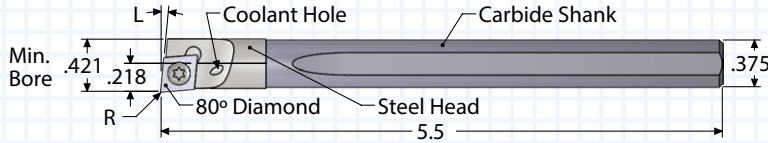


# INDEXABLE BORING BAR AND INSERTS

## 3/8" CARBIDE SHANK - DIAMOND SHAPED INSERTS

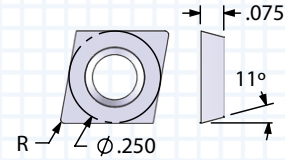
EACH BAR COMES WITH ONE SCREW AND ONE KEY. INSERTS SOLD SEPARATELY.

### BAR WITH COOLANT HOLE



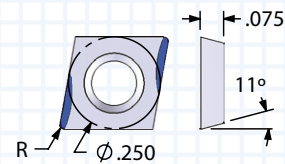
| "L" ANGLE | BAR FLAT | INSERT TYPE | RH/LH | ORDER #         |                 | EDP #           |                 |
|-----------|----------|-------------|-------|-----------------|-----------------|-----------------|-----------------|
|           |          |             |       | COOLANT THROUGH | COOLANT THROUGH | COOLANT THROUGH | COOLANT THROUGH |
| 5°        | NONE     | ACP2        | RIGHT | ADBC375R5R      |                 | 300542          |                 |
| 5°        | FLAT     | ACP2        | RIGHT | ADBC375F5R      |                 | 300530          |                 |
| 0°        | NONE     | ACP2        | RIGHT | ADBC375R0R      |                 | 300536          |                 |
| 0°        | FLAT     | ACP2        | RIGHT | ADBC375F0R      |                 | 300524          |                 |
| 5°        | NONE     | ACP2        | LEFT  | ADBC375R5L      |                 | 300539          |                 |
| 5°        | FLAT     | ACP2        | LEFT  | ADBC375F5L      |                 | 300527          |                 |
| 0°        | NONE     | ACP2        | LEFT  | ADBC375R0L      |                 | 300533          |                 |
| 0°        | FLAT     | ACP2        | LEFT  | ADBC375F0L      |                 | 300521          |                 |

### CARBIDE INSERTS



80° DIAMOND FLAT TOP

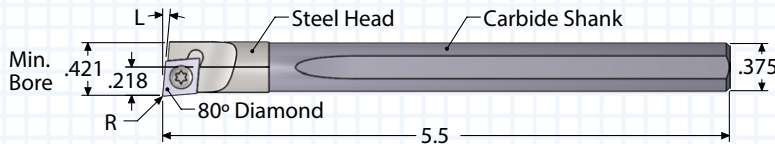
| FIVE SCREWS | "R" CORNER RADIUS | ORDER #       |             | EDP #         |             |
|-------------|-------------------|---------------|-------------|---------------|-------------|
|             |                   | FIVE UNCOATED | FIVE ALTiN+ | FIVE UNCOATED | FIVE ALTiN+ |
| AT8+        | 0.003             | ACP2031       | ACP2031E    | 301197        | 301204      |
| AT8+        | 0.007             | ACP2071       | ACP2071E    | 301211        | 301225      |
| AT8+        | 0.015             | ACP2151       | ACP2151E    | 301253        | 301267      |



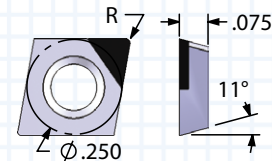
80° DIAMOND CHIP CONTROL RIGHT HAND ONLY

| FIVE SCREWS | "R" CORNER RADIUS | ORDER #       |             | EDP #         |             |
|-------------|-------------------|---------------|-------------|---------------|-------------|
|             |                   | FIVE UNCOATED | FIVE ALTiN+ | FIVE UNCOATED | FIVE ALTiN+ |
| AT8+        | 0.007             | ACP207L3      | ACP207L3E   | 301240        | 301247      |
| AT8+        | 0.015             | ACP215L3      | ACP215L3E   | 301282        | 301289      |

### BAR WITHOUT COOLANT HOLE



| "L" ANGLE | BAR FLAT | INSERT TYPE | RH/LH | ORDER #         |                 | EDP #           |                 |
|-----------|----------|-------------|-------|-----------------|-----------------|-----------------|-----------------|
|           |          |             |       | NO COOLANT HOLE | NO COOLANT HOLE | NO COOLANT HOLE | NO COOLANT HOLE |
| 5°        | NONE     | ACP2        | RIGHT | ACBC375R5R      |                 | 300142          |                 |
| 5°        | FLAT     | ACP2        | RIGHT | ACBC375F5R      |                 | 300130          |                 |
| 0°        | NONE     | ACP2        | RIGHT | ACBC375R0R      |                 | 300136          |                 |
| 0°        | FLAT     | ACP2        | RIGHT | ACBC375F0R      |                 | 300124          |                 |
| 5°        | NONE     | ACP2        | LEFT  | ACBC375R5L      |                 | 300139          |                 |
| 5°        | FLAT     | ACP2        | LEFT  | ACBC375F5L      |                 | 300127          |                 |
| 0°        | NONE     | ACP2        | LEFT  | ACBC375R0L      |                 | 300133          |                 |
| 0°        | FLAT     | ACP2        | LEFT  | ACBC375F0L      |                 | 300121          |                 |



80° DIAMOND CBN/PCD TIPPED

| ONE SCREW | "R" CORNER RADIUS | ORDER #     |            | EDP #   |         |
|-----------|-------------------|-------------|------------|---------|---------|
|           |                   | ONE CBN     | ONE PCD    | ONE CBN | ONE PCD |
| AT8+      | 0.007             | ACP2071CBN2 | ACP2071PCD | 301218  | 301232  |
| AT8+      | 0.015             | ACP2151CBN2 | ACP2151PCD | 301260  | 301274  |

Inserts and compatible bars are listed together.

# INDEXABLE BORING BAR FEED AND SPEED CHART

| MATERIAL                          | HB/Rc  | SPEED RANGE (SFM) |         | CUTTING CONDITIONS   |                      |             |
|-----------------------------------|--------|-------------------|---------|----------------------|----------------------|-------------|
|                                   |        | UNCOATED          | ALTIN+  | MAX DOC<br>ACD & ATD | MAX DOC<br>ATP & ACP | FEED<br>IPR |
| CAST IRON                         | 160 HB | 75-200            | 200-550 | 0.020                | 0.060                | .0005-.010  |
| CARBON STEEL                      | 18 Rc  | 75-200            | 200-450 | 0.018                | 0.060                | .0005-.010  |
| ALLOY STEEL                       | 20 Rc  | 75-200            | 200-425 | 0.015                | 0.060                | .0005-.010  |
| TOOL STEEL                        | 25 Rc  | 75-175            | 175-300 | 0.010                | 0.030                | .0005-.010  |
| 300 STAINLESS STEEL               | 150 HB | 75-175            | 175-350 | 0.015                | 0.028                | .0005-.010  |
| 400 STAINLESS STEEL               | 195 HB | 75-210            | 130-420 | 0.012                | 0.028                | .0005-.010  |
| HIGH TEMP ALLOY<br>(Ni & Co BASE) | 20 Rc  | 50-130            | 130-300 | 0.008                | 0.020                | .0005-.010  |
| TITANIUM                          | 25 Rc  | 50-120            | 120-275 | 0.009                | 0.022                | .0005-.010  |
| HEAT TREATED ALLOYS<br>(38-45Rc)  | 40 Rc  | 50-100            | 100-200 | 0.005                | 0.010                | .0005-.005  |
| ALUMINUM                          | 100 HB | 75-250            | 250-750 | 0.025                | 0.095                | .0005-.010  |
| BRASS, ZINC                       | 80 HB  | 75-300            | 250-650 | 0.023                | 0.090                | .0005-.010  |

SFM = Surface Feet per Minute

Starting parameters only. Length to diameter ratios, setup, and machine rigidity may affect performance. The max Depth Of Cut (DOC) acceptable at the minimum Inches Per Revolution (IPR).

## SELECTING AN INDEXABLE BORING BAR

|   |  |
|---|--|
| 1 | From the part or print, verify the diameter of hole to be machined. Select the boring bar that has a minimum bore diameter smaller than the diameter to be machined. |
| 2 | Check machine for shank size needed. If the shank needs to be larger, consider a step bar.   |
| 3 | Match the operation needed on the part with the necessary lead angle. Select 0° lead to bore to a shoulder. Select 5° lead to bore and face a shoulder.              |
| 4 | Choose from flat top or chip control insert based on application and material being machined.  |
| 5 | Choose from .003", .007", or .015" radius based on finish required and part specifications for corner radius.  |

## SELECTING AN INDEXABLE INSERT GRADE

|                 |   |
|-----------------|---|
| <b>UNCOATED</b> | is a submicron premium carbide grade for machining steel and non-ferrous materials.         |
| <b>ALTIN+</b>   | is a premium coated grade for steel, cast irons and high temperature alloys at highest SFM. |
| <b>CBN</b>      | are ideal for hardened steel (45+ RC) and cast iron.  |
| <b>PCD</b>      | are ideal for non-ferrous materials.  |

# INDEXABLE BORING BAR TROUBLESHOOTING

| PROBLEM               | CAUSE              | SOLUTION   |
|-----------------------|--------------------|--|
| RAPID FLANK WEAR      | CUTTING CONDITIONS | Reduce the cutting speed.  |
|                       | INSERT             | Select a coated grade.   |
|                       | HEAT               | Use the SCT coolant holder. If coolant is not available, use shop air and a coated tool. Use a coolant through boring bar.   |
| BUILT-UP EDGE         | INSERT             | Select a coated grade.   |
|                       | CUTTING FORCE      | Use chip control insert to free up cut.  |
|                       | HEAT               | Use coolant through boring bar or holder. If coolant is not available, use shop air and a coated tool. Use coolant through boring bar.   |
| INSERT BREAKAGE       | CUTTING CONDITIONS | Reduce depth of cut. Reduce feed rate.   |
|                       | INSERT             | Select a larger corner radius  |
|                       | PART               | Check the drilled hole to make sure the full diameter of the drill is deeper than the programmed bore depth.   |
| SURFACE TOO ROUGH     | CUTTING CONDITIONS | Reduce feed rate. The rate is too great for the nose radius.   |
|                       | INSERT             | Select a larger corner radius.<br>The feed rate (IPR) should not be greater than 1/2 the nose radius.  |
| CHATTER               | SETUP              | Set insert above center. Change the speed of the machine. The overhang ratio should be less than 8x bar diameter for carbide. Clamping length should be at least 3x the boring bar diameter. |
|                       | BORING BAR         | Select the largest diameter bar that will bore the required diameter.  |
| TAPER BIGGER IN BACK  | CUTTING FORCES     | Forces may deflect bar below center causing the hole to become larger.   |
|                       | BUILT-UP EDGE      | A built-up edge will cause the hole to become large until the built-up edge breaks off, then hole will be smaller.   |
|                       | PROGRAM            | If the taper is consistent (not from chip packing) then the program can be altered to bore a taper in opposite direction resulting in a straight hole.                                       |
| TAPER SMALLER IN BACK | CHIP PACKING       | If the boring bar is too large to allow chips to evacuate then the chips may pack on the insert and cause the bar to deflect away from the bore.   |
|                       | PROGRAM            | If the taper is consistent (not from chip packing) then the program can be altered to bore a taper in opposite direction resulting in a straight hole.                                       |

# CBN & PCD INSERTS TECHNICAL INFORMATION

## PCD TIPPED INSERT FEED AND SPEED

| MATERIAL                     | BHN/Rc      | SPEED RANGE (SFM) | FEED IPR  | PCD TIPPED INSERTS  |                     |
|------------------------------|-------------|-------------------|-----------|---------------------|---------------------|
|                              |             |                   |           | TOOL DIA. .220-.363 | TOOL DIA. .421-.560 |
|                              |             |                   |           | MAX DOC             | MAX DOC             |
| LOW SILICON ALUMINUM         | 225-350 BHN | 1000-5000         | .001-.007 | 0.025               | 0.08                |
| HIGH SILICON ALUMINUM        | 270-425 BHN | 600-3000          | .001-.007 | 0.025               | 0.08                |
| METAL MATRIX COMPOSITIES     | N/A         | 500-2000          | .001-.007 | 0.015               | 0.035               |
| COPPER ALLOYS, BRASS, BRONZE | 80-120 BHN  | 750-3500          | .001-.007 | 0.025               | 0.08                |
| PRESINTERED TUNGSTEN CARBIDE | 140-300 BHN | 100-350           | .001-.005 | 0.007               | 0.012               |
| ACRYLICS                     | N/A         | 700-1500          | .001-.007 | 0.025               | 0.08                |
| FIBERGLASS                   | N/A         | 600-1000          | .001-.007 | 0.02                | 0.06                |
| GRAPHITES                    | N/A         | 600-1000          | .001-.007 | 0.025               | 0.08                |
| NYLON, PLASTIC               | N/A         | 700-1500          | .001-.007 | 0.025               | 0.08                |
| HARD RUBBER                  | N/A         | 500-2500          | .001-.007 | 0.025               | 0.08                |

| APPLICATION GUIDELINES  |
|---|
| Make sure the machine and setup is rigid and solid. Chatter will cause chipping.                      |
| Tool height when boring should be slightly above center. Tool deflection will put the tool on center. |
| Do not stop the machine with the tool in cut. This will result in tool breakage.                      |
| Use of coolant will reduce heat and improve surface finish.   |
| Do not contact the tool to a hard surface prior to the machining process- this will cause chipping.   |
| Higher speeds minimize tool buildup.  |
| Depth of cut should not exceed 70% of PCD tip length.   |

SFM = Surface Feet per Minute DOC= Depth of Cut

AS THE DOC DECREASES THE FEED RATE CAN INCREASE

SCT PCD tools and inserts are excellent for continuous cutting of a wide range of non-ferrous and non-metal materials. The products are precision ground for machining to sub-micron finishes with maximum tool life. PCD allows for higher cutting speeds with longer tool life.

## CBN TIPPED INSERT FEED AND SPEED

| MATERIAL                     | BHN/Rc      | SPEED RANGE (SFM) | FEED IPR  | CBN TIPPED INSERTS  |                     |
|------------------------------|-------------|-------------------|-----------|---------------------|---------------------|
|                              |             |                   |           | TOOL DIA. .220-.363 | TOOL DIA. .421-.560 |
|                              |             |                   |           | MAX DOC             | MAX DOC             |
| HEAT TREATED ALLOY           | 45-60Rc     | 200-600           | .001-.005 | 0.01                | 0.04                |
| TOOL STEEL                   | 45-60Rc     | 200-600           | .001-.005 | 0.01                | 0.04                |
| NODULAR IRON                 | N/A         | 600-1500          | .001-.005 | 0.009               | 0.035               |
| PEARLITIC IRON               | 220-240 BHN | 600-2500          | .001-.007 | 0.009               | 0.035               |
| WHITE/CHILLED IRON           | 54-60Rc     | 200-500           | .001-.005 | 0.008               | 0.035               |
| SUPER ALLOY Ni BASE          | 240-475 BHN | 200-800           | .001-.005 | 0.008               | 0.035               |
| COBALT BASED ALLOY, STELLITE | 45-55Rc     | 200-500           | .001-.005 | 0.008               | 0.035               |
| INCONELS                     | 45-55Rc     | 200-500           | .001-.005 | 0.008               | 0.035               |

| APPLICATION GUIDELINES  |
|---|
| Make sure the machine and setup is rigid and solid. Chatter will cause chipping                       |
| Tool height when boring should be slightly above center. Tool deflection will put the tool on center. |
| Do not stop the machine with the tool in cut. This will result in tool breakage.                      |
| Coolant use is not advised as it could cause thermal cracking.  |
| Do not contact the tool to a hard surface prior to the machining process. This will cause chipping.   |
| Depth of cut should not exceed 30% of CBN tip length.   |

SFM = Surface Feet per Minute DOC= Depth of Cut

AS THE DOC DECREASES THE FEED RATE CAN INCREASE

SCT CBN tools and inserts are excellent for continuous cutting of a wide range of hardened steels, powdered metals, cast irons and super alloys. The products are precision ground with hones for machining to sub-micron finishes with maximum tool life.

CBN tipped tools and inserts can take the place of grinding.