



# DEEP HOLE MACHINING TOOLS AND ACCESSORIES





# **BTA HELLER**

### Deep Hole Machining Tools and Systems

BTA Heller, a division of USA-based Sunnen Products Company, is recognized as the premiere deep hole tooling and systems manufacturer in the world. Backed by the most knowledgeable, service-oriented staff in the industry, BTA Heller is the only source for turnkey solutions for deep hole drilling applications.

BTA Heller and Sunnen are committed to designing, manufacturing, and delivering world class deep hole machining tools and systems that meet or exceed customer requirements.

Whether a Single Tube, Double Tube, Gun Drilling or other specialty system is needed, BTA Heller has the engineering expertise and manufacturing capabilities to meet any deep hole machining requirements.

To speak to our technical experts call (248) 597-0346.

**BTA Heller** A Division of **SUNNEN** 

### Single Tube System



- Ideal when drilling materials with poor chip forming properties, such as stainless steel and low-carbon steel.
- Works well when using materials with an uneven structure prone to chip-breaking.
- Good choice for long series production
- Well-suited for uniform and extremely long work pieces.
- Note: Requires a special deep hole drilling machine.

### Double Tube (DTS) or Ejector System



- Requires no seal between the work piece and the drill bushing.
- Easily adapted to existing machines, including conventional lathes, turning centers, machining centers and horizontal boring machines.
- Ideal for machining work pieces with potential sealing problems.
- Good choice to use with a pre-drilled hole instead of a drill bushing for guidance, for example in machining centers.

### Gun Drill System



- Works well for small diameters.
- Can be easily applied to machining centers by using a pre-drilled hole for guidance.
- Note: Requires high coolant pressure.



# SOLID DRILLING TOOLS

### BTA Heller offers a full line of brazed and indexable solid drilling tools.

Our brazed tooling line covers a range of diameters from 11,1 - 65 mm (.437" - 2.559"). All tools are ground on 5-axis tool cutter grinders for consistent tool life from each tool. Each tool is designed with extra-long guide pads for straighter holes. Multiple carbide grade coating options are offered for optimal tool life. Re-tipping services are available for all industry standard drill heads, providing additional cost savings for your drilling operations.

BTA Heller indexable drill heads cover a range of diameters from 15.9 - 508 mm (.625" - 20"). These tools are designed with robust pressed carbide inserts available in multiple carbide grades, coatings and chip

breaker designs. The Hellerdex indexable tools adjust up to 5 mm (.197") on diameter when using plus-style spares.

BTA Heller provides close diameter tolerance and high surface finish. With ideal machine part setup conditions .003" per/ft tool centerline deviation is attainable.



BRAZED DRILL

**Ejector** Diameter Range 18.40 – 65.00 mm (.724 – 2.559 inch) 100 x DC **STS** Diameter Range 15.6 – 65.00 mm (.496 – 2.559 inch) 150 x DC



### **HELLERDEX-3 CUTTER**

**Ejector** Diameter Range 38.00 – 107 mm (1.496 – 4.212 inch) 100 x DC **STS** Diameter Range 38.00 – 107 mm (1.496 – 4.212 inch) 100 x DC



MICRODEX Ejector Diameter Range 18.40 – 28.00 mm (.724 – 1.102 inch)

100 x DC

**STS** Diameter Range 15.97 – 28.00 mm (.628 – 1.102 inch) 100 x DC



### **HELLERDEX-5 CUTTER**

**Ejector** Diameter Range 107.00 – 169.00 mm (4.213 – 6.653 inch) 100 x DC

**STS** Diameter Range 107.00 – 169.00 mm (4.213 – 6.653 inch) 100 x DC



DIRECTDEX

**Ejector** Diameter Range 30 – 65.00 mm (1.181 – 2.559 inch) 100 x DC **STS** Diameter Range 30 – 65.00 mm (1.181 – 2.559 inch) 100 x DC



### **HELLERDEX-7 CUTTER**

**Ejector** Diameter Range 169 – 184 mm (6.654 – 7.24 inch) 100 x DC **STS** Diameter Range 169 – 233 mm (6.654 – 9.173 inch) 100 x DC



# **TREPANNING TOOLS**

BTA Heller combines many years of experience with a standard complement of indexable trepanning tools to fit the needs of today's industry.

The basic principle of trepanning, unlike solid drilling, is that a core is developed during the trepanning process. In the majority of cases, the cores that remain can be used to produce other parts. Trepanning is a great alternative if you don't have sufficient horsepower to push solid drilling tools.

BTA Heller offers trepanning tools to meet most special needs. This includes designing trepanning tools that can produce a specific core size, such as tensile strength sample blanks. Mating core cropping tools are available and make it possible to trepan blind holes.

Our standard compliment of indexable trepanning tools covers a diameter range 76.2 - 610 mm (3.000 - 24") and can be threaded for either an internal or external fast lead threads. This tooling line is designed with robust pressed inserts available in multiple carbide grades, coatings and chip-breakers. Tools with precision ground inserts are available for improved chip control when trepanning specialty materials.

All of our trepanning tools feature reversible carbide pads for added life and straighter holes. The Stabilizer trepan tools add guide pads to improve stability and eliminates tool chatter and spiraling.



STABILIZER-1 START

**STS** Diameter Range 76.20 – 762 mm (3.000 – 30.00 inch) 100 x DC



**STABILIZER-4 START** 

**STS** Diameter Range 76.20 – 762 mm (3.000 – 30.00 inch) 100 x DC



CORE MAXIMIZER

**STS** Diameter Range 76.20 – 762 mm (3.000 – 30.00 inch) 100 x DC



# **COUNTER BORING/REAMING TOOLS**

BTA Heller offers a full line of indexable insert tools ranging from 12,7 – 711 mm (.50-28") diameter.

BTA Heller's counter boring/reaming tools are generally for bore depths 7+ times the diameter (L/D) and are used to open up existing holes with increased precision, productivity and versatility. In many cases the holes produced will have tolerances and surface finishes that will not require secondary operations such as honing. Multi-cutter or stepped counter boring/reaming tools can be designed to conform with component design criteria or as roughing tools for subsequent form boring operations.

The counter boring/reaming tools are available in both push and pull styles. Pull style tools are the first choice to accurately open up and straighten an existing hole. When concentricity is of the utmost importance, self-piloting tools are a good choice, but tools are also available for applications that will pilot off of the existing bore.

BTA Heller counter boring/reaming tools can be designed

as range-style tools to cover various size ranges. These tools are designed with deeper pockets which are furnished with adjustable shoes. When an alternate tool diameter is needed, simply shim the tool out to the new diameter required. In larger diameter tool sizes, it is possible to adjust the tool size up to as much as 25,4 mm (1.00") on diameter.

### Advantages of BTA Heller counter boring tools:

- Bore depths greater than 100 times the tool diameter
- Obtain tool centerline deviation as little as .001" per/ ft. in certain applications
- I.D. or O.D chip removal
- Better bore finish and I.D. tolerances by use of carbide inserts with factory-ground circle lands
- Reversible pre-ground carbide guide pads double usage life



PUSH COUNTER BORE

**Ejector** Diameter Range 25.4 – 184 mm (1.0 – 7.240 inch) 100 x DC **STS** Diameter Range 25.4 – 762 mm (1.00 – 30.00 inch) 100 x DC



### **RANGE-STYLE PULL**

**STS** Diameter Range 25.4 – 184 mm (1.00 – 30.00 inch) 100 x DC



### RANGE STYLE PUSH COUNTER BORE

**Ejector** Diameter Range 25.4 – 184 mm (1.0 – 7.240 inch) 100 x DC **STS** Diameter Range 25.4 – 762 mm (1.00 – 30.00 inch) 100 x DC



### PILOTED

 Ejector
 STS

 Diameter Range
 Diameter Range

 25.4 - 184.00 mm
 25.4 - 762 mm

 (1.00 - 7.240 inch)
 (1 - 30.00 inch)

 100 x DC
 100 x DC



HEAVY STOCK REMOVAL RANGE-STYLE

**STS** Diameter Range 152.4 – 762 mm (6.0 – 30.000 inch) 100 x DC



### **REAMING TOOL**

**Ejector** Diameter Range 25.4 – 184 mm (1.00 – 7.240 inch) 100 x DC **STS** Diameter Range 25.4 – 762 mm (1 – 30.00 inch)

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# FORM TOOLS

# BTA Heller form tools are designed for your specific blind bore applications, reducing production time and costs.

Blind bores usually require some sort of form at the bottom of the bore. BTA Heller offers its engineering expertise to design and then manufacture form boring tools that are specifically designed for such components.

An initial roughing tool operation creates the nearshape of the blind bore configuration, removing as much material as is practical. The form boring tool follows, producing the final shape and finish to the bore. Regardless of the hole configuration, whether flat bottomed with a corner radius, full ball radius, stepped or bores that require a long taper, we offer form tools for your application. Form cutters are available in several variations that suit the desired form, including brazed-in-place, replaceable-resharpenable or special indexable form cutting inserts.

### Advantages of BTA Heller form tools:

- Reduced production time...a two-step operation will produce a complex form at any bore depth.
- Reduced production costs on applications too difficult or too deep for single point boring bars.
- Hole tolerance as fine as .001" possible.
- Concentricity requirements of .001" obtainable for close proximity stepped bores.
- Surface finishes of 32-63 micro-inches obtainable.
- Runout tolerance of .001" per foot obtainable with proper machine and part setup.



FORM SOLUTION

**Ejector** \*Made to order **STS** \*Made to order



FORM SOLUTION Ejector STS \*Made to order \*Made to order



INDEXABLE FORM SOLUTION Ejector STS \*Made to order \*Made to order



# SKIVING/ROLLER BURNISHING TOOLS

Cost-effective, high-production bore sizing starts with BTA Heller skiving/roller burnishing tools.

The BTA Heller skiving/roller burnishing tool is actually a combination reaming/skiving/roller burnishing tool assembly. In the skiving/roller burnishing process the skiving portion of the tool (a modified floating reamer) produces a geometrically true round bore, which is immediately burnished by rollers housed within the same tool.

This process has proven to be the fastest method of I.D. finishing of seamless or DOM tubing, with average rates of metal removal from 2,5 - 3,8 mm (100-150 in/ min). Depending on the application, the skiving/roller burnishing tool assembly is capable of as much as 6,35 mm (.25") total stock removal in one operation.

BTA Heller offers a full range of individual or combined skiving/roller burnishing tool assemblies from 12,7 - 508 mm (.5 - 20") diameter and for cylinders up to 10 m (33 ft) long. The tools are most frequently used on standalone deep hole drilling machines.



HYDRAFINISH SKIVING/ROLLER BURNISHING

STS **Diameter Range** 38 – 660 mm (1.496 - 25.984 inch)



JETFINISH LC SKIVING

Ejector Diameter Range 38 – 184 mm

STS **Diameter Range** 38 – 660 mm (1.496 - 7.240 inch) (1.496 - 25.984 inch)



JETFINISH HC SKIVING

STS Ejector Diameter Range **Diameter Range** 38 – 660 mm 38 – 184 mm (1.496 - 7.240 inch) (1.496 - 25.984 inch)



The Sunnen SHD-Series Skiving/Roller Burnishing Systems use BTA Heller Skiving/Roller Burnishing Tools



## SPECIAL DEEP HOLE BORING TOOLS, DEEP HOLE MACHINE ACCESSORIES

Let BTA Heller provide a turnkey drilling system for you complete with machines, tools and accessories.

### These drilling tools and accessories will complete your turnkey drilling system:

- Premium quality, industry standard or special drill tubes.
- Pressure heads (coolant induction units) for STS / BTA drilling machines.
- Stationary and rotating coolant inducers for DTS or twotube drilling systems.
- Stationary and rotating drill tube guides or vibration dampeners.
- Drill tube driver collets.
- Drill bushings.
- Coolant pumping and filtration systems.

### To order parts or accessories please call (248) 597-0346

- Chip handling equipment.
- Lantern chucks for pull-style single- or multi-cutter counter boring tools and internal profiling tools.
- Cross-hole drill adapters for cross-hole drilling.
- X-axis drive units specifically meant for internal profiling tools.
- Deep-hole drilling machines.
- Hydraulic power packs.



BOTTLE BORING / INTERNAL PROFILING TOOLS



CHUCK STYLE PRESSURE HEAD



VIBRATION DAMPENER COLLET



STEPPED COUNTER BORING TOOL



SPINDLE MOUNTED BAR DRIVER



THREAD ADAPTER



CONE STYLE PRESSURE HEAD



**DRILL BUSHINGS** 



THREAD ADAPTER WITH GUIDE PAD SUPPORT

**BTA Heller** A Division of **Schwer** 

## **DEEP HOLE MACHINING ACCESSORIES**

Drill Tubes and Ejector Systems



SINGLE START BTA THREAD CONNECTION



**4-START OUTER DRILL TUBE** 



**4-START THREAD CONNECTION** 



**INNER DRILL TUBE** 



**4-START OUTER DRILL TUBE** 



**INNER DRILL TUBE** 

### **Ejector System Coolant Inducers**



**BTA Heller** A Division of **Survey** 

# DEEP HOLE MACHINING ACCESSORIES (continued)

### **Coolant Systems**



BTA Heller designs and manufactures self-contained coolant pumping systems. The purpose of coolant in a deep hole drilling system is to:

- Support and lubricate the pads
- Improve tool life
- Dissipate heat
- Aid with chip evacuation

### Coolant system for ejector systems

- · Self-contained unit ready to operate
- Nema 12 enclosure with 230 or 460 V, 3 phase, 60 or 50 Hz
- Positive displacement pump for constant coolant volume
- Safety features include high/low coolant level warning and dirty filter warning indicator.
- Filtration vessel 30 Micron

### **Available Options**

- · Heat exchanger to maintain constant oil temperature
- Chip conveyor

### **Deep Hole Machining Oil**



### BTA Hellercut 1, 2 and 3 Advantages

- Excellent EP and Lubricity Additives
- Light Viscosity
- Superior Chip Removal
- No Gummy Residue
- Improved Finish
- Excellent Tool Life
- Provides Excellent Lubrication to Machine Tool
- Oily Residue Resists Rust and Corrosion
- 10 30% Improved Tool Life

### Inserts

BTA Heller inserts are available in multiple carbide grades, coatings and chip breaker designs.



### Guide Pads

Solid carbide and brazed-style guide pads are available.









### WORLDWIDE

BTA Heller is a division of Sunnen Products Company, and our products are sold and supported globally by Sunnen. Sunnen's global manufacturing, distribution, sales and service network allows us to deliver quality solutions worldwide.

Our state-of-the-art Technical Services Centers allow our technical experts to develop innovative solutions to customer application challenges. The Centers also provide answers for customer questions and training for our representatives around the world.

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