20				
	1/4	24-1490	24-1490-C	R-055-4				
.055	3/8	24-1495	24-1495-C	R-055-6				
	1/2	24-1500	24-1500-C	R-055-8				
	3/4	24-1505	24-1505-C	R-055-12				
	1"	24-1510	24-1510-C	R-055-16				
.057	1-1/4	24-1515	24-1515-C	R-055-20				
	1/4	24-1520	24-1520-C	R-062-4				
	3/8	24-1525	24-1525-C	R-062-6				
	1/2	24-1530	24-1530-C	R-062-8				
.062	3/4	24-1535	24-1535-C	R-062-12				
	1"	24-1540	24-1540-C	R-062-16				
	1-1/4	24-1545	24-1545-C	R-062-20				
	1/4	24-1550	24-1550-C	R-069-4				
.069	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				
	1"	24-1570	24-1570-C	R-069-16				
.071	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				
	1/2	24-1590	24-1590-C	R-087-8				
.087	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				
	1/2	24-1610	24-1610-C	R-095-8				
.093	3/4	24-1615	24-1615-C	R-095-12				
	1"	24-1620	24-1620-C	R-095-16				
	1/2	24-1625	24-1625-C	R-126-8				
	3/4	24-1630	24-1630-C	R-126-12				
.125	1"	24-1635	24-1635-C	R-126-16				
	1"	24-1635	24-1635-C	R-126-16				

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



MIN HOLE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTN COATED EDP#	TOOL ID	OFFSET	SHANK & OVERALL LENGTH
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			
.189	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			
.250	1-1/2	24-1760	24-1760-C	R-250-24			
	1-1/2	24-1760	24-1760-C	R-250-24			

made from

ITC CARBIDE

APPLICATION :

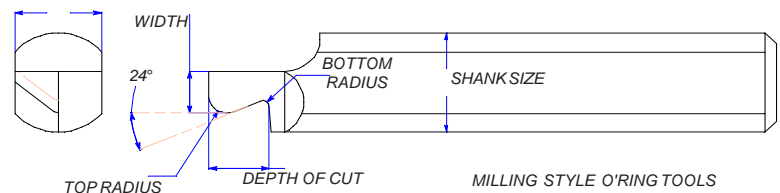
USED TO CUT-TURN 24° O-RING DOVETAILS. THEY CUT WITH BOTH TOP & BOTTOM RADIUS.

SERIES 53

O-RING DOVETAIL GROOVERS

O-RING SIZE	WIDTH	EDP NUMBER	DEPTH OF CUT	BOTTOM RADIUS	TOP RADIUS	SHANK DIA.x LGTH
.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

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



MILLING STYLE O-RING TOOLS ARE ON PAGE 58

REVISIONS:

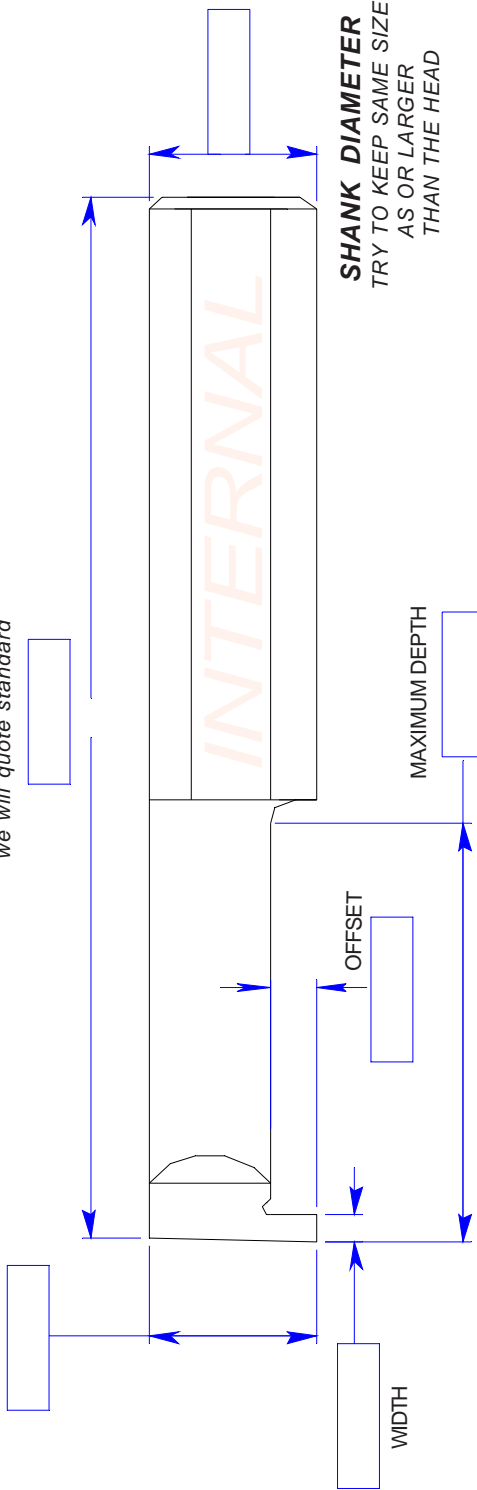
Simply make a copy
fill in the information below and fax or email to us. fax # 909-392-2627
we will quote as soon as possible. INFO@internaltool.com

MAJOR DIAMETER

Try to keep same size
as shank or smaller

OVERALL LENGTH

If not sure leave blank
we will quote standard

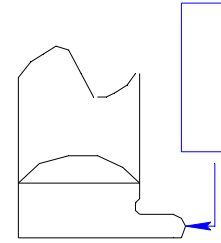


SHANK DIAMETER
TRY TO KEEP SAME SIZE
AS OR LARGER
THAN THE HEAD

Quote in quantities of ?

THE MORE YOU BUY
THE CHEAPER THEY GET

QUANTITY: _____



FULL RADIUS
YES OR NO?

RADIUS SHANK SIDE

RADIUS FRONT SIDE

YOUR COMPANY NAME: _____

CONTACT: _____

PHONE: _____

FAX: _____

YOUR DISTRIBUTOR: _____

INTERNAL TOOL

DRAWN BY: _____

DATE: _____

REV: _____

TOOL NUMBER: _____

TOLERANCE UNLESS
OTHERWISE SPECIFIED

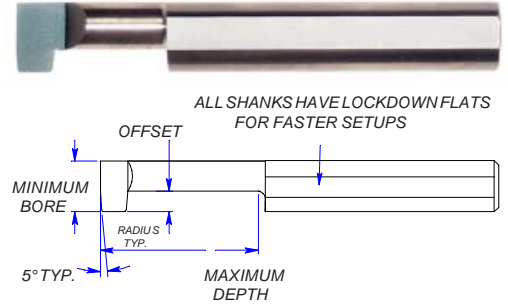
- .X = +/- 1/32
- .XX = +/- .010
- .XXX = +/- .002
- .XXXX = +/- .0005
- ANGLES +/- 0.15°

SERIES 27 *made from ITC CARBIDE*

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

O-RING GROOVE TOOLS

MINIMUM BORE	GROOVE WIDTH	MAX DEPTH	ORDER EDP#	ALTIN COATED EDP#	TOOL ID	OFFSET	CORNER RADIUS	SHANK
.250	.096/.098	.500	27-1300	27-1300-C	O-096-8	.100	.010/.020	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	.115	.010/.020	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	



SERIES 06 *made from ITC CARBIDE*

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

MULTI-REACH GROOVING TOOLS

MINIMUM BORE	TOOL I.D.	GROOVE WIDTH	ORDER EDP#	ALTIN 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 08 *made from ITC CARBIDE*

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

MULTI-REACH THREADING TOOLS

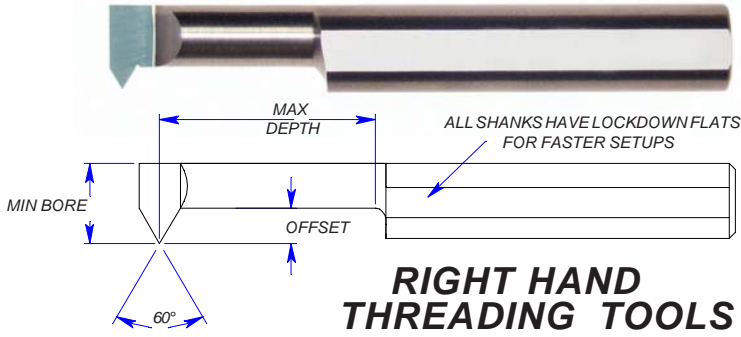
MINIMUM BORE	TOOL I.D.	ORDER EDP#	ALTIN EDP#	OFFSET	LARGEST PITCH	SHANK DIAMETER	SHANK LENGTH
.310	LT-310-4	08-1500	08-1500-C	.060	16	1/4"	4"
.375	LT-375-4	08-1505	08-1505-C	.060	16	5/16"	4"
.460	LT-460-6	08-1510	08-1510-C	.080	11	3/8"	6"
.610	LT-610-6	08-1515	08-1515-C	.100	9	1/2"	6"
.750	LT-750-6	08-1520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

CARBIDE SHANKS PROVIDE MAXIMUM RIDGIDITY.



APPLICATION : **RIGHT HAND ID THREADING**

SERIES 30 made from **ITC CARBIDE**

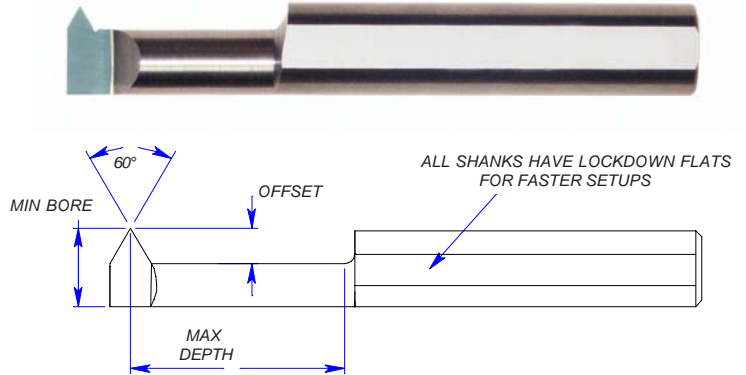


RIGHT HAND THREADING TOOLS

MIN BORE	MAX DEPTH	ORDER EDP#	ALTiN 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	.400	30-1399	30-1399-C	T-160-1000	.040	1/4 X 2-1/2 O.A.L.
	.500	30-1400	30-1400-C	T-180-350		
	.750	30-1405	30-1405-C	T-180-500		
.200	.750	30-1410	30-1410-C	T-180-750	.040	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		
.200	.600	30-1425	30-1425-C	T-200-600	.045	1/4 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		
.230	.400	30-1440	30-1440-C	T-230-400	.055	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		
.230	1.000	30-1455	30-1455-C	T-230-1000	.055	5/16 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		
.290	1.500	30-1482	30-1482-C	T-290-1500	.070	5/16 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		
	.500	30-1515	30-1515-C	T-360-500		
.360	.750	30-1520	30-1520-C	T-360-750	.085	3/8 X 2-1/2 O.A.L.
	1.000	30-1525	30-1525-C	T-360-1000		
	1.250	30-1530	30-1530-C	T-360-1250		
.360	1.500	30-1532	30-1532-C	T-360-1500	.085	3/8 X 2-1/2 O.A.L.
	1.800	30-1535	30-1535-C	T-360-1800		
	.750	30-1540	30-1540-C	T-490-750		
.490	1.000	30-1542	30-1542-C	T-490-1000	.120	1/2 X 3" O.A.L.
	1.500	30-1545	30-1545-C	T-490-1500		
	2.000	30-1550	30-1550-C	T-490-2000		

APPLICATION : **LEFT HAND AND OD THREADING**

SERIES 31 made from **ITC CARBIDE**

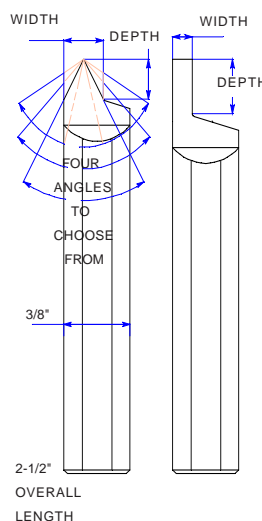


LEFT HAND THREADING TOOLS

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 O.A.L.
	.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 O.A.L.
	.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 O.A.L.
	.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 O.A.L.
	.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 O.A.L.
	.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 O.A.L.
	.750	31-1280	TL-360-750		
	1.000	31-1285	TL-360-1000		

SERIES 39

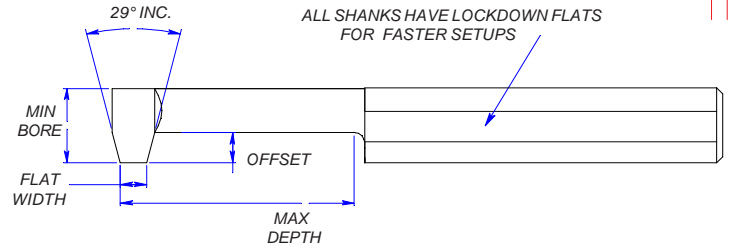
EXTERNAL THREAD / GROOVE / CHAMFER TOOLS



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
0°	.031	.094	GROOVE	39-1020	EX-031-GRV
0°	.062	.188	GROOVE	39-1025	EX-062-GRV
0°	.094	.281	GROOVE	39-1030	EX-094-GRV
0°	.125	.375	GROOVE	39-1035	EX-125-GRV

SEE HOLDERS ON PAGE 19

SERIES 32-34 APPLICATION : ACME ID THREADING



SERIES 32 made from **ITC CARBIDE**

ACME THREADING TOOLS

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

SERIES 34 made from **ITC CARBIDE**

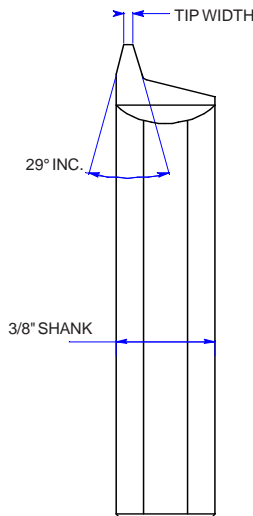
STUB ACME THREADING TOOLS

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

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



SEE HOLDERS ON PAGE 19

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

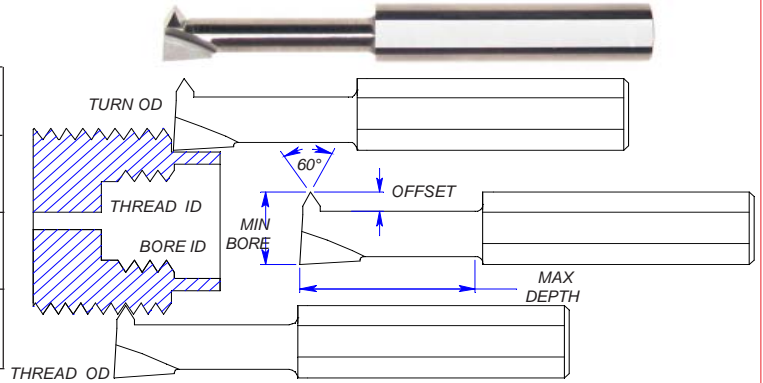


SERIES 50 made from **ITC CARBIDE**

APPLICATION : BORING & THREADING WITH THE SAME TOOL.

COMBINATION BORE & THREAD

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



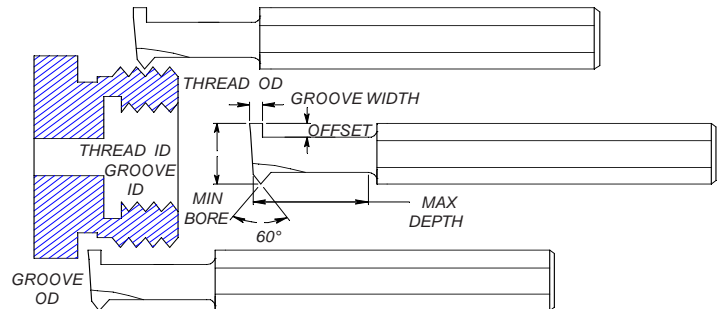
SERIES 52 made from **ITC CARBIDE**

APPLICATION : THREADING & GROOVING WITH THE SAME TOOL.

PLEASE SPECIFY GROOVE WIDTH WHEN ORDERING

COMBINATION THREAD & GROOVE

MIN BORE	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	GROOVE WIDTH	OFFSET	SHANK
1/4	.500 .750 1.000	52-1100 52-1105 52-1110	TG-240-500 TG-240-750 TG-240-1000	3/32 MAX	.050	1/4 X 2-1/2 O.A.L.
5/16	.500 .750 1.000	52-1115 52-1120 52-1125	TG-310-500 TG-310-750 TG-310-1000	1/8 MAX	.060	5/16 X 2-1/2 O.A.L.
3/8	.500 .750 1.000	52-1130 52-1135 52-1140	TG-360-500 TG-360-750 TG-360-1000	5/32 MAX	.080	3/8 X 2-1/2 O.A.L.



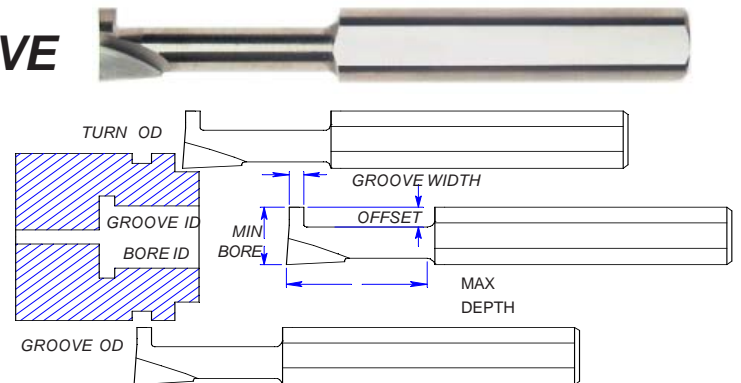
SERIES 48 made from **ITC CARBIDE**

APPLICATION : BORING & GROOVING WITH THE SAME TOOL.

PLEASE SPECIFY GROOVE WIDTH WHEN ORDERING

COMBINATION BORE & GROOVE

MIN BORE	MAX DEPTH	ORDER EDP#	TOOL IDENTIFICATION	GROOVE WIDTH	OFFSET	SHANK
1/4	.500 .750 1.000	48-1100 48-1105 48-1110	BG-240-500 BG-240-750 BG-240-1000	3/32 MAX	.050	1/4 X 2-1/2 O.A.L.
5/16	.500 .750 1.000	48-1115 48-1120 48-1125	BG-310-500 BG-310-750 BG-310-1000	1/8 MAX	.060	5/16 X 2-1/2 O.A.L.
3/8	.500 .750 1.000	48-1130 48-1135 48-1140	BG-360-500 BG-360-750 BG-360-1000	5/32 MAX	.080	3/8 X 2-1/2 O.A.L.



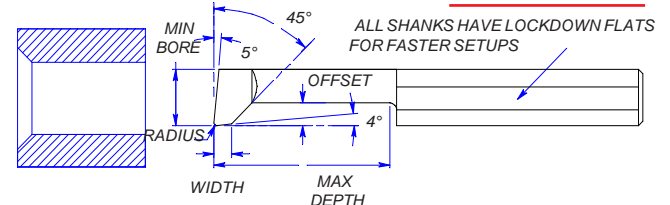
SERIES 55

BORE & BACK CHAMFER TOOLS

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

APPLICATION :

**BORING
RELIEVING
PROFILING
BORE & REMOVE BURR ON
BACKSIDE OF A HOLE**

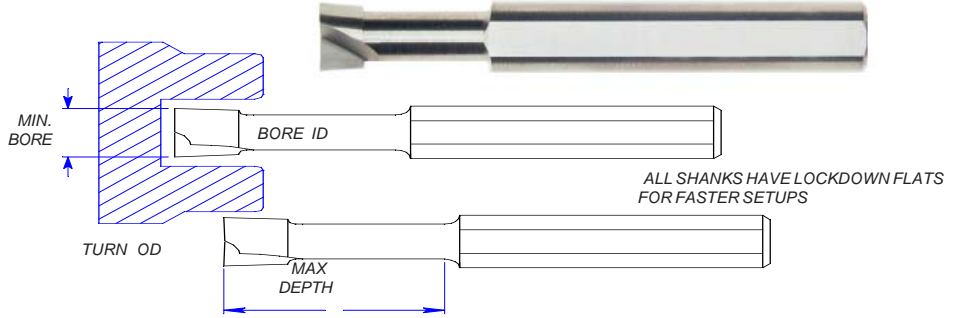


SERIES 54 DOUBLE EDGE BORING TOOL

made from **ITC CARBIDE**

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

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

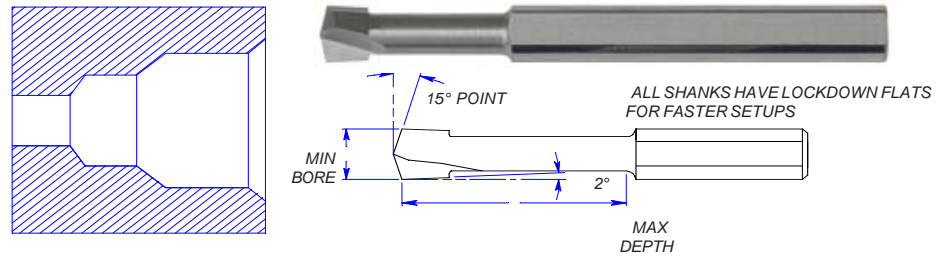


SERIES 59 DRILL & BORE TOOL

made from **ITC CARBIDE**

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

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

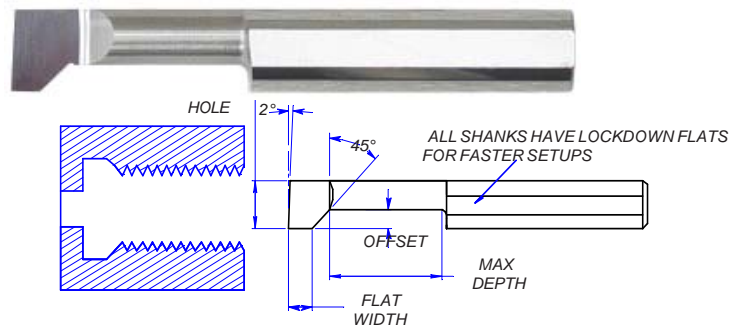


SERIES 46 THREAD RELIEF TOOLS

made from **ITC CARBIDE**

APPLICATION : BORE A THREAD RELIEF HELPS PREVENT THREAD TOOL BREAKAGE.

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

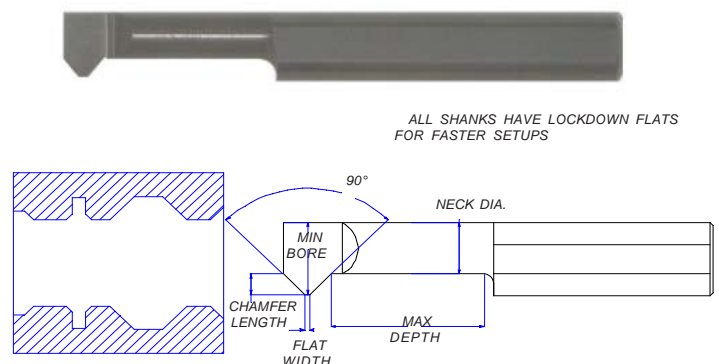


SERIES 43 LATHE I.D. CHAMFER TOOLS

made from **ITC CARBIDE**

APPLICATION : INSIDE CHAMFERS

MIN BORE	MAX DEPTH	FLAT WIDTH	CHAMFER LENGTH	NECK DIA.	ORDER EDP#	TOOL IDENTIFICATION	SHANK
.115	.500	.030	.040	.075	43-2000	LA-115-500	1/8 X 2"
	.750	.030	.040	.075	43-2005	LA-115-750	O.A.L.
.175	.750	.030	.050	.125	43-2010	LA-175-750	3/16 X 2-1/2
	1.00	.030	.050	.125	43-2015	LA-175-1000	O.A.L.
.240	.750	.030	.070	.170	43-2020	LA-240-750	1/4 X 2-1/2
	1.250	.030	.070	.170	43-2025	LA-240-1250	O.A.L.
.300	.750	.030	.090	.210	43-2030	LA-300-750	5/16 X 2-1/2
	1.250	.030	.090	.210	43-2035	LA-300-1250	O.A.L.
.360	.750	.030	.110	.250	43-2040	LA-360-750	3/8 X 2-1/2
	1.250	.030	.110	.250	43-2045	LA-360-1250	O.A.L.
.490	1.000	.030	.140	.350	43-2050	LA-490-1000	1/2 X 3"
	1.500	.030	.140	.350	43-2055	LA-490-1500	O.A.L.



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

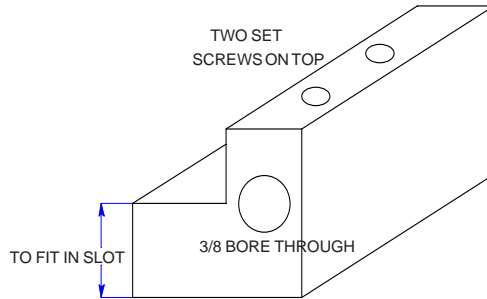
ORDER EDP#	BUSHING SIZE
98-2450	1/8
98-2455	3/16
98-2460	1/4
98-2465	5/16
98-2470	3/8
98-2475	1/2

SERIES 39

APPLICATION : A HOLDER THAT ALLOWS YOU TO HOLD OUR 3/8 ROUND SHANKS IN A SQUARE SLOT HOLDER. A PERFECT MATCH FOR OUR SERIES 39 OD TURNING , GROOVING AND THREADING TOOLS.

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



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

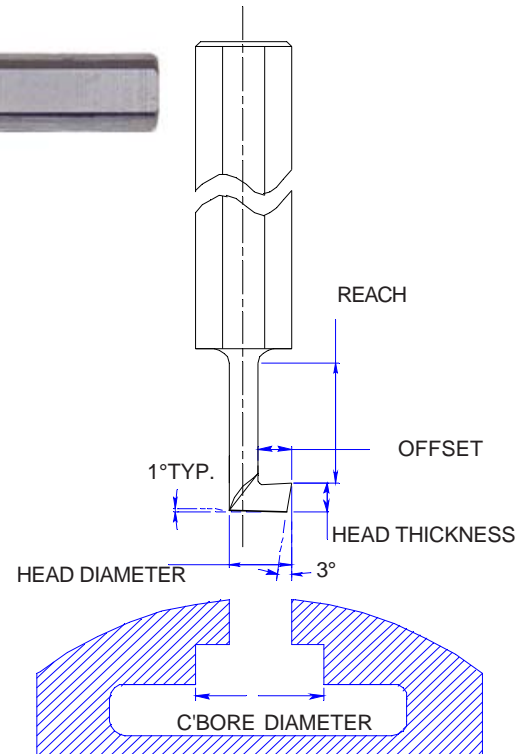
SERIES 66

ITC CARBIDE



CNC BACK-SPOT FACERS *made from*

HEAD DIAMETER	OFFSET	REACH	HEAD THICKNESS	MAXIMUM C'BORE DIA.	ORDER EDP#	TOOL IDENTIFICATION	SHANK	OVERALL LENGTH
.135	.050	.375	3/32	.235	66-1100	BA-188-375	3/16	2-1/2
		.625			66-1105	BA-188-625		
.180	.065	.375	3/32	.310	66-1110	BA-250-375	1/4	2-1/2
		.625			66-1115	BA-250-625		
		.500			66-1120	BA-312-500		
.225	.085	.750	1/8	.395	66-1125	BA-312-750	5/16	2-1/2
		.500			66-1130	BA-375-500		
.270	.100	.750	1/8	.470	66-1135	BA-375-750	3/8	2-1/2
		.500			66-1140	BA-500-500		
.370	.130	.750	1/8	.630	66-1145	BA-500-750	1/2	3"
		1.000			66-1150	BA-500-1000		
		.500			66-1155	BA-625-500		
		.750			66-1160	BA-625-750		
.435	.190	1.000	5/32	.815	66-1165	BA-625-1000	5/8	3-1/2
		1.250			66-1170	BA-625-1250		
		.500			66-1175	BA-750-500		
		.750			66-1180	BA-750-750		
.530	.225	1.000	3/16	.980	66-1185	BA-750-1000	3/4	4"
		1.250			66-1190	BA-750-1250		

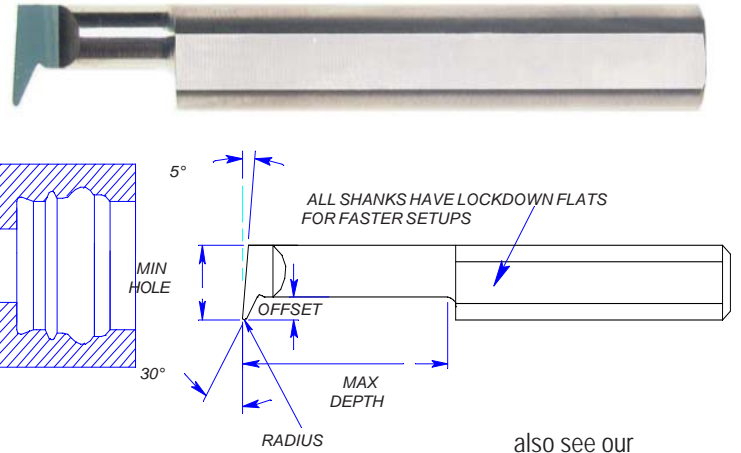


SERIES 56 made from **ITC CARBIDE**

MIN HOLE	MAX DEPTH	TIP RADIUS	OFFSET	ORDER EDP#	ALTIN COATED EDP#	SHANK
.120	.250	.007	.050	56-1080	56-1080-C	1/8 x 2" O.A.L.
	.500			56-1085	56-1085-C	
	.750			56-1090	56-1090-C	
.180	.500	.010	.080	56-1100	56-1100-C	3/16 x 2-1/2 O.A.L.
	.750			56-1105	56-1105-C	
	1.000			56-1110	56-1110-C	
.220	.500	.010	.080	56-1115	56-1115-C	1/4 x 2-1/2 O.A.L.
	.750			56-1120	56-1120-C	
	1.000			56-1125	56-1125-C	
.300	.500	.015	.110	56-1130	56-1130-C	5/16 x 2-1/2 O.A.L.
	.750			56-1135	56-1135-C	
	1.000			56-1140	56-1140-C	
.360	.500	.015	.130	56-1145	56-1145-C	3/8 x 2-1/2 O.A.L.
	.750			56-1150	56-1150-C	
	1.000			56-1155	56-1155-C	
.490	.500	.015	.160	56-1160	56-1160-C	1/2 x 3" O.A.L.
	.750			56-1165	56-1165-C	
	1.000			56-1170	56-1170-C	
	1.250			56-1175	56-1175-C	
	1.250			56-1180	56-1180-C	

PROFILE TOOLS

APPLICATION : **STANDARD PROFILING TOOL**



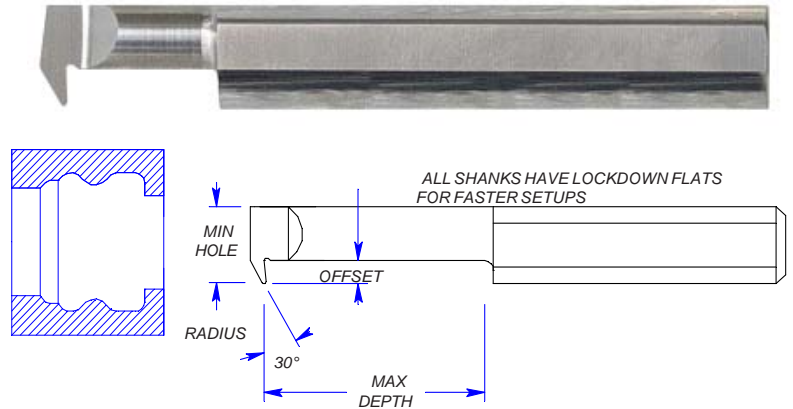
also see our quick-profile tools pg. 9

SERIES 56 made from **ITC CARBIDE**

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

REVERSE PROFILE TOOLS

APPLICATION : **REVERSE PROFILING TOOL**



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 HOLE	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"

LOOKING FOR SOMETHING DIFFERENT?

CHECK OUT QUICK CHANGE PROFILE TOOLS ON PAGE 9

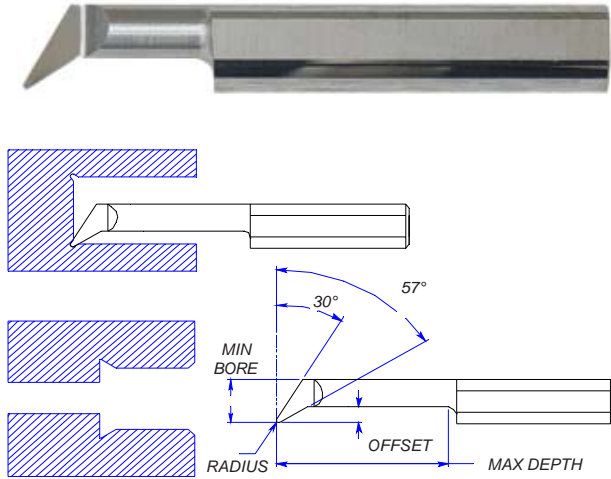


CARBIDE SHANKS PROVIDE MAXIMUM RIDGIDITY



SERIES 56

R.H. OFFSET PROFILE TOOLS



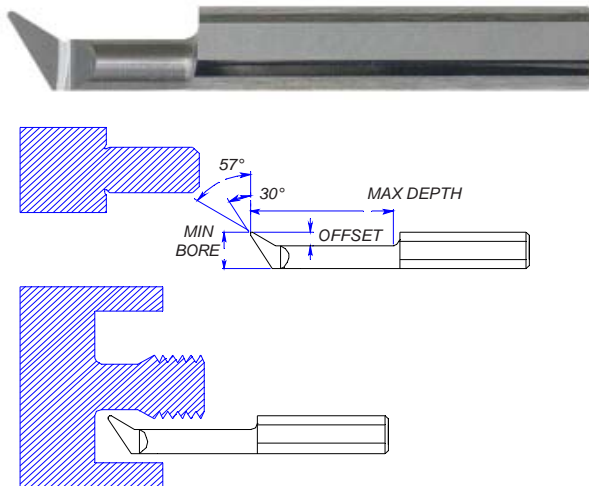
SERIES 56

made from **ITC CARBIDE**

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

MIN HOLE	MAX DEPTH	RADIUS	OFFSET	ORDER EDP#	TOOL IDENTIFICATION	SHANK
.220	.500	.010	.080	56-1815	ROP-220-500	1/4 X 2-1/2 O.A.L.
	.750			56-1820	ROP-220-750	
	1.000			56-1825	ROP-220-1000	
.300	.500	.015	.110	56-1830	ROP-300-500	5/16 X 2-1/2 O.A.L.
	.750			56-1835	ROP-300-750	
	1.000			56-1840	ROP-300-1000	
.360	.500	.015	.130	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	
.490	.500	.015	.160	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



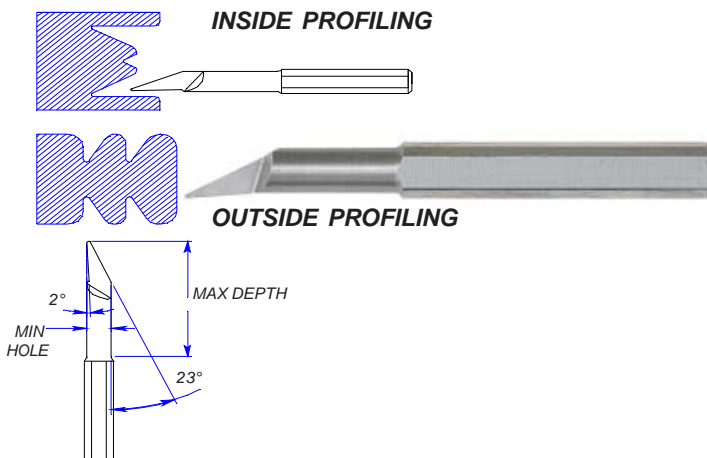
SERIES 56

made from **ITC CARBIDE**

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

MIN HOLE	MAX DEPTH	RADIUS	OFFSET	ORDER EDP#	TOOL IDENTIFICATION	SHANK
.220	.500	.010	.080	56-1915	LOP-220-500	1/4 X 2-1/2 O.A.L.
	.750			56-1920	LOP-220-750	
	1.000			56-1925	LOP-220-1000	
.300	.500	.015	.110	56-1930	LOP-300-500	5/16 X 2-1/2 O.A.L.
	.750			56-1935	LOP-300-750	
	1.000			56-1940	LOP-300-1000	
.360	.500	.015	.130	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	
.490	.500	.015	.160	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.**

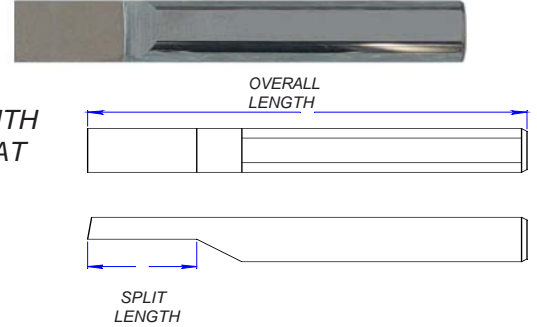
MIN HOLE	MAX DEPTH	RADIUS	OFFSET	ORDER EDP#	TOOL IDENTIFICATION	SHANK
.220	.500	.010	.020	56-1315	FIP-220-500	1/4 X 2-1/2
	.750			56-1320	FIP-220-750	
	1.000			56-1325	FIP-220-1000	
.300	.750	.015	.020	56-1330	FIP-300-750	5/16 X 2-1/2
	1.000			56-1335	FIP-300-1000	
				56-1340	FIP-360-750	
.360	1.000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

SERIES 70 made from **ITC 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

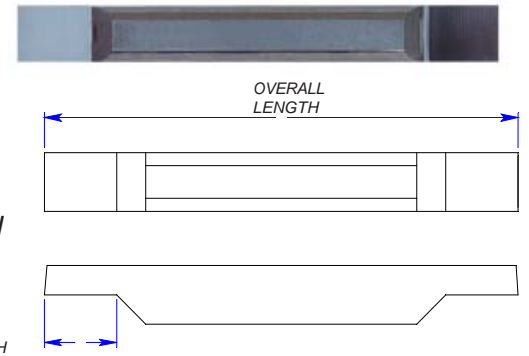


SERIES 70 made from **ITC CARBIDE** APPLICATION : **A DOUBLE END BLANK THAT THE USER CAN GRIND INTO THEIR OWN SPECIAL TOOL.**

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



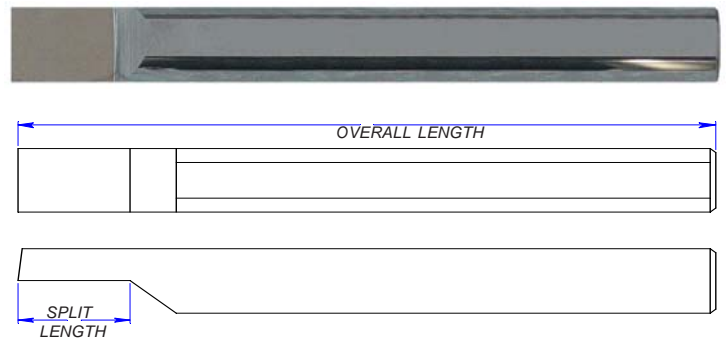
SERIES 70 made from **ITC CARBIDE**

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



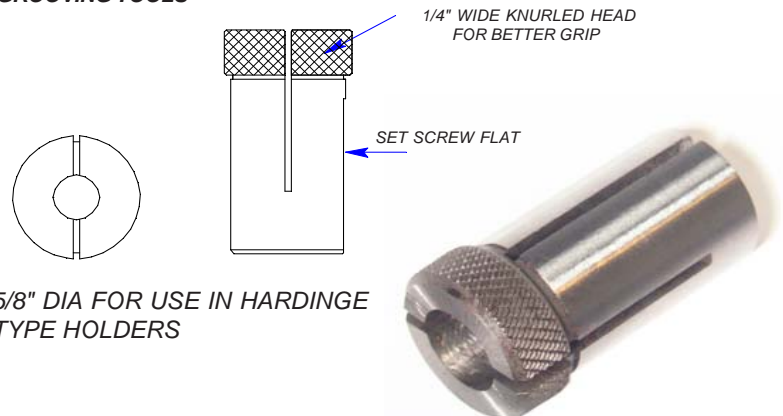
SERIES 94 APPLICATION : **USED TO HOLD OUR BORING & GROOVING TOOLS**

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 **ITC CARBIDE**

DOUBLE END FACE / OD GROOVE TOOLS

SQUARE NOSE

GROOVE WIDTH	GROOVE DEPTH	ORDER EDP#	ALTN 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

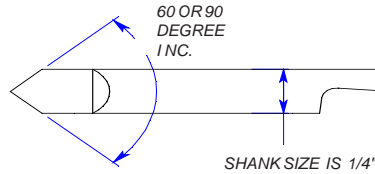
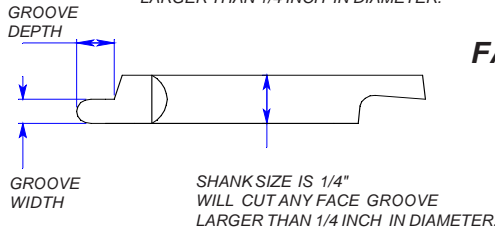
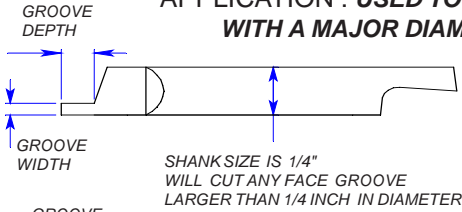
FULL RADIUS NOSE

GROOVE WIDTH	GROOVE DEPTH	ORDER EDP#	ALTN 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#	TIALN 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 **ITC CARBIDE**

SINGLE END FACE / OD GROOVE TOOLS

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

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

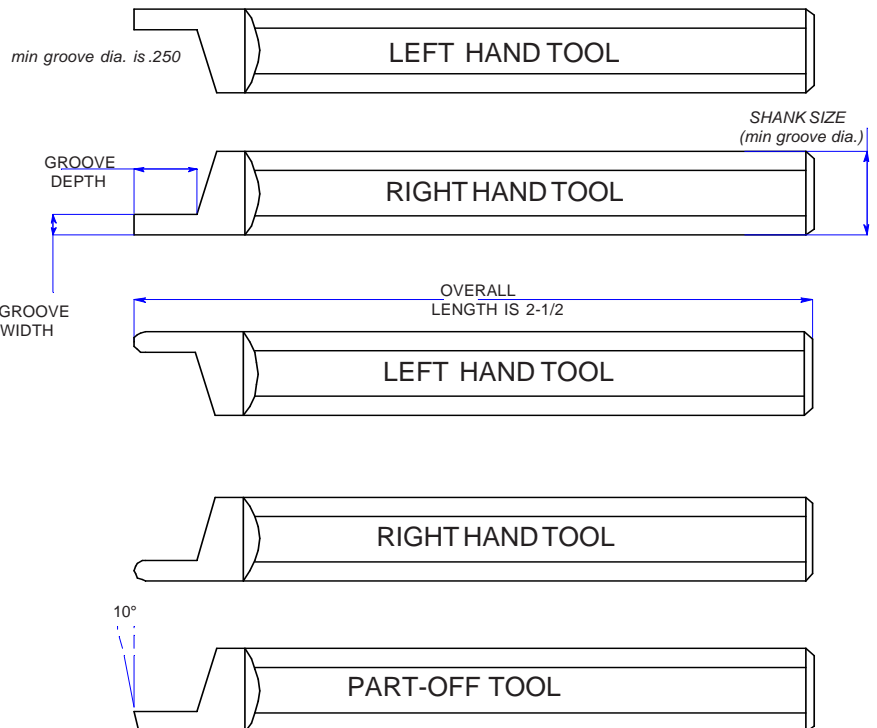
FULL RADIUS NOSE

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

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 19



SERIES 14

5/16" 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
							ORDEREDP#	ORDEREDP#	ORDEREDP#
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#
G10E C-2	.007	TBGT-521L	15-1100
T1200A CERMET	.007	TBGT-520.5LFW	15-1110
AC325 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

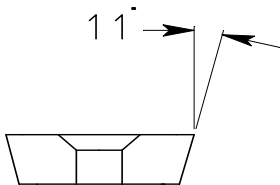
SHANK STYLES

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDEREDP#	ORDEREDP#	ORDEREDP#
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

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
							ORDEREDP#	ORDEREDP#	ORDEREDP#
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#
G10E C-2	.007	TPGT-630.5L	15-1150
T12A CERMET	.007	TPGT-630.5L	15-1160
AC325 TIN COATED	.007	TPGT-630.5L	15-1170
T12A CERMET	.015	TPGT-631L	15-1180
AC325 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	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	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

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#
T11-56	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

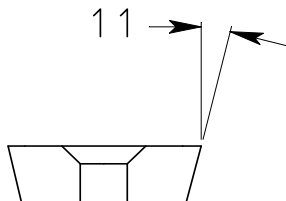
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
T11-62	1/2	1/4	99-1165	BHF0308R	1/8	3"	14-1138	14-1141	14-1144
						6"	14-1147	14-1150	14-1153
						9"	14-1156	14-1159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

11/16" MINIMUM BORE

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#
T11-68	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

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#
T11-75	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
G10E UN-COATED	.007	TPGG-220.5L	15-1210
G10E UN-COATED	.015	TPGG-221L	15-1220
T130Z CERMET	.015	TPGG-221L	15-1230

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

7/8" MINIMUM BORE

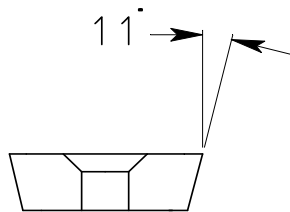
							SHANK STYLES		
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T11-87	3/4	3/8	99-1115	BFXO410R	3/16	3"	14-1246	14-1249	14-1252
						6"	14-1255	14-1258	14-1261
						9"	14-1264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

1" MINIMUM BORE

							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#
T11-100	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

							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#
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

SERIES 16

1/4 I.C.



**CCMT 21.51
INSERT**

TOOL GEOMETRY FOR BORING STEEL & TOUGH MATERIALS

3/8" MINIMUM BORE

SHANKSTYLES

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

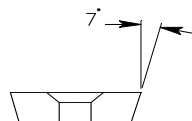
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-68	5/8	1/4	99-1125	S-95	3/32	3"	16-1786	16-1789	16-1792
						6"	16-1795	16-1798	16-1801
						9"	16-1804	16-1807	16-1810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

3/4" MINIMUM BORE

HEAD I.D.	SHANK 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#
D07-75	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
TRIANGLE 5/16 I.C.**

SERIES 16

3/8 I.C.



**CCMT 32.51
INSERT**

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

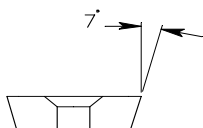
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	INSERT THICKNESS	SHANK LENGTH	STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
							ORDER EDP#	ORDER EDP#	ORDER EDP#
D07-87	3/4	3/8	99-1132	S-98	5/32	3"	16-1858	16-1861	16-1864
						6"	16-1867	16-1870	16-1873
						9"	16-1876	16-1879	16-1882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

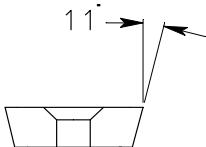
11/16" MINIMUM BORE

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 INSERTS
CPGT 32.51**



SERIES 12

TOOL GEOMETRY FOR BORING ALUMINUM & SOFTER MATERIALS

SHANK STYLES

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#
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

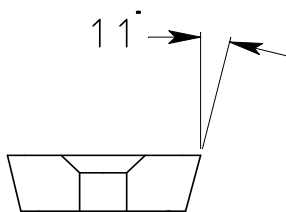
1" MINIMUM BORE

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 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

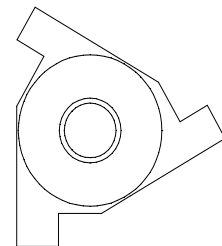
.750 MINIMUM BORE

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 36

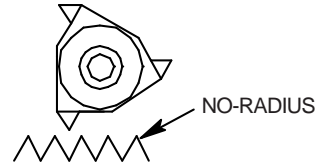
.236 MINIMUM BORE

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

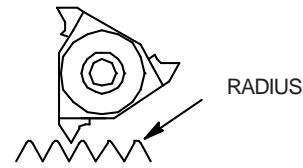
60 DEGREE INSERTS FOR .236 BARS

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

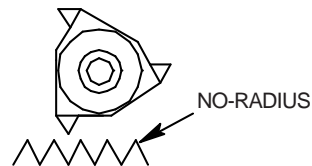
.354 MINIMUM BORE

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

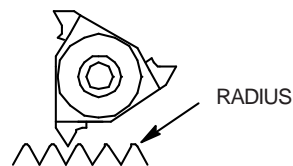
3/16 I.C. 60 DEGREE INSERTS FOR .307 & .354 BARS

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





SERIES 36 .390 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#
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

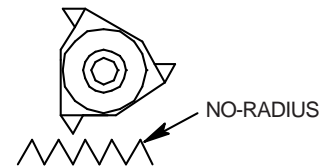
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
						ORDER EDP#	ORDER EDP#	ORDER EDP#
T004	3/8	1/4	99-1150	S-11	3"	36-1215	36-1220	36-1225
					6"	36-1230	36-1235	36-1240

SERIES 36 .625 MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK	CARBIDE SHANK	CARBIDE WITH COOLANT HOLE
						ORDER EDP#	ORDER EDP#	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

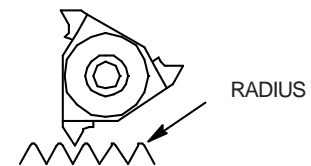
60 DEGREE INSERTS FOR .390, .470 & .625 BARS

PITCH RANGE	TIN COATED
16-48	37-1368



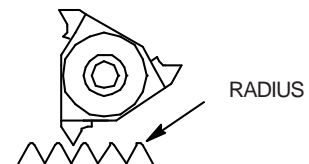
FULL PROFILE INSERTS FOR .390, .470 & .625 BARS

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 ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE 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

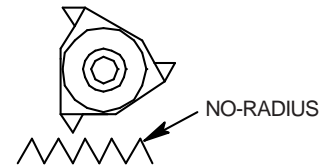
HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE ORDER EDP#
T007	5/8	3/8	99-1160	S-16	3"	36-1320	36-1325	36-1330
					6"	36-1335	36-1340	36-1345
					9"	36-1350	36-1355	36-1360

SERIES 36 1" MINIMUM BORE

HEAD I.D.	SHANK DIA.	INSERT I.C.	SCREW EDP #	SCREW NUMBER	SHANK LENGTH	SHANK STYLES		
						STEEL SHANK ORDER EDP#	CARBIDE SHANK ORDER EDP#	CARBIDE WITH COOLANT HOLE 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

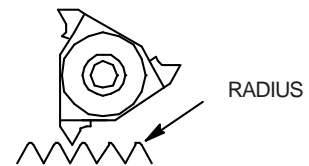
60 DEGREE INSERTS FOR .640 .750 & 1" BARS

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



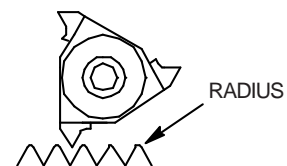
FULL PROFILE INSERTS FOR .640 .750 & 1" BARS

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

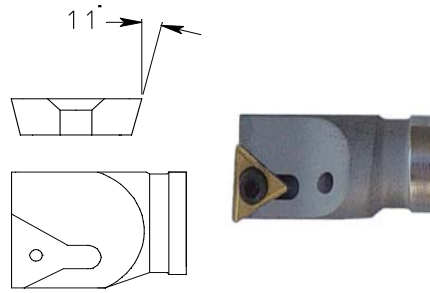
PITCH	C-2 UNCOATED	TIN COATED
27	37-1462	37-1464
18	37-1466	37-1468
14	37-1470	37-1472
11-1/2	37-1474	37-1476
8	37-1478	37-1480



REPLACEMENT SCREWS

SERIES 40 11 DEGREE TRIANGLE

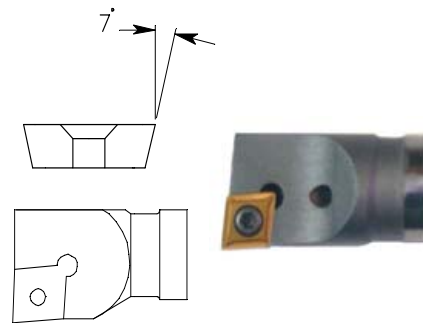
ORDER EDP#	HEAD I.D.	MIN BORE	SHANK DIA.	INSERT	I.C.	INSERT THICKNESS
40-1110	T11-31	5/16	1/4	TBGP-520	5/32	1/16
40-1115	T11-37	3/8	5/16	TPGP-630	3/16	3/32
40-1120	T11-43	7/16	3/8	TPGP-630	3/16	3/32
40-1125	T11-50	1/2	3/8	TPGG-22YL	1/4	1/8
40-1130	T11-56	9/16	1/2	TPGG-22YL	1/4	1/8
40-1135	T11-62	5/8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



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

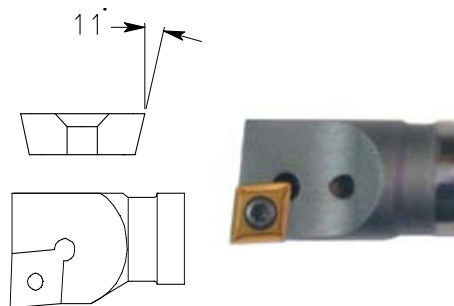
SERIES 40 7 DEGREE DIAMOND

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



SERIES 40 11 DEGREE DIAMOND

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



SERIES 40 LAY DOWN STYLE THREADING TOOLS

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



WE OFFER HEAD REPLACEMENT SERVICE FOR THE FOLLOWING LABOR COST ADD HEAD +LABOR

LABOR PRICE EACH

SHANK DIA.	1 PC	2-6 PCS	7-12 PCS
3/16	\$18.00	\$14.50	\$11.00
1/4	\$18.00	\$14.50	\$11.00
5/16	\$20.50	\$18.00	\$15.00
3/8	\$24.50	\$20.00	\$17.00
1/2	\$27.50	\$22.00	\$19.00
5/8	\$30.50	\$24.00	\$21.00
3/4	\$33.00	\$30.00	\$27.00
1"	\$38.00	\$34.00	\$29.00

SERIES 40 LAY DOWN STYLE GROOVING TOOLS

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



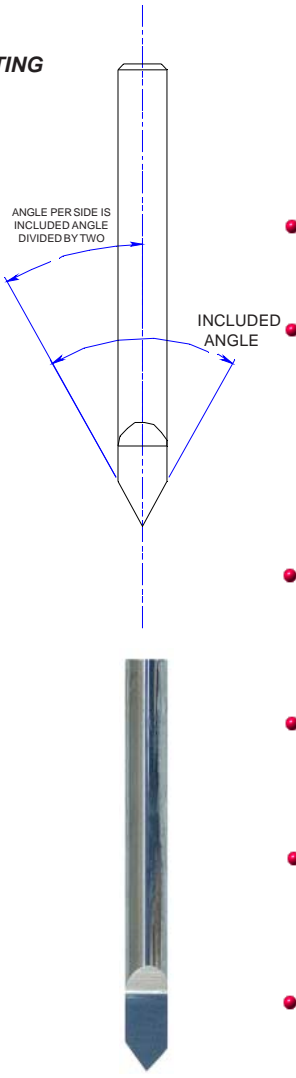
SERIES 62 made from **ITC CARBIDE**

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	



SERIES 62 made from **ITC CARBIDE**

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	



SERIES 62 made from **ITC CARBIDE**

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	
	120°	62-1815	62-1815-C	
3/16	40°	62-1820	62-1820-C	4"
	60°	62-1825	62-1825-C	
	90°	62-1830	62-1830-C	
	120°	62-1835	62-1835-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	



SERIES 62 made from **ITC CARBIDE**

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	



SERIES 62 made from **ITC CARBIDE**

DOUBLE END 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°	62-1400	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	



SERIES 63 made from **ITC CARBIDE**

APPLICATION: **FOR COUNTER SINKING HOLES**
6 FLUTE DOUBLE END
CHATTER FREE STYLE

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"

New!



SERIES 61 made from **ITC CARBIDE**

RUNNER CUTTERS

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

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	2-1/2"
		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	

SPECIAL SIZES AVAILABLE ON REQUEST

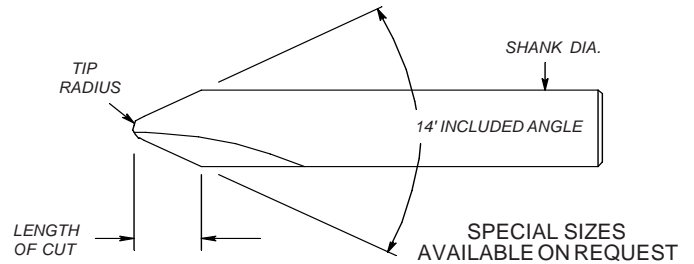


SERIES 60 made from **ITC CARBIDE**

DIE SINKERS

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

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"

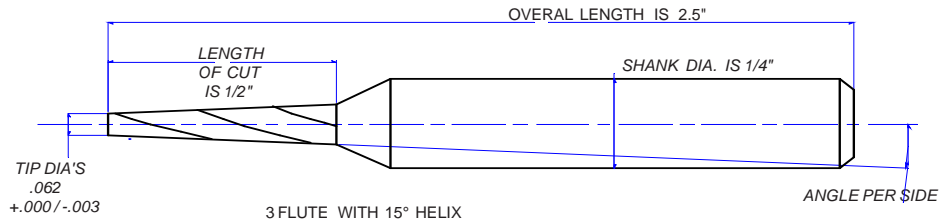


SERIES 69 made from **ITC CARBIDE**

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

SMALL 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 64 2 FLUTE

SERIES 64 4FLUTE

**2 FLUTE
SINGLE END**



CHAMFER MILLS

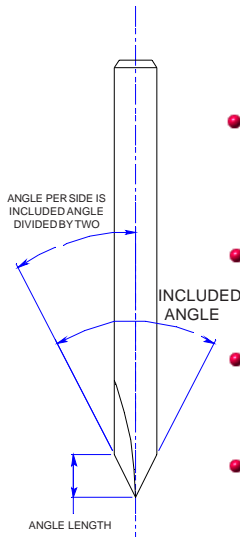
APPLICATION : **GROUND WITH POSITIVE AXIAL RAKE & CLEARANCE PRIMARILY FOR ALUMINUM & SOFTER MATERIALS**

made from **ITC CARBIDE**

INCLUDED ANGLE	UN-COATED EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 2 flute	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
60° PER SIDE	64-2830	64-2830-C	3/8	2-1/2	.105
	64-2840	64-2840-C	1/2	3"	.140
90° 2 flute	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
45° PER SIDE	64-2880	64-2880-C	3/8	2-1/2	.187
	64-2890	64-2890-C	1/2	3"	.250
60° 2 flute	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
30° PER SIDE	64-2930	64-2930-C	3/8	2-1/2	.312
	64-2940	64-2940-C	1/2	3"	.420
50° 2 flute	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
25° PER SIDE	64-7235	64-7235-C	1/2	3"	.500
	64-7240	64-7240-C	1/4	2-1/2	.280
45° 2 flute	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
22.5° PER SIDE	64-7260	64-7260-C	1/4	2-1/2	.320
	64-7265	64-7265-C	5/16	2-1/2	.405
40° 2 flute	64-7270	64-7270-C	3/8	2-1/2	.490
	64-7275	64-7275-C	1/2	3"	.660

NOW AVAILABLE WITH ALTN COATING

**CHAMFER
C'SINK
EDGE BREAK**



**4 FLUTE
SINGLE END**



CHAMFER MILLS

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

made from **ITC CARBIDE**

INCLUDED ANGLE	UN-COATED EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 4 flute	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
60° PER SIDE	64-4830	64-4830-C	3/8	2-1/2	.105
	64-4840	64-4840-C	1/2	3"	.140
90° 4 flute	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
45° PER SIDE	64-4880	64-4880-C	3/8	2-1/2	.187
	64-4890	64-4890-C	1/2	3"	.250
60° 4 flute	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
30° PER SIDE	64-4930	64-4930-C	3/8	2-1/2	.312
	64-4940	64-4940-C	1/2	3"	.420
50° 4 flute	64-7400	64-7400-C	1/4	2-1/2	.250
	64-7405	64-7405-C	5/16	2-1/2	.310
	64-7410	64-7410-C	3/8	2-1/2	.375
25° PER SIDE	64-7415	64-7415-C	1/2	3"	.500
	64-7420	64-7420-C	1/4	2-1/2	.280
45° 4 flute	64-7425	64-7425-C	5/16	2-1/2	.350
	64-7430	64-7430-C	3/8	2-1/2	.430
	64-7435	64-7435-C	1/2	3"	.580
22.5° PER SIDE	64-7440	64-7440-C	1/4	2-1/2	.320
	64-7445	64-7445-C	5/16	2-1/2	.405
40° 4 flute	64-7450	64-7450-C	3/8	2-1/2	.490
	64-7455	64-7455-C	1/2	3"	.660

SERIES 64 2 FLUTE LONG

SERIES 64 4FLUTE LONG



**2 FLUTE LONG REACH
CHAMFER MILLS**

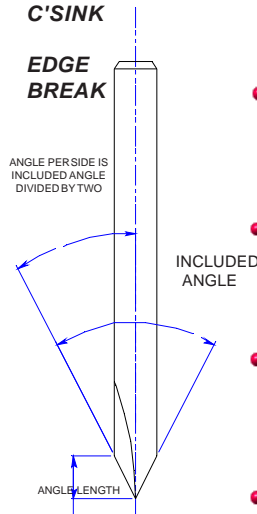
APPLICATION : **GROUND WITH POSITIVE AXIAL RAKE & CLEARANCE PRIMARILY FOR ALUMINUM & SOFTER MATERIALS**

made from **ITC CARBIDE**

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
60° PER SIDE	64-6830	64-6830-C	3/8	6"	.105
	64-6840	64-6840-C	1/2	6"	.140
90° 2 flute	64-6850	64-6850-C	3/16	4"	.090
	64-6860	64-6860-C	1/4	4"	.125
	64-6870	64-6870-C	5/16	4"	.156
45° PER SIDE	64-6880	64-6880-C	3/8	6"	.187
	64-6890	64-6890-C	1/2	6"	.250
60° 2 flute	64-6900	64-6900-C	3/16	4"	.160
	64-6910	64-6910-C	1/4	4"	.200
	64-6920	64-6920-C	5/16	4"	.270
30° PER SIDE	64-6930	64-6930-C	3/8	6"	.312
	64-6940	64-6940-C	1/2	6"	.420

NOW AVAILABLE WITH ALTN COATING

**CHAMFER
C'SINK
EDGE BREAK**



**4 FLUTE LONG REACH
CHAMFER MILLS**

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

made from **ITC CARBIDE**

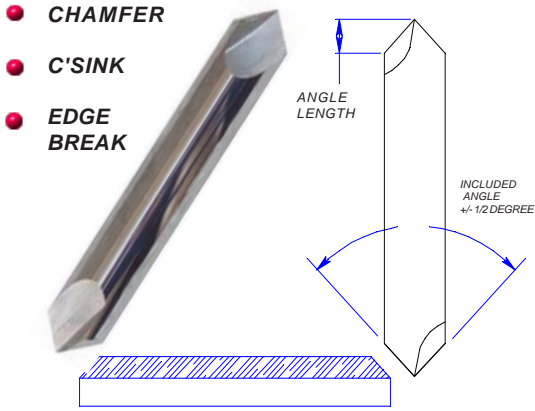
INCLUDED ANGLE	UN-COATED EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 4 flute	64-8800	64-8800-C	3/16	4"	.050
	64-8810	64-8810-C	1/4	4"	.060
	64-8820	64-8820-C	5/16	4"	.090
60° PER SIDE	64-8830	64-8830-C	3/8	6"	.105
	64-8840	64-8840-C	1/2	6"	.140
90° 4 flute	64-8850	64-8850-C	3/16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

SERIES 64

2 FLUTE DOUBLE END CHAMFER MILLS

NOW AVAILABLE WITH ALTiN COATING

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



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

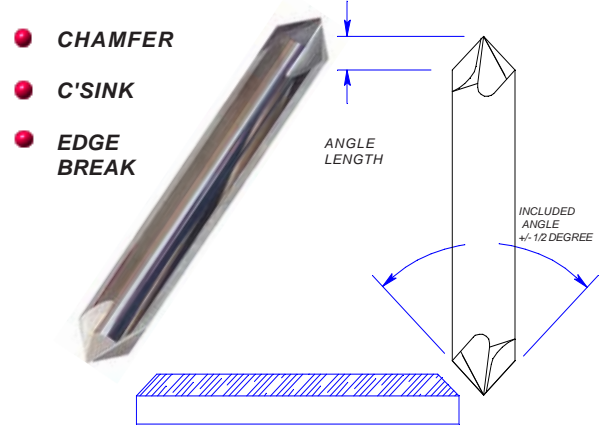
INCLUDED ANGLE	UN-COATED EDP#	ALTiN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 2 flute	64-1175	64-1175-C	1/8	2"	.035
	64-1180	64-1180-C	3/16	2-1/2	.050
	64-1200	64-1200-C	1/4	2-1/2	.060
	64-1203	64-1203-C	5/16	2-1/2	.090
	64-1205	64-1205-C	3/8	2-1/2	.105
	64-1210	64-1210-C	1/2	3"	.140
100° 2 flute	64-1211	64-1211-C	5/8	3-1/2	.180
	64-2200	64-2200-C	1/8	2"	.050
	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
90° 2 flute	64-2225	64-2225-C	1/2	3"	.205
	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
82° 2 flute	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	64-1224	64-1224-C	1/8	2"
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
64-1240		64-1240-C	1/2	3"	.280
60° 4 flute	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
	64-1247	64-1247-C	5/16	2-1/2	.270
	64-1250	64-1250-C	3/8	2-1/2	.312
60° 4 flute	64-1255	64-1255-C	1/2	3"	.420
	64-1260	64-1260-C	5/8	3-1/2	.540

UN-MATCHED TOOL VARIETY

SERIES 64

4 FLUTE DOUBLE END CHAMFER MILLS

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



made from **ITC CARBIDE** SERIES 64 4 FLUTE

INCLUDED ANGLE	UN-COATED EDP#	ALTiN COATED EDP#	SHANK DIA.	OVERALL LENGTH	ANGLE LENGTH
120° 4 flute	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	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	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	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
	60° 4 flute	64-1424	64-1424-C	1/8	2"
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
60° 4 flute	64-1441	64-1441-C	5/8	3-1/2	.350
	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
60° 4 flute	64-1455	64-1455-C	1/2	3"	.420
	64-1460	64-1460-C	5/8	3-1/2	.540

SERIES 68 *made from ITC CARBIDE*

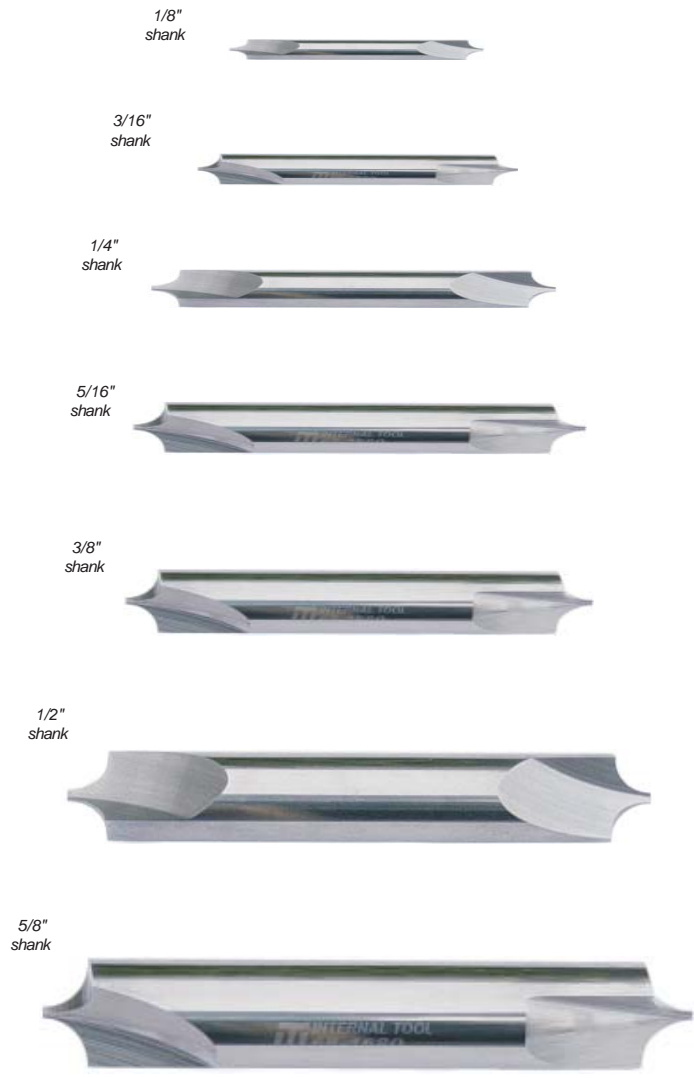
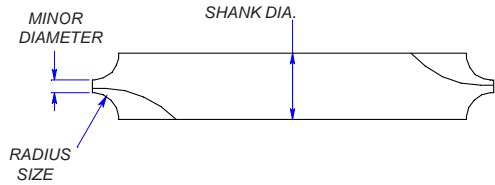
42 DIFFERENT SIZES
FROM .005 TO .2500
ALL DOUBLE END
2 FLUTE
SOLID MICROGRAIN CARBIDE

2 FLUTE CORNER ROUNDING ENDMILLS

New!

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

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	
	.0625 (1/16)	.040	68-1600	SR-187-063	
1/4"	.0781 (5/64)	.040	68-1605	SR-250-078	2-1/2"
	.0787 (2.0 MM)	.040	68-1610	SR-250-079	
	.0938 (3/32)	.040	68-1615	SR-250-094	
	.0984 (2.5 MM)	.040	68-1620	SR-250-098	
5/16"	.1094 (7/64)	.055	68-1625	SR-312-109	2-1/2"
	.1181 (3.0 MM)	.055	68-1630	SR-312-118	
	.1250 (1/8)	.055	68-1635	SR-312-125	
3/8"	.1378 (3.5 MM)	.055	68-1640	SR-375-138	2-1/2"
	.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	

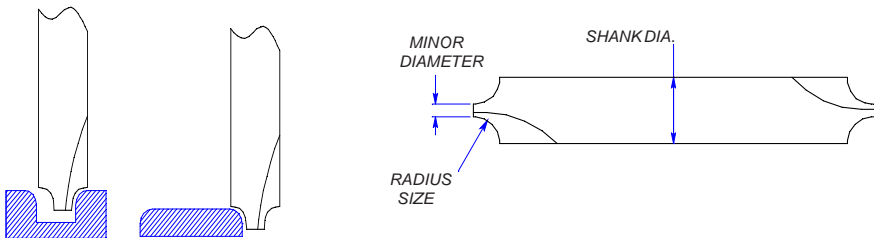
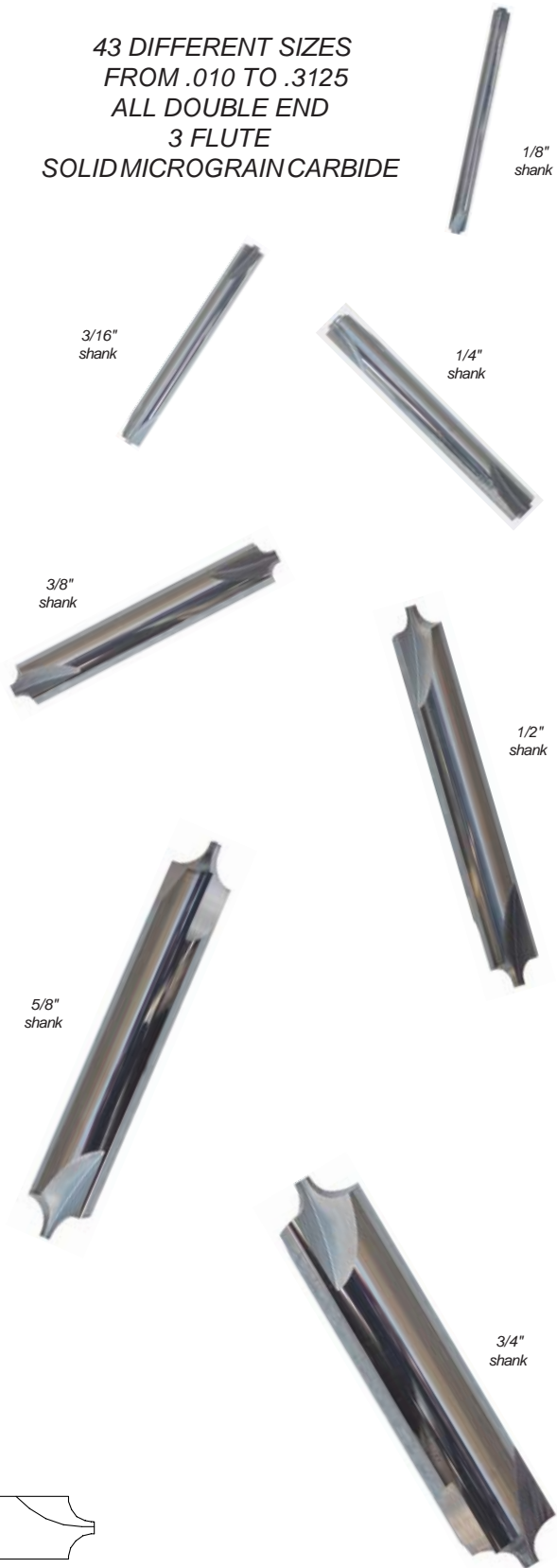


SERIES 68 *made from ITC CARBIDE*

CORNER ROUNDING ENDMILLS

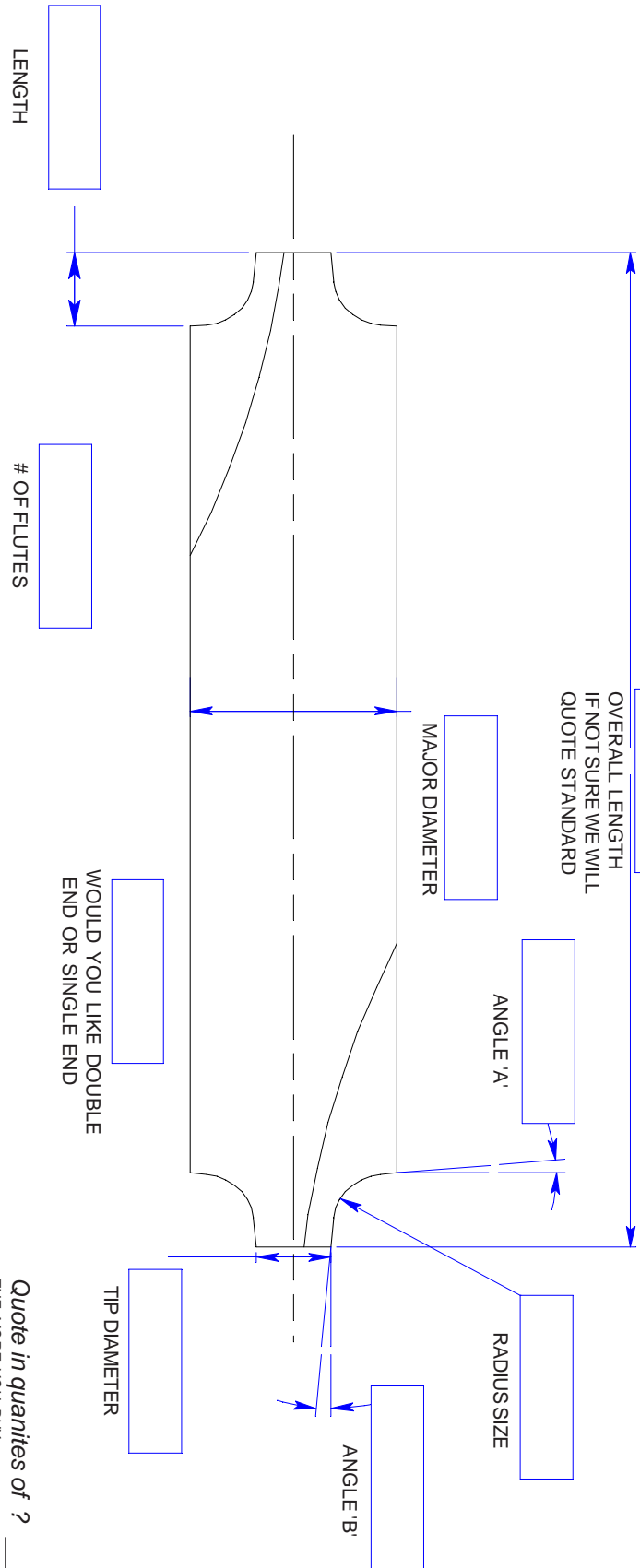
43 DIFFERENT SIZES
FROM .010 TO .3125
ALL DOUBLE END
3 FLUTE
SOLID MICROGRAIN CARBIDE

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	
.125 (1/8)	.115	68-1310	68-1310-C		
1/2	.140 (9/64)	.120	68-1312	68-1312-C	3"
	.1562 (5/32)	.120	68-1315	68-1315-C	
	.1575 (4MM)	.120	68-1317	68-1317-C	
	.1718 (11/64)	.120	68-1320	68-1320-C	
5/8	.1875 (3/16)	.120	68-1325	68-1325-C	3-1/2"
	.1969 (5MM)	.120	68-1327	68-1327-C	
	.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	
3/4	.250 (1/4)	.120	68-1345	68-1345-C	4"
	.2812 (9/32)	.120	68-1350	68-1350-C	
	.2969 (19/64)	.120	68-1352	68-1352-C	
	.3125 (5/16)	.120	68-1355	68-1355-C	



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.

**CORNER ROUNDERS
 MADE TO ORDER**



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

REVISIONS:



DRAWN BY: DATE: REV:

TOOL NUMBER:

made from **ITC CARBIDE**

TOLERANCE UNLESS OTHERWISE SPECIFIED

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

Company name _____

Contact _____

Phone _____

Fax _____

Your distributor _____

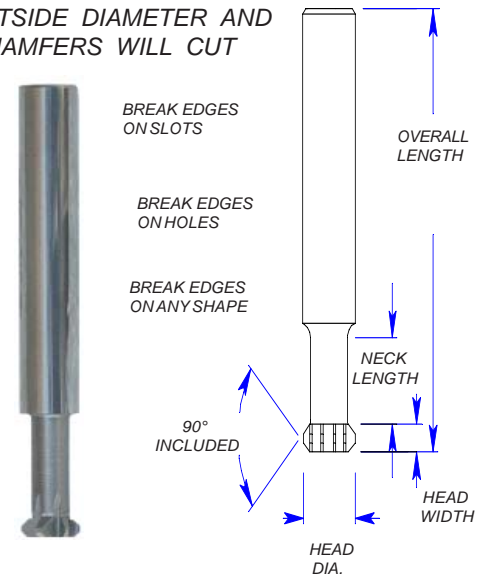
SERIES 65 APPLICATION: **FOR EDGE BREAKING / CHAMFERING.**

EDGE BREAKERS

made from **ITC CARBIDE**

OUTSIDE DIAMETER AND CHAMFERS WILL CUT

HEAD DIA.	HEAD WIDTH	NECK DIAMETER	CHAMFER SIZE	NECK LENGTH	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	OVERALL LENGTH
.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		
				1.000	65-1285	65-1285-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		

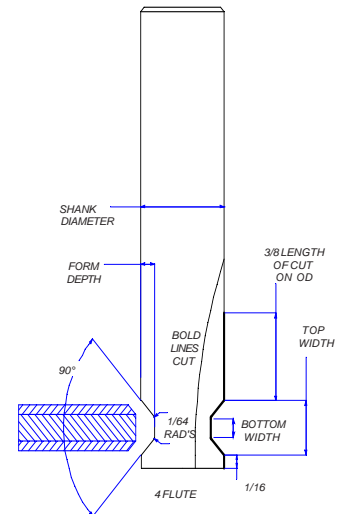


SERIES 72 APPLICATION: **FOR CHAMFERING BOTH SIDES OF A PART OR PLATE**

DOUBLE CHAMFER CUTTERS

made from **ITC CARBIDE**

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

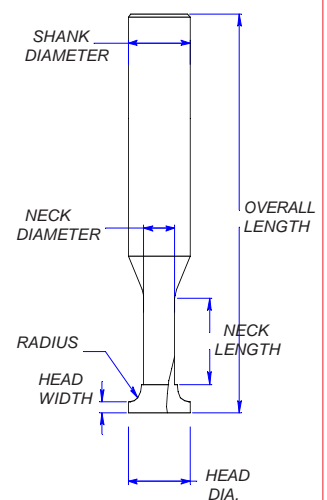


SERIES 67 APPLICATION: **FOR ROUNDING BACK OR INSIDE CORNERS**

REVERSE CORNER ROUNDERS

made from **ITC CARBIDE**

ORDER EDP#	TOOL ID	RADIUS SIZE	HEAD DIA.	NECK DIAMETER	NECK LENGTH	SHANK DIA.	HEAD WIDTH	OVERALL LENGTH
67-1400	RC-031-250	.031	.187	.110	.250	3/16	1/16	2-1/2"
67-1405	RC-031-500				.500			
67-1410	RC-031-750				.750			
67-1415	RC-047-375	.047	.250	.140	.375	1/4	1/16	2-1/2"
67-1420	RC-047-625				.625			
67-1425	RC-047-875				.875			
67-1430	RC-062-375	.062	.312	.170	.375	5/16	1/16	2-1/2"
67-1435	RC-062-625				.625			
67-1440	RC-062-875				.875			
67-1445	RC-062-1000				1.000			
67-1450	RC-093-500	.093	.375	.170	.500	3/8	3/32	2-1/2"
67-1455	RC-093-750				.750			
67-1460	RC-093-1000				1.000			
67-1465	RC-093-1250				1.250			
67-1470	RC-125-500	.125	.500	.230	.500	1/2	3/32	3"
67-1475	RC-125-750				.750			
67-1480	RC-125-1000				1.000			
67-1485	RC-125-1250				1.250			
67-1490	RC-187-500	.187	.625	.230	.500	5/8	3/32	3-1/2"
67-1495	RC-187-750				.750			
67-1500	RC-187-1000				1.000			
67-1505	RC-187-1250				1.250			



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 AND UNUSUAL LENGTHS AND DIAMETERS

THE RIGHT LENGTH OF CUT FOR ANY JOB

SERIES 41 4 FLUTE

made from **ITC CARBIDE**



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

SIZE +.000/-0.002	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
1/8	.125	41-1251	41-1251-C	.250	2"	1/8
		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
11/64	.172	41-1721	41-1721-C	.380	2"	3/16
		41-1722	41-1722-C	.650	2-1/2"	3/16
		41-1723	41-1723-C	.800	2-1/2"	3/16
3/16	.187	41-1871	41-1871-C	.380	2"	3/16
		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
13/64	.203	41-2031	41-2031-C	.400	2"	1/4
		41-2032	41-2032-C	.800	2-1/2"	1/4
7/32	.218	41-2181	41-2181-C	.400	2"	1/4
		41-2182	41-2182-C	.800	2-1/2"	1/4
15/64	.234	41-2341	41-2341-C	.400	2"	1/4
		41-2342	41-2342-C	.800	2-1/2"	1/4
6mm	.236	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
9/32	.281	41-2811	41-2811-C	.500	2"	5/16
		41-2812	41-2812-C	.800	2-1/2"	5/16
19/64	.297	41-2971	41-2971-C	.500	2"	5/16
		41-2972	41-2972-C	.800	2-1/2"	5/16
5/16	.312	41-3121	41-3121-C	.500	2"	5/16
		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 +.000/-0.002	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
23/64	.359	41-3591	41-3591-C	.500	2"	3/8
		41-3592	41-3592-C	.750	2-1/2"	3/8
3/8	.375	41-3751	41-3751-C	.500	2"	3/8
		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"	7/16
		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

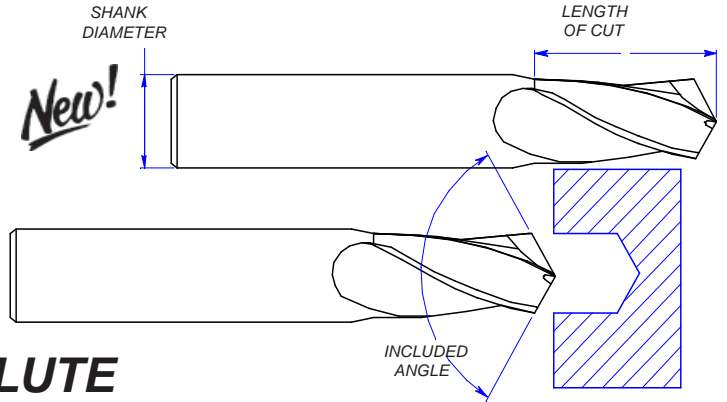
SERIES 49 made from **ITC CARBIDE**

DRILL-MILLS

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



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



NOW AVAILABLE IN 2 AND 4 FLUTE

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"	2-1/2	1/4
.281	49-1215	49-2215	1"	2-1/2	5/16
.312	49-1265	49-2265	1"	2-1/2	5/16
.343	49-1315	49-2315	1"	2-1/2	3/8
.375	49-1365	49-2365	1"	2-1/2	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"	2-1/2	1/4
.281	49-1210	49-2210	1"	2-1/2	5/16
.312	49-1260	49-2260	1"	2-1/2	5/16
.343	49-1310	49-2310	1"	2-1/2	3/8
.375	49-1360	49-2360	1"	2-1/2	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

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"	2-1/2	1/4
.281	49-1205	49-2205	1"	2-1/2	5/16
.312	49-1255	49-2255	1"	2-1/2	5/16
.343	49-1305	49-2305	1"	2-1/2	3/8
.375	49-1355	49-2355	1"	2-1/2	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

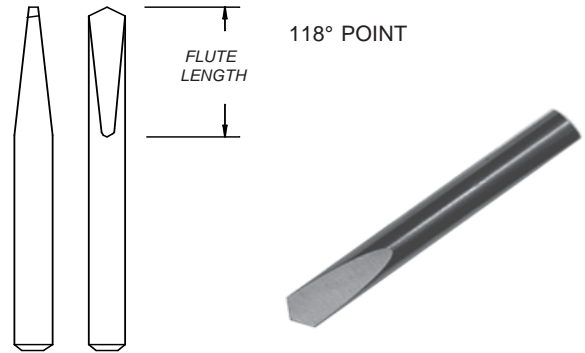
SIZE	4 FLUTE EDP #	2 FLUTE EDP #	LENGTH OF CUT	OVERALL LENGTH	SHANK DIAMETER
.125	49-1000	49-2000	5/8	2"	1/8
.187	49-1050	49-2050	3/4	2-1/2	3/16
.218	49-1100	49-2100	3/4	2-1/2	1/4
.250	49-1150	49-2150	1"	2-1/2	1/4
.281	49-1200	49-2200	1"	2-1/2	5/16
.312	49-1250	49-2250	1"	2-1/2	5/16
.343	49-1300	49-2300	1"	2-1/2	3/8
.375	49-1350	49-2350	1"	2-1/2	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

APPLICATION: **FOR DRILLING SHALLOW DEPTH HOLES IN HARD MATERIALS**

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"

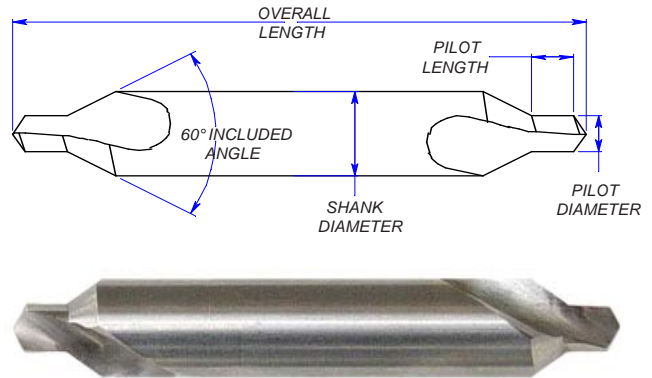


SERIES 71 made from **ITC CARBIDE**

CARBIDE CENTER DRILLS

APPLICATION: **DRILLING CENTERS IN JUST ABOUT ANY MATERIAL.**

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



SPOTTING DRILLS

SERIES 75 made from **ITC CARBIDE**

New!

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

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

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

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

SERIES 76 made from **ITC 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**

New!

	ORDER EDP#	TOOL ID	CUTTER WIDTH	CUTTER DIAMETER +0.000 / -.005	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
1/4	76-1400	AKS-250-015	.0150	.250	.125	1/4	1/4	4	2-1/2
	76-1435	AKS-250-031	.0312						
	76-1455	AKS-250-062	.0625						
5/16	76-1460	AKS-312-015	.0150	.312	.150	5/16	5/16	4	2-1/2
	76-1470	AKS-312-031	.0312						
	76-1480	AKS-312-062	.0625						
	76-1485	AKS-312-093	.0938						
	76-1490	AKS-312-125	.1250						
3/8	76-1500	AKS-375-031	.0312	.375	.200	3/8	3/8	4	2-1/2
	76-1510	AKS-375-062	.0625						
	76-1515	AKS-375-093	.0938						
	76-1520	AKS-375-125	.1250						
	76-1530	AKS-375-187	.1875						
1/2	76-1535	AKS-500-031	.0312	.500	.250	3/8	1/2	6	3"
	76-1545	AKS-500-062	.0625						
	76-1550	AKS-500-093	.0938						
	76-1555	AKS-500-125	.1250						
	76-1560	AKS-500-156	.1562						
	76-1565	AKS-500-187	.1875						
	76-1570	AKS-500-250	.2500						



FOR COPPER



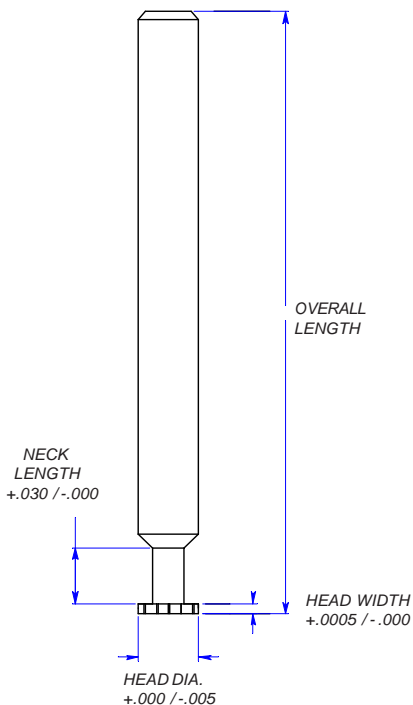
FOR PLASTICS



FOR ALUMINUM



**KEY CUTTERS
FOR
SOFTER MATERIALS**

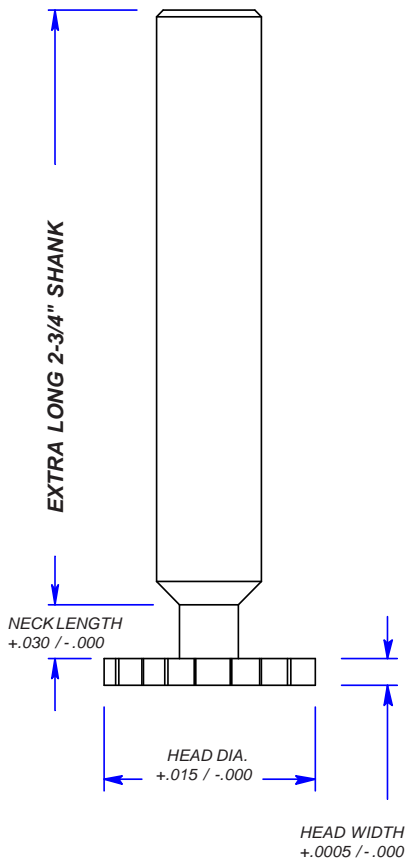


SERIES 78 made from **ITC CARBIDE**

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**

New!



	ORDER EDP#	TOOL ID	CUTTER WIDTH	NECK DIAMETER	NECK LENGTH	CUTTER DIAMETER +.015 / -.000	SHANK DIA.	# OF TEETH	OVERALL LENGTH
5/8	78-1660	AKH-625-031	.0312	.280	1/4	.625	1/2	6	2-3/4"
	78-1670	AKH-625-062	.0625	.280					
	78-1680	AKH-625-093	.0938	.280					
	78-1690	AKH-625-125	.1250	.280					
	78-1700	AKH-625-156	.1562	.280					
	78-1705	AKH-625-187	.1875	.280					
3/4	78-1720	AKH-625-250	.2500	.280	1/4	.750	1/2	6	2-3/4"
	78-1728	AKH-750-031	.0312	.280					
	78-1730	AKH-750-062	.0625	.280					
	78-1740	AKH-750-093	.0938	.280					
	78-1750	AKH-750-125	.1250	.280					
	78-1760	AKH-750-156	.1562	.280					
7/8	78-1765	AKH-750-187	.1875	.280	1/4	.875	1/2	6	2-3/4"
	78-1785	AKH-750-250	.2500	.280					
	78-1800	AKH-750-312	.3125	.490					
	78-1810	AKH-750-375	.3750	.490					
	78-1813	AKH-875-062	.0625	.280					
	78-1815	AKH-875-125	.1250	.280					
1"	78-1825	AKH-875-187	.1875	.280	1/4	1.000	1/2	6	2-3/4"
	78-1835	AKH-875-250	.2500	.280					
	78-1846	AKH-100-031	.0312	.280					
	78-1850	AKH-100-062	.0625	.280					
	78-1855	AKH-100-093	.0938	.280					
	78-1860	AKH-100-125	.1250	.280					
1-1/4"	78-1862	AKH-100-156	.1562	.280	1/4	1.250	1/2	6	2-3/4"
	78-1865	AKH-100-187	.1875	.490					
	78-1875	AKH-100-250	.2500	.490					
	78-1885	AKH-100-312	.3125	.490					
	78-1890	AKH-100-375	.3750	.490					
	78-1912	AKH-125-031	.0312	.280					
1-1/4"	78-1915	AKH-125-062	.0625	.280	1/4	1.250	1/2	6	2-3/4"
	78-1920	AKH-125-093	.0938	.280					
	78-1925	AKH-125-125	.1250	.280					
	78-1932	AKH-125-187	.1875	.490					
	78-1940	AKH-125-250	.2500	.490					
	78-1945	AKH-125-312	.3125	.490					
	78-1950	AKH-125-375	.3750	.490					

**KEY CUTTERS
FOR
SOFTER MATERIALS**

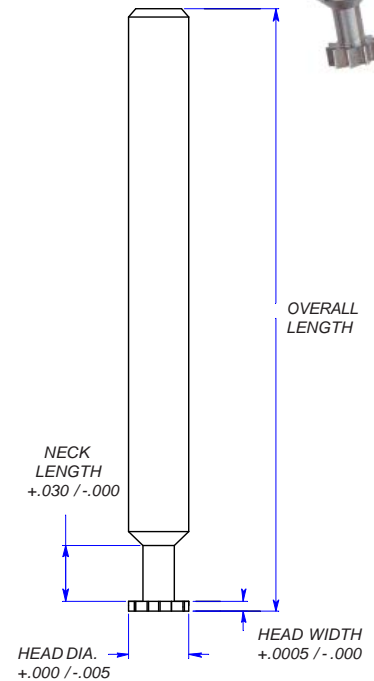


SERIES 76 made from **ITC CARBIDE**

ONE PIECE SOLID CONSTRUCTION

SOLID CARBIDE KEY CUTTERS

	ORDER EDP#	ALTiN COATED EDP#	CUTTER WIDTH	CUTTER DIAMETER +.000 / -.005	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
3/32	76-0800	76-0800-C	.0150	.094	.046	1/8	1/8	4	2"
	76-0810	76-0810-C	.0312						
	76-0815	76-0815-C	.0469						
1/8	76-0900	76-0900-C	.0150	.125	.060	1/8	1/8	6	2"
	76-0910	76-0910-C	.0312						
	76-0920	76-0920-C	.0469						
5/32	76-0950	76-0950-C	.0150	.156	.078	3/16	3/16	6	2-1/2"
	76-0955	76-0955-C	.0312						
	76-0960	76-0960-C	.0469						
3/16	76-0965	76-0965-C	.0625	.187	.094	3/16	3/16	6	2-1/2"
	76-1050	76-1050-C	.0150						
	76-1055	76-1055-C	.0312						
1/4	76-1060	76-1060-C	.0469	.250	.125	1/4	1/4	6	2-1/2"
	76-1065	76-1065-C	.0625						
	76-1100	76-1100-C	.0150						
	76-1105	76-1105-C	.0180						
	76-1110	76-1110-C	.0200						
	76-1115	76-1115-C	.0230						
	76-1120	76-1120-C	.0250						
	76-1125	76-1125-C	.0280						
	76-1130	76-1130-C	.0300						
	76-1135	76-1135-C	.0312						
	76-1140	76-1140-C	.0350						
	76-1145	76-1145-C	.0380						
	76-1150	76-1150-C	.0400						
	76-1155	76-1155-C	.0625						
	5/16	76-1157	76-1157-C						
76-1159		76-1159-C	.0938						
76-1160		76-1160-C	.0150						
76-1165		76-1165-C	.0200						
76-1170		76-1170-C	.0312						
76-1175		76-1175-C	.0469						
76-1180		76-1180-C	.0625						
76-1182		76-1182-C	.0781						
76-1185		76-1185-C	.0938						
3/8	76-1190	76-1190-C	.1250	.375	.200	3/8	3/8	8	2-1/2"
	76-1195	76-1195-C	.1562						
	76-1200	76-1200-C	.0312						
	76-1205	76-1205-C	.0469						
	76-1210	76-1210-C	.0625						
	76-1212	76-1212-C	.0781						
	76-1215	76-1215-C	.0938						
1/2	76-1220	76-1220-C	.1250	.500	.250	3/8	1/2	10	3"
	76-1225	76-1225-C	.1562						
	76-1230	76-1230-C	.1875						
	76-1235	76-1235-C	.0312						
	76-1240	76-1240-C	.0468						
	76-1245	76-1245-C	.0625						
	76-1247	76-1247-C	.0781						
	76-1250	76-1250-C	.0938						
	76-1255	76-1255-C	.1250						
	76-1257	76-1257-C	.1406						
	76-1260	76-1260-C	.1562						
	76-1265	76-1265-C	.1875						
	76-1270	76-1270-C	.2500						

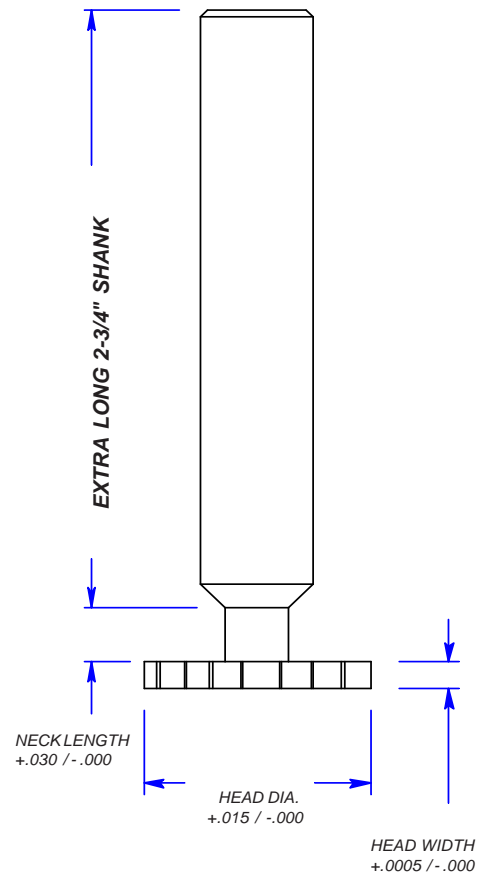


ANY WIDTH REDUCED TO YOUR SPECIFICATIONS.
SPECIALS, CORNER RADIUS, STAGGER TOOTH AND LEFT HAND AVAILABLE.

SERIES 78 made from *ITC CARBIDE*

CARBIDE HEAD STEEL SHANK KEY CUTTERS

HEAD DIAMETER	ORDER EDP #	TOOL ID	WIDTH	STD. #	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
3/8	78-1100	HK-375-047	.0469		.200	1/4	1/2	8	2-3/4
	78-1105	HK-375-063	.0625		.200	1/4			
	78-1110	HK-375-094	.0938		.200	1/4			
	78-1115	HK-375-125	.1250		.200	1/4			
7/16	78-1116	HK-437-031	.0312		.250	1/4	1/2	8	2-3/4
	78-1117	HK-437-063	.0625		.250	1/4			
	78-1118	HK-437-125	.1250		.250	1/4			
1/2	78-1120	HK-500-031	.0312		.250	1/4	1/2	10	2-3/4
	78-1125	HK-500-047	.0469		.250	1/4			
	78-1130	HK-500-063	.0625	# 204	STD.	STD.			
	78-1135	HK-500-078	.0781		.250	1/4			
	78-1140	HK-500-094	.0938	# 304	STD.	STD.			
	78-1145	HK-500-109	.1094		.250	1/4			
	78-1150	HK-500-125	.1250	# 404	STD.	STD.			
9/16	78-1156	HK-562-031	.0312		.250	1/4	1/2	10	2-3/4
	78-1157	HK-562-063	.0625		.250	1/4			
	78-1158	HK-562-125	.1250		.250	1/4			
	78-1160	HK-625-031	.0312		.280	1/4			
5/8	78-1165	HK-625-047	.0469		.280	1/4	1/2	10	2-3/4
	78-1170	HK-625-063	.0625		.280	1/4			
	78-1175	HK-625-078	.0781		.280	1/4			
	78-1180	HK-625-094	.0938	# 305	STD.	STD.			
	78-1185	HK-625-109	.1094		.280	1/4			
	78-1190	HK-625-125	.1250	# 405	.225	1/4			
	78-1195	HK-625-141	.1406		.280	1/4			
	78-1200	HK-625-156	.1562	# 505	.250	1/4			
	78-1205	HK-625-188	.1875	# 605	.250	1/4			
	78-1210	HK-625-203	.2031		.280	1/4			
	78-1215	HK-625-218	.2188		.280	1/4			
	78-1220	HK-625-250	.2500		.280	1/4			
	78-1225	HK-625-281	.2812		.280	1/4			
	11/16	78-1226	HK-687-063	.0625		.280			
78-1227		HK-687-125	.1250		.280	1/4			
3/4	78-1228	HK-750-031	.0312		.280	1/4	1/2	10	2-3/4
	78-1229	HK-750-047	.0469		.280	1/4			
	78-1230	HK-750-063	.0625		.280	1/4			
	78-1235	HK-750-078	.0781		.280	1/4			
	78-1240	HK-750-094	.0938		.280	1/4			
	78-1245	HK-750-109	.1094		.280	1/4			
	78-1250	HK-750-125	.1250	# 406	.230	1/4			
	78-1255	HK-750-141	.1406		.280	1/4			
	78-1260	HK-750-156	.1562	# 506	.250	1/4			
	78-1265	HK-750-188	.1875	# 606	.280	1/4			
	78-1270	HK-750-203	.2031		.280	1/4			
	78-1275	HK-750-219	.2188		.280	1/4			
	78-1280	HK-750-234	.2344		.280	1/4			
	78-1285	HK-750-250	.2500	# 806	.280	1/4			
	78-1290	HK-750-265	.2656		.490	1/4			
	78-1295	HK-750-281	.2812		.490	1/4			
	78-1300	HK-750-312	.3125		.490	1/4			
78-1305	HK-750-344	.3438		.490	1/4				
78-1310	HK-750-375	.3750		.490	1/4				

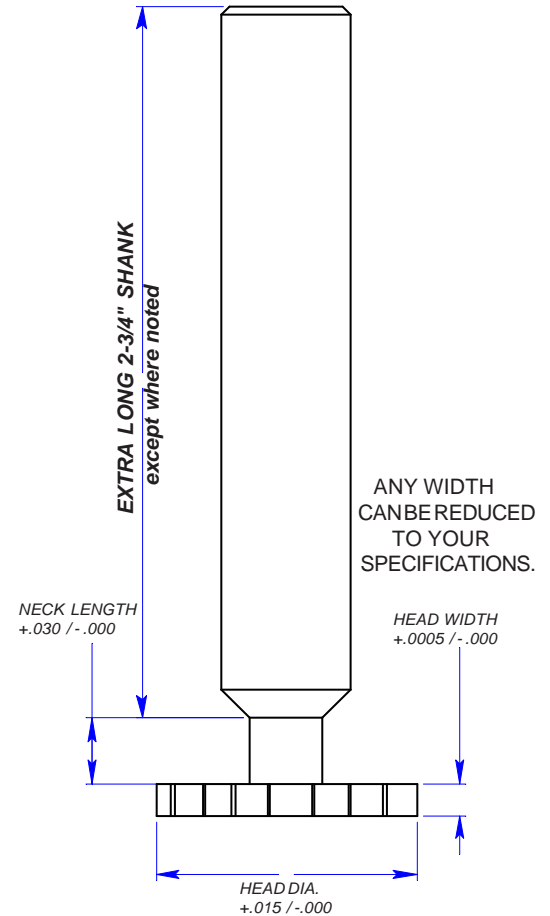


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SERIES 78 made from **ITC CARBIDE**

CARBIDE HEAD STEEL SHANK KEY CUTTERS

HEAD DIAMETER	ORDER EDP #	TOOL ID	HEAD WIDTH	STD.#	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
7/8	78-1313	HK-875-062	.0625		.280	1/4	1/2	12	2-3/4
	78-1315	HK-875-125	.1250		.280	1/4			
	78-1320	HK-875-156	.1562	#507	.250	1/4			
	78-1325	HK-875-187	.1875	#607	.280	1/4			
	78-1330	HK-875-219	.2188	#707	.280	1/4			
	78-1335	HK-875-250	.2500	#807	.345	1/4			
	78-1340	HK-875-312	.3125		.490	1/4			
78-1345	HK-875-375	.3750		.490	1/4				
1"	78-1346	HK-100-032	.0312		.280	1/4	1/2	12	2-3/4
	78-1348	HK-100-047	.0469		.280	1/4			
	78-1350	HK-100-062	.0625		.280	1/4			
	78-1352	HK-100-078	.0781		.280	1/4			
	78-1355	HK-100-094	.0938		.280	1/4			
	78-1360	HK-100-125	.1250		.280	1/4			
	78-1362	HK-100-156	.1562		.280	1/4			
	78-1365	HK-100-187	.1875	#608	.280	1/4			
	78-1370	HK-100-219	.2188	#708	.340	1/4			
	78-1375	HK-100-250	.2500	#808	.345	1/4			
	78-1380	HK-100-281	.2812		.490	1/4			
	78-1385	HK-100-312	.3125	#1008	.400	1/4			
	78-1390	HK-100-375	.3750	#1208	.400	1/4			
1-1/8	78-1395	HK-112-125	.1250		.280	1/4	1/2	12	2-3/4
	78-1400	HK-112-187	.1875	#609	.280	1/4			
	78-1405	HK-112-219	.2188		.490	1/4			
	78-1410	HK-112-250	.2500		.490	1/4			
1-1/4	78-1412	HK-125-031	.0312		.280	1/4	1/2	14	2-3/4
	78-1415	HK-125-062	.0625		.280	1/4			
	78-1420	HK-125-094	.0938		.280	1/4			
	78-1425	HK-125-125	.1250		.280	1/4			
	78-1427	HK-125-156	.1562		.280	1/4			
	78-1430	HK-125-187	.1875	#610	.320	1/4			
	78-1435	HK-125-219	.2188	#710	.380	1/4			
	78-1440	HK-125-250	.2500	#810	.379	1/4			
	78-1445	HK-125-312	.3125	#1010	.437	1/4			
78-1450	HK-125-375	.3750	#1210	.430	1/4				
1-3/8	78-1475	HK-137-250	.2500	#811	.400	1/4	1/2	14	2" solid carbide
	78-1480	HK-137-312	.3125	#1011	.470	1/4			
	78-1485	HK-137-375	.3750	#1211	.470	1/4			
1-1/2	78-1452	HK-150-032	.0312		.280	1/4	1/2	16	2-3/4
	78-1455	HK-150-062	.0625		.280	1/4			
	78-1460	HK-150-094	.0938		.280	1/4			
	78-1465	HK-150-125	.1250		.280	1/4			
	78-1470	HK-150-187	.1875		.490	1/4			
	78-1490	HK-150-250	.2500	#812	.430	1/4			
	78-1495	HK-150-312	.3125	#1012	.460	1/4			
78-1500	HK-150-375	.3750	#1212	.490	1/4				
1-3/4	78-1505	HK-175-062	.0625		.490	1/4	1/2	16	2-3/4
	78-1510	HK-175-125	.1250		.490	1/4			
	78-1515	HK-175-187	.1875		.490	1/4			
2"	78-1520	HK-200-062	.0625		.490	1/4	1/2	18	2-3/4
	78-1525	HK-200-125	.1250		.490	1/4			
	78-1530	HK-200-187	.1875		.490	1/4			

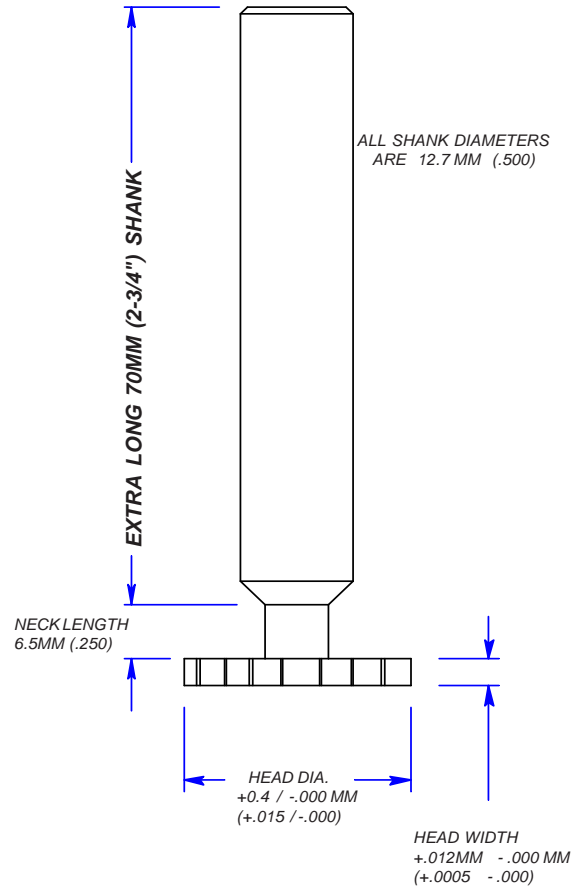


SPECIALS
 CORNER RADIUS
 STAGGER TOOTH
 ALTIM COATED
 AND LEFT HAND
 ARE AVAILABLE ON REQUEST.

SERIES 79 *made from ITC CARBIDE*

METRIC CARBIDE HEAD STEEL SHANK KEY CUTTERS

HEAD DIAMETER	ORDER EDP #	TOOL ID	WIDTH	NECK DIA	# OF TEETH
10MM (.394)	79-1800	MK-10-1.0	1.0 (.0394)	5MM (.196)	8
	79-1805	MK-10-2.0	2.0 (.0787)		
	79-1810	MK-10-3.0	3.0 (.1181)		
12MM (.472)	79-1815	MK-12-1.0	1.0 (.0394)	5MM (.196)	8
	79-1820	MK-12-2.0	2.0 (.0787)		
	79-1825	MK-12-3.0	3.0 (.1181)		
14MM (.551)	79-1830	MK-14-1.0	1.0 (.0394)	6MM (.236)	10
	79-1835	MK-14-2.0	2.0 (.0787)		
	79-1840	MK-14-3.0	3.0 (.1181)		
	79-1845	MK-14-4.0	4.0 (.1575)		
16MM (.629)	79-1850	MK-16-1.0	1.0 (.0394)	7MM (.275)	10
	79-1855	MK-16-2.0	2.0 (.0787)		
	79-1860	MK-16-3.0	3.0 (.1181)		
	79-1865	MK-16-4.0	4.0 (.1575)		
18MM (.708)	79-1870	MK-18-1.0	1.0 (.0394)	7MM (.275)	10
	79-1875	MK-18-2.0	2.0 (.0787)		
	79-1880	MK-18-3.0	3.0 (.1181)		
	79-1885	MK-18-4.0	4.0 (.1575)		
20MM (.787)	79-1890	MK-18-5.0	5.0 (.1969)	7MM (.275)	10
	79-1895	MK-20-1.0	1.0 (.0394)		
	79-1900	MK-20-2.0	2.0 (.0787)		
	79-1905	MK-20-3.0	3.0 (.1181)		
	79-1910	MK-20-4.0	4.0 (.1575)		
24MM (.944)	79-1915	MK-20-5.0	5.0 (.1969)	7MM (.275)	12
	79-1920	MK-24-1.0	1.0 (.0394)		
	79-1925	MK-24-2.0	2.0 (.0787)		
	79-1930	MK-24-3.0	3.0 (.1181)		
	79-1935	MK-24-4.0	4.0 (.1575)		
30MM (1.182)	79-1940	MK-24-5.0	5.0 (.1969)	7MM (.275)	12
	79-1945	MK-30-1.0	1.0 (.0394)		
	79-1950	MK-30-2.0	2.0 (.0787)		
	79-1955	MK-30-3.0	3.0 (.1181)		
	79-1960	MK-30-4.0	4.0 (.1575)		
32MM (1.260)	79-1965	MK-30-5.0	5.0 (.1969)	7MM (.275)	14
	79-1970	MK-32-1.0	1.0 (.0394)		
	79-1975	MK-32-2.0	2.0 (.0787)		
	79-1980	MK-32-3.0	3.0 (.1181)		
	79-1985	MK-32-4.0	4.0 (.1575)		
38MM (1.497)	79-1990	MK-32-5.0	5.0 (.1969)	7MM (.275)	14
	79-1995	MK-38-1.0	1.0 (.0394)		
	79-2000	MK-38-2.0	2.0 (.0787)		
	79-2005	MK-38-3.0	3.0 (.1181)		
	79-2010	MK-38-4.0	4.0 (.1575)		
	79-2015	MK-38-5.0	5.0 (.1969)		



ANY WIDTH CAN BE REDUCED TO YOUR SPECIFICATIONS.

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

RETAINING RING CARBIDE KEY CUTTERS

SERIES 77 made from **ITC CARBIDE** APPLICATION: ALL CLEARANCE ANGLES, RAKE ANGLES AND DISH CLEARANCE'S ARE SPECIFICALLY ENGINEERED AND DESIGNED FOR CUTTING RETAINING RING GROOVES

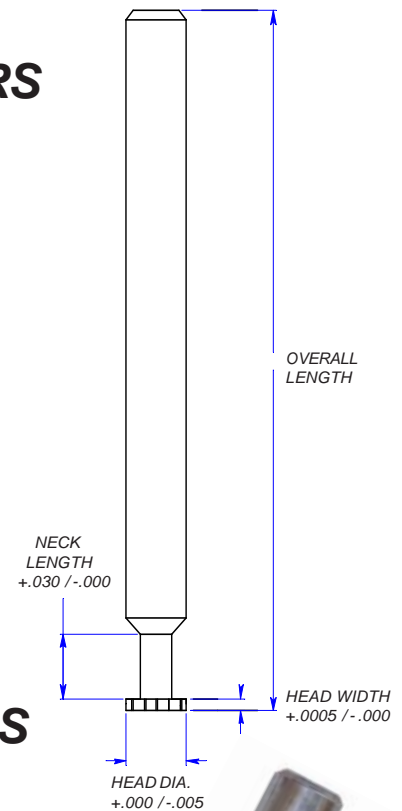
ORDER EDP#	TOOL ID	CUTTER WIDTH	HEAD DIAMETER	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
77-1900	RK-187-018	.018	.187	.094	3/16	3/16	6	2-1/2
77-1910	RK-187-029	.029						
77-1920	RK-250-039	.039	.250	.125	1/4	1/4	6	2-1/2
77-1930	RK-250-046	.046						
77-1940	RK-312-056	.056	.312	.150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

SERIES 74 made from **ITC CARBIDE**

LONG SHANK SOLID CARBIDE KEY CUTTERS

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

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



LONG SHANK CARBIDE HEAD KEY CUTTERS

SERIES 74 made from **ITC CARBIDE**

ORDER EDP#	TOOL ID	CUTTER WIDTH	HEAD DIAMETER	NECK DIAMETER	NECK LENGTH	SHANK DIA.	# OF TEETH	OVERALL LENGTH
74-0200	EK-625-062	.0625	.625	.280	1/4	1/2	10	6"
74-0205	EK-625-125	.1250						
74-0210	EK-750-062	.0625	.750	.250	1/4	1/2	10	6"
74-0215	EK-750-125	.1250						
74-0220	EK-875-062	.0625	.875	.280	1/4	1/2	12	6"
74-0225	EK-875-125	.1250						
74-0230	EK-100-062	.0625	1.00	.280	1/4	1/2	12	6"
74-0235	EK-100-125	.1250						
74-0240	EK-125-062	.0625	1.250	.280	1/4	1/2	14	6"
74-0245	EK-125-125	.1250						

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



SERIES 78 made from **ITC CARBIDE**

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

CARBIDE HEAD 3/8" STEEL SHANK KEY CUTTERS

HEAD DIAMETER	WIDTH	ORDER EDP #	TOOL IDENTIFICATION	NECK DIA.	NECK LENGTH	CUTTER DIA.	SHANK DIA.	# OF TEETH	SHANK LENGTH
1/2	.0312	78-0870	LK-500-031	.250	1/4	.500	3/8	10	2-3/4
	.0625	78-0880	LK-500-063	.250	1/4				
	.0938	78-0890	LK-500-094	.250	1/4				
	.1250	78-0895	LK-500-125	.250	1/4				
5/8	.0312	78-0900	LK-625-031	.250	1/4	.625	3/8	10	2-3/4
	.0625	78-0905	LK-625-063	.250	1/4				
	.0938	78-0910	LK-625-094	.250	1/4				
	.1250	78-0915	LK-625-125	.250	1/4				
3/4	.0312	78-0920	LK-750-031	.250	1/4	.750	3/8	12	2-3/4
	.0625	78-0925	LK-750-063	.250	1/4				
	.0938	78-0930	LK-750-094	.250	1/4				
	.1250	78-0935	LK-750-125	.250	1/4				

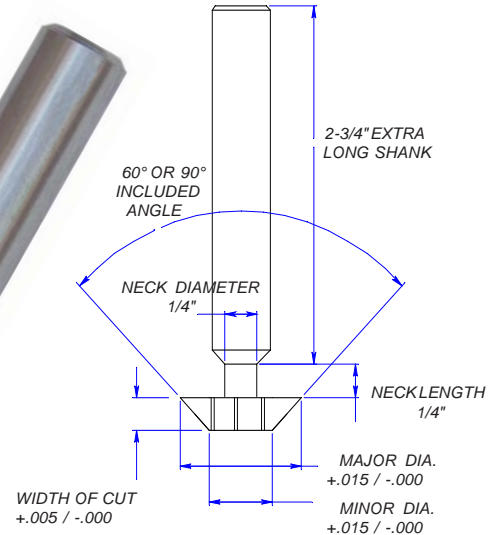
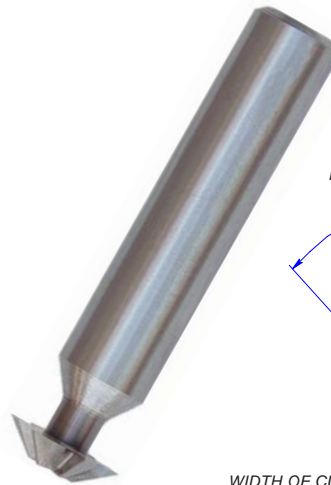


SERIES 90 made from **ITC CARBIDE**

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

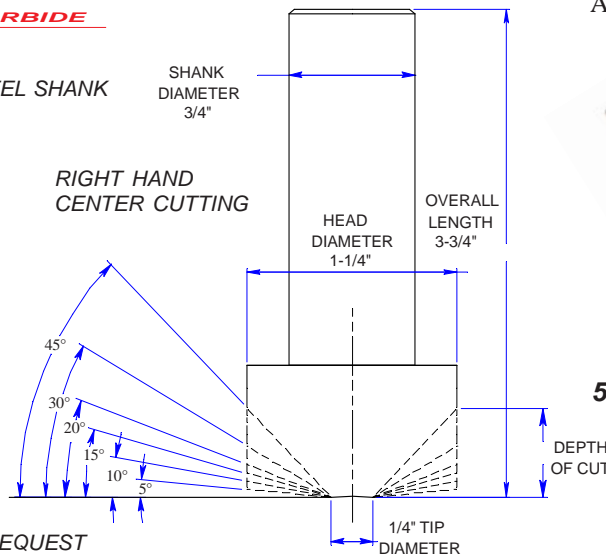


SERIES 81 made from **ITC CARBIDE**

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**



SPECIAL ANGLES AVAILABLE ON REQUEST

ITC CARBIDE: MAXIMUM SHEAR WITH MINIMUM WEAR

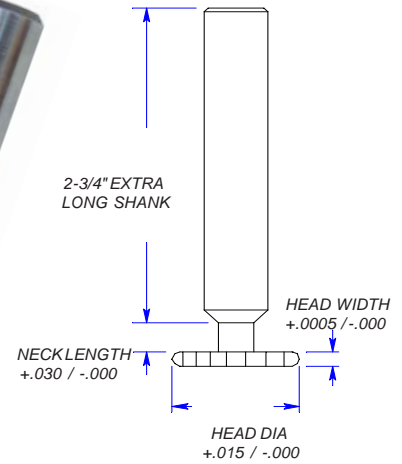
SERIES 80 made from **ITC CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

FULL RADIUS KEY CUTTERS

HEAD DIA.	HEAD WIDTH	ORDER EDP#	TOOL IDENTIFICATION	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
.500	1/16	80-1100	FR-500-063	.280	1/4	1/2	6	2-3/4
	3/32	80-1105	FR-500-094					
	1/8	80-1110	FR-500-125					
.625	1/16	80-1115	FR-625-063	.280	1/4	1/2	6	2-3/4
	3/32	80-1120	FR-625-094					
	1/8	80-1125	FR-625-125					
.750	1/16	80-1130	FR-750-063	.280	1/4	1/2	8	2-3/4
	3/32	80-1135	FR-750-094					
	1/8	80-1140	FR-750-125					
1.000	1/16	80-1145	FR-100-063	.280	1/4	1/2	8	2-3/4
	3/32	80-1150	FR-100-094					
	1/8	80-1155	FR-100-125					

SPECIAL WIDTHS ARE AVAILABLE ON REQUEST.

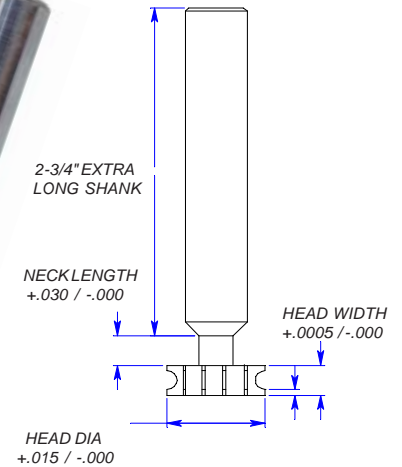


SERIES 82 made from **ITC CARBIDE**

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					
		.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					



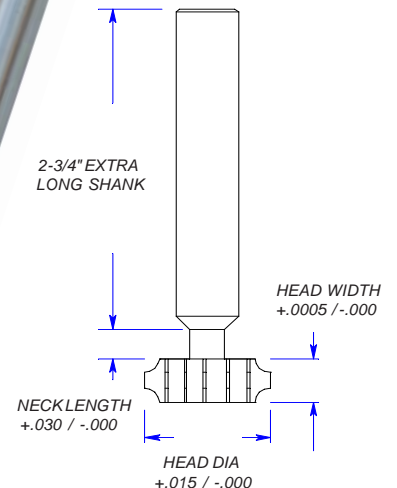
SERIES 84 made from **ITC CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

DOUBLE CONCAVE RADIUS CUTTERS

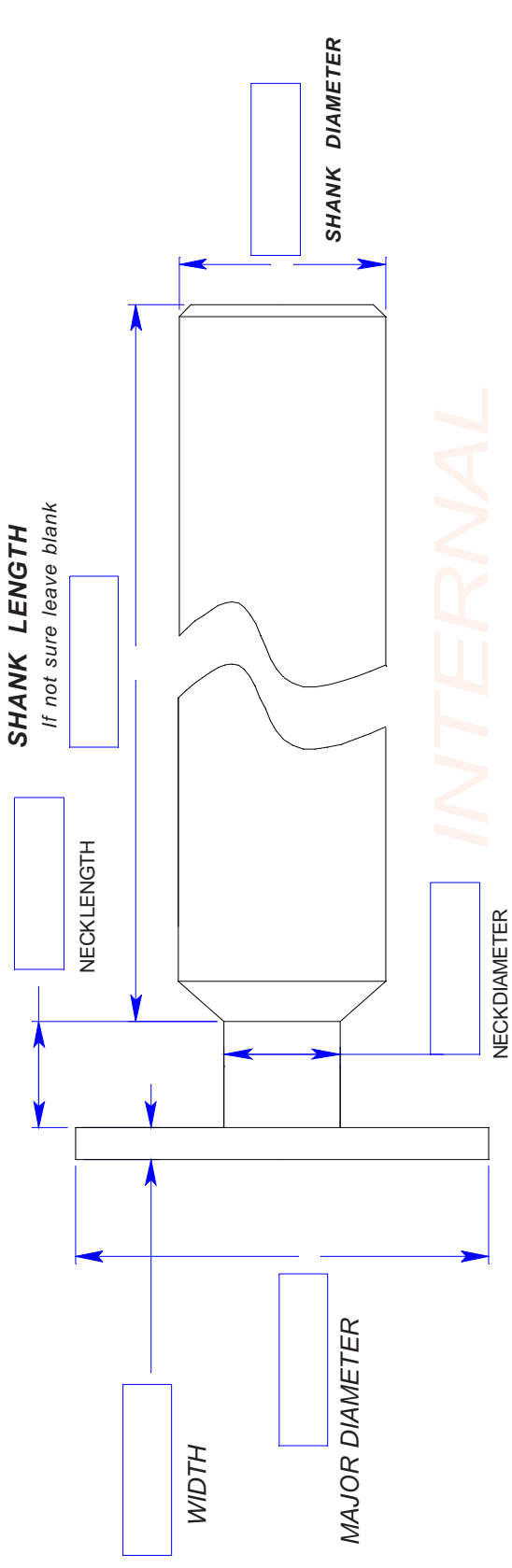
HEAD DIA.	RADIUS SIZE	HEAD WIDTH	ORDER EDP#	TOOL IDENTIFICATION	NECK DIA.	NECK LENGTH	SHANK DIA.	# OF TEETH	SHANK LENGTH
1/2	.010	.115	84-1100	DR-500-010	.280	1/4	1/2	6	2-3/4
	.015	.125	84-1105	DR-500-015					
	.020	.135	84-1110	DR-500-020					
5/8	.031	.155	84-1115	DR-625-031	.280	1/4	1/2	6	2-3/4
	.046	.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					

SPECIAL SIZES AVAILABLE ON REQUEST



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.



INTERNAL

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

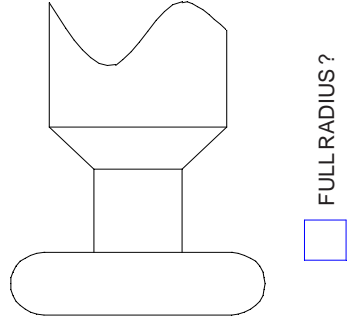
YOUR COMPANY NAME: _____

CONTACT: _____

PHONE: _____

FAX: _____

YOUR DISTRIBUTOR: _____



FULL RADIUS ?

CORNERRADIUS INSIDE - SIZE?

CORNERRADIUS OUTSIDE - SIZE?

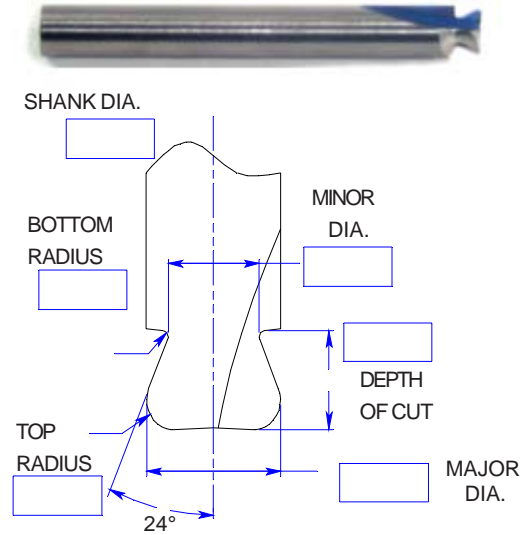
INTERNAL TOOL		TOLERANCE UNLESS OTHERWISE SPECIFIED	
		X = +/- 1/32 .XX = +/- .010 .XXX = +/- .002 .XXXX = +/- .0005 ANGLES +/- 0.15°	
DRAWN BY:	DATE:	REV:	
TOOL NUMBER:			

SERIES 51 *made from ITC CARBIDE*

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

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 12

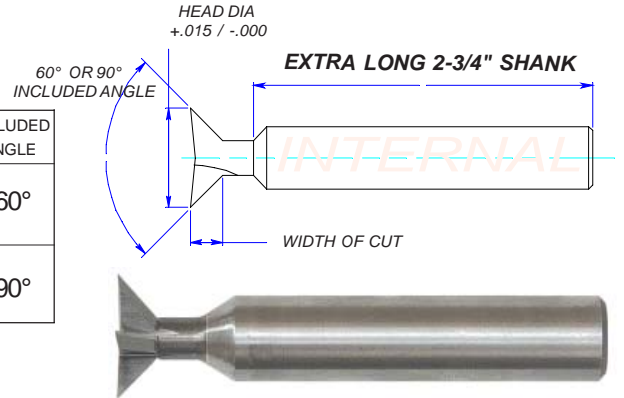
NEED A SPECIAL SIZE ?
MAKE A COPY, FILL IN THE INFORMATION,
AND FAX IT TO US FOR A QUOTE .

SERIES 86 *made from ITC CARBIDE*

CARBIDE HEAD ON HARDENED STEEL SHANK

DOVETAIL CUTTERS WITH STEEL SHANK

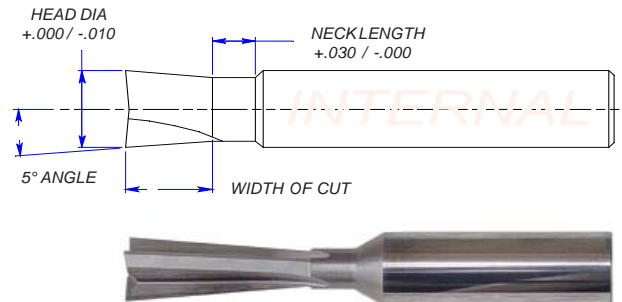
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH	INCLUDED ANGLE
3/8	.187	.160	86-1200	86-1200-C	1/2	5	3-1/8	1/4	60°
1/2	.250	.210	86-1205	86-1205-C	1/2	6	3-1/8	1/4	
3/4	.312	.350	86-1210	86-1210-C	1/2	5	3-1/8	1/4	
3/8	.125	.125	86-1215	86-1215-C	1/2	4	3-1/8	1/4	90°
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	



SERIES 86 *made from ITC CARBIDE*

5° DOVETAIL CUTTERS

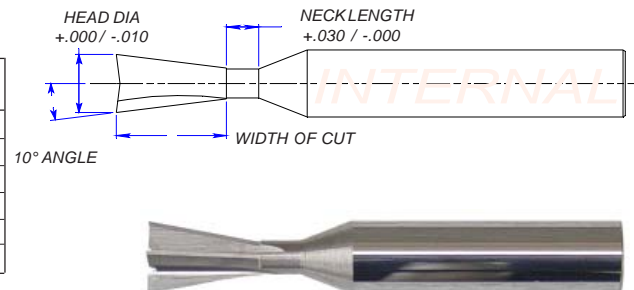
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.500	.100	86-0100	86-0100-C	3/16	4	2-1/2	1/4
1/4	.625	.135	86-0105	86-0105-C	1/4	4	2-1/2	1/4
5/16	.750	.175	86-0110	86-0110-C	5/16	4	2-1/2	1/4
3/8	.875	.210	86-0115	86-0115-C	3/8	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 ITC CARBIDE*

10° DOVETAIL CUTTERS

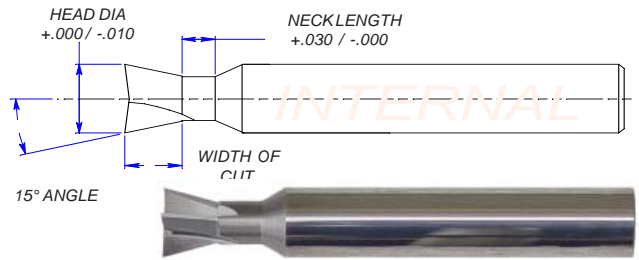
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.250	.090	86-0200	86-0200-C	3/16	4	2-1/2	1/4
1/4	.350	.120	86-0205	86-0205-C	1/4	4	2-1/2	1/4
5/16	.450	.140	86-0210	86-0210-C	5/16	4	2-1/2	1/4
3/8	.550	.175	86-0215	86-0215-C	3/8	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 **ITC CARBIDE**

15° DOVETAIL CUTTERS

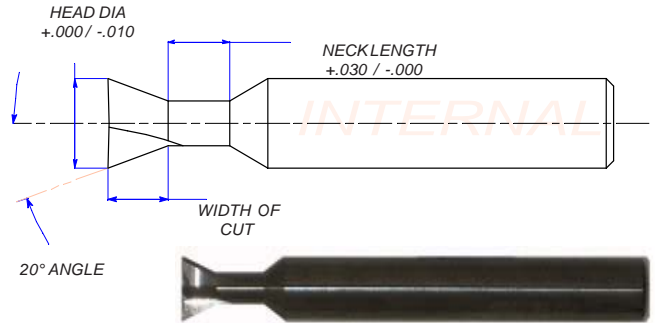
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.125	.110	86-1000	86-1000-C	3/16	4	2-1/2	1/4
1/4	.160	.150	86-1005	86-1005-C	1/4	4	2-1/2	1/4
5/16	.190	.200	86-1010	86-1010-C	5/16	4	2-1/2	1/4
3/8	.250	.230	86-1015	86-1015-C	3/8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

20° DOVETAIL CUTTERS

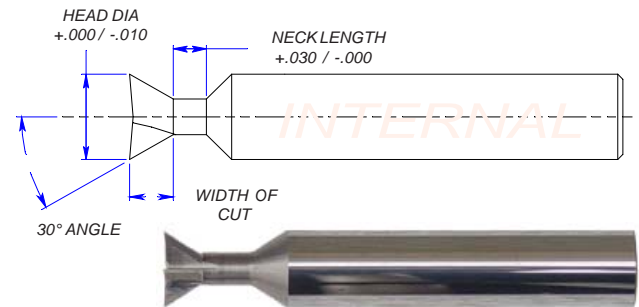
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.085	.062	86-1250	86-1250-C	1/8	3	2"	3/16
3/16	.130	.090	86-1255	86-1255-C	3/16	3	2-1/2	1/4
1/4	.170	.125	86-1260	86-1260-C	1/4	3	2-1/2	1/4
5/16	.255	.125	86-1265	86-1265-C	5/16	4	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 **ITC CARBIDE**

30° DOVETAIL CUTTERS

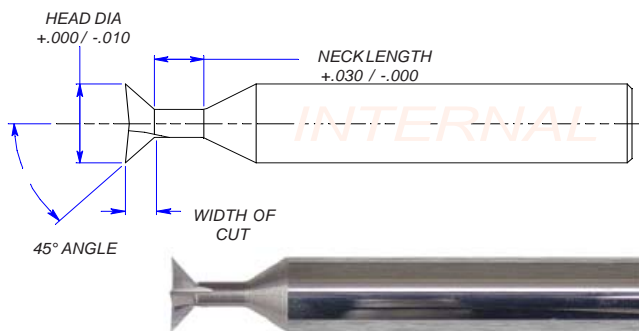
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.054	.062	86-1095	86-1095-C	1/8	3	2"	3/16
3/16	.080	.090	86-1100	86-1100-C	3/16	3	2-1/2	1/4
1/4	.100	.125	86-1105	86-1105-C	1/4	4	2-1/2	1/4
5/16	.160	.125	86-1107	86-1107-C	5/16	4	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



SERIES 86 made from **ITC CARBIDE**

45° DOVETAIL CUTTERS

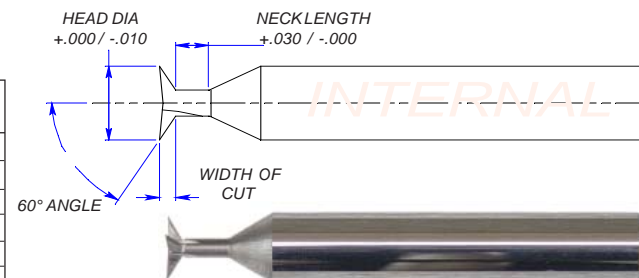
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
1/8	.032	.062	86-1119	86-1119-C	1/8	3	2"	3/16
3/16	.045	.090	86-1120	86-1120-C	3/16	3	2-1/2	1/4
1/4	.060	.115	86-1125	86-1125-C	1/4	3	2-1/2	1/4
5/16	.080	.150	86-1127	86-1127-C	5/16	4	2-1/2	1/4
3/8	.110	.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



SERIES 86 made from **ITC CARBIDE**

60° DOVETAIL CUTTERS

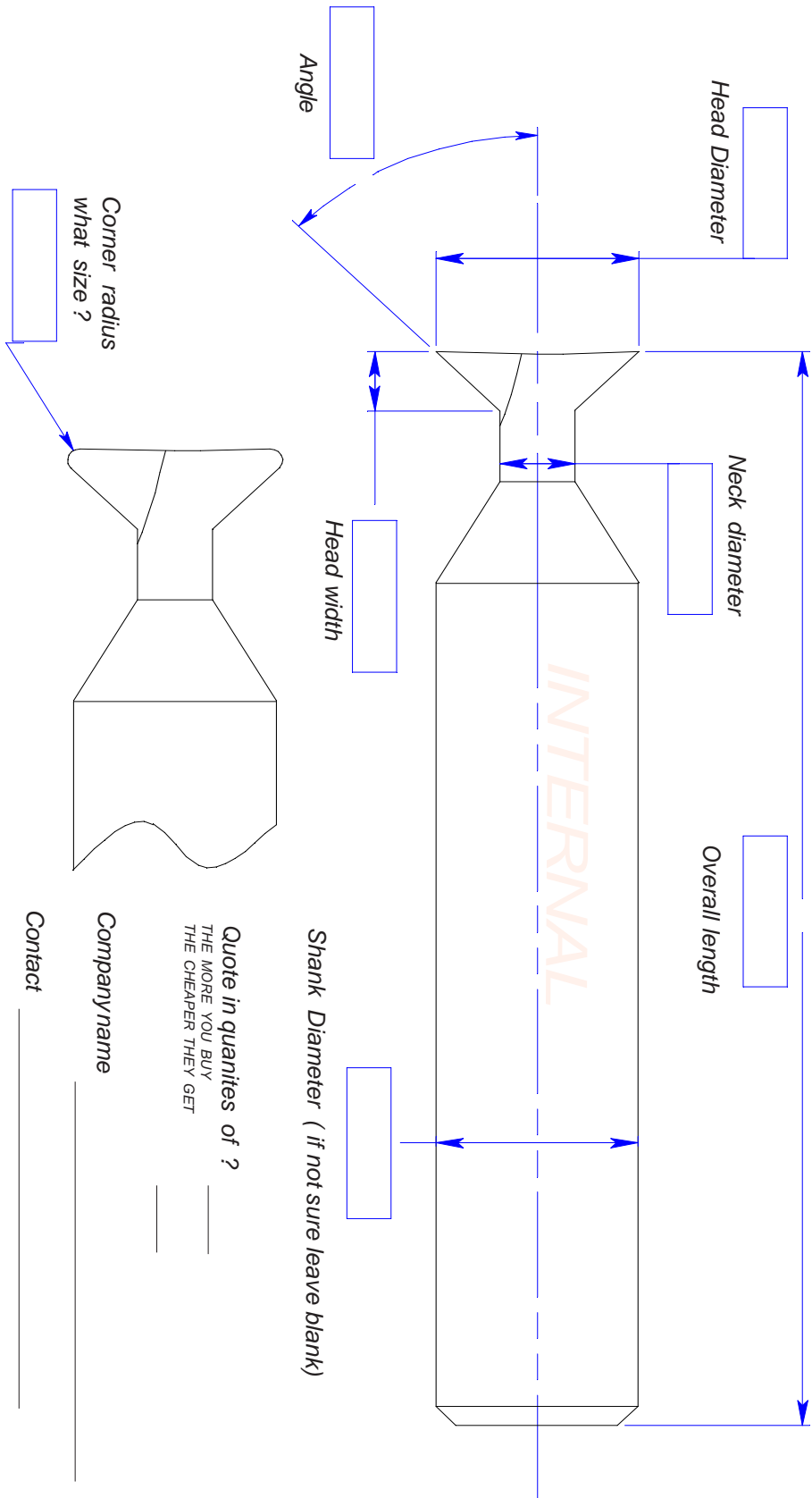
HEAD DIAMETER	WIDTH OF CUT	NECK DIAMETER	ORDER EDP#	ALTN COATED EDP#	SHANK DIA.	# OF TEETH	O.A.L. LENGTH	NECK LENGTH
3/16	.032	.070	86-1160	86-1160-C	3/16	3	2-1/2	1/4
1/4	.048	.080	86-1165	86-1165-C	1/4	3	2-1/2	1/4
5/16	.062	.095	86-1170	86-1170-C	5/16	4	2-1/2	1/4
3/8	.078	.100	86-1175	86-1175-C	3/8	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	6	3-1/2	1/4



**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:	



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 92 made from **ITC CARBIDE**

SOLID CARBIDE

30° INC. DOUBLE ANGLE CUTTERS

HEAD & SHANK DIA.	WIDTH OF CUT	ORDER EDP#	ALTIM COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH
1/4	.032	92-0900	92-0900-C	.250	1/8	4
		92-0905	92-0905-C	.750		
3/8	.050	92-0907	92-0907-C	.312	3/16	4
		92-0910	92-0910-C	1.000		
1/2	.067	92-0912	92-0912-C	.375	1/4	4
		92-0920	92-0920-C	1.250		

60° INC. DOUBLE ANGLE CUTTERS

HEAD & SHANK DIA.	WIDTH OF CUT	ORDER EDP#	ALTIM COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH
1/4	.070	92-1200	92-1200-C	.250	1/8	4
		92-1205	92-1205-C	.750		
3/8	.105	92-1210	92-1210-C	.312	3/16	4
		92-1215	92-1215-C	1.000		
1/2	.140	92-1220	92-1220-C	.375	1/4	4
		92-1225	92-1225-C	1.250		

90° INC. DOUBLE ANGLE CUTTERS

HEAD & SHANK DIA.	WIDTH OF CUT	ORDER EDP#	ALTIM COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH
1/8	.120	92-9800	92-9800-C		1/8	4
		92-9805	92-9805-C			
3/16	.185	92-9810	92-9810-C		3/16	4
		92-9815	92-9815-C			
1/4	.250	92-1000	92-1000-C	.250	1/4	4
		92-1005	92-1005-C	.750		
5/16		92-1006	92-1006-C			
		92-1007	92-1007-C			
3/8		92-1010	92-1010-C	.312		
		92-1015	92-1015-C	1.000		
1/2		92-1020	92-1020-C	.375		
		92-1025	92-1025-C	1.250		

SERIES 92 made from **ITC CARBIDE**

CARBIDE HEAD ON HARDENED STEEL SHANK

90° INC. DOUBLE ANGLE CUTTERS

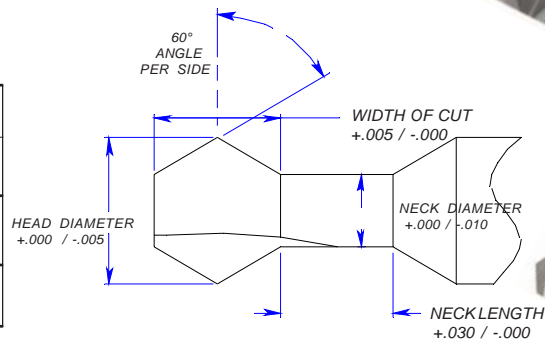
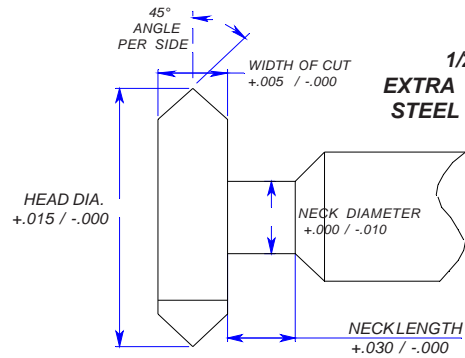
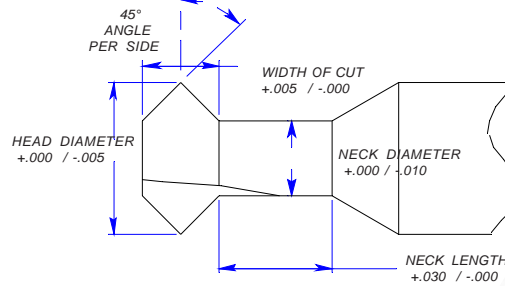
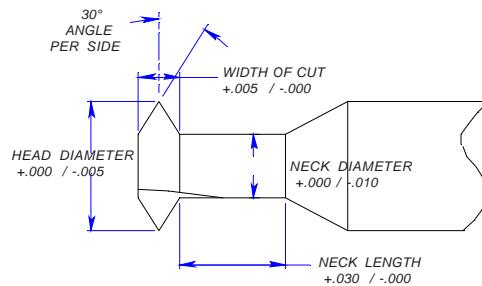
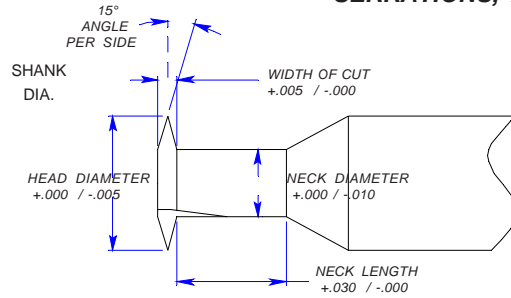
HEAD DIAMETER	WIDTH OF CUT	ORDER EDP#	ALTIM COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH
1/2	.125	92-1100	92-1100-C	.250	1/4	6
	.187	92-1105	92-1105-C	.250		
5/8	.187	92-1110	92-1110-C	.250	1/4	6
	.250	92-1115	92-1115-C	.250		
3/4	.125	92-1117	92-1117-C	.250	1/4	6
	.250	92-1120	92-1120-C	.250		

SERIES 92 made from **ITC CARBIDE** SOLID CARBIDE

120° INC. DOUBLE ANGLE CUTTERS

HEAD & SHANK DIA.	WIDTH OF CUT	ORDER EDP#	ALTIM COATED EDP#	NECK LENGTH	NECK DIAMETER	# OF TEETH
1/4	.215	92-1300	92-1300-C	.250	1/8	4
3/8	.320	92-1310	92-1310-C	.312	3/16	4
1/2	.430	92-1320	92-1320-C	.375	1/4	4

APPLICATION: FOR CUTTING CHAMFERS, SERRATIONS, ANGLES ETC.



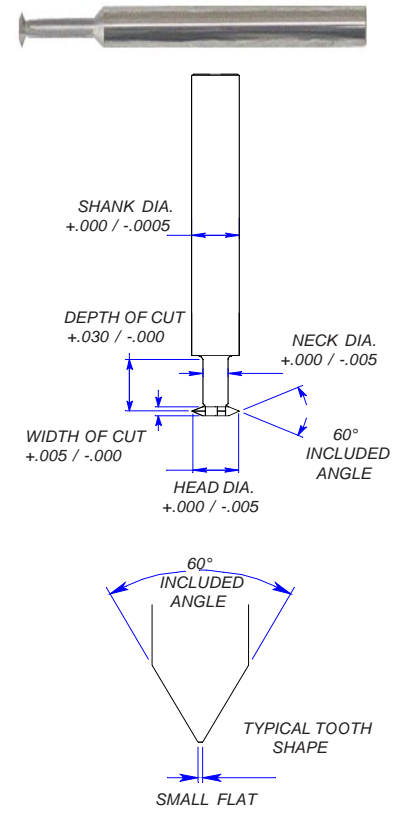
QUICK SELECTOR FOR
STANDARD I.D. THREADS

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

I.D. THREAD TO CUT TOOL TO USE

4-40		
4-48	M2.5 X .45	88-0870
5-40	M3.0 X .5	88-0880
5-44	M3.5 X .6	88-0880
6-32		
6-40		
8-32		
8-36	M4.0 X .7	88-0900
10-24	M4.5 X .75	88-0910
10-32	M5.0 X .8	88-0915
12-24		
12-28		
1/4-20		
1/4-28	M6.0 X 1.0	88-1000
5/16-18	M7.0 X 1.0	88-1005
5/16-24		
3/8-16	M8.0 X 1.0	88-1020
3/8-24	M8.0 X 1.25	88-1025
7/16-14	M10.0 X 1.0	88-1027
7/16-20	M10.0 X 1.25	
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		
5/8-18	M16 X 2.0	88-1060
3/4-10	M16 X 5.0	88-1065
3/4-16		88-1070

HEAD DIAMETER	WIDTH OF CUT	NECK DIA.	ORDER EDP#	ALTIN COATED EDP#	DEPTH OF CUT	SHANK DIA.	# OF TEETH	PITCH RANGE
.100	.032	.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	
1/8	.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	
5/32	.045	.070	88-1000	88-1000-C	1/4	3/16	4	24-56
			88-1005	88-1005-C	1/2	3/16	4	
3/16	.055	.090	88-1010	88-1010-C	3/8	3/16	4	18-56
			88-1015	88-1015-C	3/4	3/16	4	
			88-1017	88-1017-C	1"	3/16	4	
1/4	.065	.130	88-1020	88-1020-C	3/8	1/4	4	16-48
			88-1025	88-1025-C	3/4	1/4	6	
			88-1027	88-1027-C	1"	1/4	6	
5/16	.078	.180	88-1030	88-1030-C	1/2	5/16	6	14-40
			88-1035	88-1035-C	1"	5/16	6	
3/8	.095	.200	88-1040	88-1040-C	1/2	3/8	6	12-32
			88-1045	88-1045-C	3/4	3/8	6	
			88-1050	88-1050-C	1"	3/8	6	
			88-1055	88-1055-C	1-1/4	3/8	6	
1/2	.100	.300	88-1060	88-1060-C	1"	1/2	5	11-32
			88-1065	88-1065-C	1-1/4	1/2	5	
			88-1070	88-1070-C	1-1/2	1/2	5	



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 59.

SERIES 88 *made from ITC CARBIDE*

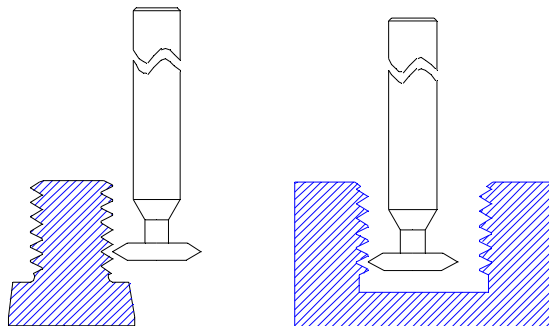
CARBIDE HEAD ON HARDENED STEEL SHANK

THREAD MILLS

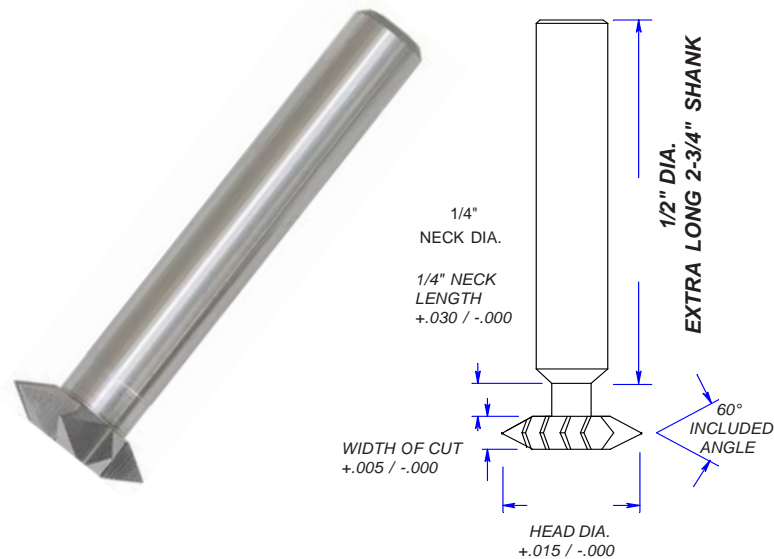
HEAD DIAMETER	PITCH RANGE	WIDTH OF CUT	ORDER EDP#	ALTIN COATED EDP#	# OF TEETH	
1/2	16 - 32	.062	88-1100	88-1100-C	6	
	5/8	16 - 32	.062	88-1105		88-1105-C
11 - 28		.094	88-1110	88-1110-C		
8 - 28		.135	88-1112	88-1112-C		
3/4	11 - 24	.094	88-1115	88-1115-C		8
	7 - 24	.156	88-1120	88-1120-C		
1"	7 - 20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

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.**



MILL EXTERNAL THREADS MILL INTERNAL THREADS



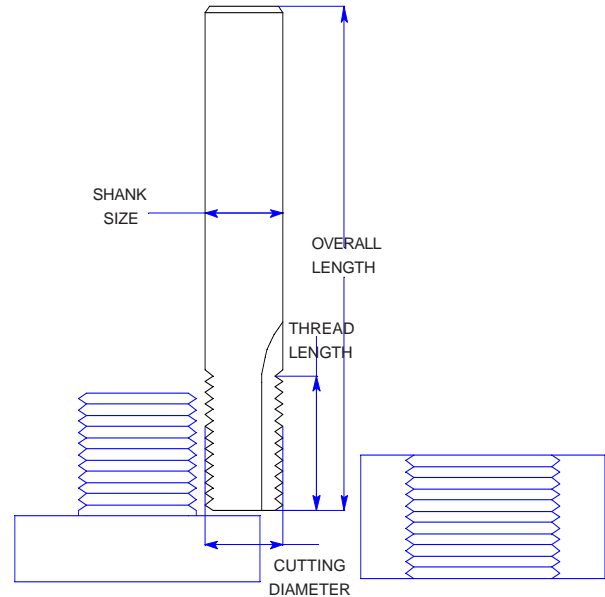
SERIES 89 made from **ITC CARBIDE**

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 89 made from **ITC CARBIDE**

MULTIPLE THREAD INTERNAL / EXTERNAL

TAPERED PIPE THREAD MILLS ALTIN COATED

SIZE	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	SHANK SIZE	ALTIN COATED EDP#
1/16-27	.245	.437	2-1/2"	3	1/4	89-1500
1/8-27	.310	.437	2-1/2"	4	5/16	89-1505
1/4-18	.305	.625	3"	4	3/8	89-1510
3/8-18	.305	.625	3"	4	3/8	89-1515
1/2-14	.495	.875	3-1/2"	4	1/2	89-1520
3/4-14	.495	.875	3-1/2"	4	1/2	89-1525
1"-11-1/2	.620	1.125	4"	5	3/4	89-1530

SERIES 89 made from **ITC CARBIDE**

MULTIPLE THREAD INTERNAL / EXTERNAL

STRAIGHT PIPE THREAD MILLS ALTIN COATED

SIZE	CUTTING DIAMETER	THREAD LENGTH	OVERALL LENGTH	NUMBER OF FLUTES	SHANK SIZE	ALTIN COATED EDP#
1/16-27	.245	.437	2-1/2"	3	1/4	89-1750
1/8-27	.310	.437	2-1/2"	4	5/16	89-1755
1/4-18	.305	.625	3"	4	3/8	89-1760
3/8-18	.305	.625	3"	4	3/8	89-1765
1/2-14	.495	.875	3-1/2"	4	1/2	89-1770
3/4-14	.495	.875	3-1/2"	4	1/2	89-1775
1"-11-1/2	.620	1.125	4"	5	3/4	89-1780



SERIES 93 *made from ITC CARBIDE*

CARBIDE REAMERS



STRAIGHT FLUTE RIGHT HAND CUT DIAMETERS +.0003 / -.0000

CUTTING DIAMETER	FLUTE LENGTH	OVERALL LENGTH	SHANK SIZE	NUMBER OF FLUTES	ORDER EDP#
.0620	1/2"	1-1/2"	.0620	4	93-0620
.0625	1/2"	1-1/2"	.0625	4	93-0625
.0630	1/2"	1-1/2"	.0630	4	93-0630
.0635	1/2"	1-1/2"	.0635	4	93-0635
.0930	1/2"	2"	.0930	4	93-0930
.0935	1/2"	2"	.0935	4	93-0935
.0938	1/2"	2"	.0938	4	93-0938
.0940	1/2"	2"	.0940	4	93-0940
.0945	1/2"	2"	.0945	4	93-0945
.1090	5/8"	2-1/4"	.1090	4	93-1090
.1094	5/8"	2-1/4"	.1094	4	93-1094
.1100	5/8"	2-1/4"	.1100	4	93-1100
.1240	5/8"	2-1/4"	.1240	4	93-1240
.1245	5/8"	2-1/4"	.1245	4	93-1245
.1250	5/8"	2-1/4"	.1250	4	93-1250
.1255	5/8"	2-1/4"	.1255	4	93-1255
.1700	7/8"	2-3/4"	.1700	4	93-1700
.1719	7/8"	2-3/4"	.1719	4	93-1719
.1725	7/8"	2-3/4"	.1725	4	93-1725
.1860	7/8"	2-3/4"	.1860	4	93-1860
.1865	7/8"	2-3/4"	.1865	4	93-1865
.1870	7/8"	2-3/4"	.1870	4	93-1870
.1875	7/8"	2-3/4"	.1875	4	93-1875
.1880	7/8"	2-3/4"	.1880	4	93-1880
.1885	7/8"	2-3/4"	.1885	4	93-1885
.2025	1"	3"	.2025	4	93-2025
.2031	1"	3"	.2031	4	93-2031
.2035	1"	3"	.2035	4	93-2035
.2330	1"	3"	.2330	4	93-2330
.2340	1"	3"	.2340	4	93-2340
.2344	1"	3"	.2344	4	93-2344
.2350	1"	3"	.2350	4	93-2350
.2470	1"	3"	.2470	4	93-2470
.2475	1"	3"	.2475	4	93-2475
.2480	1"	3"	.2480	4	93-2480
.2485	1"	3"	.2485	4	93-2485
.2490	1"	3"	.2490	4	93-2490
.2495	1"	3"	.2495	4	93-2495
.2500	1"	3"	.2500	4	93-2500
.2505	1"	3"	.2505	4	93-2505
.2510	1"	3"	.2510	4	93-2510
.2515	1"	3"	.2515	4	93-2515
.2520	1"	3"	.2520	4	93-2520
.2650	1-1/8"	3-1/4"	.2650	6	93-2650
.2656	1-1/8"	3-1/4"	.2656	6	93-2656
.2660	1-1/8"	3-1/4"	.2660	6	93-2660
.2800	1-1/8"	3-1/4"	.2800	6	93-2800
.2812	1-1/8"	3-1/4"	.2812	6	93-2812
.2820	1-1/8"	3-1/4"	.2820	6	93-2820
.2960	1-1/8"	3-1/4"	.2960	6	93-2960
.2965	1-1/8"	3-1/4"	.2965	6	93-2965
.2969	1-1/8"	3-1/4"	.2969	6	93-2969
.2975	1-1/8"	3-1/4"	.2975	6	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

SPECIAL SIZES AVAILABLE ON REQUEST

SERIES 85 *made from* **ITC 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

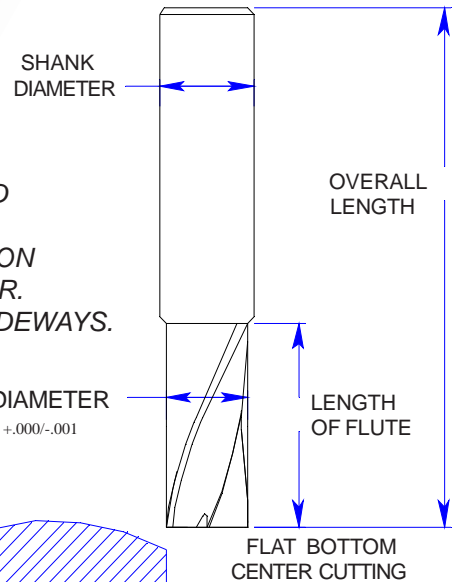
FLAT BOTTOM CENTER CUTTING
 15° RIGHT HAND HELIX, RIGHT HAND CUT
 DIAMETER TOLERANCE +.000 / -.001

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

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	DEPTH OF CUT		
				INSERT BARS SERIES 16THRU 18 PAGE 45 THRU 48	SOLID CARBIDE BARS OUR SERIES 10 PAGE 2	TIN COATED SOLID 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
WASPALOY		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.

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

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
WASPALOY		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-9AI-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

$$300 \times 4 = 1200 \text{ divided by } .750 = 1600 \text{ RPM}$$

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

$$.001 \times 10 \times 1600 = 16$$

MULTIPLIER

NUMBER OF
TEETH

RPM

INCHES PER
MINUTE

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

SPEEDS AND FEEDS FOR THREADING TOOLS

MATERIAL	TYPE	SPEED SURFACE FEET PER MINUTE	FEED Infeed per pass 1st pass	FEED Infeed per pass last pass
PLASTIC	TEFLON	250-400	.015	.001
	NYLON	250-400	.015	.001
	PHENOLIC	250-400	.015	.001
	GLASS FILLED	250-400	.015	.001
MAGNESIUM	AZ, AM, EZ, ZE, HK	100-200	.020	.001
ALUMINUM	2021 THRU 6061	100-200	.020	.001
COPPER		100-200	.010	.001
BRASS		200-300	.010	.001
BRONZE		200-300	.010	.001
CAST IRON		85-140	.015	.0005
STEEL	1005-1029	50-150	.015	.001
	1030-1055	50-150	.015	.001
	1060-1095	50-150	.015	.001
	10L45-10L50	50-150	.015	.001
	12L13-12L15	50-150	.015	.001
	41L30-41L50	50-150	.015	.001
	4140-4150	50-150	.015	.001
	4140 (35 HRC)	50-150	.015	.001
	8617-8622	50-150	.015	.001
	M1-M6	50-150	.015	.001
	H10-H19	50-150	.015	.001
	D2-D7	50-150	.015	.001
	A2-A9, 01-07	50-150	.015	.001
	W1, W2	50-150	.015	.001
M-50, 52100	50-150	.015	.001	
TITANIUM	TI-9AI-6V	40-65	.020	.0005
STAINLESS	405-446	65-100	.015	.001
	15-5PH, 16-6PH, 14-4PH	65-100	.015	.001
NICKEL	NICKEL 200-230	40-100	.015	.001

SINGLE POINT THREADING ROUGHING INFEEED DEPTH PER PASS

THREADS PER INCH	8	10	11	12	13	14	16	18	20	24	28	32	36	40
PASS 1	.0171	.0148	.0148	.0134	.0124	.0114	.0110	.0110	.0099	.0094	.0079	.0083	.0072	.0083
PASS 2	.0283	.0243	.0243	.0219	.0202	.0189	.0179	.0178	.0159	.0150	.0126	.0130	.0113	.0128
PASS 3	.0372	.0318	.0318	.0287	.0264	.0244	.0233	.0231	.0206	.0194	.0163	.0167	.0145	
PASS 4	.0449	.0383	.0383	.0345	.0317	.0293	.0279	.0276	.0246	.0231	.0194			
PASS 5	.0517	.0441	.0441	.0396	.0364	.0337	.0321	.0316	.0282					
PASS 6	.0580	.0494	.0494	.0443	.0407	.0376	.0358							
PASS 7	.0637	.0543	.0543	.0486	.0447	.0413								
PASS 8	.0691	.0588	.0588											
PASS 9	.0742													

IN MOST CASES
A FINISH OR SPRING PASS
IS RECCOMENDED.

FORMULA FOR CONVERTING SURFACE FEET PER MINUTE (SFM)
TO REVOLUTIONS PER MINUTE (RPM)

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

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

SPEEDS AND FEEDS FOR FACE GROOVING

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

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

RPM=SFM X 12
 (1) X DIAMETER

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.

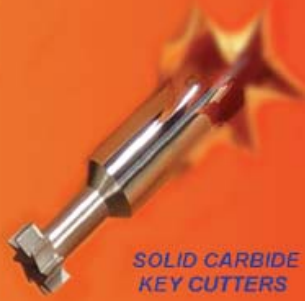
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EMAIL INFO@INTERNALTOOL.COM
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Internal Tool Inc. 1338 Palomares Ave. LaVerne CA. 91750

DESCRIPTION	PAGE	DESCRIPTION	PAGE
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BORE AND GROOVE COMBINATION TOOLS	17	GROOVING TOOLS TIALN COATED	11
BORE & THREAD COMBINATION TOOLS	17	GROOVING TOOLS QUICK CHANGE	9
BORING TOOLS SOLID CARBIDE	6	I.D. CHAMFER TOOLS	18
BORING TOOLS CARBIDE TIALN COATED	7	KEYWAY CUTTERS 3/8 SHANK	55
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INTERNAL TOOL INC. CUTTING TOOLS



BORE & GROOVE



SOLID CARBIDE
KEY CUTTERS



SINGLE ANGLE
CUTTERS



INSERT
BORING BARS



EDGE BRAKERS



DRILL & BORE TOOLS



MAX-GROOVE
GROOVE TOOLS



DOUBLE CONCAVE
RADIUS CUTTERS



O-RING DOVETAIL
CUTTERS



FACE GROOVING TOOLS



CORNER ROUNDING
ENDMILLS



ENGRAVING TOOLS



MULTI-REACH
PROFILERS



LEFT HAND
PROFILERS



MULTI-REACH
GROOVE TOOLS



CONCAVE RADIUS
CUTTERS

INTERNAL TOOL 09



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