

Cutting Tool Catalog

*gear cutting tools, gundrills, carbide drills & reamers,
cryogenic machine tools, pcd tooling, carbide blanks and preforms*

Gear Cutting Tools



Hobbing Cutter Family

Hobs

Star SU leads the way in developing high performance hobbing using solid carbide and high speed steel hobs in wet and dry cutting applications.

- Involute Gear Hobs
- Non-Involute Gear Hobs
- Special Drive Hobs
- Shank Hobs
- Worm Gear Hobs

Milling Cutters

Star SU offers a complete line of unground, precision unground, and ground milling cutters. The unique after heat treat form process reduces heat treat distortion and improves surface hardness for better tool life.

Milling Cutter Types

- Single and Duplex
- Saw Blade
- Multiple Thread
- Special Form
- Rack Milling



Milling Cutter Family



Hobbing Cutter Family

Gear Shaving Cutters

As one of the largest producers of cutting tools worldwide, and with a particular expertise in shaving technology, Star SU offers a wide range of shaving technology including; transverse, diagonal, underpass, plunge, internal/external shaving, semi-finished or finished shaving cutters from multiple worldwide locations.

Chamfer & Deburring

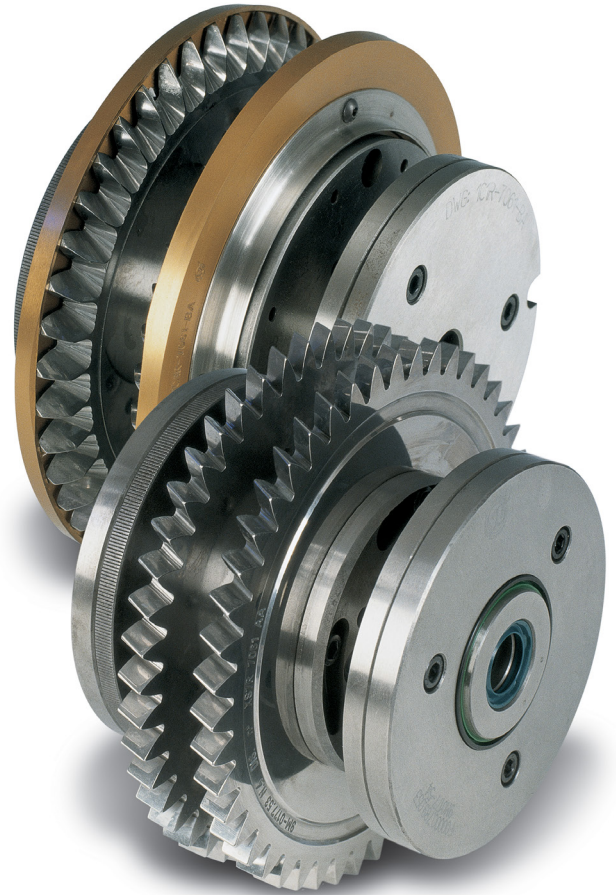
Star SU and Samputensili design and build a line of chamfer, deburring, and rolling tools.

Why Chamfer and Debur?

- A burr which is not removed may break off and damage bearings or gears.
- Over-carbonizing may result in excessive pressure being exerted on gear lateral surfaces causing a break.
- A hardened burr may lead to premature wear of tools in finishing operations.
- Removal of very sharp burrs removes the risk of tool handling injuries.

Why roll?

- Rolling serves to remove build up on tooth flanks by plastic deformation during chamfering.
- Levels out the surface after structural changes during the chamfer/debur process.



Master Gears, Ring & Plug Gauges

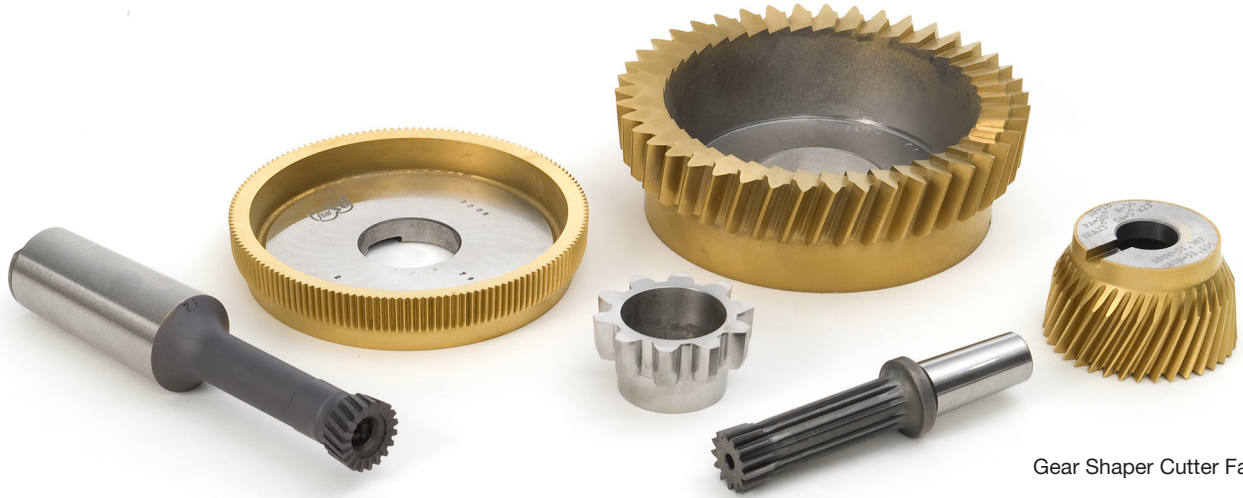
All master gear design and production processes are all carried out using special software and modern manufacturing methods and goes through full CNC machining inspections to ensure maximum quality.

Measurement, setting, calibration, and correction tools

- Master gears to DIN 3970 standards
- Setting masters to adjust and calibrate quality control instruments
- Rolling gears to measure noise
- Burnishing gears to reduce burrs and nicks
- Plugs and ring gauges

Gear Shaper Cutters

Star SU has more than 115 years of shaper cutter experience combined, between Star SU, Fellows, and Samputensili, which allows us to manufacture reliable shaper cutters in a full range of HSS and carbide with Balzers coatings.



Gear Shaper Cutter Family

Shaper cutter types

- Disc-type
- Deep counterbore-type
- Shank-type
- Sykes/Herringbone sets
- Internal

Scudding® Cutters

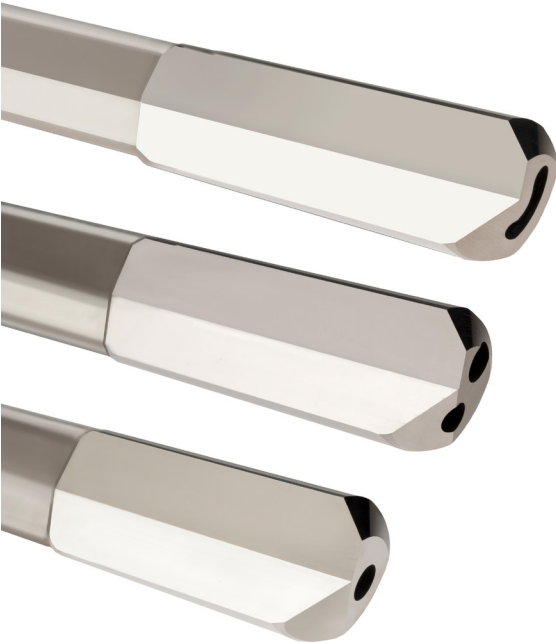
Star SU and Proficator have partnered to manufacture Scudding® tools for the global market.

Scudding® compliments shaping, broaching, and other gear cutting processes to produce gear and spline teeth at reduced cycle times and tool costs.



Scudding® Cutter Family

Gundrills



Coolant Hole Styles: Kidney Shaped Hole (top), Dual Hole Configuration (middle), Single Hole (bottom)

Single Flute Gundrills

The single flute gundrill has the ability to machine straight deep holes and hold excellent finishes. This tool is a general purpose drill designed for deep hole drilling in virtually any material, can be custom fit to each application, and is available in a variety of carbide grades & coatings to help optimize tool life and chip evacuation/formation. The tool length ranges from 0.093" (2.4mm) - 1.5" (38.1mm) and also in custom lengths. The single flute gundrill is available in our 24 and 72 hour expedited shipping program, see website for more information.

Coolant Hole Style Configurations

- **Kidney Shaped Hole (KDS)**
Recommended for cutting diameters under 0.315" (8mm)
- **Dual Hole Configuration (TCH)**
Recommended for cutting diameters 0.315" (8mm) and greater.
- **Single Hole (GDS)**
Recommended for diameters 0.551" (14mm) and greater.

Solid Carbide Single Flute Gundrills

Solid carbide drills are a deep hole drill that can run at much higher feeds rates than conventional gundrills. They do not require whip support for lengths up to 80 x the cutting diameter, and are highly polished, aiding in maximizing chip evacuation. These tools can be designed with special end forms to meet your custom requirements. Additionally, special coatings are chosen, based on the application, to enhance overall tool performance.

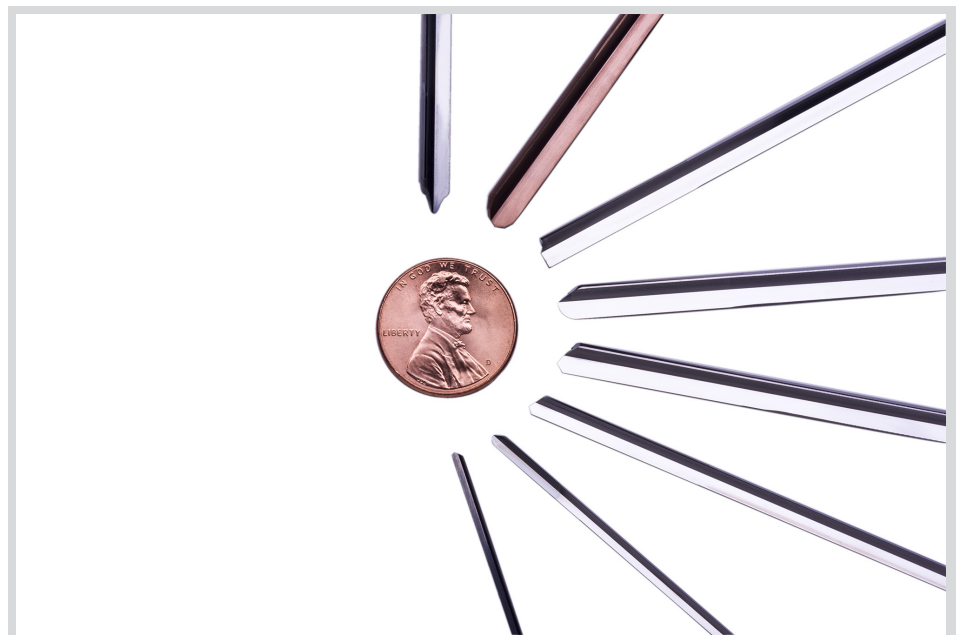
Specifications

Diameter Range

- .039" [1.00mm] - .060" [1.52mm]
- .061" [1.53mm] - .070" [1.78mm]
- .071" [1.79mm] - .200" [5.08mm] and greater

Range of overall length of flute

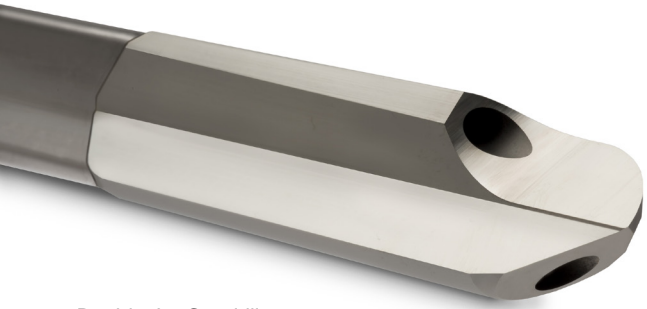
- Up to 7" [178mm]
- Up to 10" [254mm]
- Up to 11.25" [286mm]



Single Flute Gundrill Family

Double Jet Gundrill

The Double Jet Gundrill boasts a unique design that keeps constant coolant on the cutting edge during the entry, in the cut, and breakthroughs while machining. This tool also allows the jet of the coolant fluid to assist in breaking the chip. The diameter range of the double jet gundrill is 0.250" (6.35mm) - 1.5" (38.1mm) and is available in customer specific lengths.

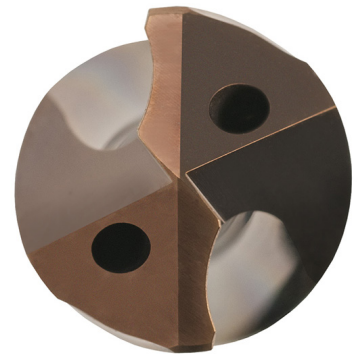


Double Jet Gundrill

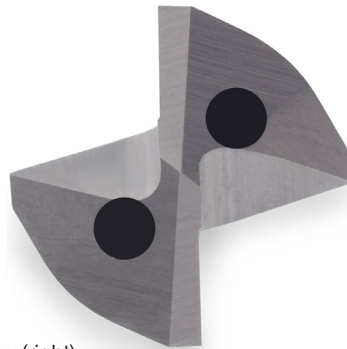
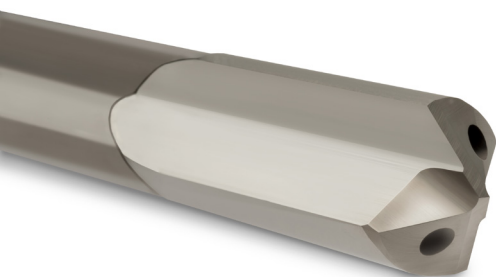
Solid Carbide Twist Drill

Deep Hole Twist Drills are available in lengths up to 30x diameter and to custom lengths, and are reversed engineered for your specific application.

- Sculptured flute geometry for superior chip control
- Polished beyond cutting area flutes for enhanced chip evacuation
- Standard h6 tolerance on shank and cutting diameter
- Proper speeds and feeds result in longer tool life and better chip evacuation
- Geometries vary based on materials being machined
- Coolant feed range: 0.075" (0.9mm) and up.



Top View (above),
Twist Drill side view (bottom)



Double Crimp Gundrill side view (left), top view (right)

Double Crimp Gundrills

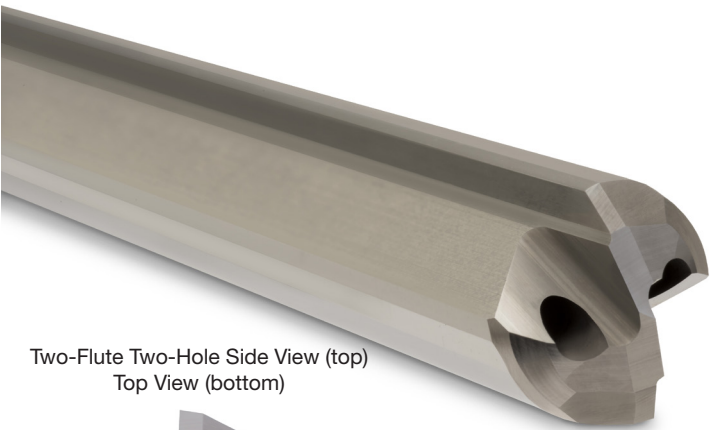
The double crimp gundrill can obtain double the feed rate compared to the single flute gundrill. Based on the combinations of geometric angles, clearances and back taper, the double crimp gundrill is able to reduce chip load by 50% and achieve higher penetration.

Size Range

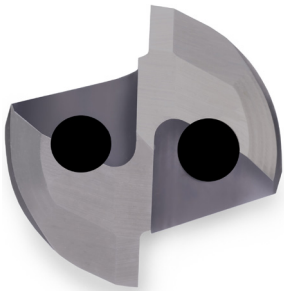
- Diameters 0.188" (4.78mm) - 0.563" (14.3mm)
- Available in custom lengths

Common materials machined

- Aluminum
- Iron



Two-Flute Two-Hole Side View (top)
Top View (bottom)



Two-Flute Two-Hole Gundrills

Like the double crimp gundrill, the Two Flute Two Hole Milled Style Gundrill is used for high penetration deep hole applications. The body of this tool is milled out of bar stock which maximizes the rigidity reducing the body deflection at higher RPM.

Size Range

- Diameters .25" (6.35mm) - 2.0" (50.80mm)
- Custom lengths up to 48" (1219.2mm)



Push and Pull Reamers

Push and Pull Reamers

Firearm push and pull reamers are manufactured from the special carbide grades, chosen during the design phase, ensuring high quality cutting edges. These reamers ensure tight tolerances and are products range between 17-50 caliber, including some shotgun gages.

Rifle Buttons

Star SU offers a high quality, competitive cost alternative as a manufacturer of high precision rifle buttons made to your specific manufacturing needs.



Rifle Buttons

Advantages

- Improved part quality achieved with good finishes
- Button to button performance consistency
- Excellent lead times
- Size range: 17-50 caliber including common shotgun gages

Carbide Drills and Reamers

Solid Carbide Step Drills

Specially designed, solid carbide drills are available in a diameter range starting from 1.5mm and greater.

Styles available

- Straight or helical drills
- Single or multiple diameters
- Single or multiple-flute design



Solid Carbide Drills

Multi Diameter Form Tools

Star SU has perfected a line of hydraulic cavity/porting tools that will allow cuts from either a solid or cast core. In many cases, these multi-step tools will allow cavity machining in one pass. Our latest engineered designs hold extremely tight tolerances and superior surface finish.



Multi Diameter Form Drills

Reamers

Star SU special designed reamers are manufactured with precision tolerances to achieve your part print requirements.

Styles available

- Single and multi-diameter
- Straight flute, and right hand or left hand spiral
- Single or multiple-flute design
- Super Round Tool (SRT) technology



Reamers Family

Solid Carbide Core Drills

Custom built and designed core drills are ideal for machining aluminum, ductile, nodular, and compacted graphite irons (CGI). Our special engineered designs allow our solid carbide drills to machine either in solid or cored casting conditions. These core drills reduce cycle times, provide consistency in the overall life of the product. In addition, solid carbide core drills can be re-sharpened many times, keeping the cost per hole competitive. They are available as three or four fluted core drills.



Solid Carbide Core Drill

Super Round Tool (SRT) Reamers

The design of the SRT Reamer offers a unique geometry that combines multiple straight flutes, and helical flutes to ensure roundness and finish.

Advantages

- Roundness and straightness within microns
- Lowest cost per hole
- Increase in throughput by reducing cycle times
- Diameters starting at 0.1875" (4.76mm)
- Custom built to your application



SRT Reamer side view (left),
Top view (right)

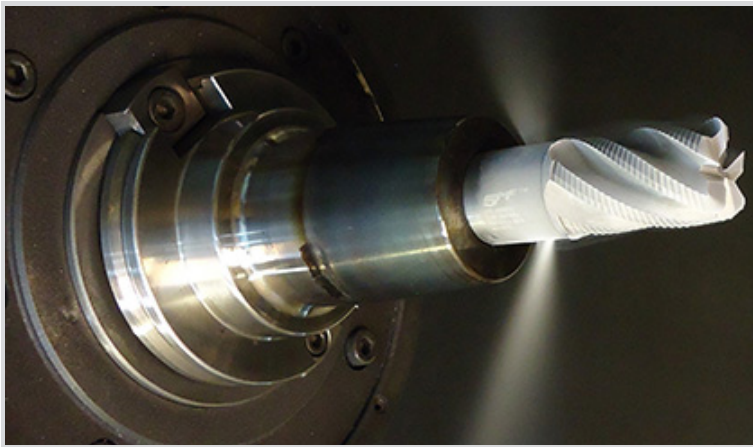
Valve Guide Reamers

Star SU valve guide reamers utilize pressurized coolant to produce ultra-smooth, precise holes.

- Produces holes to tolerance of 0.0005" (0.13mm) and less in powder metal, cast iron, iron, aluminum, bronze, and exotic materials
- Valve Guide Reamers start at 0.1875" (4.76mm)
- Produces bores with excellent roundness/straightness and finish



Valve Guide Reamer



5ME® Cryogenic Machining Process

5ME® Cryogenic Machining

Star SU is a supplier of BlueZone™ cryogenic cutting tool technology licensed by 5ME®. The patented breakthrough technology delivers liquid nitrogen (at -321° F) directly to the cutting edge of the tools, which enables substantially faster processing speeds and increased tool life compared to conventional cooling methods.

Advantages

- Increased processing speeds and metal removal rates (MRR)
- Decreased tool wear
- Improved surface integrity and part quality
- Green manufacturing
 - No hazardous coolants
 - Lower overhead
 - Sustainable manufacturing

BlueZone™ Cryogenic Cutting Tools

Tool types available

- Endmills
- Taper ball end mills
- Drills
- Reamers
- Threadmills

Diameter restrictions apply



Cryogenic Cutting Tool - Endmill

PCD Tooling

Star SU / Neher produces high performance PCD tools that are engineered to customer requirements. Our wide range of PCD products include Circular Milling Tools, Face Milling Tools, Combination Tools, Counterbore Tools, Precision reamer / multi-step reamers and PCD drills.

Our PCD products can be applied to all types of non-ferrous materials such as; Aluminum, Magnesium, Copper, Brass, Wood, Graphite, Fiber Glass and many more.



PCD Family



PCD Precision Reamers

PCD Precision Reamers

Star SU / Neher designs and builds precision helical and straight flute PCD reamers, available in carbide and steel body monoblock styles. All tools are manufactured specifically to meet custom design requirements.

Our multi-fluted, fixed pocket PCD precision reamer technology is proven to produce excellent bore roundness, surface finishes, and size control. These PCD precision reamers are available with multiple diameters to ensure optimum concentricity, straightness, and bore location.

PCD Drills

PCD drills from Star SU / Neher increase part quality with over all consistency, improved surface finish, and less tool changes, resulting in an extended tool life. The PCD drills are available in multi-step and are made to custom lengths and diameters.



PCD Drill



Combination Tooling

PCD Combination Tooling

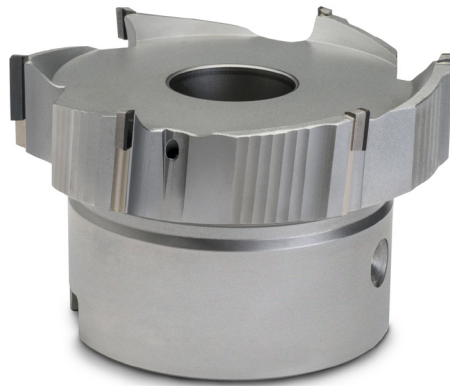
Star SU / Neher engineers and manufactures high quality combination PCD tools designed to meet or exceed custom requirements. Our combination tools are engineered to provide customers:

- Reduced cycle time
- Reduced number of tools needed
- Increased magazine capacity
- Improved concentricity and form accuracy

As an example the shown combination threadmill was specially designed to drill, ream, spotface and threadmill all in one tool.

PCD Milling Cutters

Fixed Pocket Milling Cutters are engineered to machine both high and low silicon aluminum. Our standard and special design cutters allow for the maximum number of cutting teeth compared to indexable cutters allowing for reduced cycle times.



Milling Cutter Top View (right),
Milling Cutter Side View (left)

PCD Deep Pocket Side Mill

Our special designed combination PCD Deep Pocket Side Mills feature coolant holes sized and placed for optimal performance. Additionally, the tools are equipped with replaceable PCD Face Mill technology, which allows the reconditioning worn PCD's, keeping the overall piece price down for the life cycle of our product.



Deep Pocket Side Mill

Carbide Blanks and Preforms

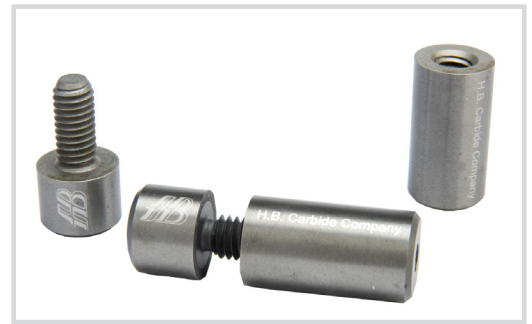
H.B. Carbide is an industry leader providing customers throughout the world with high quality “special” tungsten carbide preforms. All preforms are sinter-hipped. These special preforms serve many industries including automotive, aerospace, energy, firearms, medical, construction and agriculture.

Save time and increase productivity

- Increased machine capacity
- Increased grinding wheel and coolant life
- Minimal grind stock
- Shorter finish grind cycle times



Blanks and Preforms Family (above)
Threaded Preform Blanks (below)



Drill & Reamer Blanks

Drill & reamer blank types including; straight & spiral flutes, coolant holes, stepped diameters, centers, flats, chamfers, keyways, PCD Pockets and threaded preform blanks.



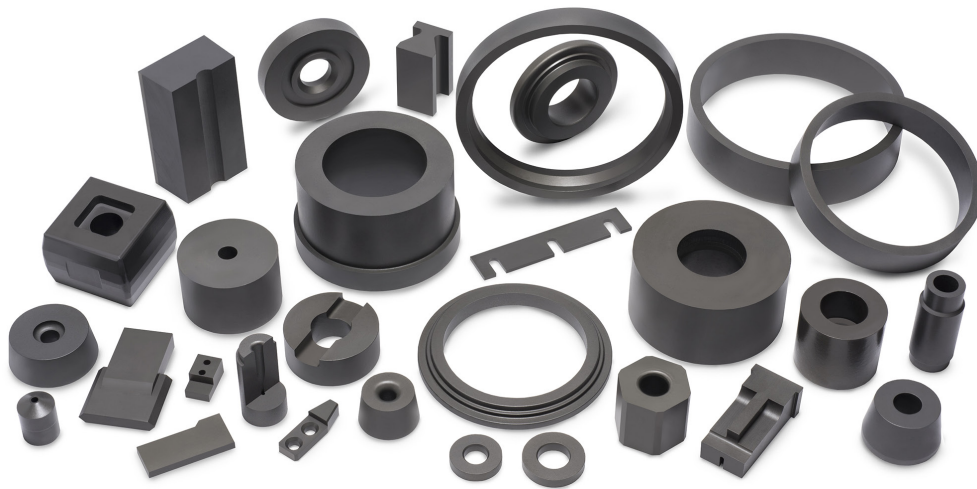
Drill and Reamer Blanks

Specialty Blanks

H. B. Carbide's specialty blanks can be manufactured for your specific requirements using any of the grades we offer. Our carbide blank specialists will assist you with everything from grade selection to preform design.



Specialty Blanks



Die & Bushing Blanks

Die & Bushing Blanks

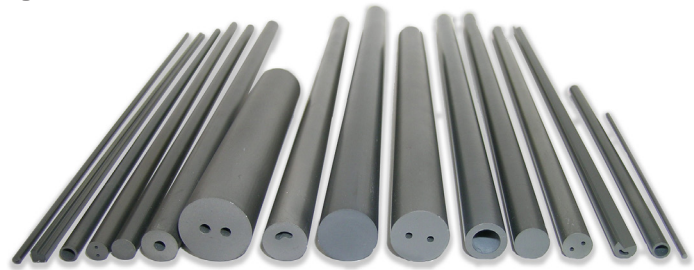
Carbide die and bushing blanks save time, increase productivity, and are manufactured for a variety of applications including wire drawing dies, cold heading dies, stamping dies, wear parts, seal rings, and bushings.

Standard/Special Extrusion Preforms

Using high quality materials and state of the art technology allows us to extract standard and special extrusions.

Preform features available:

- Straight flutes
- Spiral flutes
- Crossholes
- Steps
- Centers
- Flats
- Keyways
- Chamfers
- Threaded



Standard and Special Extrusion Preforms



Helical Coolant Rods and Preforms

H.B. Carbide now offers two-hole helical 30 degree spiral coolant-fed product. Standard 330mm length rods, special cut to length rods, and preforms are available on request.

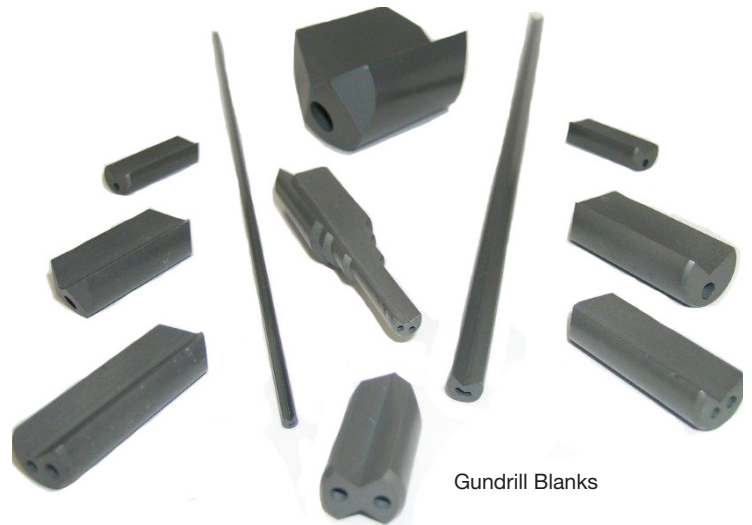


OD Grinding

Centerless and between center OD grinding is available on all preformed blanks. H6 tolerance standard.

Gundrill Blanks

H.B. Carbide offers a complete lineup of deep hole drills and gundrill blanks. These blanks can be full length sticks, cut to length heads, and can have preformed presharpener angles included. Round or other shaped coolant holes can be manufactured in single, double, or kidney holes.



Gundrill Blanks



Flat Blanks

Flat Blanks

Custom preform flat blanks include saw blade blanks, form tool blanks, washers, and EDM blanks. The EDM blanks are guaranteed against cracking.

Preform flat blank features

- Chamfers
- Through holes for wire starting
- Holes for arbors in saw blanks and washers
- Angles
- Sharpening angles on saw blanks



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