

Member IMC Group  
**Ingersoll**  
Cutting Tools

**BTA  
DRILLS**

*Ingersoll* **BORE** line





## YOUR ROADMAP TO HIGHER PRODUCTIVITY

Ingersoll Cutting Tools and the Ingersoll Bore Line team are proud to introduce this new line of BTA-type deep hole drilling product. Within these pages you will find complete modular systems designed for the most difficult deep hole applications.

Brazed or indexable heads for drilling, boring and reaming are available for both the Single Tube System (STS) and the Double Tube System (DTS). Both the brazed style and indexable style heads utilize Ingersoll's high performance drilling carbide grades.

Ingersoll's BTA drills range in diameter from .315" to 10" (and larger upon request) with drilling depths up to 100 x diameter. Combined with our already successful line of gun drills Ingersoll has positioned itself in the market to be your single source for deep hole drilling solutions.



# Ingersoll





**Indexable**  
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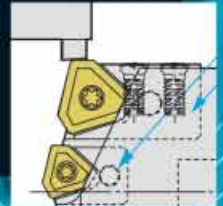
**Brazed**  
Page 62



**Reamers**  
Page 72



**Tubes**  
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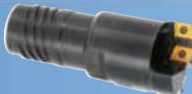


**User Guide**  
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# BTA DRILLS

## Indexable Drill

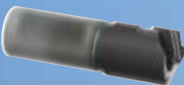
|                                                                                     | Drill Dia.<br>(mm)       | Drill Dia.<br>(in)    | Surface<br>Finish | Drilling<br>Depth (Max) | Series | Page |
|-------------------------------------------------------------------------------------|--------------------------|-----------------------|-------------------|-------------------------|--------|------|
|    | 38.00-106.99             | 1.496-4.212           | 3um               | 100 x D                 | TBTA3  | 14   |
|    | 107.00-168.99            | 4.213-6.653           | 3um               | 100 x D                 | TBTA5  | 20   |
|    | 169.00-232.99<br>245.99* | 6.654-9.173<br>9.685* | 3um               | 100 x D                 | TBTA7  | 25   |
|    | 29.00-37.99              | 1.142-1.496           | 3um               | 100 x D                 | TBTA-A | 33   |
|  | 16.01-28.50              | .630-1.122            | 3um               | 100 x D                 | TBTA-B | 39   |
|  | 25.00-53.20              | .984-2.094            | 3um               | 100 x D                 | TBTA-C | 45   |
|  | 30.00-65.00              | 1.181-2.559           | 3um               | 100 x D                 | TBTA-D | 51   |
|  | 62.00-183.99             | 2.441-7.244           | 3um               | 100 x D                 | TBTA-L | 58   |

## Brazed Drill

|                                                                                     | Drill Dia.<br>(mm) | Drill Dia.<br>(in) | Surface<br>Finish | Drilling<br>Depth (Max) | Series  | Page |
|-------------------------------------------------------------------------------------|--------------------|--------------------|-------------------|-------------------------|---------|------|
|  | 12.60-65.00        | .496-2.559         | 2um               | 100 x D                 | BTA-SE4 | 64   |

\*In case of inner single thread connection.

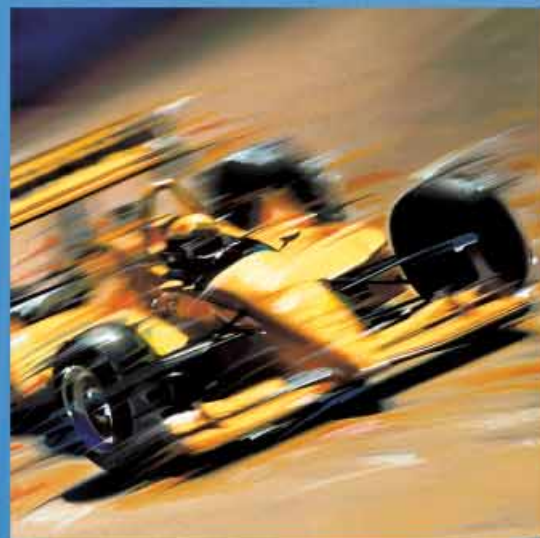
## Brazed Drill

|                                                                                   | Drill Dia.<br>(mm) | Drill Dia.<br>(in) | Surface<br>Finish | Drilling<br>Depth (Max) | Series  | Page |
|-----------------------------------------------------------------------------------|--------------------|--------------------|-------------------|-------------------------|---------|------|
|  | 18.41-65.00        | .725-2.559         | 2um               | 100 x D                 | BTA-DE4 | 66   |
|  | 12.60-20.00        | .496-.787          | 2um               | 100 x D                 | BTS-SE4 | 68   |
|  | 8.00-14.49         | .315-.570          | 2um               | 100 x D                 | BTS-SE1 | 69   |
|  | 14.51-65.00        | .571-2.559         | 2um               | 100 x D                 | BTS-SI1 | 70   |

## Reamer

|                                                                                     | Reamer Dia.<br>(mm) | Reamer Dia.<br>(in) | Surface<br>Finish | Drilling<br>Depth (Max)       | Series | Page |
|-------------------------------------------------------------------------------------|---------------------|---------------------|-------------------|-------------------------------|--------|------|
|  | 25.00-110.99        | .984-4.370          | 1-2um             | 100 x D                       | TBTA-R | 76   |
|  | 14.51-65.00         | .571-2.559          | 1-2um             | 100 x D                       | BTA-R  | 83   |
|  | 6.00-24.99          | .236-.984           | 1-2um             | Dependant<br>on Shank<br>Type | BTRS   | 87   |
|  | 6.00-24.99          | .236-.984           | 1-2um             | Dependant<br>on Shank<br>Type | BTRW   | 88   |
|  | 6.00-24.99          | .236-.984           | 1-2um             | Dependant<br>on Shank<br>Type | BTRM   | 89   |

# Ingersoll



# CUTTING TOOLS CUTTING TOOLS

# BTA DRILLS

*Cutting Tools*

## **BTA Indexable**

**Tolerance** – Exceptional Hole Tolerance of H7 available in just one pass with optimum cutting conditions.

**Exceptional Surface Finish** – Surface finish of 3.2S with optimum cutting conditions.

**Excellent Hole Straightness** – 0.1mm/meter in workpiece rotating application.

**Superior Concentricity** – Bore roundness.

### **Cost Effective solutions in Deep Hole Drilling**

- Fully Adjustable – A diameter change of up to +0.3mm by adjusting the two outer cartridge screws. (adjustment varies according to head diameter)
- An Innovative approach to Deep Hole Drilling with ***Dia plus kits***. By exchanging only the outer cartridge and guide pads the original head diameter can be increased up to 5mm.
- Multipurpose Inserts – Newly designed geometry and coating for deep hole drilling applications. Excellent for drilling high temp. nickel alloys and Inconel.

**Sub Guide Pad** – For stable machining conditions.

**Guide Pad Protectors** – To prevent damage during rapid traverse.

**Guide Pads** – Precision made guide pads fit accurately with no adjustment. Pockets are back tapered for reversible guide pads.

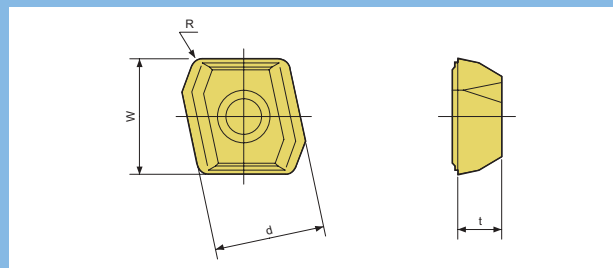
\*Ceramic Guide Pads-Averaging 200 meters per pad at 50mm dia drill trials available.

-Improved guide pad life extends the life of the inserts on steel, alloy steel, and stainless steel applications.

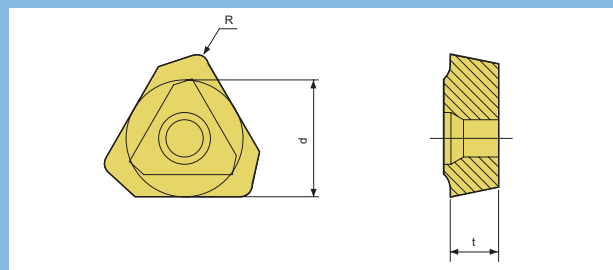
\*Note - Not for titanium or water soluble oil

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Cutting Tools

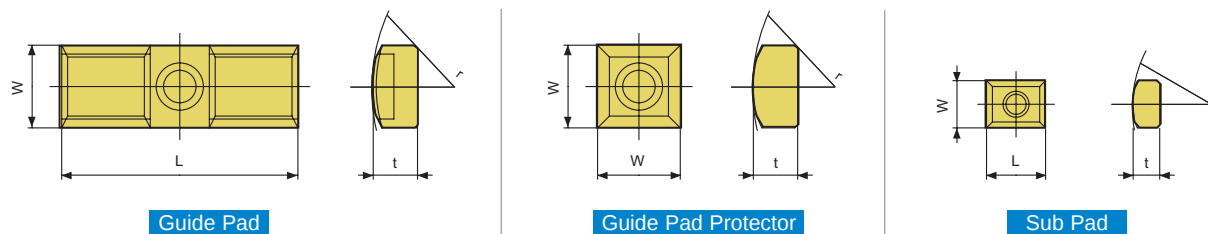
## ■ BTA INDEXABLE INSERT FOR TBTA 3.../5.../7...



| Designation        | Dimension |       |       |       | Pocket |       |       | Grade  | Screw          |
|--------------------|-----------|-------|-------|-------|--------|-------|-------|--------|----------------|
|                    | d         | t     | R     | W     | Center | Inner | Outer | IN2005 |                |
| <b>NPMX 0803RB</b> | 0.315     | 0.125 | 0.031 | 0.329 | ○      | ○     | ○     |        | <b>CSTB2.2</b> |
| <b>NPMX 0803RG</b> | 0.315     | 0.125 | 0.031 | 0.329 | ○      | ○     | ○     |        | <b>CSTB2.2</b> |

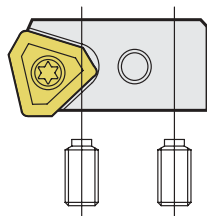


| Designation        | Dimension |       |       | Pocket |       |       | Grade  | Screw           |
|--------------------|-----------|-------|-------|--------|-------|-------|--------|-----------------|
|                    | d         | t     | R     | Center | Inner | Outer | IN2005 |                 |
| <b>TPMX 1403RB</b> | 0.333     | 0.138 | 0.016 | ○      | ○     | ○     |        | <b>CSTB2.5</b>  |
| <b>TPMX 1403RG</b> | 0.333     | 0.138 | 0.031 | ○      | ○     | ○     |        | <b>CSTB2.5</b>  |
| <b>TPMX 1704RB</b> | 0.406     | 0.157 | 0.016 | ○      | ○     | ○     |        | <b>CSTB3.5D</b> |
| <b>TPMX 1704RG</b> | 0.406     | 0.157 | 0.031 | ○      | ○     | ○     |        | <b>CSTB3.5D</b> |
| <b>TPMX 2405RB</b> | 0.559     | 0.217 | 0.016 | ○      | ○     | ○     |        | <b>CSTB4M</b>   |
| <b>TPMX 2405RG</b> | 0.559     | 0.217 | 0.047 | ○      | ○     | ○     |        | <b>CSTB4M</b>   |
| <b>TPMX 2807RB</b> | 0.669     | 0.295 | 0.031 | ○      | ○     | ○     |        | <b>CSTB5</b>    |
| <b>TPMX 2807RG</b> | 0.669     | 0.295 | 0.063 | ○      | ○     | ○     |        | <b>CSTB5</b>    |



| Type                | Designation | Dimension |       |       |       | Screw   |
|---------------------|-------------|-----------|-------|-------|-------|---------|
|                     |             | W         | t     | L     | r     |         |
| Guide Pad           | PAD-GC08    | 0.315     | 0.177 | 0.984 | 0.689 | CSTB3S  |
|                     | PAD-GC10    | 0.394     | 0.236 | 1.378 | 0.787 | CSTB4S  |
|                     | PAD-GC14    | 0.551     | 0.295 | 1.575 | 0.984 | CSTA5S  |
|                     | PAD-GC18    | 0.709     | 0.354 | 1.575 | 1.181 | LS1206S |
| Guide Pad Protector | PAD-P08     | 0.315     | 0.177 | 0.315 | 0.689 | CSTB3S  |
|                     | PAD-P10     | 0.394     | 0.236 | 0.394 | 0.787 | CSTB4S  |
|                     | PAD-P14     | 0.551     | 0.295 | 0.551 | 0.984 | CSTA5S  |
|                     | PAD-P18     | 0.709     | 0.354 | 0.709 | 1.181 | LS1206S |
| Sub Pad             | PAD-S08     | 0.315     | 0.177 | 0.394 | 0.689 | CSTB3S  |
|                     | PAD-S10     | 0.394     | 0.197 | 0.394 | 1.142 | CSTB3S  |
|                     | PAD-S14     | 0.551     | 0.276 | 0.787 | 1.772 | CCSTA5S |

Outer



Inner & Center



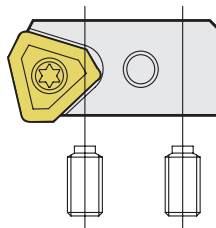
| Designation    |                   | Adjust Screw | Wrench | Lock Screw | Wrench | Insert     |
|----------------|-------------------|--------------|--------|------------|--------|------------|
| Outer          | <b>PERC05R</b>    | AS0003-5     | H1.5   | LS1803RH   | H2     | NPMX0803.. |
|                | <b>PERC402-04</b> | AS0004-8     | H2     | LS1803.5RH | H2.5   | NPMX1403.. |
|                | <b>PERC402-32</b> | AS0005-10    | H2.5   | LS1805RH   | H3     | NPMX1704.. |
|                | <b>PERC402-43</b> | AS0005-15    | H2.5   | L1806RH    | H4     | NPMX2405.. |
|                | <b>PERC402-63</b> | AS0006-15    | H3     | L1806RH    | H4     | NPMX2807.. |
| Inner & Center | <b>CENC05R</b>    | -            | -      | CSTB3      | T9     | NPMX0803.. |
|                | <b>CENC402-04</b> | -            | -      | CSTB3.5    | T15    | NPMX1403.. |
|                | <b>CENC402-32</b> | -            | -      | CSTA5      | T15    | NPMX1704.. |
|                | <b>CENC402-43</b> | -            | -      | LS1206     | H3     | NPMX2405.. |
|                | <b>CENC402-63</b> | -            | -      | LS1206     | H3     | NPMX2807.. |

## BTA INDEXABLE DIA PLUS KITS FOR TBTA 3.../ 5.../ 7...

With Dia Plus kits, BTA indexable drill can increase hole size by up to 0.197 beyond target drill diameter.

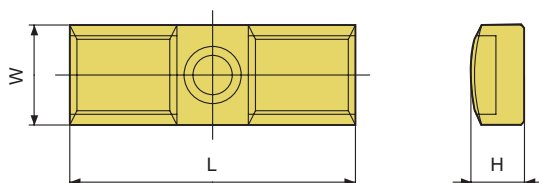
Dia plus kits are composed of \*cartridge and \*guide pad.

### \* Cartridge



| Cartridge         | Dimension        |                  |                  |                  |                  |
|-------------------|------------------|------------------|------------------|------------------|------------------|
|                   | D+0.039          | D+0.079          | D+0.118          | D+0.157          | D+0.197          |
| <b>PERC05</b>     | PERC05R+0.039    | PERC05R+0.079    |                  |                  |                  |
| <b>PERC402-04</b> | PERC402-04+0.039 | PERC402-04+0.079 | PERC402-04+0.118 |                  |                  |
| <b>PERC402-32</b> | PERC402-32+0.039 | PERC402-32+0.079 | PERC402-32+0.118 | PERC402-32+0.157 |                  |
| <b>PERC402-43</b> | PERC402-43+0.039 | PERC402-43+0.079 | PERC402-43+0.118 | PERC402-43+0.157 | PERC402-43+0.197 |
| <b>PERC402-63</b> | PERC402-63+0.039 | PERC402-63+0.079 | PERC402-63+0.118 | PERC402-63+0.157 | PERC402-63+0.197 |

### \* Guide Pad

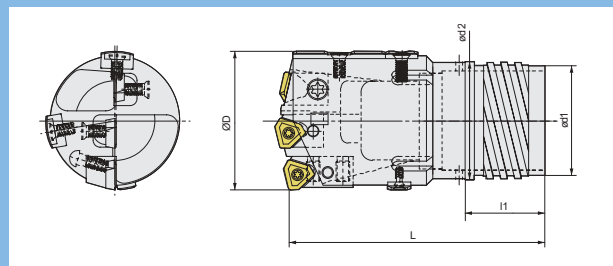


| Guide Pad       | Dimension      |       |                |       |                |       |                |       |                |       |
|-----------------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|
|                 | D+0.039        | H     | D+0.079        | H     | D+0.118        | H     | D+0.157        | H     | D+0.197        | H     |
| <b>PAD-GC08</b> | PAD-GC08+0.039 | 0.197 | PAD-GC08+0.079 | 0.217 | PAD-GC08+0.118 | 0.236 |                |       |                |       |
| <b>PAD-GC10</b> | PAD-GC10+0.039 | 0.256 | PAD-GC10+0.079 | 0.276 | PAD-GC10+0.118 | 0.295 | PAD-GC10+0.157 | 0.315 |                |       |
| <b>PAD-GC14</b> | PAD-GC14+0.039 | 0.315 | PAD-GC14+0.079 | 0.335 | PAD-GC14+0.118 | 0.354 | PAD-GC14+0.157 | 0.374 | PAD-GC14+0.197 | 0.394 |
| <b>PAD-GC18</b> | PAD-GC18+0.039 | 0.374 | PAD-GC18+0.079 | 0.394 | PAD-GC18+0.118 | 0.413 | PAD-GC18+0.157 | 0.433 | PAD-GC18+0.197 | 0.453 |

## BTA INDEXABLE - 3 CARTRIDGE SYSTEM SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

1.496 - 4.212

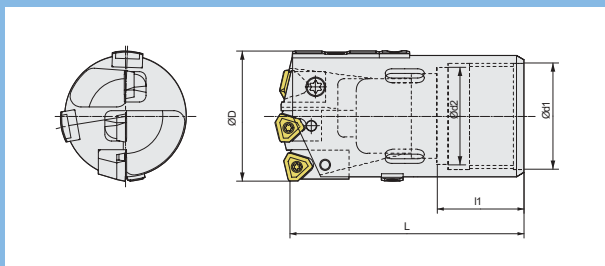


| Designation        | Diameter      | Dimension |      |       |       | Tube      |          |
|--------------------|---------------|-----------|------|-------|-------|-----------|----------|
|                    |               | L         | l1   | d1    | d2    | Part      | Diameter |
| TBTA3-xx.xxxSE4-33 | 1.496 - 1.559 | 3.35      | 1.20 | 1.063 | 1.181 | BTSI 033  | 1.299    |
| TBTA3-xx.xxxSE4-36 | 1.559 - 1.693 | 3.35      | 1.20 | 1.181 | 1.299 | BTSI 036  | 1.417    |
| TBTA3-xx.xxxSE4-39 | 1.693 - 1.850 | 3.74      | 1.20 | 1.299 | 1.417 | BTSI 039  | 1.535    |
| TBTA3-xx.xxxSE4-43 | 1.851 - 2.035 | 3.74      | 1.20 | 1.417 | 1.535 | BTSI 043  | 1.693    |
| TBTA3-xx.xxxSE4-47 | 2.036 - 2.213 | 3.94      | 1.36 | 1.555 | 1.693 | BTSI 047  | 1.850    |
| TBTA3-xx.xxxSE4-51 | 2.213 - 2.386 | 4.33      | 1.36 | 1.713 | 1.850 | BTSI 051  | 2.008    |
| TBTA3-xx.xxxSE4-56 | 2.386 - 2.559 | 4.33      | 1.36 | 1.870 | 2.008 | BTSI 056A | 2.205    |
| TBTA3-xx.xxxSE4-56 | 2.559 - 2.637 | 5.91      | 2.44 | 1.850 | 2.047 | BTSI 056B | 2.205    |
| TBTA3-xx.xxxSE4-62 | 2.638 - 2.874 | 5.91      | 2.44 | 2.087 | 2.283 | BTSI 062  | 2.441    |
| TBTA3-xx.xxxSE4-68 | 2.874 - 3.149 | 5.91      | 2.44 | 2.283 | 2.480 | BTSI 068  | 2.677    |
| TBTA3-xx.xxxSE4-75 | 3.150 - 3.425 | 7.09      | 3.23 | 2.520 | 2.756 | BTSI 075  | 2.953    |
| TBTA3-xx.xxxSE4-82 | 3.425 - 3.937 | 7.09      | 3.23 | 2.795 | 3.031 | BTSI 082  | 3.228    |
| TBTA3-xx.xxxSE4-94 | 3.937 - 4.212 | 7.09      | 3.23 | 3.268 | 3.504 | BTSI 094  | 3.701    |

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## BTA INDEXABLE - 3 CARTRIDGE SYSTEM SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

**Diameters**  
1.496 - 4.212

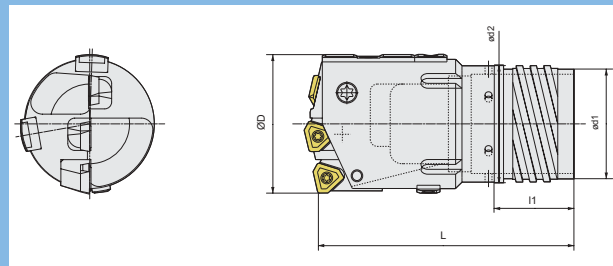


| Designation        | Diameter      | Dimension |      |       |       | Tube     |          |
|--------------------|---------------|-----------|------|-------|-------|----------|----------|
|                    |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA3-xx.xxxSI1-33 | 1.496 - 1.574 | 3.15      | 1.57 | 1.181 | 1.063 | BTSE 033 | 1.299    |
| TBTA3-xx.xxxSI1-36 | 1.575 - 1.732 | 3.15      | 1.57 | 1.299 | 1.181 | BTSE 036 | 1.417    |
| TBTA3-xx.xxxSI1-39 | 1.732 - 1.850 | 3.54      | 1.57 | 1.457 | 1.339 | BTSE 039 | 1.535    |
| TBTA3-xx.xxxSI1-43 | 1.850 - 2.047 | 3.54      | 1.57 | 1.614 | 1.457 | BTSE 043 | 1.693    |
| TBTA3-xx.xxxSI1-47 | 2.047 - 2.244 | 3.94      | 1.57 | 1.732 | 1.575 | BTSE 047 | 1.850    |
| TBTA3-xx.xxxSI1-51 | 2.244 - 2.401 | 4.33      | 1.57 | 1.929 | 1.772 | BTSE 051 | 2.008    |
| TBTA3-xx.xxxSI1-56 | 2.402 - 2.677 | 4.33      | 1.57 | 2.087 | 1.929 | BTSE 056 | 2.205    |
| TBTA3-xx.xxxSI1-62 | 2.677 - 2.952 | 4.72      | 1.57 | 2.323 | 2.126 | BTSE 062 | 2.441    |
| TBTA3-xx.xxxSI1-68 | 2.953 - 3.189 | 5.91      | 2.76 | 2.559 | 2.362 | BTSE 068 | 2.677    |
| TBTA3-xx.xxxSv1-75 | 3.189 - 3.582 | 5.91      | 2.76 | 2.795 | 2.598 | BTSE 075 | 2.953    |
| TBTA3-xx.xxxSI1-82 | 3.583 - 3.897 | 5.91      | 2.76 | 3.110 | 2.913 | BTSE 082 | 3.228    |
| TBTA3-xx.xxxSI1-94 | 3.898 - 4.212 | 5.91      | 2.76 | 3.543 | 3.346 | BTSE 094 | 3.701    |

## BTA INDEXABLE - 3 CARTRIDGE SYSTEM DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

1.496 - 4.212

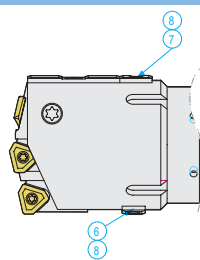
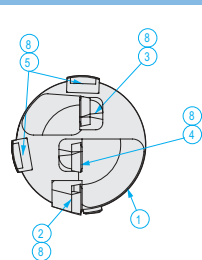


| Designation          | Diameter      | Dimension |      |       |       | Tube       |            |       |
|----------------------|---------------|-----------|------|-------|-------|------------|------------|-------|
|                      |               | L         | l1   | d1    | d2    | Outer Tube | Inner Tube | Dia   |
| TBTA3-xx.xxxDE4-35.5 | 1.496 - 1.559 | 3.35      | 1.20 | 1.181 | 1.299 | BTDO 035.5 | BTDI 026   | 1.398 |
| TBTA3-xx.xxxDE4-39   | 1.559 - 1.693 | 3.35      | 1.20 | 1.299 | 1.417 | BTDO 039   | BTDI 029   | 1.535 |
| TBTA3-xx.xxxDE4-42.5 | 1.693 - 1.850 | 3.74      | 1.20 | 1.417 | 1.535 | BTDO 042.5 | BTDI 032   | 1.673 |
| TBTA3-xx.xxxDE4-46.5 | 1.851 - 2.035 | 3.74      | 1.36 | 1.555 | 1.693 | BTDO 046.5 | BTDI 035   | 1.831 |
| TBTA3-xx.xxxDE4-51   | 2.036 - 2.213 | 3.94      | 1.36 | 1.713 | 1.850 | BTDO 051   | BTDI 039   | 2.008 |
| TBTA3-xx.xxxDE4-55.5 | 2.213 - 2.559 | 4.33      | 1.36 | 1.870 | 2.008 | BTDO 055.5 | BTDI 043A  | 2.185 |
| TBTA3-xx.xxxDE4-56   | 2.559 - 2.637 | 5.91      | 2.44 | 1.850 | 2.047 | BTDO 056   | BTDI 043B  | 2.205 |
| TBTA3-xx.xxxDE4-62   | 2.638 - 2.874 | 5.91      | 2.44 | 2.087 | 2.283 | BTDO 062   | BTDI 048   | 2.441 |
| TBTA3-xx.xxxDE4-68   | 2.874 - 3.149 | 5.91      | 2.44 | 2.283 | 2.480 | BTDO 068   | BTDI 053   | 2.677 |
| TBTA3-xx.xxxDE4-75   | 3.150 - 3.425 | 7.09      | 3.23 | 2.520 | 2.756 | BTDO 075   | BTDI 059   | 2.953 |
| TBTA3-xx.xxxDE4-82   | 3.425 - 3.937 | 7.09      | 3.23 | 2.795 | 3.031 | BTDO 082   | BTDI 066   | 3.228 |
| TBTA3-xx.xxxDE4-94   | 3.937 - 4.212 | 7.09      | 3.23 | 3.268 | 3.504 | BTDO 094   | BTDI 078   | 3.701 |

# BTA INDEXABLE - 3 CARTRIDGE SYSTEM ASSEMBLY OF TBTA3 SERIES

## Diameters

1.496 - 2.165



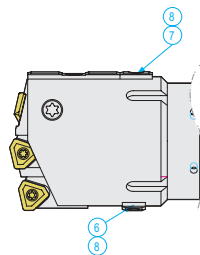
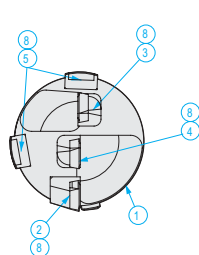
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

| Parts     |                     | Diameter      |               |               |               |               |
|-----------|---------------------|---------------|---------------|---------------|---------------|---------------|
|           |                     | 1.496 - 1.574 | 1.575 - 1.771 | 1.772 - 1.889 | 1.890 - 2.047 | 2.047 - 2.165 |
| Cartridge | Outer               | PERC 05R      | PERC 4002-04  | PERC 402-04   | PERC 402-04   | PERC 402-32   |
|           | Adjust Screw        | AS0003-5      | AS0004-8      | AS0004-8      | AS0004-8      | AS0005-10     |
|           | Wrench              | H1.5          | H2            | H2            | H2            | H2.5          |
|           | Screw               | LS1803RH      | LS1803.5RH    | LS1803.5RH    | LS1803.5RH    | LS1805RH      |
|           | Wrench              | H2            | H2.5          | H2.5          | H2.5          | H3            |
|           | Inner               | CENC 05R      | CENC 05R      | CENC 05R      | CENC 402-04   | CENC 402-04   |
|           | Screw               | CSTB3         | CSTB3         | CSTB3         | CSTB3.5       | CSTB3.5       |
|           | Wrench              | T9            | T9            | T9            | T15           | T15           |
|           | Center              | CENC 05R      | CENC 05R      | CENC 402-04   | CENC 402-04   | CENC 402-04   |
|           | Screw               | CSTB3         | CSTB3         | CSTB3.5       | CSTB3.5       | CSTB3.5       |
|           | Wrench              | T9            | T9            | T15           | T15           | T15           |
|           | Insert              | NPMX 0803RG   | TPMX 1403RG   | TPMX 1403RG   | TPMX 1403RG   | TPMX 1704RG   |
| Insert    | Screw               | CSTB2.2       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB3.5D      |
|           | Wrench              | T7            | T8            | T8            | T8            | T9            |
|           | Inner               | NPMX 0803RG   | NPMX 0803RG   | NPMX 0803RG   | TPMX 1403RG   | TPMX 1403RG   |
|           | Screw               | CSTB2.2       | CSTB2.2       | CSTB2.2       | CSTB2.5       | CSTB2.5       |
|           | Wrench              | T7            | T7            | T7            | T8            | T8            |
|           | Center              | NPMX 0803RG   | NPMX 0803RG   | TPMX 1403RG   | TPMX 1403RG   | TPMX 1403RG   |
|           | Screw               | CSTB2.2       | CSTB2.2       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|           | Wrench              | T7            | T7            | T8            | T8            | T8            |
| Pad       | Guide Pad           | PAD-GC08      | PAD-GC08      | PAD-GC10      | PAD-GC10      | PAD-GC10      |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB4S        | CSTB4S        | CSTB4S        |
|           | Wrench              | T9            | T9            | T15           | T15           | T15           |
|           | Guide Pad Protector | PAD-P08       | PAD-P08       | PAD-P10       | PAD-P10       | PAD-P10       |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB4S        | CSTB4S        | CSTB4S        |
|           | Wrench              | T9            | T9            | T15           | T15           | T15           |
|           | Sub Guide Pad       | PAD-S08       | PAD-S08       | PAD-S08       | PAD-S08       | PAD-S08       |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        |
|           | Wrench              | T9            | T9            | T9            | T9            | T9            |

## BTA INDEXABLE - 3 CARTRIDGE SYSTEM ASSEMBLY OF TBTA3 SERIES

### Diameters

2.165 - 3.070



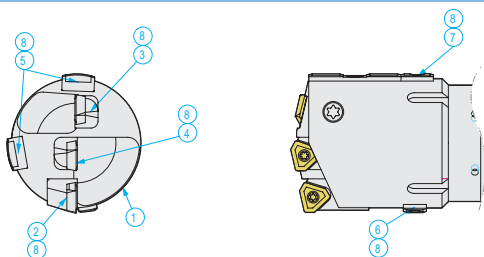
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

| Parts     |                     | Diameter      |               |               |               |               |
|-----------|---------------------|---------------|---------------|---------------|---------------|---------------|
|           |                     | 2.165 - 2.283 | 2.283 - 2.362 | 2.362 - 2.519 | 2.520 - 2.677 | 2.677 - 3.070 |
| Cartridge | Outer               | PERC 402-32   | PERC 402-32   | PERC 402-32   | PERC 402-43   | PERC 402-32   |
|           | Adjust Screw        | AS0005-10     | AS0005-10     | AS0005-10     | AS0005-15     | AS0005-10     |
|           | Wrench              | H2.5          | H2.5          | H2.5          | H2.5          | H2.5          |
|           | Screw               | LS1805RH      | LS1805RH      | LS1805RH      | LS1806RH      | LS1806RH      |
|           | Wrench              | H3            | H3            | H3            | H4            | H4            |
|           | Inner               | CENC 402-04   | CENC 402-32   | CENC 402-32   | CENC 402-32   | CENC 402-43   |
|           | Screw               | CSTB3.5       | CSTA5         | CSTA5         | CSTA5         | LS1206        |
|           | Wrench              | T15           | T15           | T15           | T15           | H3            |
|           | Center              | CENC 402-32   | CENC 402-32   | CENC 402-32   | CENC 402-32   | CENC 402-43   |
|           | Screw               | CSTA5         | CSTA5         | CSTA5         | CSTA5         | LS1206        |
|           | Wrench              | T15           | T15           | T15           | T15           | H3            |
| Insert    | Outer               | TPMX 1704RG   | TPMX 1704RG   | TPMX 1704RG   | TPMX 2405RG   | TPMX 1704RG   |
|           | Screw               | CSTB3.5D      | CSTB3.5D      | CSTB3.5D      | CSTB4M        | CSTB3.5D      |
|           | Wrench              | T9            | T9            | T9            | T15           | T9            |
|           | Inner               | TPMX 1403RG   | TPMX 1704RG   | TPMX 1704RG   | TPMX 1704RG   | TPMX 2405RG   |
|           | Screw               | CSTB2.5       | CSTB3.5D      | CSTB3.5D      | CSTB3.5D      | CSTB4M        |
|           | Wrench              | T8            | T9            | T9            | T9            | T15           |
|           | Center              | TPMX 1704RG   | TPMX 1704RG   | TPMX 1704RG   | TPMX 1704RG   | TPMX 2405RG   |
|           | Screw               | CSTB3.5D      | CSTB3.5D      | CSTB3.5D      | CSTB3.5D      | CSTB4M        |
|           | Wrench              | T9            | T9            | T9            | T9            | T15           |
| Pad       | Guide Pad           | PAD-GC10      | PAD-GC10      | PAD-GC14      | PAD-GC14      | PAD-GC14      |
|           | Screw               | CSTB4S        | CSTB4S        | CSTA5S        | CSTA5S        | CSTA5S        |
|           | Wrench              | T15           | T15           | T15           | T15           | T15           |
|           | Guide Pad Protector | PAD-P10       | PAD-P10       | PAD-P14       | PAD-P14       | PAD-P14       |
|           | Screw               | CSTB4S        | CSTB4S        | CSTA5S        | CSTA5S        | CSTA5S        |
|           | Wrench              | T15           | T15           | T15           | T15           | T15           |
|           | Sub Guide Pad       | PAD-S08       | PAD-S08       | PAD-S08       | PAD-S10       | PAD-S10       |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        |
|           | Wrench              | T9            | T9            | T9            | T9            | T9            |

# BTA INDEXABLE - 3 CARTRIDGE SYSTEM ASSEMBLY OF TBTA3 SERIES

## Diameters

3.071 - 4.212



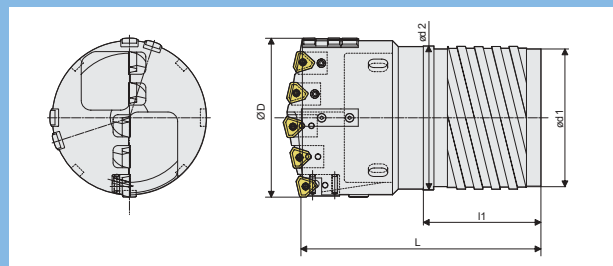
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

| Parts     |                     | Diameter      |               |               |               |
|-----------|---------------------|---------------|---------------|---------------|---------------|
|           |                     | 3.071 - 3.346 | 3.346 - 3.622 | 3.622 - 3.897 | 3.898 - 4.212 |
| Cartridge | Outer               | PERC 402-43   | PERC 402-63   | PERC 402-43   | PERC 402-63   |
|           | Adjust Screw        | AS0005-15     | AS0006-15     | AS0005-15     | AS0006-15     |
|           | Wrench              | H2.5          | H3            | H2.5          | H3            |
|           | Screw               | LS1806RH      | LS1806RH      | LS1806RH      | LS1806RH      |
|           | Wrench              | H4            | H4            | H4            | H4            |
|           | Inner               | CENC 402-43   | CENC 402-43   | CENC 402-63   | CENC 402-63   |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Center              | CENC 402-43   | CENC 402-43   | CENC 402-63   | CENC 402-63   |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Wrench              | H3            | H3            | H3            | H3            |
| Insert    | Outer               | TPMX 2405RG   | TPMX 2807RG   | TPMX 2405RG   | TPMX 2807RG   |
|           | Screw               | CSTB4M        | CSTB5         | CSTB4M        | CSTB5         |
|           | Wrench              | T15           | T20           | T15           | T20           |
|           | Inner               | TPMX 2405RG   | TPMX 2405RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB5         | CSTB5         |
|           | Wrench              | T15           | T15           | T20           | T20           |
|           | Center              | TPMX 2405RG   | TPMX 2405RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB5         | CSTB5         |
|           | Wrench              | T15           | T15           | T20           | T20           |
| Pad       | Guide Pad           | PAD-GC14      | PAD-GC14      | PAD-GC14      | PAD-GC18      |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        | LS1206S       |
|           | Wrench              | T15           | T15           | T15           | H3            |
|           | Guide Pad Protector | PAD-P14       | PAD-P14       | PAD-P14       | PAD-P18       |
|           | Screw               | CSTB5S        | CSTB5S        | CSTA5S        | LS1206S       |
|           | Wrench              | T15           | T15           | T15           | H3            |
|           | Sub Guide Pad       | PAD-S10       | PAD-S10       | PAD-S10       | PAD-S14       |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB3S        | CSTA5S        |
|           | Wrench              | T9            | T9            | T9            | T15           |

## BTA INDEXABLE - 5 CARTRIDGE SYSTEM SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

4.213 - 6.653

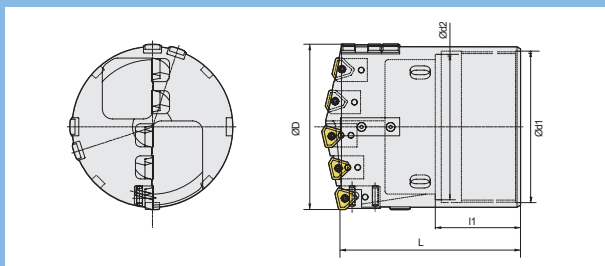


| Designation         | Diameter      | Dimension |      |       |       | Tube     |          |
|---------------------|---------------|-----------|------|-------|-------|----------|----------|
|                     |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA5-xx.xxxSE4-094 | 4.213 - 4.409 | 7.09      | 3.23 | 3.268 | 3.504 | BTSI 094 | 3.701    |
| TBTA5-xx.xxxSE4-106 | 4.409 - 4.881 | 8.07      | 4.02 | 3.740 | 3.976 | BTSI 106 | 4.173    |
| TBTA5-xx.xxxSE4-118 | 4.882 - 5.354 | 8.07      | 4.02 | 4.213 | 4.449 | BTSI 118 | 4.646    |
| TBTA5-xx.xxxSE4-130 | 5.354 - 5.826 | 8.07      | 4.02 | 4.685 | 4.921 | BTSI 130 | 5.118    |
| TBTA5-xx.xxxSE4-142 | 5.827 - 6.299 | 8.86      | 4.80 | 5.157 | 5.394 | BTSI 142 | 5.591    |
| TBTA5-xx.xxxSE4-154 | 6.299 - 6.653 | 8.86      | 4.80 | 5.630 | 5.866 | BTSI 154 | 6.063    |

# Ingersoll

## ■ BTA INDEXABLE - 5 CARTRIDGE SYSTEM SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

**Diameters**  
4.213 - 6.653

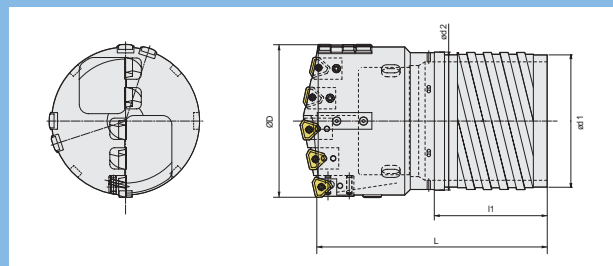


| Designation         | Diameter      | Dimension |      |       |       | Tube     |          |
|---------------------|---------------|-----------|------|-------|-------|----------|----------|
|                     |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA5-xx.xxxSI1-094 | 4.213 - 4.370 | 5.91      | 2.76 | 3.543 | 3.346 | BTSE 094 | 3.701    |
| TBTA5-xx.xxxSI1-106 | 4.370 - 4.842 | 5.91      | 2.76 | 4.016 | 3.819 | BTSE 106 | 4.173    |
| TBTA5-xx.xxxSI1-118 | 4.843 - 5.315 | 5.91      | 2.76 | 4.488 | 4.291 | BTSE 118 | 4.646    |
| TBTA5-xx.xxxSI1-130 | 5.315 - 5.866 | 5.91      | 2.76 | 4.961 | 4.764 | BTSE 130 | 5.118    |
| TBTA5-xx.xxxSI1-142 | 5.866 - 6.378 | 5.91      | 2.76 | 5.472 | 5.276 | BTSE 142 | 5.591    |
| TBTA5-xx.xxxSI1-154 | 6.378 - 6.653 | 7.48      | 3.35 | 5.945 | 5.709 | BTSE 154 | 6.063    |

## BTA INDEXABLE - 5 CARTRIDGE SYSTEM DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

4.213 - 6.653

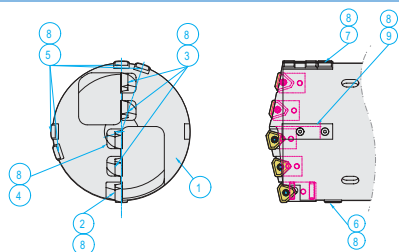


| Designation         | Diameter      | Dimension |      |       |       | Tube       |            |          |
|---------------------|---------------|-----------|------|-------|-------|------------|------------|----------|
|                     |               | L         | l1   | d1    | d2    | Outer Tube | Inner Tube | Diameter |
| TBTA5-xx.xxxDE4-094 | 4.213 - 4.409 | 7.09      | 3.23 | 3.268 | 3.504 | BTDO 094   | BTDI 078   | 3.701    |
| TBTA5-xx.xxxDE4-106 | 4.409 - 4.881 | 8.07      | 4.02 | 3.740 | 3.976 | BTDO 106   | BTDI 090   | 4.173    |
| TBTA5-xx.xxxDE4-118 | 4.882 - 5.354 | 8.07      | 4.02 | 4.213 | 4.449 | BTDO 118   | BTDI 092   | 4.646    |
| TBTA5-xx.xxxDE4-130 | 5.354 - 5.826 | 8.07      | 4.02 | 4.685 | 4.921 | BTDO 130   | BTDI 093   | 5.118    |
| TBTA5-xx.xxxDE4-142 | 5.827 - 6.299 | 8.86      | 4.80 | 5.157 | 5.394 | BTDO 142   | BTDI 094   | 5.591    |
| TBTA5-xx.xxxDE4-154 | 6.299 - 6.653 | 8.86      | 4.80 | 5.630 | 5.866 | BTDO 154   | BTDI 095   | 6.063    |

# BTA INDEXABLE - 5 CARTRIDGE SYSTEM ASSEMBLY OF TBTA5 SERIES

## Diameters

4.213 - 5.944

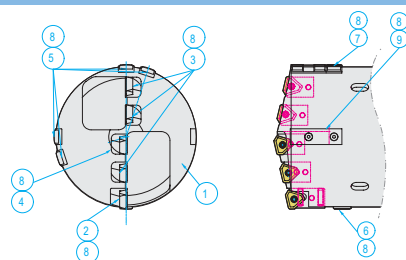


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

| Parts     |                     | Diameter      |               |               |               |
|-----------|---------------------|---------------|---------------|---------------|---------------|
|           |                     | 4.213 - 4.645 | 4.646 - 5.354 | 5.354 - 5.708 | 5.709 - 5.944 |
| Cartridge | Outer               | PERC 402-43   | PERC 402-43   | PERC 402-43   | PERC 402-43   |
|           | Adjust Screw        | AS0005-15     | AS0005-15     | AS0005-15     | AS0005-15     |
|           | Wrench              | H2.5          | H2.5          | H2.5          | H2.5          |
|           | Screw               | LS1806RH      | LS1806RH      | LS1806RH      | LS1806RH      |
|           | Wrench              | H4            | H4            | H4            | H4            |
|           | Inner               | CENC 402-32   | CENC 402-43   | CENC 402-43   | CENC 402-43   |
|           | Screw               | CSTA5         | LS1206        | LS1206        | LS1206        |
|           | Wrench              | T15           | H3            | H3            | H3            |
|           | Center              | CENC 402-43   | CENC 402-43   | CENC 402-63   | CENC 402-63   |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Center              | CENC 402-43   | CENC 402-43   | CENC 402-63   | CENC 402-63   |
| Insert    | Outer               | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M        |
|           | Wrench              | T15           | T15           | T15           | T15           |
|           | Inner               | TPMX 1704RG   | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   |
|           | Screw               | CSTB3.5D      | CSTB4M        | CSTB4M        | CSTB4M        |
|           | Wrench              | T9            | T15           | T15           | T15           |
|           | Center              | TPMX 2405RG   | TPMX 2405RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB5         | CSTB5         |
|           | Wrench              | T15           | T15           | T20           | T20           |
| Pad       | Guide Pad           | PAD-GC18      | PAD-GC18      | PAD-GC18      | PAD-GC18      |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Guide Pad Protector | PAD-P18       | PAD-P18       | PAD-P18       | PAD-P18       |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Sub Guide Pad       | PAD-S14       | PAD-S14       | PAD-S14       | PAD-S14       |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        | CSTA5S        |
|           | Wrench              | T15           | T15           | T15           | T15           |

# ■ **BTA INDEXABLE - 5 CARTRIDGE SYSTEM** ASSEMBLY OF TBTA5 SERIES

**Diameters**  
5.945 - 6.653

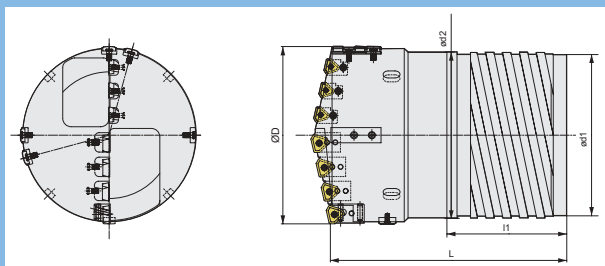


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

| Parts     |                     | Diameter      |               |               |
|-----------|---------------------|---------------|---------------|---------------|
|           |                     | 5.945 - 6.181 | 6.181 - 6.417 | 6.417 - 6.653 |
| Cartridge | Outer               | PERC 402-63   | PERC 402-63   | PERC 402-63   |
|           | Adjust Screw        | AS0006-15     | AS0006-15     | AS0006-15     |
|           | Wrench              | H3            | H3            | H3            |
|           | Screw               | LS1806RH      | LS1806RH      | LS1806RH      |
|           | Wrench              | H4            | H4            | H4            |
|           | Inner               | CENC 402-43   | CENC 402-43   | CENC 402-63   |
|           | Screw               | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            |
|           | Center              | CENC 402-63   | CENC 402-63   | CENC 402-63   |
|           | Screw               | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            |
| Insert    | Outer               | TPMX 2807RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB5         | CSTB5         | CSTB5         |
|           | Wrench              | T20           | T20           | T20           |
|           | Inner               | TPMX 2405RG   | TPMX 2405RG   | TPMX 2807RG   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB5         |
|           | Wrench              | T15           | T15           | T20           |
|           | Center              | TPMX 2807RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB5         | CSTB5         | CSTB5         |
|           | Wrench              | T20           | T20           | T20           |
| Pad       | Guide Pad           | PAD-GC18      | PAD-GC18      | PAD-GC18      |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            |
|           | Guide Pad Protector | PAD-P18       | PAD-P18       | PAD-P18       |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            |
|           | Sub Guide Pad       | PAD-S14       | PAD-S14       | PAD-S14       |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        |
|           | Wrench              | T15           | T15           | T15           |

# ■ **BTA INDEXABLE - 7 CARTRIDGE SYSTEM** SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

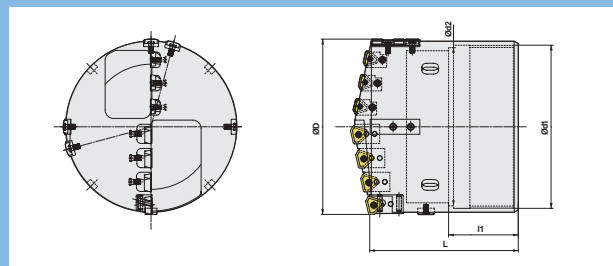
**Diameters**  
6.654 - 9.173



| Designation         | Diameter      | Dimension |      |       |       | Tube     |          |
|---------------------|---------------|-----------|------|-------|-------|----------|----------|
|                     |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA7-xx.xxxSE4-154 | 6.654 - 6.771 | 9.06      | 4.80 | 5.630 | 5.866 | BTSI 154 | 6.063    |
| TBTA7-xx.xxxSE4-166 | 6.772 - 7.244 | 9.06      | 4.80 | 6.102 | 6.339 | BTSI 166 | 6.535    |
| TBTA7-xx.xxxSE4-178 | 7.244 - 7.716 | 9.84      | 5.59 | 6.575 | 6.811 | BTSI 178 | 7.008    |
| TBTA7-xx.xxxSE4-190 | 7.717 - 8.189 | 9.84      | 5.59 | 7.047 | 7.283 | BTSI 190 | 7.480    |
| TBTA7-xx.xxxSE4-202 | 8.189 - 8.661 | 9.84      | 5.59 | 7.520 | 7.756 | BTSI 202 | 7.953    |
| TBTA7-xx.xxxSE4-214 | 8.661 - 9.133 | 10.63     | 6.38 | 7.913 | 8.189 | BTSI 214 | 8.425    |
| TBTA7-xx.xxxSE4-226 | 9.134 - 9.173 | 10.63     | 6.38 | 8.386 | 8.661 | BTSI 226 | 8.898    |

## BTA INDEXABLE - 7 CARTRIDGE SYSTEM SINGLE TUBE SYSTEMS - INNER SINGLE START THREAD

**Diameters**  
6.654 - 9.685

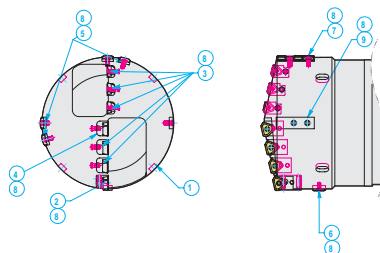


| Designation         | Diameter      | Dimension |      |       |       | Tube     |          |
|---------------------|---------------|-----------|------|-------|-------|----------|----------|
|                     |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA7-xx.xxxSI1-154 | 6.654 - 6.850 | 7.48      | 3.35 | 5.709 | 5.945 | BTSE 154 | 6.063    |
| TBTA7-xx.xxxSI1-166 | 6.850 - 7.322 | 7.48      | 3.35 | 6.181 | 6.417 | BTSE 166 | 6.535    |
| TBTA7-xx.xxxSI1-178 | 7.323 - 7.795 | 7.48      | 3.35 | 6.654 | 6.890 | BTSE 178 | 7.008    |
| TBTA7-xx.xxxSI1-190 | 7.795 - 8.267 | 7.48      | 3.35 | 7.126 | 7.362 | BTSE 190 | 7.480    |
| TBTA7-xx.xxxSI1-202 | 8.268 - 8.740 | 7.48      | 3.35 | 7.598 | 7.835 | BTSE 202 | 7.953    |
| TBTA7-xx.xxxSI1-214 | 8.740 - 9.212 | 7.48      | 3.35 | 8.071 | 8.307 | BTSE 214 | 8.425    |
| TBTA7-xx.xxxSI1-226 | 9.213 - 9.685 | 7.48      | 3.35 | 8.543 | 8.780 | BTSE 226 | 8.898    |

# BTA INDEXABLE - 7 CARTRIDGE SYSTEM ASSEMBLY OF TBTA7 SERIES

## Diameters

6.654 - 8.228



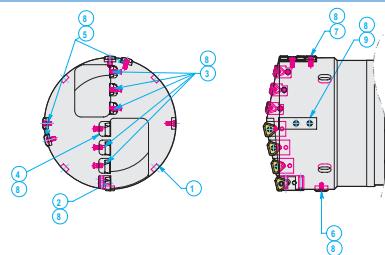
1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

| Parts     |                     | Diameter      |               |               |               |
|-----------|---------------------|---------------|---------------|---------------|---------------|
|           |                     | 6.654 - 7.441 | 7.441 - 7.756 | 7.756 - 7.992 | 7.992 - 8.228 |
| Cartridge | Outer               | PERC 402-43   | PERC 402-43   | PERC 402-43   | PERC 402-43   |
|           | Adjust Screw        | AS0005-15     | AS0005-15     | AS0005-15     | AS0005-15     |
|           | Wrench              | H2.5          | H2.5          | H2.5          | H2.5          |
|           | Screw               | LS1806RH      | LS1806RH      | LS1806RH      | LS1806RH      |
|           | Wrench              | H4            | H4            | H4            | H4            |
|           | Inner               | CENC 402-43   | CENC 402-43   | CENC 402-43   | CENC 402-43   |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Center              | CENC 402-43   | CENC 402-63   | CENC 402-63   | CENC 402-63   |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Center              | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   |
| Insert    | Screw               | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M        |
|           | Wrench              | T15           | T15           | T15           | T15           |
|           | Inner               | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M        |
|           | Wrench              | T15           | T15           | T15           | T15           |
|           | Center              | TPMX 2405RG   | TPMX 2807RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB4M        | CSTB5         | CSTB5         | CSTB5         |
|           | Wrench              | T15           | T20           | T20           | T20           |
|           | Center              | TPMX 2405RG   | TPMX 2807RG   | TPMX 2807RG   | TPMX 2807RG   |
| Pad       | Guide Pad           | PAD-GC18      | PAD-GC18      | PAD-GC18      | PAD-GC18      |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Guide Pad Protector | PAD-P18       | PAD-P18       | PAD-P18       | PAD-P18       |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            | H3            |
|           | Sub Guide Pad       | PAD-S14       | PAD-S14       | PAD-S14       | PAD-S14       |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        | CSTA5S        |
|           | Wrench              | T15           | T15           | T15           | T15           |
|           | Center              | TPMX 2405RG   | TPMX 2807RG   | TPMX 2807RG   | TPMX 2807RG   |

## BTA INDEXABLE - 7 CARTRIDGE SYSTEM ASSEMBLY OF TBTA7 SERIES

### Diameters

8.228 - 8.937

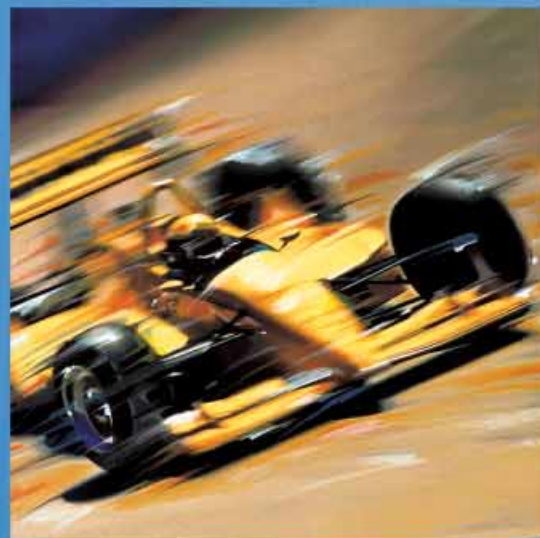


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw
9. Filler

| Parts     |                     | Diameter      |               |               |
|-----------|---------------------|---------------|---------------|---------------|
|           |                     | 8.228 - 8.464 | 8.465 - 8.700 | 8.701 - 8.937 |
| Cartridge | Outer               | PERC 402-63   | PERC 402-63   | PERC 402-63   |
|           | Adjust Screw        | AS0006-15     | AS0006-15     | AS0006-15     |
|           | Wrench              | H3            | H3            | H3            |
|           | Screw               | L1806RH       | L1806RH       | L1806RH       |
|           | Wrench              | H4            | H4            | H4            |
|           | Inner               | CENC 402-43   | CENC 402-43   | CENC 402-43   |
|           | Screw               | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            |
|           | Center              | CENC 402-63   | CENC 402-63   | CENC 402-63   |
|           | Screw               | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            |
| Insert    | Outer               | TPMX 2807RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB5         | CSTB5         | CSTB5         |
|           | Wrench              | T20           | T20           | T20           |
|           | Inner               | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB4M        |
|           | Wrench              | T15           | T15           | T15           |
|           | Center              | TPMX 2807RG   | TPMX 2807RG   | TPMX 2807RG   |
|           | Screw               | CSTB5         | CSTB5         | CSTB5         |
|           | Wrench              | T20           | T20           | T20           |
| Pad       | Guide Pad           | PAD-GC18      | PAD-GC18      | PAD-GC18      |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            |
|           | Guide Pad Protector | PAD-P18       | PAD-P18       | PAD-P18       |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | H3            | H3            | H3            |
|           | Sub Guide Pad       | PAD-S14       | PAD-S14       | PAD-S14       |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        |
|           | Wrench              | T15           | T15           | T15           |



# Ingersoll



# BTA DRILLS

## **BTA Indexable - Small Diameter**

### **TBTA-A Type**

TBTA-A... is an improved solution compared to brazed BTA drills because it uses replaceable inserts.

**Available Range: Dia. 29.00mm - 37.99mm.**

**The diameter can be adjusted for precise holes with enhanced surface finish.**

**Cartridges protect head shank.**

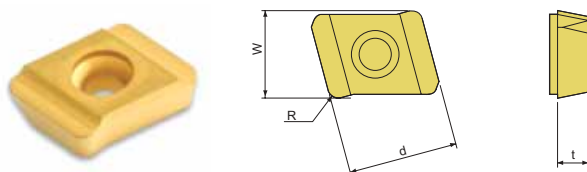
**Can obtain more precise holes than TBTA-C.. or TBTA-D..**

**Single tube system is available.**

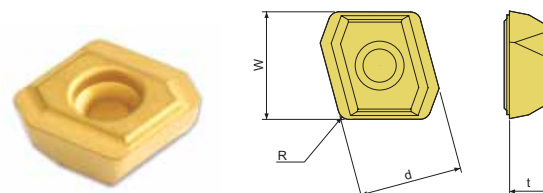
## BTA INDEXABLE FOR SMALL DIAMETER SERIES "Y"

### Insert for TBTA-A

Inner, Center & Outer Insert

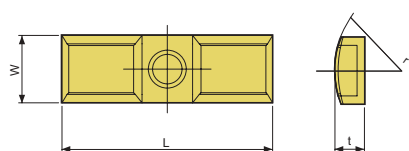


Inner & Outer Insert

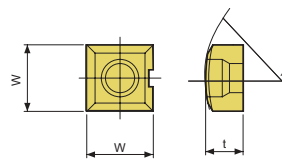


| Designation        | Dimension |       |       |       | Pocket |       |       | Grade  | Screw           |
|--------------------|-----------|-------|-------|-------|--------|-------|-------|--------|-----------------|
|                    | d         | t     | R     | W     | Center | Inner | Outer |        |                 |
| <b>NPMX 0802RG</b> | 0.335     | 0.094 | 0.031 | 0.256 | ○      | ○     | ○     | IN2005 | <b>CSTB 2.2</b> |
| <b>NPMX 0803RG</b> | 0.315     | 0.125 | 0.031 | 0.329 |        | ○     | ○     |        | <b>CSTB 2.2</b> |

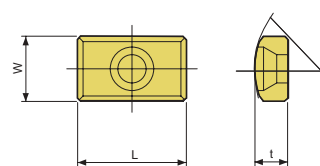
### Pad



Guide Pad



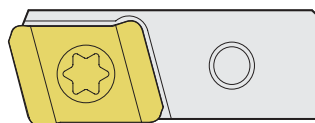
Guide Pad Protector



Sub Pad

| Type                       | Designation         | Dimension |       |       |       | Screw            |
|----------------------------|---------------------|-----------|-------|-------|-------|------------------|
|                            |                     | W         | t     | L     | r     |                  |
| <b>Guide Pad</b>           | <b>PAD-GC08-140</b> | 0.315     | 0.138 | 0.984 | 0.551 | <b>CSTB 3S</b>   |
| <b>Guide Pad Protector</b> | <b>PAD-P08-140</b>  | 0.315     | 0.138 | 0.315 | 0.551 | <b>CSTB 3S</b>   |
| <b>Sub Pad</b>             | <b>PAD-S06</b>      | 0.236     | 0.118 | 0.394 | 0.315 | <b>CSTB 2.2S</b> |

### Cartridge for TBTA-A



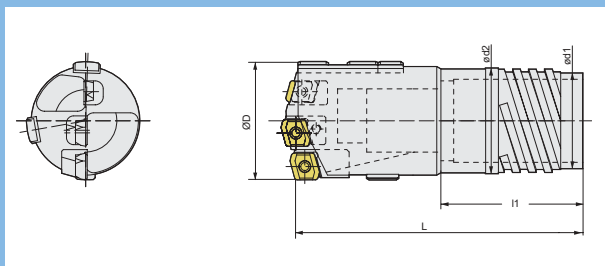
| Designation               |                | Adjust Screw | Wrench | Lock Screw | Wrench | Insert     |
|---------------------------|----------------|--------------|--------|------------|--------|------------|
| <b>Outer</b>              | <b>PERC05R</b> | AS0003-5     | H1.5   | LS1803RH   | H2     | NPMX0803.. |
|                           | <b>PERC06R</b> | AS0002.5-5   | H1.27  | CSTB2.5    | H8     | NPMX0802.. |
| <b>Inner &amp; Center</b> | <b>CENC05R</b> | -            | -      | CSTB3      | T9     | NPMX0803.. |
|                           | <b>CENC06R</b> | -            | -      | CSTB2.5    | T8     | NPMX0802.. |

# Ingersoll

## ■ BTA INDEXABLE FOR SMALL DIAMETER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

1.142 - 1.496

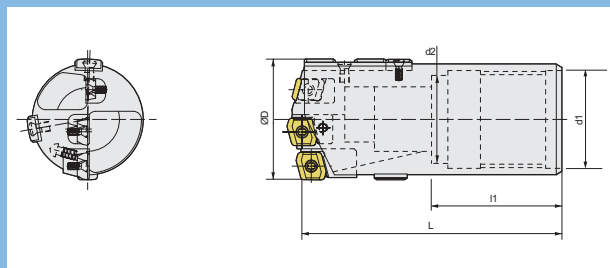


| Designation        | Diameter      | Dimension |      |       |       | Tube     |          |
|--------------------|---------------|-----------|------|-------|-------|----------|----------|
|                    |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA-Axx.xxxSE4-26 | 1.142 - 1.220 | 2.72      | 0.96 | 0.827 | 0.925 | BTSI 026 | 1.024    |
| TBTA-Axx.xxxSE4-28 | 1.221 - 1.311 | 2.72      | 0.96 | 0.906 | 1.004 | BTSI 028 | 1.102    |
| TBTA-Axx.xxxSE4-30 | 1.311 - 1.425 | 2.72      | 0.96 | 1.004 | 1.102 | BTSI 030 | 1.181    |
| TBTA-Axx.xxxSE4-33 | 1.426 - 1.496 | 2.95      | 1.20 | 1.063 | 1.181 | BTSI 033 | 1.299    |

## BTA INDEXABLE FOR SMALL DIAMETER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

### Diameters

1.142 - 1.496



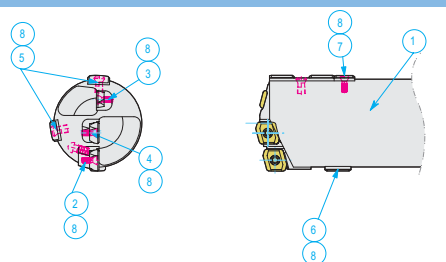
| Designation        | Diameter      | Dimension |      |       |       | Tube     |          |
|--------------------|---------------|-----------|------|-------|-------|----------|----------|
|                    |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA-Axx.xxxSI1-24 | 1.142 - 1.181 | 2.95      | 0.98 | 0.866 | 0.748 | BTSE 024 | 0.945    |
| TBTA-Axx.xxxSI1-26 | 1.181 - 1.259 | 2.95      | 0.98 | 0.945 | 0.827 | BTSE 026 | 1.024    |
| TBTA-Axx.xxxSI1-28 | 1.260 - 1.338 | 2.95      | 0.98 | 1.024 | 0.906 | BTSE 028 | 1.102    |
| TBTA-Axx.xxxSI1-30 | 1.339 - 1.456 | 3.54      | 1.57 | 1.063 | 0.945 | BTSE 030 | 1.181    |
| TBTA-Axx.xxxSI1-33 | 1.457 - 1.496 | 3.54      | 1.57 | 1.181 | 1.063 | BTSE 033 | 1.299    |

# Indersol

## BTA INDEXABLE FOR SMALL DIAMETER ASSEMBLY OF TBTA-A SERIES

### Diameters

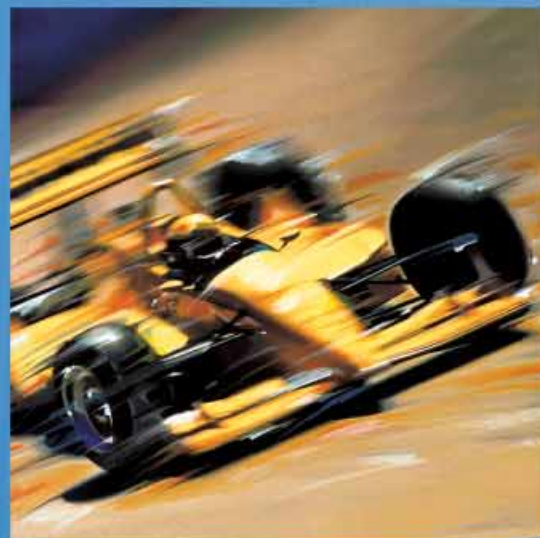
1.142 - 1.496



1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

| Parts     |                     | Diameter      |               |               |
|-----------|---------------------|---------------|---------------|---------------|
|           |                     | 1.142 - 1.338 | 1.339 - 1.378 | 1.378 - 1.496 |
| Cartridge | Outer               | PERC 06R      | PERC 06R      | PERC 05R      |
|           | Adjust Screw        | AS0002.5-5    | AS0002.5-5    | AS0003-5      |
|           | Wrench              | H1.27         | H1.27         | H1.5          |
|           | Screw               | CSTB2.5       | CSTB2.5       | LS1803RH      |
|           | Wrench              | T8            | T8            | H2            |
|           | Inner               | CENC 06R      | CENC 06R      | CENC 06R      |
|           | Screw               | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|           | Wrench              | T8            | T8            | T8            |
|           | Center              | CENC 06R      | CENC 05R      | CENC 05R      |
|           | Screw               | CSTB2.5       | CSTB3         | CSTB3         |
|           | Wrench              | T8            | T9            | T9            |
|           | Wrench              | T8            | T9            | T9            |
| Insert    | Outer               | NPMX 0802RG   | NPMX 0802RG   | NPMX 0803RG   |
|           | Screw               | CSTB2.2       | CSTB2.2       | CSTB2.2       |
|           | Wrench              | T7            | T7            | T7            |
|           | Inner               | NPMX 0802RG   | NPMX 0803RG   | NPMX 0803RG   |
|           | Screw               | CSTB2.2       | CSTB2.2       | CSTB2.2       |
|           | Wrench              | T7            | T7            | T7            |
|           | Center              | NPMX 0802RG   | NPMX 0802RG   | NPMX 0802RG   |
|           | Screw               | CSTB2.2       | CSTB2.2       | CSTB2.2       |
|           | Wrench              | T7            | T7            | T7            |
| Pad       | Guide Pad           | PAD-GC08-140  | PAD-GC08-140  | PAD-GC08-140  |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB3S        |
|           | Wrench              | T9            | T9            | T9            |
|           | Guide Pad Protector | PAD-P08-140   | PAD-P08-140   | PAD-P08-140   |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB3S        |
|           | Wrench              | T9            | T9            | T9            |
|           | Sub Guide Pad       | PAD-S06       | PAD-S06       | PAD-S06       |
|           | Screw               | CSTB2.2S      | CSTB2.2S      | CSTB2.2S      |
|           | Wrench              | T7            | T7            | T7            |

# Ingersoll



# BTA DRILLS

## **BTA Indexable - Small Diameter**

### **TBTA-B Type**

TBTA-B... do not need cartridges so it is a cost effective solution as only insert and pad inventory is required.

**Available Range:** Dia. 16.01mm - 28.50mm.

**Three stepped staggered cutting edge for improved chip removal.**

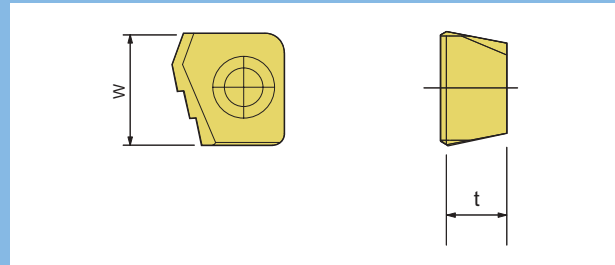
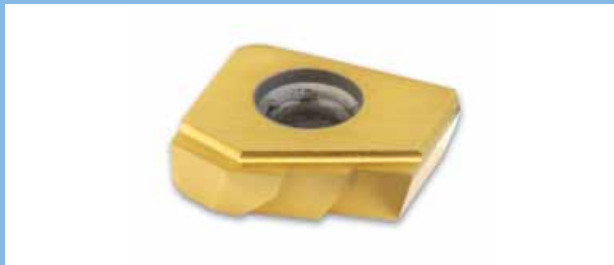
**Precise holes and high quality surface finish.**

**Easy diameter setting with ball and adjustment screw.**

**Ensure machine has good safety equipment.**

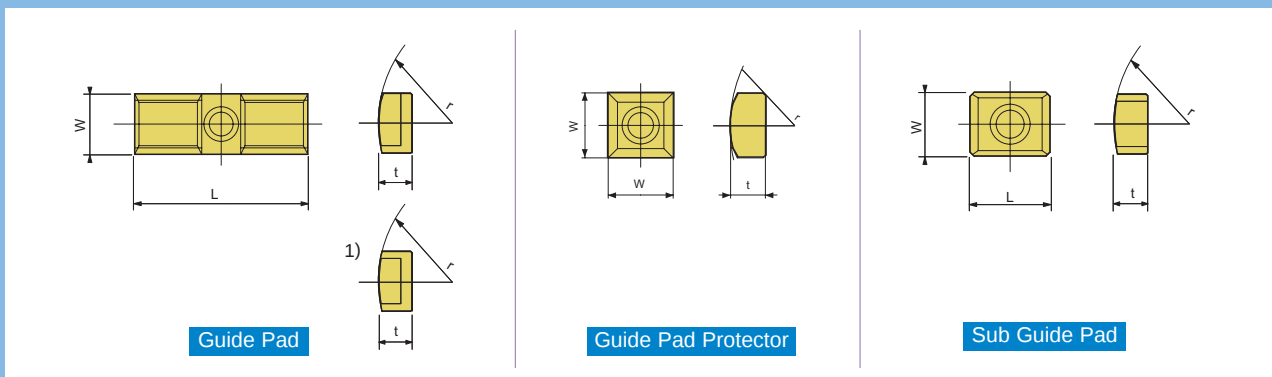
## BTA INDEXABLE FOR SMALL DIAMETER

### Insert for TBTA-B



| Designation  | Dimension |       | Pocket |       |       | Grade  | Screw       |
|--------------|-----------|-------|--------|-------|-------|--------|-------------|
|              | t         | W     | Center | Inner | Outer | IN2005 |             |
| XPMT 16002UB | 0.110     | 0.374 |        |       | ○     |        | CSTAN03-4.5 |
| XPMT 18003UB | 0.120     | 0.433 |        |       | ○     |        | CSTAN05-5.5 |
| XPMT 21003UB | 0.140     | 0.512 |        |       | ○     |        | CSTAN05-6.5 |
| XPMT 25003UB | 0.134     | 0.571 |        |       | ○     |        | CSTA4-7.5   |

### Pad

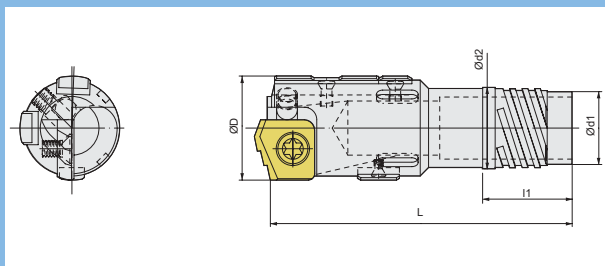


| Type                | Designation                | Dimension |       |       |       | Screw    |
|---------------------|----------------------------|-----------|-------|-------|-------|----------|
|                     |                            | W         | t     | L     | r     |          |
| Guide Pad           | PAD-GC06-075               | 0.236     | 0.128 | 0.787 | 0.295 | CSTB2.2S |
|                     | PAD-GC06-085               | 0.236     | 0.150 | 0.787 | 0.335 | CSTB2.2S |
|                     | PAD-GC06-100               | 0.236     | 0.154 | 0.787 | 0.394 | CSTB2.2S |
|                     | PAD-GC08-120 <sup>1)</sup> | 0.315     | 0.173 | 0.984 | 0.472 | CSTB3S   |
| Guide Pad Protector | PAD-P06-075                | 0.236     | 0.128 | 0.236 | 0.295 | CSTB2.2S |
|                     | PAD-P06-085                | 0.236     | 0.150 | 0.236 | 0.335 | CSTB2.2S |
|                     | PAD-P06-100                | 0.236     | 0.154 | 0.236 | 0.394 | CSTB2.2S |
|                     | PAD-P08-120                | 0.236     | 0.173 | 0.236 | 0.472 | CSTB3S   |
| Sub Guide Pad       | PAD-S06                    | 0.236     | 0.118 | 0.394 | 0.315 | CSTB2.2S |

# Ingersoll

## ■ BTA INDEXABLE FOR SMALL DIAMETER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

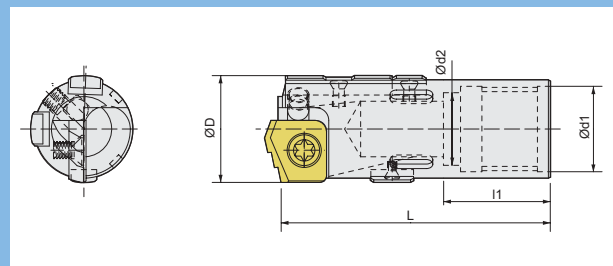
**Diameters**  
0.630 - 1.122



| Designation        | Diameter      | Dimension |      |       |       | Tube     |          |
|--------------------|---------------|-----------|------|-------|-------|----------|----------|
|                    |               | L         | l1   | d1    | d2    | Part     | Diameter |
| TBTA-Bxx.xxxSE4-14 | 0.630 - 0.657 | 2.44      | 0.79 | 0.425 | 0.496 | BTSI 014 | 0.551    |
| TBTA-Bxx.xxxSE4-15 | 0.658 - 0.697 | 2.44      | 0.79 | 0.465 | 0.535 | BTSI 015 | 0.591    |
| TBTA-Bxx.xxxSE4-16 | 0.697 - 0.744 | 2.44      | 0.85 | 0.492 | 0.571 | BTSI 016 | 0.630    |
| TBTA-Bxx.xxxSE4-17 | 0.744 - 0.787 | 2.44      | 0.85 | 0.531 | 0.610 | BTSI 017 | 0.669    |
| TBTA-Bxx.xxxSE4-18 | 0.788 - 0.858 | 2.66      | 0.85 | 0.551 | 0.630 | BTSI 018 | 0.709    |
| TBTA-Bxx.xxxSE4-20 | 0.859 - 0.949 | 2.66      | 0.85 | 0.630 | 0.709 | BTSI 020 | 0.787    |
| TBTA-Bxx.xxxSE4-22 | 0.949 - 1.039 | 2.85      | 0.85 | 0.689 | 0.768 | BTSI 022 | 0.866    |
| TBTA-Bxx.xxxSE4-24 | 1.040 - 1.122 | 2.85      | 0.85 | 0.748 | 0.827 | BTSI 024 | 0.945    |

## BTA INDEXABLE FOR SMALL DIAMETER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

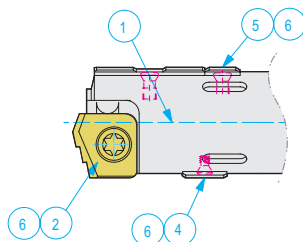
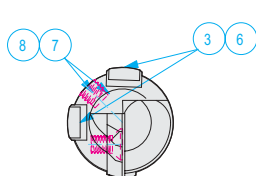
**Diameters**  
0.630 - 1.122



| Designation          | Diameter      | Dimension |      |       |       | Tube       |          |
|----------------------|---------------|-----------|------|-------|-------|------------|----------|
|                      |               | L         | l1   | d1    | d2    | Part       | Diameter |
| TBTA-Bxx.xxxSI1-13   | 0.630 - 0.650 | 1.97      | 0.91 | 0.500 | 0.437 | BTSE 013B  | 0.512    |
| TBTA-Bxx.xxxSI1-14   | 0.650 - 0.679 | 1.97      | 0.91 | 0.528 | 0.465 | BTSE 014A  | 0.551    |
| TBTA-Bxx.xxxSI1-14   | 0.680 - 0.709 | 1.97      | 0.91 | 0.539 | 0.476 | BTSE 014B  | 0.551    |
| TBTA-Bxx.xxxSI1-15   | 0.709 - 0.748 | 1.97      | 0.91 | 0.567 | 0.504 | BTSE 015   | 0.591    |
| TBTA-Bxx.xxxSI1-16.5 | 0.748 - 0.787 | 1.97      | 0.91 | 0.606 | 0.543 | BTSE 016.5 | 0.650    |
| TBTA-Bxx.xxxSI1-18   | 0.787 - 0.866 | 2.17      | 0.98 | 0.650 | 0.571 | BTSE 018   | 0.709    |
| TBTA-Bxx.xxxSI1-20   | 0.866 - 0.984 | 2.17      | 0.98 | 0.748 | 0.630 | BTSE 020   | 0.787    |
| TBTA-Bxx.xxxSI1-22   | 0.984 - 1.063 | 2.36      | 0.98 | 0.787 | 0.669 | BTSE 022   | 0.866    |
| TBTA-Bxx.xxxSI1-24   | 1.063 - 1.122 | 2.36      | 0.98 | 0.866 | 0.748 | BTSE 024   | 0.945    |

# BTA INDEXABLE FOR SMALL DIAMETER ASSEMBLY OF TBTA-B SERIES

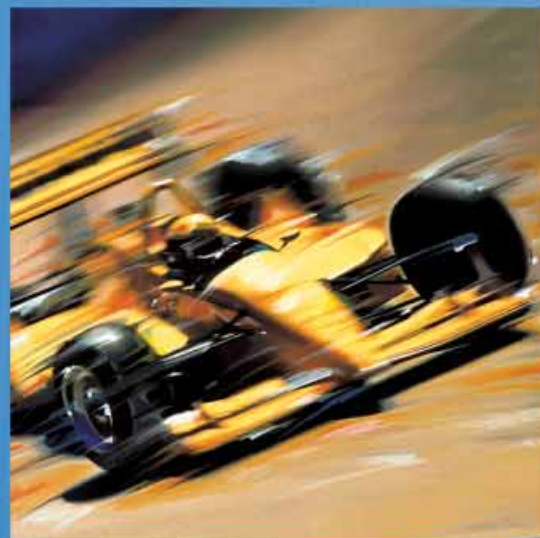
**Diameters**  
0.630 - 1.122



1. Head Shank
2. Indexable Insert
3. Guide Pad
4. Sub Guide
5. Guide Pad Protector
6. Lock Screw
7. Adjust Ball
8. Adjust Screw

| Parts  |                     | Diameter      |               |               |               |
|--------|---------------------|---------------|---------------|---------------|---------------|
|        |                     | 0.630 - 0.709 | 0.709 - 0.827 | 0.827 - 0.984 | 0.984 - 1.122 |
| Insert | Insert              | XPMT 16002UB  | XPMT 18003UB  | XPMT 21003UB  | XPMT 25003UB  |
|        | Screw               | CSTANO5-5.5   | CSTANO5-5.5   | CSTANO5-5.5   | CSTANO5-5.5   |
|        | Wrench              | T9            | T9            | T9            | T9            |
|        | Adjust Screw        | B2.5          | B3            | B4            | B5            |
|        | Wrench              | AS0003-3.5    | AS0003-3.5    | AS0003-3.5    | AS0003-3.5    |
|        | Adjust Ball         | H1.5          | H1.5          | H1.5          | H1.5          |
| Pad    | Guide Pad           | PAD-GC06-075  | PAD-GC06-085  | PAD-GC06-100  | PAD-GC08-120  |
|        | Screw               | CSTB2.2S      | CSTB2.2S      | CSTB2.2S      | CSTB2.2S      |
|        | Wrench              | T7            | T7            | T7            | T7            |
|        | Guide Pad Protector | PAD-P06-075   | PAD-P06-085   | PAD-P06-100   | PAD-P08-120   |
|        | Screw               | CSTB2.2S      | CSTB2.2S      | CSTB2.2S      | CSTB2.2S      |
|        | Wrench              | T7            | T7            | T7            | T7            |
|        | Sub Guide Pad       | PAD-S06       | PAD-S06       | PAD-S06       | PAD-S06       |
|        | Screw               | CSTB2.2S      | CSTB2.2S      | CSTB2.2S      | CSTB2.2S      |
|        | Wrench              | T7            | T7            | T7            | T7            |

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# BTA DRILLS

**BTA Indexable**  
**Cost effective solution for standard tolerance applications**

## **TBTA-C Type**

TBTA-C... can contribute to your productivity by utilising its thick inserts to improve high feed capability.

**Available Range:** Dia. 25.00 mm - 53.20 mm.

**Cartridges not required - Cost effective solution.**

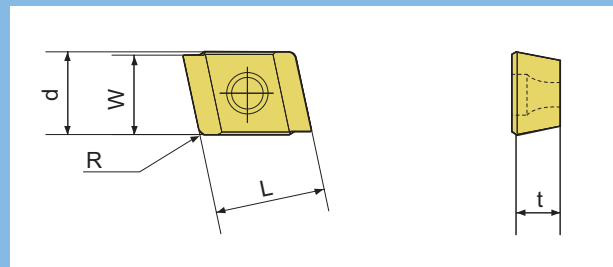
**Minimum down time to change inserts as precise setting is not required.**

**Large chip evacuation design for improved chip removal.**

**Only 4 inserts for whole range.**

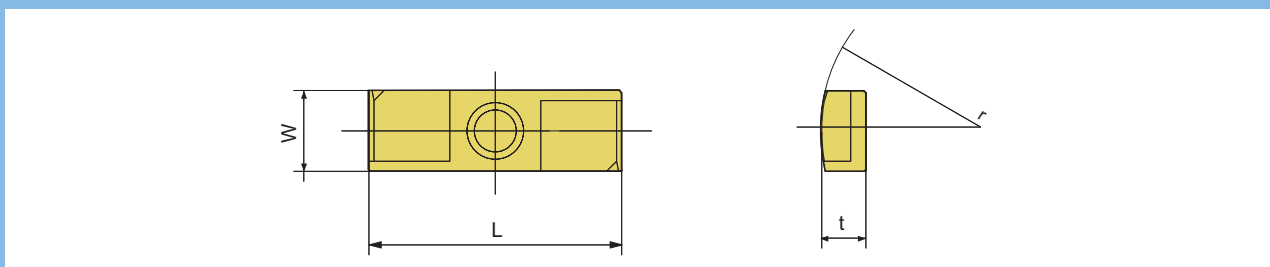
**Single & Double tube systems are available.**

## Insert for TBTA-C



| Designation         | Dimension |       |       |       |       | Pocket |       |       | Grade  | Screw           |
|---------------------|-----------|-------|-------|-------|-------|--------|-------|-------|--------|-----------------|
|                     | d         | t     | L     | W     | R     | Center | Inner | Outer | IN2005 |                 |
| <b>NPMT 05504R1</b> | 0.217     | 0.157 | 0.394 | 0.205 | 0.024 | ○      | ○     | ○     |        | <b>CSTB 2.5</b> |
| <b>NPMT 06504R1</b> | 0.256     | 0.157 | 0.394 | 0.244 | 0.024 | ○      | ○     | ○     |        |                 |
| <b>NPMT 07504R1</b> | 0.295     | 0.157 | 0.394 | 0.283 | 0.024 | ○      | ○     | ○     |        |                 |
| <b>NPMT 09504R1</b> | 0.374     | 0.157 | 0.394 | 0.362 | 0.024 | ○      | ○     | ○     |        |                 |

## Pad



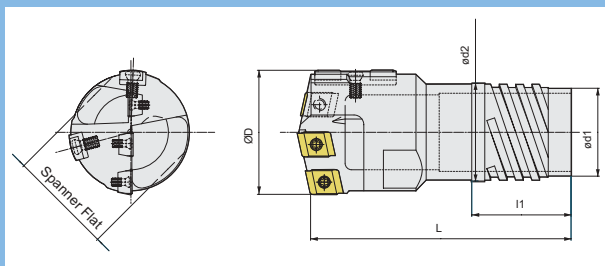
| Type             | Designation      | Dimension |       |       |       | Screw            |
|------------------|------------------|-----------|-------|-------|-------|------------------|
|                  |                  | W         | t     | L     | r     |                  |
| <b>Guide Pad</b> | <b>PAD-GO-07</b> | 0.276     | 0.138 | 0.787 | 0.472 | <b>CSTB 3S</b>   |
|                  | <b>PAD-GO-08</b> | 0.315     | 0.177 | 0.984 | 0.610 | <b>CSTB 3.5S</b> |
|                  | <b>PAD-GO-10</b> | 0.394     | 0.177 | 1.181 | 0.787 | <b>CSTB 3.5S</b> |

# Ingersoll

## BTA INDEXABLE SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

0.984 - 2.094

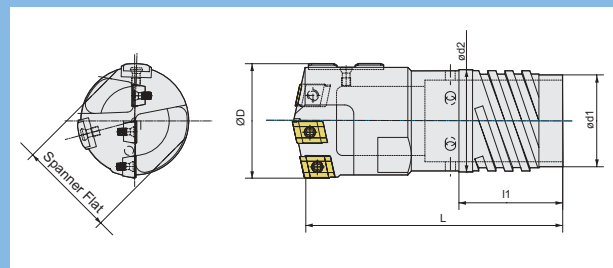


| Designation        | Diameter      | Dimension |      |       |       | Spanner Flat | Tube     |          |
|--------------------|---------------|-----------|------|-------|-------|--------------|----------|----------|
|                    |               | L         | l1   | d1    | d2    |              | Part     | Diameter |
| TBTA-Cxx.xxxSE4-22 | 0.984 - 1.039 | 2.56      | 0.85 | 0.689 | 0.768 | 0.75         | BTSI 022 | 0.866    |
| TBTA-Cxx.xxxSE4-24 | 1.040 - 1.130 | 2.56      | 0.85 | 0.748 | 0.827 | 0.83         | BTSI 024 | 0.945    |
| TBTA-Cxx.xxxSE4-26 | 1.130 - 1.220 | 2.76      | 0.96 | 0.827 | 0.925 | 0.94         | BTSI 026 | 1.024    |
| TBTA-Cxx.xxxSE4-28 | 1.221 - 1.311 | 2.76      | 0.96 | 0.906 | 1.004 | 1.02         | BTSI 028 | 1.102    |
| TBTA-Cxx.xxxSE4-30 | 1.311 - 1.425 | 2.76      | 0.96 | 1.004 | 1.102 | 1.10         | BTSI 030 | 1.181    |
| TBTA-Cxx.xxxSE4-33 | 1.426 - 1.559 | 2.95      | 1.20 | 1.063 | 1.181 | 1.18         | BTSI 033 | 1.299    |
| TBTA-Cxx.xxxSE4-36 | 1.559 - 1.693 | 3.15      | 1.20 | 1.181 | 1.299 | 1.26         | BTSI 036 | 1.417    |
| TBTA-Cxx.xxxSE4-39 | 1.693 - 1.850 | 3.54      | 1.20 | 1.299 | 1.417 | 1.42         | BTSI 039 | 1.535    |
| TBTA-Cxx.xxxSE4-43 | 1.851 - 2.035 | 3.54      | 1.20 | 1.417 | 1.535 | 1.50         | BTSI 043 | 1.693    |
| TBTA-Cxx.xxxSE4-47 | 2.036 - 2.094 | 3.54      | 1.36 | 1.555 | 1.693 | 1.81         | BTSI 047 | 1.850    |

## BTA INDEXABLE DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

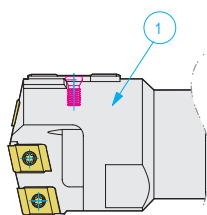
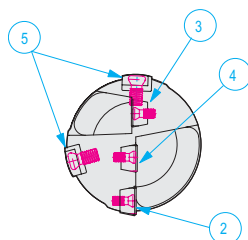
### Diameters

0.984 - 2.094



| Designation          | Diameter      | Dimension |      |       |       | Spanner Flat | Tube       |            |          |
|----------------------|---------------|-----------|------|-------|-------|--------------|------------|------------|----------|
|                      |               | L         | l1   | d1    | d2    |              | Outer Tube | Inner Tube | Diameter |
| TBTA-Cxx.xxxDE4-23.5 | 0.984 - 1.039 | 2.56      | 0.85 | 0.748 | 0.827 | 0.75         | BTDO 023.5 | BTDI 016   | 0.925    |
| TBTA-Cxx.xxxDE4-26   | 1.040 - 1.130 | 2.76      | 0.96 | 0.827 | 0.925 | 0.83         | BTDO 026   | BTDI 018   | 1.024    |
| TBTA-Cxx.xxxDE4-28   | 1.130 - 1.220 | 2.76      | 0.96 | 0.906 | 1.004 | 0.94         | BTDO 028   | BTDI 020   | 1.102    |
| TBTA-Cxx.xxxDE4-30.5 | 1.221 - 1.311 | 2.76      | 0.96 | 1.004 | 1.122 | 1.02         | BTDO 030.5 | BTDI 022   | 1.201    |
| TBTA-Cxx.xxxDE4-33   | 1.311 - 1.425 | 2.95      | 1.20 | 1.063 | 1.181 | 1.10         | BTDO 033   | BTDI 024   | 1.299    |
| TBTA-Cxx.xxxDE4-35.5 | 1.426 - 1.512 | 2.95      | 1.20 | 1.181 | 1.299 | 1.18         | BTDO 035.5 | BTDI 026   | 1.398    |
| TBTA-Cxx.xxxDE4-35.5 | 1.512 - 1.559 | 2.95      | 1.20 | 1.181 | 1.299 | 1.18         | BTDO 035.5 | BTDI 026   | 1.398    |
| TBTA-Cxx.xxxDE4-39   | 1.559 - 1.646 | 3.15      | 1.20 | 1.299 | 1.417 | 1.26         | BTDO 039   | BTDI 029   | 1.535    |
| TBTA-Cxx.xxxDE4-39   | 1.646 - 1.693 | 3.15      | 1.20 | 1.299 | 1.417 | 1.26         | BTDO 039   | BTDI 029   | 1.535    |
| TBTA-Cxx.xxxDE4-42.5 | 1.693 - 1.795 | 3.54      | 1.20 | 1.417 | 1.535 | 1.42         | BTDO 042.5 | BTDI 032   | 1.673    |
| TBTA-Cxx.xxxDE4-42.5 | 1.796 - 1.850 | 3.54      | 1.20 | 1.417 | 1.535 | 1.42         | BTDO 042.5 | BTDI 032   | 1.673    |
| TBTA-Cxx.xxxDE4-46.5 | 1.851 - 2.035 | 3.54      | 1.36 | 1.555 | 1.693 | 1.50         | BTDO 046.5 | BTDI 035   | 1.831    |
| TBTA-Cxx.xxxDE4-51   | 2.036 - 2.094 | 3.54      | 1.36 | 1.713 | 1.850 | 1.50         | BTDO 051   | BTDI 039   | 2.008    |

**Diameters**  
0.984 - 2.094

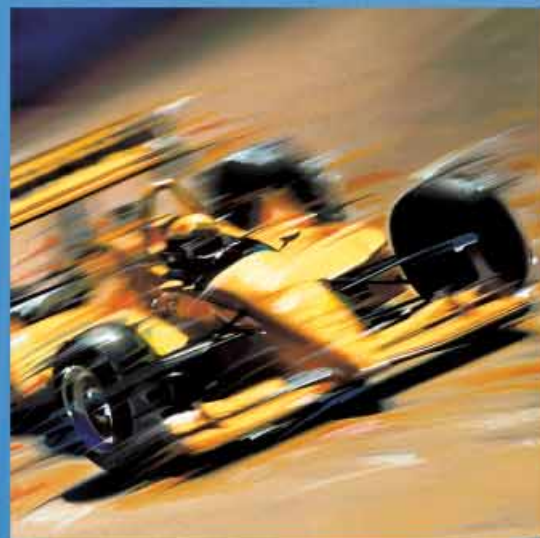


1. Head Shank
2. Outer Insert
3. Inner Insert
4. Center Insert
5. Guide Pad

| Parts  |           | Diameter      |               |               |               |               |               |               |
|--------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|        |           | 0.984 - 1.039 | 1.040 - 1.130 | 1.130 - 1.220 | 1.221 - 1.311 | 1.311 - 1.425 | 1.426 - 1.512 | 1.512 - 1.559 |
| Insert | Outer     | NPMT 05504R1  | NPMT 05504R1  | NPMT 06504R1  | NPMT 06504R1  | NPMT 06504R1  | NPMT 07504R1  | NPMT 07504R1  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            | T8            | T8            |
|        | Inner     | NPMT 05504R1  | NPMT 05504R1  | NPMT 05504R1  | NPMT 05504R1  | NPMT 06504R1  | NPMT 06504R1  | NPMT 06504R1  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            | T8            | T8            |
|        | Center    | NPMT 05504R1  | NPMT 05504R1  | NPMT 05504R1  | NPMT 06504R1  | NPMT 06504R1  | NPMT 06504R1  | NPMT 07504R1  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            | T8            | T8            |
| Pad    | Guide Pad | PAD-G007      | PAD-G007      | PAD-G007      | PAD-G007      | PAD-G007      | PAD-G007      | PAD-G008      |
|        | Screw     | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3.5       |
|        | Wrench    | T9            | T9            | T9            | T9            | T9            | T9            | T9            |

| Parts  |           | Diameter      |               |               |               |               |               |
|--------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|
|        |           | 1.559 - 1.646 | 1.646 - 1.693 | 1.693 - 1.795 | 1.796 - 1.850 | 1.851 - 2.035 | 2.036 - 2.094 |
| Insert | Outer     | NPMT 07504R1  | NPMT 09504R1  | NPMT 09504R1  | NPMT 09504R1  | NPMT 09504R1  | NPMT 09504R1  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            | T8            |
|        | Inner     | NPMT 07504R1  | NPMT 07504R1  | NPMT 07504R1  | NPMT 07504R1  | NPMT 09504R1  | NPMT 09504R1  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            | T8            |
|        | Center    | NPMT 07504R1  | NPMT 07504R1  | NPMT 09504R1  | NPMT 09504R1  | NPMT 09504R1  | NPMT 09504R1  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            | T8            |
| Pad    | Guide Pad | PAD-G008      | PAD-G008      | PAD-G008      | PAD-G010      | PAD-G010      | PAD-G010      |
|        | Screw     | CSTB3.5       | CSTB3.5       | CSTB3.5       | CSTB3.5       | CSTB3.5       | CSTB3.5       |
|        | Wrench    | T9            | T9            | T9            | T9            | T9            | T9            |

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# BTA DRILLS

## **BTA Indexable for high productivity**

### **TBTA-D type**

TBTA-D... is designed for heavy duty machining.

**Available Range:** Dia. 30.00mm - 65.00mm.

**No cartridge required - economical solution.**

**Thick inserts allow feed to be increase by x 1.5.**

**Minimum down time to change insert as precise setting is not required.**

**Wide chip evacuation area to assist with chip exhaust.**

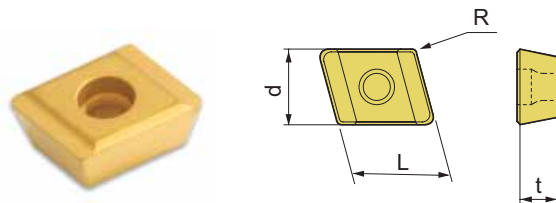
**12 inserts for whole range.**

**Single & Double tube systems are available.**

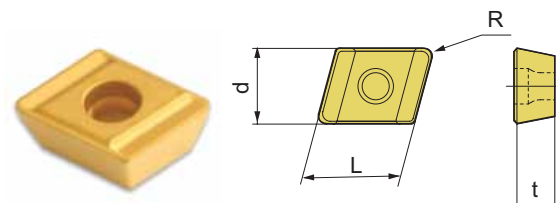
## BTA INDEXABLE FOR HIGH PRODUCTIVITY

### Insert for TBTA-D

Inner & Outer Insert

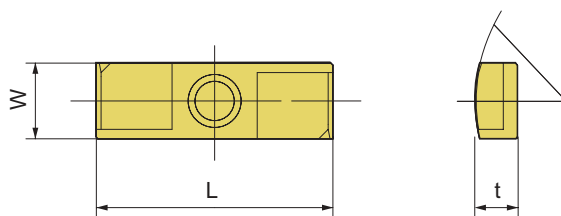


Center Insert



| Designation  | Dimension |       |       |       | Pocket |       |       | Grade  | Screw    |
|--------------|-----------|-------|-------|-------|--------|-------|-------|--------|----------|
|              | d         | t     | L     | R     | Center | Inner | Outer | IN2005 |          |
| NPMT 06504L2 | 0.256     | 0.157 | 0.394 | 0.031 | ○      |       |       |        | CSTB 2.5 |
| NPMT 0804L2  | 0.315     | 0.157 | 0.394 | 0.031 | ○      |       |       |        |          |
| NPMT 09504L2 | 0.374     | 0.157 | 0.394 | 0.031 | ○      |       |       |        |          |
| NPMT 12504L2 | 0.492     | 0.157 | 0.394 | 0.031 | ○      |       |       |        |          |
| NPMT 06504R2 | 0.256     | 0.157 | 0.394 | 0.016 |        | ○     | ○     |        | CSTB 2.5 |
| NPMT 0804R2  | 0.315     | 0.157 | 0.394 | 0.016 |        | ○     | ○     |        |          |
| NPMT 09504R2 | 0.374     | 0.157 | 0.394 | 0.016 |        | ○     | ○     |        |          |
| NPMT 12504R2 | 0.492     | 0.157 | 0.394 | 0.016 |        | ○     | ○     |        |          |

### Pad



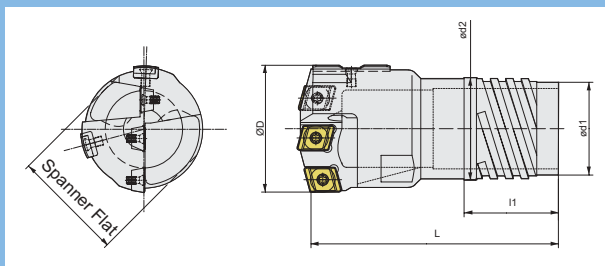
| Type      | Designation | Dimension |       |       |       | Screw    |
|-----------|-------------|-----------|-------|-------|-------|----------|
|           |             | W         | t     | L     | r     |          |
| Guide Pad | PAD-GO-07   | 0.276     | 0.138 | 0.787 | 0.472 | CSTB3S   |
|           | PAD-GO-08   | 0.315     | 0.177 | 0.984 | 0.610 | CSTB3.5S |
|           | PAD-GO-10   | 0.394     | 0.177 | 1.181 | 0.787 | CSTB3.5S |
|           | PAD-GO-12   | 0.472     | 0.217 | 1.378 | 0.984 | CSTB3.5S |

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## ■ BTA INDEXABLE FOR HIGH PRODUCTIVITY SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

1.181 - 2.559

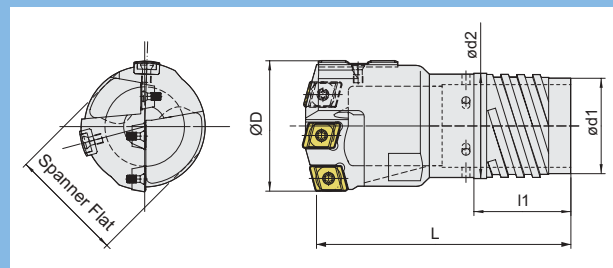


| Designation        | Diameter      | Dimension |      |       |       | Spanner Flat | Tube     |          |
|--------------------|---------------|-----------|------|-------|-------|--------------|----------|----------|
|                    |               | L         | l1   | d1    | d2    |              | Part     | Diameter |
| TBTA-Dxx.xxxSE4-26 | 1.181 - 1.220 | 2.76      | 0.96 | 0.827 | 0.925 | 0.75         | BTSI 026 | 1.024    |
| TBTA-Dxx.xxxSE4-28 | 1.221 - 1.311 | 2.76      | 0.96 | 0.906 | 1.004 | 0.83         | BTSI 028 | 1.102    |
| TBTA-Dxx.xxxSE4-30 | 1.311 - 1.425 | 2.76      | 0.96 | 1.004 | 1.102 | 0.94         | BTSI 030 | 1.181    |
| TBTA-Dxx.xxxSE4-33 | 1.426 - 1.559 | 2.95      | 1.20 | 1.063 | 1.181 | 1.02         | BTSI 033 | 1.299    |
| TBTA-Dxx.xxxSE4-36 | 1.559 - 1.693 | 3.15      | 1.20 | 1.181 | 1.299 | 1.10         | BTSI 036 | 1.417    |
| TBTA-Dxx.xxxSE4-39 | 1.693 - 1.850 | 3.54      | 1.20 | 1.299 | 1.417 | 1.18         | BTSI 039 | 1.535    |
| TBTA-Dxx.xxxSE4-43 | 1.851 - 2.035 | 3.54      | 1.20 | 1.417 | 1.535 | 1.26         | BTSI 043 | 1.693    |
| TBTA-Dxx.xxxSE4-47 | 2.036 - 2.213 | 3.54      | 1.36 | 1.555 | 1.693 | 1.42         | BTSI 047 | 1.850    |
| TBTA-Dxx.xxxSE4-51 | 2.213 - 2.386 | 3.54      | 1.36 | 1.713 | 1.870 | 1.50         | BTSI 051 | 2.008    |
| TBTA-Dxx.xxxSE4-56 | 2.386 - 2.559 | 3.54      | 1.36 | 1.870 | 2.008 | 1.81         | BTSI 056 | 2.205    |

## BTA INDEXABLE FOR HIGH PRODUCTIVITY DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

1.181 - 2.559

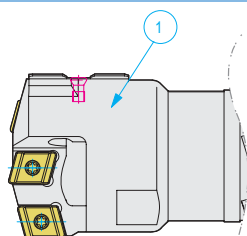
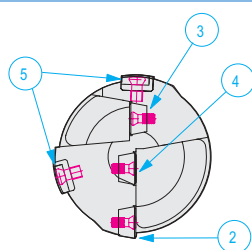


| Designation          | Diameter      | Dimension |      |       |       | Spanner Flat | Tube       |            |          |
|----------------------|---------------|-----------|------|-------|-------|--------------|------------|------------|----------|
|                      |               | L         | l1   | d1    | d2    |              | Outer Tube | Inner Tube | Diameter |
| TBTA-Dxx.xxxDE4-28   | 1.181 - 1.220 | 2.76      | 0.96 | 0.906 | 1.004 | 1.02         | BTDO 028   | BTDI 020   | 1.102    |
| TBTA-Dxx.xxxDE4-30.5 | 1.221 - 1.311 | 2.76      | 0.96 | 1.004 | 1.102 | 1.10         | BTDO 030.5 | BTDI 022   | 1.201    |
| TBTA-Dxx.xxxDE4-33   | 1.311 - 1.425 | 2.95      | 1.20 | 1.063 | 1.181 | 1.18         | BTDO 033   | BTDI 024   | 1.299    |
| TBTA-Dxx.xxxDE4-35.5 | 1.426 - 1.559 | 3.15      | 1.20 | 1.181 | 1.299 | 1.26         | BTDO 035.5 | BTDI 026   | 1.398    |
| TBTA-Dxx.xxxDE4-39   | 1.559 - 1.693 | 3.15      | 1.20 | 1.299 | 1.417 | 1.42         | BTDO 039   | BTDI 029   | 1.535    |
| TBTA-Dxx.xxxDE4-42.5 | 1.693 - 1.850 | 3.54      | 1.20 | 1.417 | 1.535 | 1.50         | BTDO 042.5 | BTDI 032   | 1.673    |
| TBTA-Dxx.xxxDE4-46.5 | 1.851 - 2.035 | 3.54      | 1.36 | 1.555 | 1.693 | 1.57         | BTDO 046.5 | BTDI 035   | 1.831    |
| TBTA-Dxx.xxxDE4-51   | 2.036 - 2.213 | 3.54      | 1.36 | 1.713 | 1.870 | 1.97         | BTDO 051   | BTDI 039   | 2.008    |
| TBTA-Dxx.xxxDE4-55.5 | 2.213 - 2.559 | 3.54      | 1.36 | 1.870 | 2.008 | 1.97         | BTDO 055.5 | BTDI 043   | 2.185    |

# BTA INDEXABLE FOR HIGH PRODUCTIVITY ASSEMBLY OF TBTA-D SERIES

## Diameters

1.181 - 2.559



1. Head Shank
2. Outer Insert
3. Inner Insert
4. Center Insert
5. Guide Pad

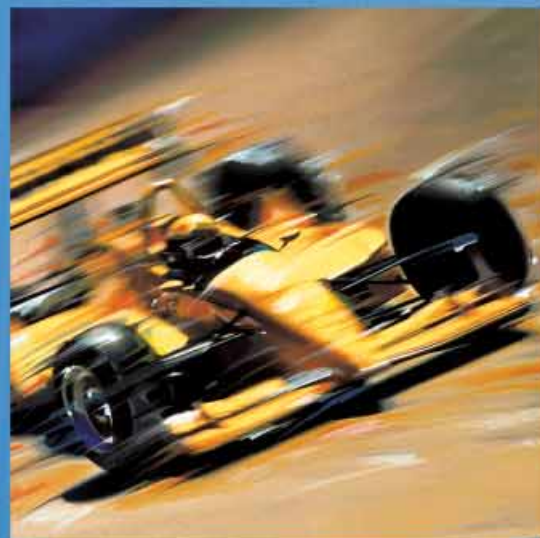
| Parts  |           | Diameter      |               |               |               |               |
|--------|-----------|---------------|---------------|---------------|---------------|---------------|
|        |           | 1.181 - 1.299 | 1.300 - 1.417 | 1.418 - 1.535 | 1.536 - 1.654 | 1.654 - 1.772 |
| Insert | Outer     | NPMT 06504R2  | NPMT 06504R2  | NPMT 0804R2   | NPMT 0804R2   | NPMT 0804R2   |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            |
|        | Inner     | NPMT 06504R2  | NPMT 06504R2  | NPMT 06504R2  | NPMT 0804R2   | NPMT 0804R2   |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            |
|        | Center    | NPMT 06504LH2 | NPMT 0804LH2  | NPMT 0804LH2  | NPMT 0804LH2  | NPMT 09504LH2 |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            |
| Pad    | Guide Pad | PAD-GO07      | PAD-GO07      | PAD-GO08      | PAD-GO08      | PAD-GO08      |
|        | Screw     | CSTB3S        | CSTB3S        | CSTB3.5       | CSTB3.5       | CSTB3.5       |
|        | Wrench    | T9            | T9            | T9            | T9            | T9            |

| Parts  |           | Diameter      |               |               |               |               |
|--------|-----------|---------------|---------------|---------------|---------------|---------------|
|        |           | 1.772 - 1.890 | 1.890 - 2.008 | 2.008 - 2.244 | 2.244 - 2.480 | 2.481 - 2.559 |
| Insert | Outer     | NPMT 09504R2  | NPMT 09504R2  | NPMT 09504R2  | NPMT 12504R2  | NPMT 12504R2  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            |
|        | Inner     | NPMT 0804R2   | NPMT 09504R2  | NPMT 09504R2  | NPMT 09504R2  | NPMT 12504R2  |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            |
|        | Center    | NPMT 09504LH2 | NPMT 09504LH2 | NPMT 12504LH2 | NPMT 12504LH2 | NPMT 12504LH2 |
|        | Screw     | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       | CSTB2.5       |
|        | Wrench    | T8            | T8            | T8            | T8            | T8            |
| Pad    | Guide Pad | PAD-GO10      | PAD-GO10      | PAD-GO10      | PAD-GO12      | PAD-GO12      |
|        | Screw     | CSTB3.5       | CSTB3.5       | CSTB3.5       | CSTB3.5       | CSTB3.5       |
|        | Wrench    | T9            | T9            | T9            | T9            | T9            |

\* Wrench for all Inserts: T8

\* Wrench for all guide pads: T9

# Ingersoll



# BTA DRILLS

## **BTA Indexable for large diameter**

### **TBTA-L Type**

TBTA-L... is designed with four-start OD thread to fit all standard single tubes.

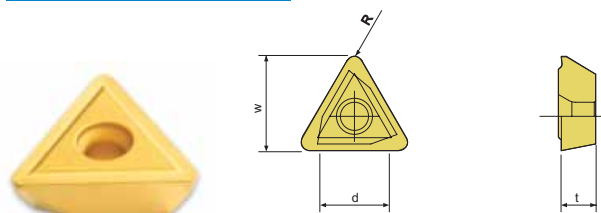
**Available Range:** Dia. 62.00mm - 183.99mm.

**Larger diameters are available upon request.**

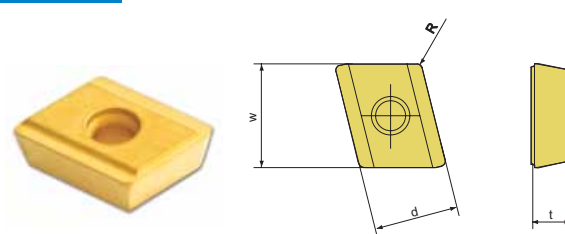
## BTA INDEXABLE FOR LARGE DIAMETER

### Insert for TBTA-L

Center & Inner & Outer Insert



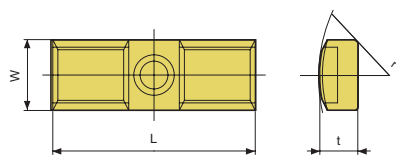
Outer Insert



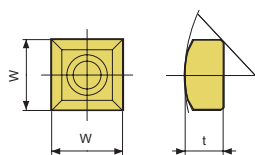
| Designation  | Dimension |       |       |       | Pocket |       |       | Grade  | Screw    |
|--------------|-----------|-------|-------|-------|--------|-------|-------|--------|----------|
|              | d         | W     | R     | t     | Center | Inner | Outer | IN2005 |          |
| TPMX 16-TDM  | 0.375     | 0.515 | 0.047 | 0.187 | ○      | ○     | ○     |        | CSTB3.5D |
| TPMX 22-TDM  | 0.500     | 0.703 | 0.047 | 0.250 | ○      | ○     | ○     |        | CSTB4M   |
| NPMT 13-TDMR | 0.433     | 0.531 | 0.031 | 0.187 |        |       | ○*    |        | CSTB3.5D |
| NPMT 19-TDMR | 0.472     | 0.768 | 0.024 | 0.250 |        |       | ○*    |        | CSTB4M   |

\* NPMX type insert is available for outer pocket on request.

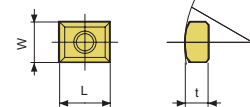
### Pad



Guide Pad



Guide Pad Protector

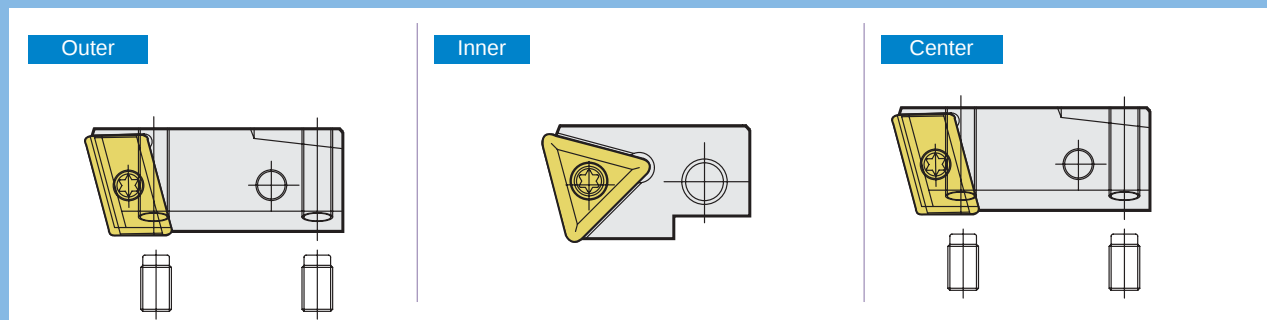


Sub Pad

| Type                | Designation | Dimension |       |       |       | Screw   |
|---------------------|-------------|-----------|-------|-------|-------|---------|
|                     |             | W         | T     | L     | R     |         |
| Guide Pad           | PAD-GC14    | 0.551     | 0.295 | 1.575 | 0.984 | CSTA5S  |
|                     | PAD-GC18    | 0.709     | 0.354 | 1.575 | 1.181 | LS1206S |
|                     | PAD-GC22    | 0.866     | 0.591 | 1.969 | 2.953 | LS1206  |
| Guide Pad Protector | PAD-P14     | 0.551     | 0.295 | 0.551 | 0.984 | CSTA5S  |
|                     | PAD-P18     | 0.709     | 0.354 | 0.709 | 1.181 | LS1206S |
|                     | PAD-P22     | 0.866     | 0.591 | 0.866 | 2.953 | LS1206  |
| Sub Pad             | PAD-S10     | 0.394     | 0.197 | 0.394 | 1.142 | CSTB3S  |
|                     | PAD-S14     | 0.551     | 0.276 | 0.787 | 1.772 | CSTB5S  |

## BTA INDEXABLE FOR LARGE DIAMETER

### Cartridge for TBTA-L

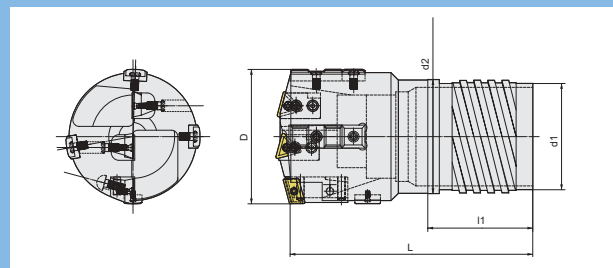


| Designation |               | Adjust Screw | Wrench | Lock Screw | Wrench | Insert      |
|-------------|---------------|--------------|--------|------------|--------|-------------|
| Outer       | PERC310-13QRA | AS0006-10    | H3     | LS1805RH   | H4     | NPMX13-TDMR |
|             | PERC310-19QRA | AS0006-15    | H3     | LS1806RH   | H4     | NPMX19-TDMR |
| Inner       | CENC310-16TRB | -            | -      | LS1206     | H3     | TPMX16-TDM  |
|             | CENC310-22TRB | -            | -      | LS1206     | H3     | TPMX22-TDM  |
| Center      | CENC310-16TLB | -            | -      | LS1206     | H3     | TPMX16-TDM  |
|             | CENC310-12TLB | -            | -      | LS1206     | H3     | TPMX22-TDM  |

## BTA INDEXABLE FOR LARGE DIAMETER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

2.441 - 7.244

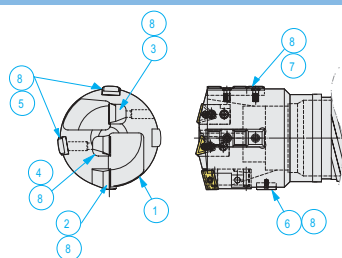


| Designation         | Diameter      | Dimension |      |       |       | Tube      |          |
|---------------------|---------------|-----------|------|-------|-------|-----------|----------|
|                     |               | L         | l1   | d1    | d2    | Part      | Diameter |
| TBTA-Lxx.xxxSE4-56A | 2.441 - 2.559 | 4.72      | 1.36 | 1.870 | 2.008 | BTSI 056A | 2.205    |
| TBTA-Lxx.xxxSE4-56B | 2.559 - 2.637 | 6.30      | 2.44 | 1.850 | 2.047 | BTSI 056B | 2.205    |
| TBTA-Lxx.xxxSE4-62  | 2.638 - 2.874 | 6.30      | 2.44 | 2.087 | 2.283 | BTSI 062  | 2.441    |
| TBTA-Lxx.xxxSE4-68  | 2.874 - 3.149 | 6.30      | 2.44 | 2.283 | 2.480 | BTSI 068  | 2.677    |
| TBTA-Lxx.xxxSE4-75  | 3.150 - 3.425 | 7.48      | 3.23 | 2.520 | 2.756 | BTSI 075  | 2.953    |
| TBTA-Lxx.xxxSE4-82  | 3.425 - 3.937 | 7.48      | 3.23 | 2.795 | 3.031 | BTSI 082  | 3.228    |
| TBTA-Lxx.xxxSE4-94  | 3.937 - 4.409 | 7.48      | 3.23 | 3.268 | 3.504 | BTSI 094  | 3.701    |
| TBTA-Lxx.xxxSE4-106 | 4.409 - 4.881 | 8.27      | 4.02 | 3.740 | 3.976 | BTSI 106  | 4.173    |
| TBTA-Lxx.xxxSE4-118 | 4.882 - 5.354 | 8.27      | 4.02 | 4.213 | 4.449 | BTSI 118  | 4.646    |
| TBTA-Lxx.xxxSE4-130 | 5.354 - 5.826 | 8.66      | 4.02 | 4.685 | 4.921 | BTSI 130  | 5.118    |
| TBTA-Lxx.xxxSE4-142 | 5.827 - 6.299 | 8.66      | 4.80 | 5.157 | 5.394 | BTSI 142  | 5.591    |
| TBTA-Lxx.xxxSE4-154 | 6.299 - 6.771 | 8.66      | 4.80 | 5.630 | 5.630 | BTSI 154  | 6.063    |
| TBTA-Lxx.xxxSE4-166 | 6.772 - 7.244 | 8.66      | 4.80 | 6.102 | 6.339 | BTSI 166  | 6.535    |

# BTA INDEXABLE FOR LARGE DIAMETER ASSEMBLY OF TBTA-L SERIES

## Diameters

2.441 - 5.118

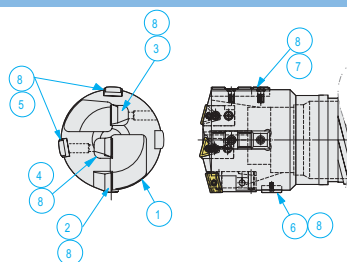


1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

| Parts     |                     | Diameter      |               |               |               |               |               |               |
|-----------|---------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|           |                     | 2.441 - 2.913 | 2.913 - 3.267 | 3.268 - 3.700 | 3.701 - 3.937 | 3.937 - 4.173 | 4.173 - 4.724 | 4.724 - 5.118 |
| Cartridge | Outer               | PERC310-13QRA | PERC310-19QRA | PERC310-19QRA | PERC310-19QRA | PERC310-19QRA | PERC310-13QRA | PERC310-19QRA |
|           | Adjust Screw        | AS0006-10     | AS0006-15     | AS0006-15     | AS0006-15     | AS0006-15     | AS0006-10     | AS0006-15     |
|           | Wrench              | H3            | H3            | H3            | H3            | H3            | H3            | H3            |
|           | Screw               | LS1805RH      | LS1806RH      | LS1806RH      | LS1806RH      | LS1806RH      | LS1805RH      | LS1806RH      |
|           | Wrench              | H4            | H4            | H4            | H4            | H4            | H4            | H4            |
|           | Inner               | CENC310-16TRB | CENC310-16TRB | CENC310-16TRB | CENC310-22TRB | CENC310-22TRB | CT310-16TRB   | CT310-16TRB   |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206        | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3            | H3            | H3            | H3            |
|           | Center              | CENC310-16TLB | CENC310-16TLB | CENC310-22TLB | CENC310-22TLB | CENC310-22TLB | CT310-16TLB   | CT310-16TLB   |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206        | LS1206        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3            | H3            | H3            | H3            |
| Insert    | Outer               | NPMT 13-TDMR  | NPMT 19-TDMR  | NPMT 19-TDMR  | NPMT 19-TDMR  | NPMT 19-TDMR  | NPMT 13-TDMR  | NPMT 19-TDMR  |
|           | Screw               | CSTB3.5D      | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M        | CSTB3.5D      | CSTB4M        |
|           | Wrench              | T9            | T15           | T15           | T15           | T15           | T9            | T15           |
|           | Inner               | TPMX 16-TDM   | TPMX 16-TDM   | TPMX 16-TDM   | TPMX 22-TDM   | TPMX 22-TDM   | TPMX 16-TDM   | TPMX 16-TDM   |
|           | Screw               | CSTB3.5D      | CSTB3.5D      | CSTB3.5D      | CSTB4M        | CSTB4M        | CSTB3.5D      | CSTB3.5D      |
|           | Wrench              | T9            | T9            | T9            | T15           | T15           | T9            | T9            |
|           | Center              | TPMX 16-TDM   | TPMX 16-TDM   | TPMX 22-TDM   | TPMX 22-TDM   | TPMX 22-TDM   | TPMX 16-TDM   | TPMX 16-TDM   |
|           | Screw               | CSTB3.5D      | CSTB3.5D      | CSTB4M        | CSTB4M        | CSTB4M        | CSTB3.5D      | CSTB3.5D      |
|           | Wrench              | T9            | T9            | T15           | T15           | T15           | T9            | T9            |
| Pad       | Guide Pad           | PAD-GC14      | PAD-GC14      | PAD-GC14      | PAD-GC18      | PAD-GC18      | PAD-GC18      | PAD-GC18      |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        | LS1206S       | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | T15           | T15           | T15           | H3            | H3            | H3            | H3            |
|           | Guide Pad Protector | PAD-P14       | PAD-P14       | PAD-P14       | PAD-P18       | PAD-P18       | PAD-P18       | PAD-P18       |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        | LS1206S       | LS1206S       | LS1206S       | LS1206S       |
|           | Wrench              | T15           | T15           | T15           | H3            | H3            | H3            | H3            |
|           | Sub Guide Pad       | PAD-S10       | PAD-S10       | PAD-S10       | PAD-S14       | PAD-S14       | PAD-S14       | PAD-S14       |
|           | Screw               | CSTB3S        | CSTB3S        | CSTB3S        | CSTA5S        | CSTA5S        | CSTA5S        | CSTA5S        |
|           | Wrench              | T9            | T9            | T9            | T15           | T15           | T15           | T15           |

## BTA INDEXABLE FOR LARGE DIAMETER ASSEMBLY OF TBTA-L SERIES

**Diameters**  
5.118 - 7.401



1. Head Shank
2. Outer Cartridge
3. Inner Cartridge
4. Center Cartridge
5. Guide Pad
6. Sub Guide Pad
7. Guide Pad Protector
8. Lock Screw

| Parts     |                     | Diameter      |               |               |                |               |               |
|-----------|---------------------|---------------|---------------|---------------|----------------|---------------|---------------|
|           |                     | 5.118 - 5.551 | 5.551 - 5.944 | 5.945 - 6.378 | 6.378 - 6.811  | 6.811 - 7.007 | 7.008 - 7.401 |
| Cartridge | Outer               | PERC310-19QRA | PERC310-19QRA | PERC310-19QRA | PERC310-190QRA | PERC310-13QRA | PERC310-13QRA |
|           | Adjust Screw        | AS0006-15     | AS0006-15     | AS0006-15     | AS0006-15      | AS0006-10     | AS0006-10     |
|           | Wrench              | H3            | H3            | H3            | H3             | H3            | H3            |
|           | Screw               | LS1806RH      | LS1806RH      | LS1806RH      | LS1806RH       | LS1805RH      | LS1805RH      |
|           | Wrench              | H4            | H4            | H4            | H4             | H4            | H4            |
|           | Inner               | CENC310-16TRB | CENC310-16TRB | CENC310-16TRB | CENC310-22TRB  | CENC310-16TRB | CENC310-16TRB |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206         | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3             | H3            | H3            |
|           | Center              | CENC310-22TLB | CENC310-22TLB | CENC310-22TLB | CENC310-22TLB  | CENC310-22TLB | CENC310-22TLB |
|           | Screw               | LS1206        | LS1206        | LS1206        | LS1206         | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3             | H3            | H3            |
| Insert    | Outer               | NPMT 19-TDMR  | NPMT 19-TDMR  | NPMT 19-TDMR  | NPMT 19-TDMR   | NPMT 13-TDMR  | NPMT 13-TDMR  |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M         | CSTB3.5D      | CSTB3.5D      |
|           | Wrench              | T15           | T15           | T15           | T15            | T9            | T9            |
|           | Inner               | TPMX 16-TDM   | TPMX 16-TDM   | TPMX 16-TDM   | TPMX 22-TDM    | TPMX 16-TDM   | TPMX 16-TDM   |
|           | Screw               | CSTB3.5D      | CSTB3.5D      | CSTB3.5D      | CSTB4M         | CSTB3.5D      | CSTB3.5D      |
|           | Wrench              | T9            | T9            | T9            | T15            | T9            | T9            |
|           | Center              | TPMX 22-TDM   | TPMX 22-TDM   | TPMX 22-TDM   | TPMX 22-TDM    | TPMX 22-TDM   | TPMX 22-TDM   |
|           | Screw               | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M         | CSTB4M        | CSTB4M        |
|           | Wrench              | T15           | T15           | T15           | T15            | T15           | T15           |
| Pad       | Guide Pad           | PAD-GC18      | PAD-GC18      | PAD-GC18      | PAD-GC18       | PAD-GC22      | PAD-GC22      |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       | LS1206S        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3             | H3            | H3            |
|           | Guide Pad Protector | PAD-P18       | PAD-P18       | PAD-P18       | PAD-P18        | PAD-P22       | PAD-P22       |
|           | Screw               | LS1206S       | LS1206S       | LS1206S       | LS1206S        | LS1206        | LS1206        |
|           | Wrench              | H3            | H3            | H3            | H3             | H3            | H3            |
|           | Sub Guide Pad       | PAD-S14       | PAD-S14       | PAD-S14       | PAD-S14        | PAD-S14       | PAD-S14       |
|           | Screw               | CSTA5S        | CSTA5S        | CSTA5S        | CSTA5S         | CSTA5S        | CSTA5S        |
|           | Wrench              | T15           | T15           | T15           | T15            | T15           | T15           |



# Ingersoll



# BTA DRILLS

*Cutting Tools*

## **BTA Brazed**

### **Tolerance**

Exceptional Hole Tolerance of H7 available in just one pass with optimum cutting conditions.

### **Exceptional Surface Finish**

Surface finish of 3.2S with optimum cutting conditions.

### **Excellent Hole Straightness**

0.1mm/meter in workpiece rotating application.

### **Superior Concentricity**

Bore roundness.

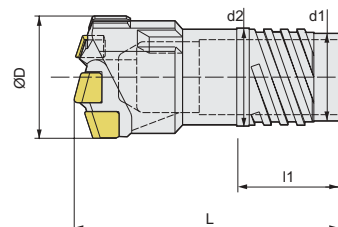
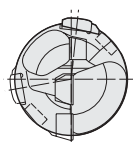
### **Cost Effective solutions in Deep Hole Drilling**

- Brazed Drills  
Provide an alternative economical solution  
BTA can be reground several times before discarding.
- Economical alternative for small diameters.

## BTA BRAZED SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

0.496 - 1.559



| Designation        | Diameter      | Dimension |      |       |       | Tube     |          | Grade |       |       |       |       |       |
|--------------------|---------------|-----------|------|-------|-------|----------|----------|-------|-------|-------|-------|-------|-------|
|                    |               | L         | l1   | d1    | d2    | Part No. | Diameter | TB103 | TB203 | TB253 | TB293 | TB200 | TB290 |
| BTA xx.xxx SE2-11* | 0.496 - 0.516 | 1.69      | 0.93 | 0.323 | 0.378 | BTSI011  | 0.433    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE2-11* | 0.516 - 0.535 | 1.69      | 0.93 | 0.323 | 0.378 | BTSI011  | 0.433    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE2-12* | 0.536 - 0.555 | 1.69      | 0.93 | 0.362 | 0.417 | BTSI012  | 0.472    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE2-12* | 0.556 - 0.575 | 1.69      | 0.93 | 0.362 | 0.417 | BTSI012  | 0.472    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE2-13* | 0.575 - 0.594 | 1.69      | 0.93 | 0.402 | 0.457 | BTSI013  | 0.512    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE2-13* | 0.595 - 0.614 | 1.69      | 0.93 | 0.402 | 0.457 | BTSI013  | 0.512    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-14  | 0.614 - 0.638 | 1.69      | 0.79 | 0.425 | 0.496 | BTSI014  | 0.551    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-14  | 0.638 - 0.657 | 1.69      | 0.79 | 0.425 | 0.496 | BTSI014  | 0.551    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-15  | 0.658 - 0.677 | 1.69      | 0.79 | 0.465 | 0.535 | BTSI015  | 0.591    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-15  | 0.678 - 0.697 | 1.69      | 0.79 | 0.465 | 0.535 | BTSI015  | 0.591    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-16  | 0.697 - 0.724 | 1.85      | 0.85 | 0.492 | 0.571 | BTSI016  | 0.630    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-16  | 0.725 - 0.744 | 1.85      | 0.85 | 0.492 | 0.571 | BTSI016  | 0.630    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-17  | 0.744 - 0.756 | 1.85      | 0.85 | 0.531 | 0.610 | BTSI017  | 0.669    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-17  | 0.756 - 0.787 | 1.85      | 0.85 | 0.531 | 0.610 | BTSI017  | 0.669    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-18  | 0.788 - 0.823 | 2.07      | 0.85 | 0.551 | 0.630 | BTSI018  | 0.709    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-18  | 0.823 - 0.858 | 2.07      | 0.85 | 0.551 | 0.630 | BTSI018  | 0.709    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-20  | 0.859 - 0.902 | 2.20      | 0.85 | 0.630 | 0.709 | BTSI020  | 0.787    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-20  | 0.902 - 0.949 | 2.20      | 0.85 | 0.630 | 0.709 | BTSI020  | 0.787    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-22  | 0.949 - 0.992 | 2.26      | 0.85 | 0.689 | 0.768 | BTSI022  | 0.866    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-22  | 0.993 - 1.039 | 2.26      | 0.85 | 0.689 | 0.768 | BTSI022  | 0.866    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx SE4-24  | 1.040 - 1.083 | 2.26      | 0.85 | 0.748 | 0.827 | BTSI024  | 0.945    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-24  | 1.083 - 1.130 | 2.26      | 0.85 | 0.748 | 0.827 | BTSI024  | 0.945    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-26  | 1.130 - 1.173 | 2.50      | 0.96 | 0.827 | 0.925 | BTSI026  | 1.024    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-26  | 1.174 - 1.220 | 2.50      | 0.96 | 0.827 | 0.925 | BTSI026  | 1.024    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-28  | 1.221 - 1.264 | 2.50      | 0.96 | 0.906 | 1.004 | BTSI028  | 1.102    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-28  | 1.264 - 1.311 | 2.50      | 0.96 | 0.906 | 1.004 | BTSI028  | 1.102    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-30  | 1.311 - 1.370 | 2.50      | 0.96 | 1.004 | 1.102 | BTSI030  | 1.181    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-30  | 1.370 - 1.425 | 2.50      | 0.96 | 1.004 | 1.102 | BTSI030  | 1.181    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-33  | 1.426 - 1.469 | 2.89      | 1.20 | 1.063 | 1.181 | BTSI033  | 1.299    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-33  | 1.469 - 1.512 | 2.89      | 1.20 | 1.063 | 1.181 | BTSI033  | 1.299    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx SE4-33  | 1.512 - 1.559 | 2.89      | 1.20 | 1.063 | 1.181 | BTSI033  | 1.299    | ○     | ○     | ○     | ○     | ○     | ○     |

● Standard

○ Semi-Standard

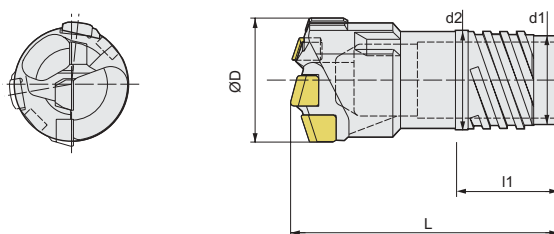
\* two start outer thread

# Ingersoll

## BTA BRAZED SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

1.559 - 2.559



| Designation       | Diameter      | Dimension |      |       |       | Tube     |          | Grade |       |       |       |       |       |
|-------------------|---------------|-----------|------|-------|-------|----------|----------|-------|-------|-------|-------|-------|-------|
|                   |               | L         | I1   | d1    | d2    | Part No. | Diameter | TB103 | TB203 | TB253 | TB293 | TB200 | TB290 |
| BTA xx.xxx SE4-36 | 1.559 - 1.598 | 2.89      | 1.20 | 1.181 | 1.299 | BTSI036  | 1.417    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-36 | 1.599 - 1.646 | 2.89      | 1.20 | 1.181 | 1.299 | BTSI036  | 1.417    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-36 | 1.646 - 1.693 | 2.89      | 1.20 | 1.181 | 1.299 | BTSI036  | 1.417    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-39 | 1.693 - 1.744 | 2.95      | 1.20 | 1.299 | 1.417 | BTSI039  | 1.535    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-39 | 1.744 - 1.795 | 2.95      | 1.20 | 1.299 | 1.417 | BTSI039  | 1.535    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-39 | 1.796 - 1.850 | 2.95      | 1.20 | 1.299 | 1.417 | BTSI039  | 1.535    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-43 | 1.851 - 1.909 | 2.95      | 1.20 | 1.417 | 1.535 | BTSI043  | 1.693    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-43 | 1.910 - 1.972 | 2.95      | 1.20 | 1.417 | 1.535 | BTSI043  | 1.693    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-43 | 1.973 - 2.035 | 2.95      | 1.20 | 1.417 | 1.535 | BTSI043  | 1.693    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-47 | 2.036 - 2.094 | 3.23      | 1.36 | 1.555 | 1.693 | BTSI047  | 1.850    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-47 | 2.095 - 2.154 | 3.23      | 1.36 | 1.555 | 1.693 | BTSI047  | 1.850    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-47 | 2.154 - 2.213 | 3.23      | 1.36 | 1.555 | 1.693 | BTSI047  | 1.850    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-51 | 2.213 - 2.299 | 3.31      | 1.36 | 1.713 | 1.850 | BTSI051  | 2.008    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-51 | 2.300 - 2.386 | 3.31      | 1.36 | 1.713 | 1.850 | BTSI051  | 2.008    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-51 | 2.386 - 2.472 | 3.31      | 1.36 | 1.713 | 1.850 | BTSI051  | 2.008    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-51 | 2.473 - 2.559 | 3.31      | 1.36 | 1.713 | 1.850 | BTSI051  | 2.008    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-56 | 2.386 - 2.472 | 3.31      | 1.36 | 1.870 | 2.008 | BTSI056  | 2.205    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx SE4-56 | 2.473 - 2.559 | 3.31      | 1.36 | 1.870 | 2.008 | BTSI056  | 2.205    | ○     | ○     | ○     | ○     | ●     | ●     |

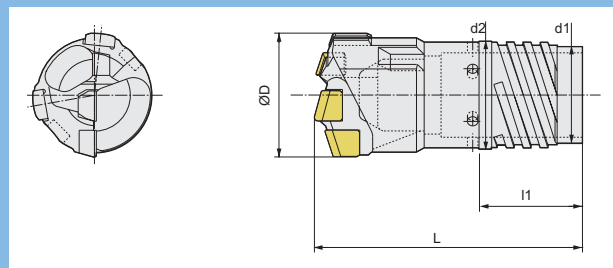
● Standard

○ Semi-Standard

## BTA BRAZED DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

0.725 - 1.559



| Designation         | Diameter      | Dimension |      |       |       | Tube       |            |          | Grade |       |       |       |       |       |
|---------------------|---------------|-----------|------|-------|-------|------------|------------|----------|-------|-------|-------|-------|-------|-------|
|                     |               | L         | l1   | d1    | d2    | Outer Tube | Inner Tube | Diameter | TB103 | TB203 | TB253 | TB293 | TB200 | TB290 |
| BTA xx.xxx DE4-18   | 0.725 - 0.756 | 1.97      | 0.85 | 0.551 | 0.630 | BTDO018    | BTDI012    | 0.709    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-18   | 0.756 - 0.787 | 1.97      | 0.85 | 0.551 | 0.630 | BTDO018    | BTDI012    | 0.709    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-19.5 | 0.788 - 0.823 | 2.20      | 0.85 | 0.630 | 0.709 | BTDO019.5  | BTDI014    | 0.768    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-19.5 | 0.823 - 0.858 | 2.20      | 0.85 | 0.630 | 0.709 | BTDO019.5  | BTDI014    | 0.768    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-21.5 | 0.859 - 0.902 | 2.20      | 0.85 | 0.689 | 0.768 | BTDO021.5  | BTDI015    | 0.846    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-21.5 | 0.902 - 0.949 | 2.20      | 0.85 | 0.689 | 0.768 | BTDO021.5  | BTDI015    | 0.846    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-23.5 | 0.949 - 0.992 | 2.26      | 0.85 | 0.748 | 0.827 | BTDO023.5  | BTDI016    | 0.925    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-23.5 | 0.993 - 1.039 | 2.26      | 0.85 | 0.748 | 0.827 | BTDO023.5  | BTDI016    | 0.925    | ●     | ●     | ●     | ●     | ●     | ●     |
| BTA xx.xxx DE4-26   | 1.040 - 1.083 | 2.38      | 0.96 | 0.827 | 0.925 | BTDO026    | BTDI018    | 1.024    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-26   | 1.083 - 1.130 | 2.38      | 0.96 | 0.827 | 0.925 | BTDO026    | BTDI018    | 1.024    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-28   | 1.130 - 1.173 | 2.50      | 0.96 | 0.906 | 1.004 | BTDO028    | BTDI020    | 1.102    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-28   | 1.174 - 1.220 | 2.50      | 0.96 | 0.906 | 1.004 | BTDO028    | BTDI020    | 1.102    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-30.5 | 1.221 - 1.264 | 2.50      | 0.96 | 1.004 | 1.102 | BTDO030.5  | BTDI022    | 1.201    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-30.5 | 1.264 - 1.311 | 2.50      | 0.96 | 1.004 | 1.102 | BTDO030.5  | BTDI022    | 1.201    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-33   | 1.311 - 1.370 | 2.78      | 1.20 | 1.063 | 1.181 | BTDO033.0  | BTDI024    | 1.299    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-33   | 1.370 - 1.425 | 2.78      | 1.20 | 1.063 | 1.181 | BTDO033.0  | BTDI024    | 1.299    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-35.5 | 1.426 - 1.469 | 2.89      | 1.20 | 1.181 | 1.299 | BTDO035.5  | BTDI026    | 1.398    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-35.5 | 1.469 - 1.512 | 2.89      | 1.20 | 1.181 | 1.299 | BTDO035.5  | BTDI026    | 1.398    | ○     | ○     | ○     | ○     | ○     | ○     |
| BTA xx.xxx DE4-35.5 | 1.512 - 1.559 | 2.89      | 1.20 | 1.181 | 1.299 | BTDO035.5  | BTDI026    | 1.398    | ○     | ○     | ○     | ○     | ○     | ○     |

● Standard

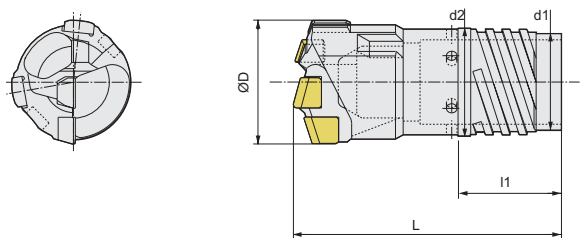
○ Semi-Standard

# Ingersoll

## BTA BRAZED DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

1.559 - 2.559



| Designation         | Diameter      | Dimension |      |       |       | Tube       |            |          | Grade |       |       |       |       |       |
|---------------------|---------------|-----------|------|-------|-------|------------|------------|----------|-------|-------|-------|-------|-------|-------|
|                     |               | L         | l1   | d1    | d2    | Outer Tube | Inner Tube | Diameter | TB103 | TB203 | TB253 | TB293 | TB200 | TB290 |
| BTA xx.xxx DE4-39   | 1.559 - 1.598 | 2.89      | 1.20 | 1.299 | 1.417 | BTDO039    | BTDI029    | 1.535    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-39   | 1.599 - 1.646 | 2.89      | 1.20 | 1.299 | 1.417 | BTDO039    | BTDI029    | 1.535    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-39   | 1.646 - 1.693 | 2.89      | 1.20 | 1.299 | 1.417 | BTDO039    | BTDI029    | 1.535    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-42.5 | 1.693 - 1.744 | 2.95      | 1.20 | 1.417 | 1.535 | BTDO042.5  | BTDI032    | 1.673    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-42.5 | 1.744 - 1.795 | 2.95      | 1.20 | 1.417 | 1.535 | BTDO042.5  | BTDI032    | 1.673    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-42.5 | 1.796 - 1.850 | 2.95      | 1.20 | 1.417 | 1.535 | BTDO042.5  | BTDI032    | 1.673    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-46.5 | 1.851 - 1.909 | 3.11      | 1.36 | 1.555 | 1.693 | BTDO046.5  | BTDI035    | 1.831    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-46.5 | 1.910 - 1.972 | 3.11      | 1.36 | 1.555 | 1.693 | BTDO046.5  | BTDI035    | 1.831    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-46.5 | 1.973 - 2.035 | 3.11      | 1.36 | 1.555 | 1.693 | BTDO046.5  | BTDI035    | 1.831    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-51   | 2.036 - 2.094 | 3.23      | 1.36 | 1.713 | 1.850 | BTDO051    | BTDI039    | 2.008    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-51   | 2.095 - 2.154 | 3.23      | 1.36 | 1.713 | 1.850 | BTDO051    | BTDI039    | 2.008    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-51   | 2.154 - 2.213 | 3.23      | 1.36 | 1.713 | 1.850 | BTDO051    | BTDI039    | 2.008    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-55.5 | 2.213 - 2.299 | 3.31      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-55.5 | 2.300 - 2.386 | 3.31      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-55.5 | 2.386 - 2.472 | 3.31      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    | ○     | ○     | ○     | ○     | ●     | ●     |
| BTA xx.xxx DE4-55.5 | 2.473 - 2.559 | 3.31      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    | ○     | ○     | ○     | ○     | ●     | ●     |

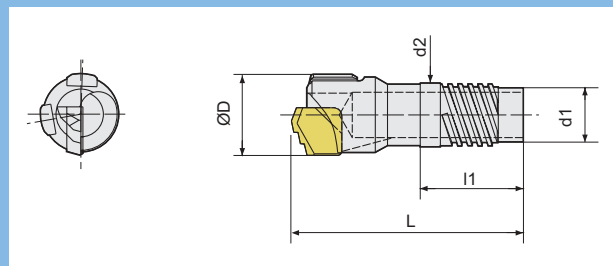
●Standard

○Semi-Standard

## BTA BRAZED SINGLE TUBE SYSTEM - OUTER TWO START AND FOUR START THREAD

### Diameters

0.496 - 0.787



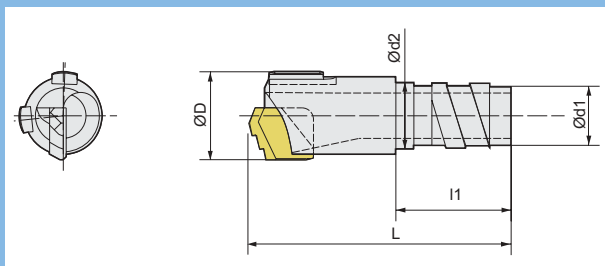
| Designation        | Diameter      | Dimension |      |       |       | Tube     |          | Grade |
|--------------------|---------------|-----------|------|-------|-------|----------|----------|-------|
|                    |               | L         | l1   | d1    | d2    | Part No. | Diameter |       |
| BTS xx.xxx SE2-11* | 0.496 - 0.535 | 1.68      | 0.81 | 0.323 | 0.378 | BTSI011  | 0.433    | TB203 |
| BTS xx.xxx SE2-12* | 0.536 - 0.575 | 1.68      | 0.89 | 0.362 | 0.417 | BTSI012  | 0.472    |       |
| BTS xx.xxx SE2-13* | 0.575 - 0.614 | 1.68      | 0.89 | 0.402 | 0.457 | BTSI013  | 0.512    |       |
| BTS xx.xxx SE4-14  | 0.615 - 0.657 | 1.70      | 0.89 | 0.425 | 0.496 | BTSI014  | 0.551    |       |
| BTS xx.xxx SE4-15  | 0.658 - 0.697 | 1.70      | 0.89 | 0.465 | 0.535 | BTSI015  | 0.591    |       |
| BTS xx.xxx SE4-16  | 0.697 - 0.744 | 1.72      | 0.89 | 0.492 | 0.571 | BTSI016  | 0.630    |       |
| BTS xx.xxx SE4-17  | 0.744 - 0.787 | 1.72      | 0.89 | 0.531 | 0.610 | BTSI017  | 0.669    |       |

\* Marks are outer two start thread

# Ingersoll

**BTA BRAZED** SINGLE TUBE SYSTEM - OUTER ONE START THREAD

**Diameters**  
0.315 - 0.570

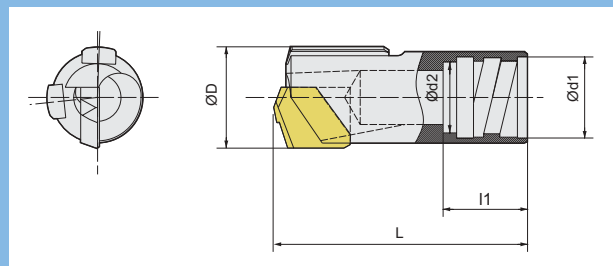


| Designation        | Diameter      | Dimension |      |       |       | Drill Tube |          | Grade |
|--------------------|---------------|-----------|------|-------|-------|------------|----------|-------|
|                    |               | L         | l1   | d1    | d2    | Part No.   | Diameter | TB203 |
| BTS xx.xxx SE1-7.1 | 0.315 - 0.354 | 1.40      | 0.63 | 0.213 | 0.236 | BTSO071    | 0.280    |       |
| BTS xx.xxx SE1-8.3 | 0.354 - 0.393 | 1.40      | 0.63 | 0.248 | 0.283 | BTSO083    | 0.327    |       |
| BTS xx.xxx SE1-9   | 0.394 - 0.433 | 1.41      | 0.63 | 0.264 | 0.299 | BTSO090    | 0.354    |       |
| BTS xx.xxx SE1-10  | 0.433 - 0.472 | 1.41      | 0.63 | 0.303 | 0.339 | BTSO100    | 0.394    |       |
| BTS xx.xxx SE1-11  | 0.472 - 0.531 | 1.41      | 0.63 | 0.323 | 0.358 | BTSO110    | 0.433    |       |
| BTS xx.xxx SE1-12  | 0.531 - 0.570 | 1.42      | 0.63 | 0.370 | 0.425 | BTSO120    | 0.472    |       |

## BTA BRAZED SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

### Diameters

0.571 - 2.559



| Designation         | Diameter      | Dimension |      |       |       | Drill Tube |          | Grade |
|---------------------|---------------|-----------|------|-------|-------|------------|----------|-------|
|                     |               | L         | l1   | d1    | d2    | Part No.   | Diameter |       |
| BTS xx.xxx SI1-12   | 0.571 - 0.591 | 2.06      | 0.91 | 0.453 | 0.390 | BTSE012A   | 0.472    | TB203 |
| BTS xx.xxx SI1-12   | 0.591 - 0.610 | 2.06      | 0.91 | 0.465 | 0.402 | BTSE012B   | 0.472    | TB203 |
| BTS xx.xxx SI1-13   | 0.611 - 0.630 | 2.06      | 0.91 | 0.488 | 0.425 | BTSE013A   | 0.512    | TB203 |
| BTS xx.xxx SI1-13   | 0.630 - 0.650 | 2.06      | 0.91 | 0.500 | 0.437 | BTSE013B   | 0.512    | TB203 |
| BTS xx.xxx SI1-14   | 0.650 - 0.679 | 2.07      | 0.91 | 0.528 | 0.465 | BTSE014A   | 0.551    | TB203 |
| BTS xx.xxx SI1-14   | 0.680 - 0.709 | 2.07      | 0.91 | 0.539 | 0.476 | BTSE014B   | 0.551    | TB203 |
| BTS xx.xxx SI1-15   | 0.709 - 0.748 | 2.08      | 0.91 | 0.567 | 0.504 | BTSE015    | 0.591    | TB203 |
| BTS xx.xxx SI1-16.5 | 0.748 - 0.787 | 2.08      | 0.91 | 0.606 | 0.543 | BTSE016.5  | 0.650    | TB203 |
| BTS xx.xxx SI1-18   | 0.787 - 0.866 | 2.44      | 0.98 | 0.650 | 0.571 | BTSE018    | 0.709    | TB203 |
| BTS xx.xxx SI1-20   | 0.866 - 0.984 | 2.46      | 0.98 | 0.748 | 0.630 | BTSE020    | 0.787    | TB203 |
| BTS xx.xxx SI1-22   | 0.984 - 1.063 | 2.74      | 0.98 | 0.787 | 0.669 | BTSE022    | 0.866    | TB203 |
| BTS xx.xxx SI1-24   | 1.063 - 1.181 | 2.76      | 0.98 | 0.866 | 0.748 | BTSE024    | 0.945    | TB203 |
| BTS xx.xxx SI1-26   | 1.181 - 1.259 | 2.97      | 0.98 | 0.945 | 0.827 | BTSE026    | 1.024    | TB203 |
| BTS xx.xxx SI1-28   | 1.260 - 1.338 | 3.37      | 0.98 | 1.024 | 0.906 | BTSE028    | 1.102    | TB203 |
| BTS xx.xxx SI1-30   | 1.339 - 1.456 | 3.39      | 1.57 | 1.063 | 0.945 | BTSE030    | 1.181    | TB203 |
| BTS xx.xxx SI1-32   | 1.457 - 1.574 | 3.39      | 1.57 | 1.181 | 1.063 | BTSE032    | 1.260    | TB203 |
| BTS xx.xxx SI1-36   | 1.575 - 1.732 | 3.41      | 1.57 | 1.299 | 1.181 | BTSE036    | 1.417    | TB203 |
| BTS xx.xxx SI1-39   | 1.732 - 1.850 | 3.82      | 1.57 | 1.457 | 1.339 | BTSE039    | 1.535    | TB203 |
| BTS xx.xxx SI1-43   | 1.850 - 2.047 | 3.83      | 1.57 | 1.614 | 1.457 | BTSE043    | 1.693    | TB203 |
| BTS xx.xxx SI1-47   | 2.047 - 2.244 | 3.85      | 1.57 | 1.732 | 1.575 | BTSE047    | 1.850    | TB203 |
| BTS xx.xxx SI1-51   | 2.244 - 2.401 | 3.87      | 1.57 | 1.929 | 1.772 | BTSE051    | 2.008    | TB203 |
| BTS xx.xxx SI1-56   | 2.402 - 2.559 | 3.89      | 1.57 | 2.087 | 1.929 | BTSE056    | 2.205    | TB203 |

## BTA BRAZED

### Grade Combination per ISO application

|          |                       | 10               | 20                              | 30          | 40 | 50 |
|----------|-----------------------|------------------|---------------------------------|-------------|----|----|
| <b>P</b> | steel                 |                  | TB253 TIALN                     |             |    |    |
|          |                       | TB103 TIALN      |                                 |             |    |    |
|          |                       |                  | TB203 TIALN<br>TB200 No Coating |             |    |    |
| <b>M</b> | Stainless steel       |                  |                                 | TB253 TIALN |    |    |
| <b>K</b> | Cast Iron             |                  | TB293 TIALN                     |             |    |    |
|          |                       |                  | TB200 No Coating                |             |    |    |
| <b>N</b> | Non-Ferrous materials | TB293 TIALN      |                                 |             |    |    |
|          |                       | TB200 No Coating |                                 |             |    |    |

1) TiN coating can be supplied upon request.

### Application of grade combinations

| Machine & working condition          | Poor  | Medium | Good  |
|--------------------------------------|-------|--------|-------|
| <b>Recommended Grade Combination</b> | TB253 |        |       |
|                                      |       | TB203  |       |
|                                      |       |        | TB103 |

### Itemised grade combinations

| Item | Standard Grade | Semi-Standard Grades | Special Grades |
|------|----------------|----------------------|----------------|
| BTA  | TB253          | TB103 TB203          | TB293          |
| BTS  | TB203          |                      |                |

# Ingersoll



# CUTTING TOOLS

# CUTTING TOOLS

# BTA DRILLS

## Cutting Tools

### **BTA Reamer**

Ingersoll BTA Reamer produces very high tolerance and excellent surface finish in deep hole applications.

#### **TBTA-R... insert indexable reamers**

- Available Range: Dia. 25.00mm - 110.99mm.
- Larger sizes are available upon request.

#### **BTA-R... head exchangable reamers**

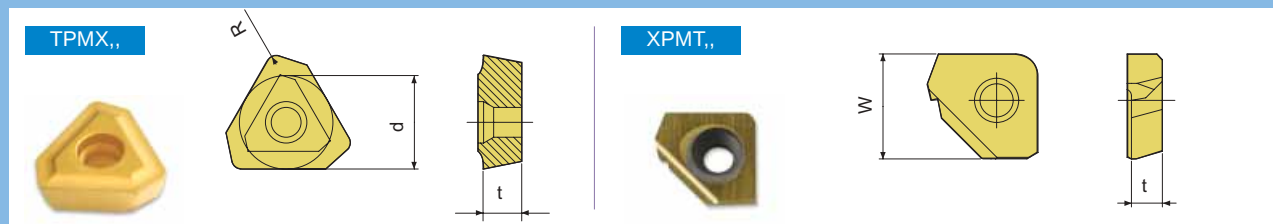
- Available Range: Dia. 14.51mm - 65.00mm.
- Chip forward reamer is used for through hole only.
- Chip backward reamer can be used for both blind and through hole reaming

#### **BTR... head exchangable reamers**

- Available Range: Dia. 6.00mm - 24.99mm.
- Single and multiple cutting edges are available.
- Insert indexable type on BTR... heads are available upon request.

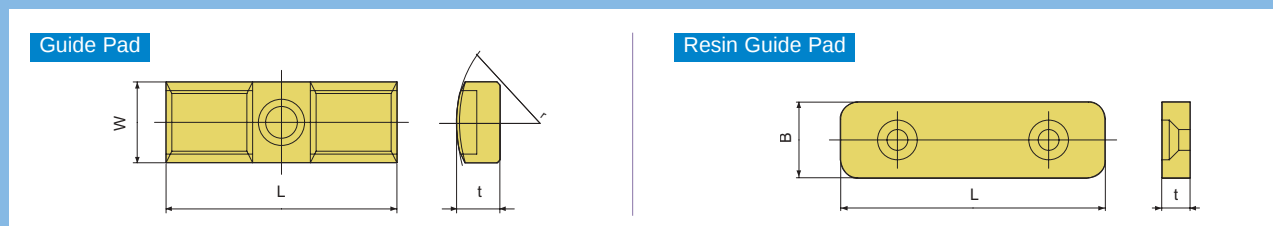
## BTA INDEXABLE REAMER

### Insert



| Designation   | Dimension |       |       |       | Pocket |       |       | Grade  | Screw    |
|---------------|-----------|-------|-------|-------|--------|-------|-------|--------|----------|
|               | d         | t     | R     | W     | Center | Inner | Outer | IN2005 |          |
| TPMX 1403LG   | 0.333     | 0.138 | 0.031 | -     |        |       | ○     |        | CSTB2.5  |
| TPMX 1704LG   | 0.406     | 0.157 | 0.031 | -     |        |       | ○     |        | CSTB3.5D |
| TPMX 2405LG   | 0.559     | 0.217 | 0.047 | -     |        |       | ○     |        | CSTB4M   |
| XPMT 16002-45 | -         | 0.106 | -     | 0.374 |        |       | ○     |        | CSTA3    |

### Pad



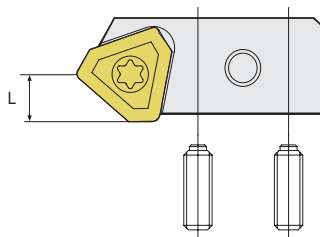
| Type            | Designation  | Dimension |       |       |       | Screw      |
|-----------------|--------------|-----------|-------|-------|-------|------------|
|                 |              | W         | t     | L     | r     |            |
| Guide Pad       | PAD-GC08-120 | 0.315     | 0.173 | 0.984 | 0.689 | CSTB3S     |
|                 | PAD-GC08     | 0.315     | 0.177 | 0.984 | 0.689 | CSTB3S     |
|                 | PAD-GC10     | 0.394     | 0.236 | 1.378 | 0.787 | CSTB4S     |
|                 | PAD-GC14     | 0.551     | 0.295 | 1.575 | 0.984 | CSTA5S     |
|                 | PAD-GC18     | 0.709     | 0.354 | 1.575 | 1.181 | LS1206S    |
| Resin Guide Pad | PAD-R10      | 0.394     | 0.157 | 1.575 | -     | LS0902.5-6 |
|                 | PAD-R12      | 0.472     | 0.197 | 1.772 | -     | LS0903-8   |
|                 | PAD-R15      | 0.591     | 0.228 | 1.969 | -     | LS0904-10  |
|                 | PAD-R20      | 0.787     | 0.295 | 2.756 | -     | LS0905-12  |
|                 | PAD-R30      | 1.181     | 0.492 | 3.150 | -     | LS0906-15  |
|                 | PAD-R35      | 1.378     | 0.610 | 3.937 | -     | LS0906-15  |

# Ingersoll

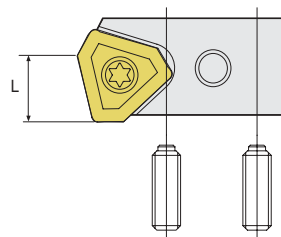
## ■ BTA INDEXABLE REAMER

### Cartridge

Accurate Applications



Open Tolerance Applications



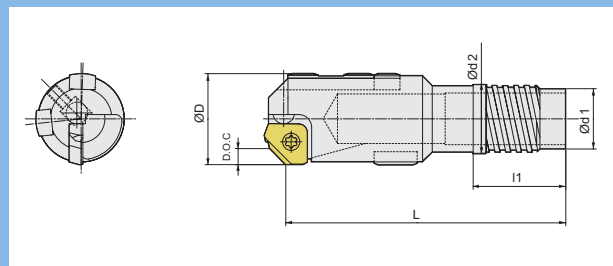
| Designation                     |           | L     | Adjust Screw | Wrench | Lock Screw | Wrench | Insert   |
|---------------------------------|-----------|-------|--------------|--------|------------|--------|----------|
| Accurate Tolerance Applications | PERC-P04R | 0.197 | AS0004-8     | H2     | LS1803.5RH | H2.5   | TPMX1403 |
|                                 | PERC-P32R | 0.236 | AS0005-10    | H2.5   | LS1805RH   | H3     | TPMX1704 |
|                                 | PERC-P43R | 0.315 | AS0005-15    | H2.5   | LS1806RH   | H4     | TPMX2405 |
| Open Tolerance Applications     | PERC-N04  | 0.315 | AS0004-8     | H2     | LS1803.5RH | H2.5   | TPMX1403 |
|                                 | PERC-N32  | 0.354 | AS0005-10    | H2.5   | LS1805RH   | H3     | TPMX1704 |
|                                 | PERC-N43  | 0.512 | AS0005-15    | H2.5   | LS1806RH   | H4     | TPMX2405 |

\* PERC-P and PERC-N cartridges are interchangeable in the same pocket.

## BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

0.984 - 1.574

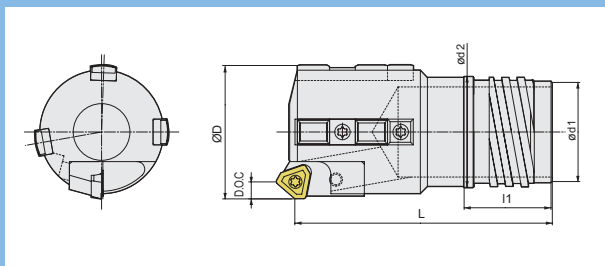


| Designation         | Diameter      | D.O.C | Dimension |      |       |       | Tube     |          |
|---------------------|---------------|-------|-----------|------|-------|-------|----------|----------|
|                     |               |       | L         | l1   | d1    | d2    | Type     | Diameter |
| TBTA-R-xx.xxxSE4-22 | 0.984 - 1.039 | 0.14  | 2.76      | 0.85 | 0.689 | 0.768 | BTSI 022 | 0.866    |
| TBTA-R-xx.xxxSE4-24 | 1.040 - 1.130 | 0.14  | 2.76      | 0.85 | 0.748 | 0.827 | BTSI 024 | 0.945    |
| TBTA-R-xx.xxxSE4-26 | 1.130 - 1.220 | 0.14  | 2.95      | 0.96 | 0.827 | 0.925 | BTSI 026 | 1.024    |
| TBTA-R-xx.xxxSE4-28 | 1.221 - 1.311 | 0.14  | 2.95      | 0.96 | 0.906 | 1.004 | BTSI 028 | 1.102    |
| TBTA-R-xx.xxxSE4-30 | 1.311 - 1.425 | 0.14  | 2.95      | 0.96 | 1.004 | 1.102 | BTSI 030 | 1.181    |
| TBTA-R-xx.xxxSE4-33 | 1.426 - 1.559 | 0.14  | 3.54      | 1.20 | 1.063 | 1.181 | BTSI 033 | 1.299    |
| TBTA-R-xx.xxxSE4-36 | 1.559 - 1.574 | 0.14  | 3.54      | 1.20 | 1.181 | 1.299 | BTSI 036 | 1.417    |

# Ingersoll

## BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

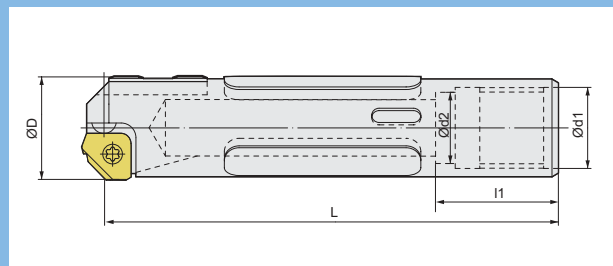
**Diameters**  
1.575 - 3.898



| Designation         | Diameter      | D.O.C | Dimension |      |       |       | Tube      |          |
|---------------------|---------------|-------|-----------|------|-------|-------|-----------|----------|
|                     |               |       | L         | l1   | d1    | d2    | Type      | Diameter |
| TBTA-R-xx.xxxSE4-36 | 1.575 - 1.693 | 0.20  | 3.54      | 1.20 | 1.181 | 1.299 | BTSI 036  | 1.417    |
| TBTA-R-xx.xxxSE4-39 | 1.693 - 1.850 | 0.20  | 3.74      | 1.20 | 1.299 | 1.417 | BTSI 039  | 1.535    |
| TBTA-R-xx.xxxSE4-43 | 1.851 - 2.035 | 0.20  | 3.94      | 1.20 | 1.417 | 1.535 | BTSI 043  | 1.693    |
| TBTA-R-xx.xxxSE4-47 | 2.036 - 2.213 | 0.20  | 3.94      | 1.36 | 1.555 | 1.693 | BTSI 047  | 1.850    |
| TBTA-R-xx.xxxSE4-51 | 2.213 - 2.386 | 0.24  | 4.13      | 1.36 | 1.713 | 1.850 | BTSI 051  | 2.008    |
| TBTA-R-xx.xxxSE4-56 | 2.386 - 2.559 | 0.24  | 4.33      | 1.36 | 1.870 | 2.008 | BTSI 056A | 2.205    |
| TBTA-R-xx.xxxSE4-56 | 2.559 - 2.637 | 0.24  | 5.91      | 2.44 | 1.850 | 2.047 | BTSI 056B | 2.205    |
| TBTA-R-xx.xxxSE4-62 | 2.638 - 2.874 | 0.31  | 5.91      | 2.44 | 2.087 | 2.283 | BTSI 062  | 2.441    |
| TBTA-R-xx.xxxSE4-68 | 2.874 - 3.149 | 0.31  | 5.91      | 2.44 | 2.283 | 2.480 | BTSI 068  | 2.677    |
| TBTA-R-xx.xxxSE4-75 | 3.150 - 3.425 | 0.31  | 7.09      | 3.23 | 2.520 | 2.756 | BTSI 075  | 2.953    |
| TBTA-R-xx.xxxSE4-82 | 3.425 - 3.937 | 0.31  | 7.09      | 3.23 | 2.795 | 3.031 | BTSI 082  | 3.228    |

## BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

**Diameters**  
0.984 - 1.574

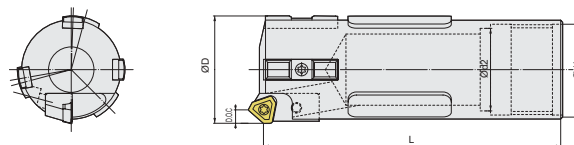


| Designation         | Diameter      | D.O.C | Dimension |      |       |       | Tube     |          |
|---------------------|---------------|-------|-----------|------|-------|-------|----------|----------|
|                     |               |       | L         | l1   | d1    | d2    | Type     | Diameter |
| TBTA-R-xx.xxxSI1-22 | 0.984 - 1.063 | 0.14  | 4.33      | 0.98 | 0.787 | 0.669 | BTSE 022 | 0.866    |
| TBTA-R-xx.xxxSI1-24 | 1.063 - 1.181 | 0.14  | 4.33      | 0.98 | 0.866 | 0.748 | BTSE 024 | 0.945    |
| TBTA-R-xx.xxxSI1-26 | 1.181 - 1.259 | 0.14  | 4.33      | 0.98 | 0.945 | 0.827 | BTSE 026 | 1.024    |
| TBTA-R-xx.xxxSI1-28 | 1.260 - 1.338 | 0.14  | 4.33      | 0.98 | 1.024 | 0.906 | BTSE 028 | 1.102    |
| TBTA-R-xx.xxxSI1-30 | 1.339 - 1.456 | 0.14  | 5.31      | 1.57 | 1.063 | 0.945 | BTSE 030 | 1.181    |
| TBTA-R-xx.xxxSI1-33 | 1.457 - 1.574 | 0.14  | 5.31      | 1.57 | 1.181 | 1.063 | BTSE 033 | 1.299    |

# Indersol

## BTA INDEXABLE REAMER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

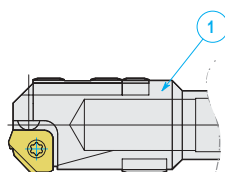
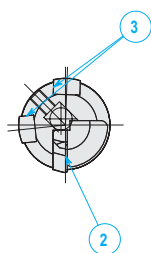
**Diameters**  
1.575 - 4.370



| Designation         | Diameter      | D.O.C | Dimension |      |       |       | Tube     |          |
|---------------------|---------------|-------|-----------|------|-------|-------|----------|----------|
|                     |               |       | L         | l1   | d1    | d2    | Type     | Diameter |
| TBTA-R-xx.xxxSI1-36 | 1.575 - 1.732 | 0.10  | 5.31      | 1.57 | 1.299 | 1.181 | BTSE 036 | 1.417    |
| TBTA-R-xx.xxxSI1-39 | 1.732 - 1.850 | 0.10  | 5.31      | 1.57 | 1.457 | 1.339 | BTSE 039 | 1.535    |
| TBTA-R-xx.xxxSI1-43 | 1.850 - 2.047 | 0.10  | 5.71      | 1.57 | 1.614 | 1.457 | BTSE 043 | 1.693    |
| TBTA-R-xx.xxxSI1-47 | 2.047 - 2.244 | 0.16  | 5.71      | 1.57 | 1.732 | 1.575 | BTSE 047 | 1.850    |
| TBTA-R-xx.xxxSI1-51 | 2.244 - 2.401 | 0.16  | 6.69      | 1.57 | 1.929 | 1.772 | BTSE 051 | 2.008    |
| TBTA-R-xx.xxxSI1-56 | 2.402 - 2.677 | 0.16  | 6.69      | 1.57 | 2.087 | 1.929 | BTSE 056 | 2.205    |
| TBTA-R-xx.xxxSI1-62 | 2.677 - 2.952 | 0.20  | 6.69      | 1.57 | 2.323 | 2.126 | BTSE 062 | 2.441    |
| TBTA-R-xx.xxxSI1-68 | 2.953 - 3.189 | 0.20  | 8.07      | 2.76 | 2.559 | 2.362 | BTSE 068 | 2.677    |
| TBTA-R-xx.xxxSI1-75 | 3.189 - 3.582 | 0.20  | 8.07      | 2.76 | 2.795 | 2.598 | BTSE 075 | 2.953    |
| TBTA-R-xx.xxxSI1-82 | 3.583 - 3.897 | 0.20  | 8.46      | 2.76 | 3.110 | 2.913 | BTSE 082 | 3.228    |
| TBTA-R-xx.xxxSI1-94 | 3.898 - 4.370 | 0.20  | 8.46      | 2.76 | 3.543 | 3.346 | BTSE 094 | 3.701    |

## BTA INDEXABLE REAMER ASSEMBLY OF TBTA-R SERIES

**Diameters**  
0.984 - 1.574



1. Head Shank
2. Cartridge & Lock Screw
3. Guide Pad

| Parts                   |           |               | Diameter      |               |               |               |
|-------------------------|-----------|---------------|---------------|---------------|---------------|---------------|
|                         |           |               | 0.984 - 1.102 | 1.102 - 1.181 | 1.181 - 1.496 | 1.496 - 1.574 |
| Close<br>Tolerance      | Cartridge | Cartridge     | -             | -             | -             | -             |
|                         |           | Adjust Screw  | -             | -             | -             | -             |
|                         |           | Wrench        | -             | -             | -             | -             |
|                         |           | Screw         | -             | -             | -             | -             |
|                         |           | Wrench        | -             | -             | -             | -             |
|                         | Insert    | Insert        | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 |
|                         |           | Screw         | CSTANO3       | CSTANO3       | CSTANO3       | CSTANO3       |
|                         |           | Wrench        | T9            | T9            | T9            | T9            |
| Normal<br>Tolerance     | Cartridge | Outer         | -             | -             | -             | -             |
|                         |           | Adjust Screw  | -             | -             | -             | -             |
|                         |           | Wrench        | -             | -             | -             | -             |
|                         |           | Screw         | -             | -             | -             | -             |
|                         |           | Wrench        | -             | -             | -             | -             |
|                         | Insert    | Inner         | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 |
|                         |           | Screw         | CSTANO3       | CSTANO3       | CSTANO3       | CSTANO3       |
|                         |           | Wrench        | T9            | T9            | T9            | T9            |
|                         | Pad       | Guide Pad (A) | PAD-GC08-120  | PAD-GC08-120  | PAD-GC08-140  | PAD-GC08      |
| Screw                   |           | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        |               |
| Wrench                  |           | T9            | T9            | T9            | T9            |               |
| Guide Pad Protector (B) |           | PAD-P08-120   | PAD-P08-120   | PAD-P08-140   | PAD-P08       |               |
| Screw                   |           | CSTB3S        | CSTB3S        | CSTB3S        | CSTB3S        |               |
| Wrench                  |           | T9            | T9            | T9            | T9            |               |
| Resin Guide Pad (C)     |           | PAD-R10       | PAD-R10       | PAD-R12       | PAD-R15       |               |
| Screw                   |           | LS0902        | LS0902        | LS0903        | LS0904        |               |
| Wrench                  |           | +             | +             | +             | +             |               |

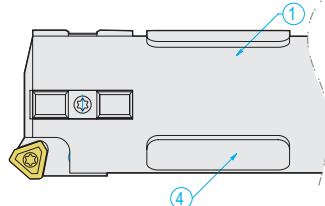
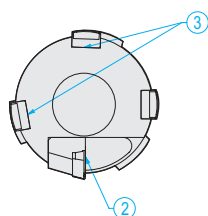
A + B is for outer four start thread connection type.  
A + C is for inner single start thread connection type.

# Indersol

## BTA INDEXABLE REAMER ASSEMBLY OF TBTA-R SERIES

### Diameters

1.575 - 2.637



1. Head Shank
2. Cartridge & Lock Screw
3. Guide Pad
4. Resin Guide Pad & Lock Screw

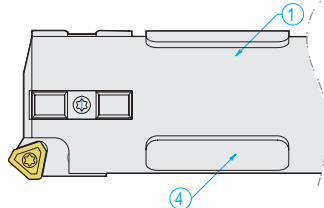
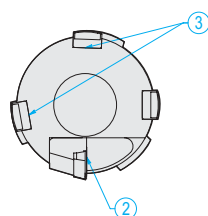
| Parts            |           |                         | Diameter      |               |               |               |
|------------------|-----------|-------------------------|---------------|---------------|---------------|---------------|
|                  |           |                         | 1.575 - 1.811 | 1.811 - 2.047 | 2.047 - 2.362 | 2.362 - 2.637 |
| Close Tolerance  | Cartridge | Cartridge               | PERC-P 04R    | PERC-P 04R    | PERC-P 32R    | PERC-P 32R    |
|                  |           | Adjust Screw            | AS0004-8      | AS0004-8      | AS0005-10     | AS0005-10     |
|                  |           | Wrench                  | H2            | H2            | H2.5          | H2.5          |
|                  |           | Screw                   | LS1803.5RH    | LS1803.5RH    | LS1805RH      | LS1805RH      |
|                  |           | Wrench                  | H2.5          | H2.5          | H3            | H3            |
|                  | Insert    | Insert                  | TPMX 1403LG   | TPMX 1403LG   | TPMX 1704LG   | TPMX 1704LG   |
|                  |           | Screw                   | CSTB2.5       | CSTB2.5       | CSTB3.5D      | CSTB3.5D      |
|                  |           | Wrench                  | T8            | T8            | T9            | T9            |
| Normal Tolerance | Cartridge | Outer                   | PERC 402-04   | PERC 402-04   | PERC 402-32   | PERC 402-32   |
|                  |           | Adjust Screw            | AS0004-8      | AS0004-8      | AS0005-10     | AS0005-10     |
|                  |           | Wrench                  | H2            | H2            | H2.5          | H2.5          |
|                  |           | Screw                   | LS1803.5RH    | LS1803.5RH    | LS1805RH      | LS1805RH      |
|                  |           | Wrench                  | H2.5          | H2.5          | H3            | H3            |
|                  | Insert    | Inner                   | TPMX 1403RG   | TPMX 1403RG   | TPMX 1704RG   | TPMX 1704RG   |
|                  |           | Screw                   | CSTB2.5       | CSTB2.5       | CSTB3.5D      | CSTB3.5D      |
|                  |           | Wrench                  | T8            | T8            | T9            | T9            |
| Pad              | Pad       | Guide Pad (A)           | PAD-GC08      | PAD-GC10      | PAD-GC10      | PAD-GC14      |
|                  |           | Screw                   | CSTB3S        | CSTB3S        | CSTB3S        | CSTA5S        |
|                  |           | Wrench                  | T9            | T9            | T9            | T15           |
|                  |           | Guide Pad Protector (B) | PAD-P08       | PAD-P10       | PAD-P10       | PAD-P14       |
|                  |           | Screw                   | CSTB3S        | CSTB4S        | CSTB4S        | CSTA5S        |
|                  |           | Wrench                  | T9            | T15           | T15           | T15           |
|                  |           | Resin Guide Pad (C)     | PAD-R15       | PAD-R15       | PAD-R15       | PAD-R20       |
|                  |           | Screw                   | LS0904        | LS0904        | LS0904        | LS0905        |
|                  |           | Wrench                  | +             | +             | +             | +             |

A + B is for outer four start thread connection type.

A + C is for inner single start thread connection type.

## BTA INDEXABLE REAMER ASSEMBLY OF TBTA-R SERIES

**Diameters**  
2.638 - 4.842



1. Head Shank
2. Cartridge & Lock Screw
3. Guide Pad
4. Resin Guide Pad & Lock Screw

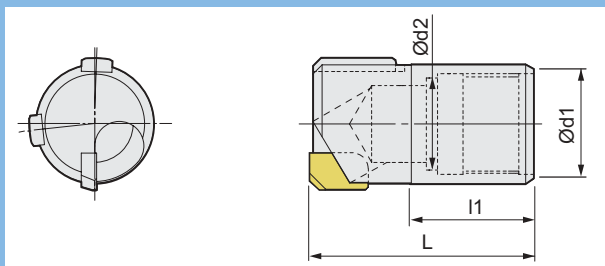
| Parts            |                         |              | Diameter      |               |               |               |
|------------------|-------------------------|--------------|---------------|---------------|---------------|---------------|
|                  |                         |              | 2.638 - 3.189 | 3.189 - 3.582 | 3.583 - 3.937 | 3.937 - 4.842 |
| Close Tolerance  | Cartridge               | Cartridge    | PERC-P 43R    | PERC-P 43R    | PERC-P 43R    | PERC-P 43R    |
|                  |                         | Adjust Screw | AS0005-15     | AS0005-15     | AS0005-15     | AS0005-15     |
|                  |                         | Wrench       | H2.5          | H2.5          | H2.5          | H2.5          |
|                  |                         | Screw        | LS1806RH      | LS1806RH      | LS1806RH      | LS1806RH      |
|                  |                         | Wrench       | H4            | H4            | H4            | H4            |
|                  | Insert                  | Insert       | TPMX 2405LG   | TPMX 2405LG   | TPMX 2405LG   | TPMX 2405LG   |
|                  |                         | Screw        | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M        |
|                  |                         | Wrench       | T15           | T15           | T15           | T15           |
| Normal Tolerance | Cartridge               | Outer        | PERC 402-43   | PERC 402-43   | PERC 402-43   | PERC 402-43   |
|                  |                         | Adjust Screw | AS0005-15     | AS0005-15     | AS0005-15     | AS0005-15     |
|                  |                         | Wrench       | H2.5          | H2.5          | H2.5          | H2.5          |
|                  |                         | Screw        | LS1806RH      | LS1806RH      | LS1806RH      | LS1806RH      |
|                  |                         | Wrench       | H4            | H4            | H4            | H4            |
|                  | Insert                  | Inner        | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   | TPMX 2405RG   |
|                  |                         | Screw        | CSTB4M        | CSTB4M        | CSTB4M        | CSTB4M        |
|                  |                         | Wrench       | T15           | T15           | T15           | T15           |
| Pad              | Guide Pad (A)           | PAD-GC14     | PAD-GC14      | PAD-GC14      | PAD-GC18      |               |
|                  | Screw                   | CSTA5S       | CSTA5S        | CSTA5S        | CSTA5S        |               |
|                  | Wrench                  | T15          | T15           | T15           | T15           |               |
|                  | Guide Pad Protector (B) | PAD-P14      | PAD-P14       | PAD-P14       | PAD-P18       |               |
|                  | Screw                   | CSTA5S       | CSTA5S        | CSTA5S        | LS1206S       |               |
|                  | Wrench                  | T15          | T15           | T15           | H3            |               |
|                  | Resin Guide Pad (C)     | PAD-R20      | PAD-R30       | PAD-R35       | PAD-R35       |               |
|                  | Screw                   | LS0905       | LS0906        | LS0906        | LS0906        |               |
|                  | Wrench                  | +            | +             | +             | +             |               |

A + B is for outer four start thread connection type.  
A + C is for inner single start thread connection type.

# HEAD CHANGE REAMER SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

## Diameters

0.571 - 2.559



| Designation             | Diameter         | Dimension |      |       |       | Tube      |          | Grade |
|-------------------------|------------------|-----------|------|-------|-------|-----------|----------|-------|
|                         |                  | L         | l1   | d1    | d2    | Part No.  | Diameter |       |
| BTA-Rxx.xxxSI1-12-□□□   | 0.571 - 0.591    | 2.05      | 0.91 | 0.453 | 0.390 | BTSE012A  | 0.472    |       |
| BTA-Rxx.xxxSI1-12-□□□   | 0.591 - 0.610    | 2.05      | 0.91 | 0.465 | 0.402 | BTSE012B  | 0.472    |       |
| BTA-Rxx.xxxSI1-13-□□□   | 0.611 - 0.630    | 2.05      | 0.91 | 0.488 | 0.425 | BTSE013A  | 0.512    |       |
| BTA-Rxx.xxxSI1-13-□□□   | 0.630 - 0.650    | 2.05      | 0.91 | 0.500 | 0.437 | BTSE013B  | 0.512    |       |
| BTA-Rxx.xxxSI1-14-□□□   | 0.650 - 0.67.913 | 2.05      | 0.91 | 0.528 | 0.465 | BTSE014A  | 0.551    |       |
| BTA-Rxx.xxxSI1-14-□□□   | 0.680 - 0.709    | 2.05      | 0.91 | 0.539 | 0.476 | BTSE014B  | 0.551    |       |
| BTA-Rxx.xxxSI1-15-□□□   | 0.709 - 0.748    | 2.05      | 0.91 | 0.567 | 0.504 | BTSE015   | 0.591    |       |
| BTA-Rxx.xxxSI1-16.5-□□□ | 0.748 - 0.787    | 2.24      | 0.91 | 0.606 | 0.543 | BTSE016.5 | 0.650    |       |
| BTA-Rxx.xxxSI1-18-□□□   | 0.787 - 0.866    | 2.24      | 0.98 | 0.650 | 0.571 | BTSE018   | 0.709    |       |
| BTA-Rxx.xxxSI1-20-□□□   | 0.866 - 0.984    | 2.24      | 0.98 | 0.748 | 0.630 | BTSE020   | 0.787    |       |
| BTA-Rxx.xxxSI1-22-□□□   | 0.984 - 1.063    | 2.64      | 0.98 | 0.787 | 0.669 | BTSE022   | 0.866    |       |
| BTA-Rxx.xxxSI1-24-□□□   | 1.063 - 1.181    | 2.64      | 0.98 | 0.866 | 0.748 | BTSE024   | 0.945    |       |
| BTA-Rxx.xxxSI1-26-□□□   | 1.181 - 1.259    | 2.64      | 0.98 | 0.945 | 0.827 | BTSE026   | 1.024    |       |
| BTA-Rxx.xxxSI1-28-□□□   | 1.260 - 1.338    | 3.15      | 0.98 | 1.024 | 0.906 | BTSE028   | 1.102    |       |
| BTA-Rxx.xxxSI1-30-□□□   | 1.339 - 1.456    | 3.15      | 1.57 | 1.063 | 0.945 | BTSE030   | 1.181    |       |
| BTA-Rxx.xxxSI1-32-□□□   | 1.457 - 1.574    | 3.15      | 1.57 | 1.181 | 1.063 | BTSE032   | 1.260    |       |
| BTA-Rxx.xxxSI1-36-□□□   | 1.575 - 1.732    | 3.54      | 1.57 | 1.299 | 1.181 | BTSE036   | 1.417    |       |
| BTA-Rxx.xxxSI1-39-□□□   | 1.732 - 1.850    | 3.54      | 1.57 | 1.457 | 1.339 | BTSE039   | 1.535    |       |
| BTA-Rxx.xxxSI1-43-□□□   | 1.850 - 2.047    | 3.54      | 1.57 | 1.614 | 1.457 | BTSE043   | 1.693    |       |
| BTA-Rxx.xxxSI1-47-□□□   | 2.047 - 2.244    | 3.54      | 1.57 | 1.732 | 1.575 | BTSE047   | 1.850    |       |
| BTA-Rxx.xxxSI1-51-□□□   | 2.244 - 2.401    | 3.54      | 1.57 | 1.929 | 1.772 | BTSE051   | 2.008    |       |
| BTA-Rxx.xxxSI1-56-□□□   | 2.402 - 2.559    | 3.54      | 1.57 | 2.087 | 1.929 | BTSE056   | 2.205    |       |

Ordering example: BTA-R00.571SI1-12-B45

•Reamer diameter: 0.571

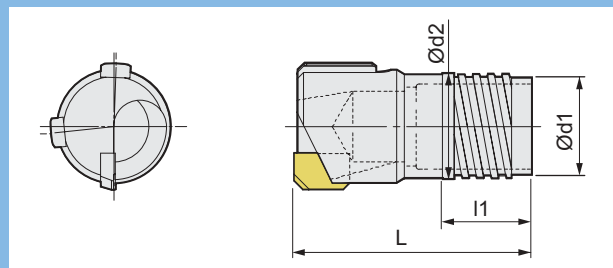
•Chip backward style (Chip forward style is available for through hole)

•Entering angle: 45degree

## HEAD CHANGE REAMER SINGLE TUBE SYSTEM - OUTER FOUR START THREAD

### Diameters

0.744 - 2.559



| Designation           | Diameter      | Dimension |      |       |       | Tube     |          | Grade |
|-----------------------|---------------|-----------|------|-------|-------|----------|----------|-------|
|                       |               | L         | l1   | d1    | d2    | Part No. | Diameter |       |
| BTA-Rxx.xxxSE4-17-□□□ | 0.744 - 0.756 | 2.24      | 1.74 | 0.531 | 0.610 | BTSI017  | 0.669    |       |
| BTA-Rxx.xxxSE4-17-□□□ | 0.756 - 0.787 | 2.24      | 1.73 | 0.531 | 0.610 | BTSI017  | 0.669    |       |
| BTA-Rxx.xxxSE4-18-□□□ | 0.788 - 0.823 | 2.56      | 1.94 | 0.551 | 0.630 | BTSI018  | 0.709    |       |
| BTA-Rxx.xxxSE4-18-□□□ | 0.823 - 0.858 | 2.56      | 1.94 | 0.551 | 0.630 | BTSI018  | 0.709    |       |
| BTA-Rxx.xxxSE4-20-□□□ | 0.859 - 0.902 | 2.56      | 2.08 | 0.630 | 0.709 | BTSI020  | 0.787    |       |
| BTA-Rxx.xxxSE4-20-□□□ | 0.902 - 0.949 | 2.56      | 2.07 | 0.630 | 0.709 | BTSI020  | 0.787    |       |
| BTA-Rxx.xxxSE4-22-□□□ | 0.949 - 0.992 | 2.56      | 2.13 | 0.689 | 0.768 | BTSI022  | 0.866    |       |
| BTA-Rxx.xxxSE4-22-□□□ | 0.993 - 1.039 | 2.56      | 2.13 | 0.689 | 0.768 | BTSI022  | 0.866    |       |
| BTA-Rxx.xxxSE4-24-□□□ | 1.040 - 1.083 | 2.56      | 2.12 | 0.748 | 0.827 | BTSI024  | 0.945    |       |
| BTA-Rxx.xxxSE4-24-□□□ | 1.083 - 1.130 | 2.56      | 2.12 | 0.748 | 0.827 | BTSI024  | 0.945    |       |
| BTA-Rxx.xxxSE4-26-□□□ | 1.130 - 1.173 | 2.76      | 2.34 | 0.827 | 0.925 | BTSI026  | 1.024    |       |
| BTA-Rxx.xxxSE4-26-□□□ | 1.174 - 1.220 | 2.76      | 2.33 | 0.827 | 0.925 | BTSI026  | 1.024    |       |
| BTA-Rxx.xxxSE4-28-□□□ | 1.221 - 1.264 | 2.76      | 2.34 | 0.906 | 1.004 | BTSI028  | 1.102    |       |
| BTA-Rxx.xxxSE4-28-□□□ | 1.264 - 1.311 | 2.76      | 2.33 | 0.906 | 1.004 | BTSI028  | 1.102    |       |
| BTA-Rxx.xxxSE4-30-□□□ | 1.311 - 1.370 | 2.76      | 2.32 | 1.004 | 1.102 | BTSI030  | 1.181    |       |
| BTA-Rxx.xxxSE4-30-□□□ | 1.370 - 1.425 | 2.76      | 2.32 | 1.004 | 1.102 | BTSI030  | 1.181    |       |
| BTA-Rxx.xxxSE4-33-□□□ | 1.426 - 1.469 | 3.23      | 2.70 | 1.063 | 1.181 | BTSI033  | 1.299    |       |
| BTA-Rxx.xxxSE4-33-□□□ | 1.469 - 1.512 | 3.23      | 2.70 | 1.063 | 1.181 | BTSI033  | 1.299    |       |
| BTA-Rxx.xxxSE4-33-□□□ | 1.512 - 1.559 | 3.23      | 2.69 | 1.063 | 1.181 | BTSI033  | 1.299    |       |
| BTA-Rxx.xxxSE4-36-□□□ | 1.559 - 1.598 | 3.23      | 2.69 | 1.181 | 1.299 | BTSI036  | 1.417    |       |
| BTA-Rxx.xxxSE4-36-□□□ | 1.599 - 1.646 | 3.23      | 2.68 | 1.181 | 1.299 | BTSI036  | 1.417    |       |
| BTA-Rxx.xxxSE4-36-□□□ | 1.646 - 1.693 | 3.23      | 2.67 | 1.181 | 1.299 | BTSI036  | 1.417    |       |
| BTA-Rxx.xxxSE4-39-□□□ | 1.693 - 1.744 | 3.23      | 2.74 | 1.299 | 1.417 | BTSI039  | 1.535    |       |
| BTA-Rxx.xxxSE4-39-□□□ | 1.744 - 1.795 | 3.23      | 2.73 | 1.299 | 1.417 | BTSI039  | 1.535    |       |
| BTA-Rxx.xxxSE4-39-□□□ | 1.796 - 1.850 | 3.23      | 2.72 | 1.299 | 1.417 | BTSI039  | 1.535    |       |
| BTA-Rxx.xxxSE4-43-□□□ | 1.851 - 1.909 | 3.23      | 2.71 | 1.417 | 1.535 | BTSI043  | 1.693    |       |
| BTA-Rxx.xxxSE4-43-□□□ | 1.910 - 1.972 | 3.23      | 2.70 | 1.417 | 1.535 | BTSI043  | 1.693    |       |
| BTA-Rxx.xxxSE4-43-□□□ | 1.973 - 2.035 | 3.23      | 2.70 | 1.417 | 1.535 | BTSI043  | 1.693    |       |
| BTA-Rxx.xxxSE4-47-□□□ | 2.036 - 2.094 | 3.66      | 2.96 | 1.555 | 1.693 | BTSI047  | 1.850    |       |
| BTA-Rxx.xxxSE4-47-□□□ | 2.095 - 2.154 | 3.66      | 2.96 | 1.555 | 1.693 | BTSI047  | 1.850    |       |
| BTA-Rxx.xxxSE4-47-□□□ | 2.154 - 2.213 | 3.66      | 2.96 | 1.555 | 1.693 | BTSI047  | 1.850    |       |
| BTA-Rxx.xxxSE4-51-□□□ | 2.213 - 2.299 | 3.66      | 3.05 | 1.713 | 1.850 | BTSI051  | 2.008    |       |
| BTA-Rxx.xxxSE4-51-□□□ | 2.300 - 2.386 | 3.66      | 3.03 | 1.713 | 1.850 | BTSI051  | 2.008    |       |
| BTA-Rxx.xxxSE4-56-□□□ | 2.386 - 2.472 | 3.66      | 3.02 | 1.870 | 2.008 | BTSI056  | 2.205    |       |
| BTA-Rxx.xxxSE4-56-□□□ | 2.473 - 2.559 | 3.66      | 3.01 | 1.870 | 2.008 | BTSI056  | 2.205    |       |

Ordering example: BTA-R00.571SE4-12-B45

•Reamer diameter: 0.571

•Chip backward style (Chip forward style is available for through hole)

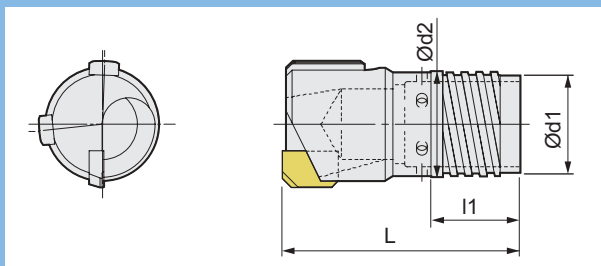
•Entering angle: 45degree

**BOREline**

# HEAD CHANGE REAMER DOUBLE TUBE SYSTEM - OUTER FOUR START THREAD

## Diameters

0.725 - 2.559



| Designation             | Diameter      | Dimension |      |       |       | Tube       |            |          | Grade |
|-------------------------|---------------|-----------|------|-------|-------|------------|------------|----------|-------|
|                         |               | L         | l1   | d1    | d2    | Outer Tube | Inner Tube | Diameter | TB103 |
| BTA-Rxx.xxxDE4-18-□□□   | 0.725 - 0.756 | 2.24      | 0.85 | 0.551 | 0.630 | BTDO018    | BTDI012    | 0.709    |       |
| BTA-Rxx.xxxDE4-18-□□□   | 0.756 - 0.787 | 2.24      | 0.85 | 0.551 | 0.630 | BTDO018    | BTDI012    | 0.709    |       |
| BTA-Rxx.xxxDE4-19.5-□□□ | 0.796 - 0.823 | 2.56      | 0.85 | 0.630 | 0.709 | BTDO019.5  | BTDI014    | 0.768    |       |
| BTA-Rxx.xxxDE4-19.5-□□□ | 0.823 - 0.858 | 2.56      | 0.85 | 0.630 | 0.709 | BTDO019.5  | BTDI014    | 0.768    |       |
| BTA-Rxx.xxxDE4-21.5-□□□ | 0.859 - 0.902 | 2.56      | 0.85 | 0.689 | 0.768 | BTDO021.5  | BTDI015    | 0.846    |       |
| BTA-Rxx.xxxDE4-21.5-□□□ | 0.902 - 0.949 | 2.56      | 0.85 | 0.689 | 0.768 | BTDO021.5  | BTDI015    | 0.846    |       |
| BTA-Rxx.xxxDE4-23.5-□□□ | 0.949 - 0.992 | 2.56      | 0.85 | 0.748 | 0.827 | BTDO023.5  | BTDI016    | 0.925    |       |
| BTA-Rxx.xxxDE4-23.5-□□□ | 0.993 - 1.039 | 2.56      | 0.85 | 0.748 | 0.827 | BTDO023.5  | BTDI016    | 0.925    |       |
| BTA-Rxx.xxxDE4-26-□□□   | 1.040 - 1.083 | 2.56      | 0.96 | 0.827 | 0.925 | BTDO026    | BTDI018    | 1.024    |       |
| BTA-Rxx.xxxDE4-26-□□□   | 1.083 - 1.130 | 2.56      | 0.96 | 0.827 | 0.925 | BTDO026    | BTDI018    | 1.024    |       |
| BTA-Rxx.xxxDE4-28-□□□   | 1.130 - 1.173 | 2.76      | 0.96 | 0.906 | 1.004 | BTDO028    | BTDI020    | 1.102    |       |
| BTA-Rxx.xxxDE4-28-□□□   | 1.174 - 1.220 | 2.76      | 0.96 | 0.906 | 1.004 | BTDO028    | BTDI020    | 1.102    |       |
| BTA-Rxx.xxxDE4-30.5-□□□ | 1.221 - 1.264 | 2.76      | 0.96 | 1.004 | 1.102 | BTDO030.5  | BTDI022    | 1.201    |       |
| BTA-Rxx.xxxDE4-30.5-□□□ | 1.264 - 1.311 | 2.76      | 0.96 | 1.004 | 1.102 | BTDO030.5  | BTDI022    | 1.201    |       |
| BTA-Rxx.xxxDE4-33-□□□   | 1.311 - 1.370 | 2.76      | 1.20 | 1.063 | 1.181 | BTDO033.0  | BTDI024    | 1.299    |       |
| BTA-Rxx.xxxDE4-33-□□□   | 1.370 - 1.425 | 2.76      | 1.20 | 1.063 | 1.181 | BTDO033.0  | BTDI024    | 1.299    |       |
| BTA-Rxx.xxxDE4-35.5-□□□ | 1.426 - 1.469 | 3.23      | 1.20 | 1.181 | 1.299 | BTDO035.5  | BTDI026    | 1.398    |       |
| BTA-Rxx.xxxDE4-35.5-□□□ | 1.469 - 1.512 | 3.23      | 1.20 | 1.181 | 1.299 | BTDO035.5  | BTDI026    | 1.398    |       |
| BTA-Rxx.xxxDE4-35.5-□□□ | 1.512 - 1.559 | 3.23      | 1.20 | 1.181 | 1.299 | BTDO035.5  | BTDI026    | 1.398    |       |
| BTA-Rxx.xxxDE4-39-□□□   | 1.559 - 1.598 | 3.23      | 1.20 | 1.299 | 1.417 | BTDO039    | BTDI029    | 1.535    |       |
| BTA-Rxx.xxxDE4-39-□□□   | 1.599 - 1.646 | 3.23      | 1.20 | 1.299 | 1.417 | BTDO039    | BTDI029    | 1.535    |       |
| BTA-Rxx.xxxDE4-39-□□□   | 1.646 - 1.693 | 3.23      | 1.20 | 1.299 | 1.417 | BTDO039    | BTDI029    | 1.535    |       |
| BTA-Rxx.xxxDE4-42.5-□□□ | 1.693 - 1.744 | 3.23      | 1.20 | 1.417 | 1.535 | BTDO042.5  | BTDI032    | 1.673    |       |
| BTA-Rxx.xxxDE4-42.5-□□□ | 1.744 - 1.795 | 3.23      | 1.20 | 1.417 | 1.535 | BTDO042.5  | BTDI032    | 1.673    |       |
| BTA-Rxx.xxxDE4-42.5-□□□ | 1.796 - 1.850 | 3.23      | 1.20 | 1.417 | 1.535 | BTDO042.5  | BTDI032    | 1.673    |       |
| BTA-Rxx.xxxDE4-46.5-□□□ | 1.851 - 1.909 | 3.23      | 1.36 | 1.555 | 1.693 | BTDO046.5  | BTDI035    | 1.831    |       |
| BTA-Rxx.xxxDE4-46.5-□□□ | 1.910 - 1.972 | 3.23      | 1.36 | 1.555 | 1.693 | BTDO046.5  | BTDI035    | 1.831    |       |
| BTA-Rxx.xxxDE4-46.5-□□□ | 1.973 - 2.035 | 3.23      | 1.36 | 1.555 | 1.693 | BTDO046.5  | BTDI035    | 1.831    |       |
| BTA-Rxx.xxxDE4-51-□□□   | 2.036 - 2.094 | 3.66      | 1.36 | 1.713 | 1.850 | BTDO051    | BTDI039    | 2.008    |       |
| BTA-Rxx.xxxDE4-51-□□□   | 2.095 - 2.154 | 3.66      | 1.36 | 1.713 | 1.850 | BTDO051    | BTDI039    | 2.008    |       |
| BTA-Rxx.xxxDE4-51-□□□   | 2.154 - 2.213 | 3.66      | 1.36 | 1.713 | 1.850 | BTDO051    | BTDI039    | 2.008    |       |
| BTA-Rxx.xxxDE4-55.5-□□□ | 2.213 - 2.299 | 3.66      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    |       |
| BTA-Rxx.xxxDE4-55.5-□□□ | 2.300 - 2.386 | 3.66      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    |       |
| BTA-Rxx.xxxDE4-55.5-□□□ | 2.386 - 2.472 | 3.66      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    |       |
| BTA-Rxx.xxxDE4-55.5-□□□ | 2.473 - 2.559 | 3.66      | 1.36 | 1.870 | 2.008 | BTDO055.5  | BTDI043A   | 2.185    |       |

Ordering example: BTA-R00.726DE4-18-B30

•Reamer diameter: 0.726

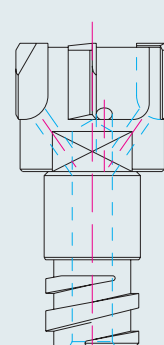
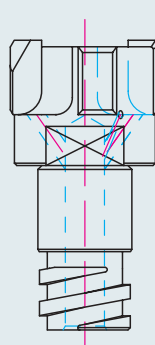
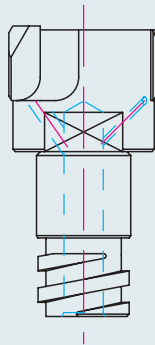
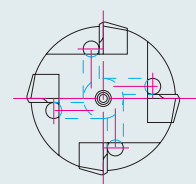
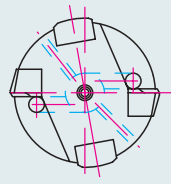
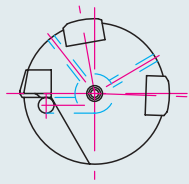
•Chip backward style (Chip forward style is available for through hole)

•Entering angle: 30degree

**BOREline**

## HEAD CHANGE REAMER BT REAMER

HEAD

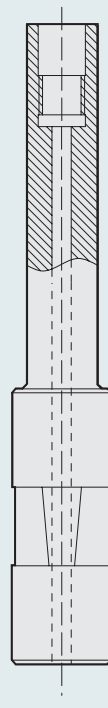


**BTRS**  
SINGLE CUTTING EDGE, DISPOSABLE

**BTRW**  
TWO CUTTING EDGES, DISPOSABLE

**BTRM**  
MULTI CUTTING EDGES, DISPOSABLE

ST Shank



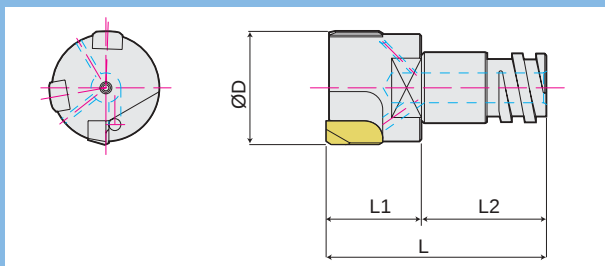
MT Shank



# BTA REAMER HEAD - SHANK SYSTEM BTRS

## Diameters

0.236 - 0.984



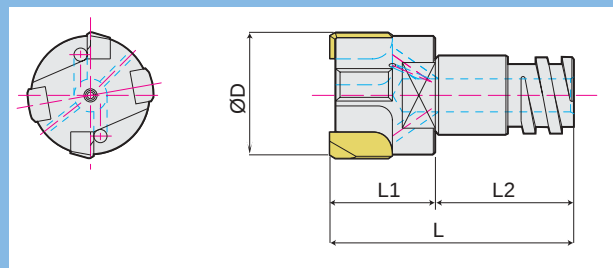
| Designation     | Diameter      | L    | L1   | L2   | Bar       |
|-----------------|---------------|------|------|------|-----------|
| BTRS xx.xxx 041 | 0.236 - 0.305 | 0.94 | 0.51 | 0.43 | BTR04-... |
| BTRS xx.xxx 051 | 0.305 - 0.344 | 0.98 | 0.51 | 0.47 | BTR05-... |
| BTRS xx.xxx 061 | 0.344 - 0.383 | 1.06 | 0.55 | 0.51 | BTR06-... |
| BTRS xx.xxx 071 | 0.384 - 0.433 | 1.14 | 0.59 | 0.55 | BTR07-... |
| BTRS xx.xxx 081 | 0.433 - 0.472 | 1.14 | 0.59 | 0.55 | BTR08-... |
| BTRS xx.xxx 091 | 0.472 - 0.511 | 1.18 | 0.59 | 0.59 | BTR09-... |
| BTRS xx.xxx 092 | 0.512 - 0.590 | 1.18 | 0.59 | 0.59 | BTR09-... |
| BTRS xx.xxx 101 | 0.591 - 0.630 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRS xx.xxx 102 | 0.630 - 0.669 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRS xx.xxx 103 | 0.669 - 0.708 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRS xx.xxx 104 | 0.709 - 0.748 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRS xx.xxx 121 | 0.748 - 0.787 | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRS xx.xxx 122 | 0.787 - 0.866 | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRS xx.xxx 123 | 0.866 - 0.944 | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRS xx.xxx 124 | 0.945 - 0.984 | 1.46 | 0.63 | 0.83 | BTR12-... |

\* For high speed machining, ceramic guide is available on request.

## BTA REAMER HEAD - SHANK SYSTEM BTRW

### Diameters

0.236 - 0.984



| Designation     | Diameter             | L    | L1   | L2   | Bar       |
|-----------------|----------------------|------|------|------|-----------|
| BTRW xx.xxx 041 | <b>0.236 - 0.305</b> | 0.94 | 0.51 | 0.43 | BTR04-... |
| BTRW xx.xxx 051 | <b>0.305 - 0.344</b> | 0.98 | 0.51 | 0.47 | BTR05-... |
| BTRW xx.xxx 061 | <b>0.344 - 0.383</b> | 1.06 | 0.55 | 0.51 | BTR06-... |
| BTRW xx.xxx 071 | <b>0.384 - 0.433</b> | 1.14 | 0.59 | 0.55 | BTR07-... |
| BTRW xx.xxx 081 | <b>0.433 - 0.472</b> | 1.14 | 0.59 | 0.55 | BTR08-... |
| BTRW xx.xxx 091 | <b>0.472 - 0.511</b> | 1.18 | 0.59 | 0.59 | BTR09-... |
| BTRW xx.xxx 092 | <b>0.512 - 0.590</b> | 1.18 | 0.59 | 0.59 | BTR09-... |
| BTRW xx.xxx 101 | <b>0.591 - 0.630</b> | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRW xx.xxx 102 | <b>0.630 - 0.669</b> | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRW xx.xxx 103 | <b>0.669 - 0.708</b> | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRW xx.xxx 104 | <b>0.709 - 0.748</b> | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRW xx.xxx 121 | <b>0.748 - 0.787</b> | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRW xx.xxx 122 | <b>0.787 - 0.866</b> | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRW xx.xxx 123 | <b>0.866 - 0.944</b> | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRW xx.xxx 124 | <b>0.945 - 0.984</b> | 1.46 | 0.63 | 0.83 | BTR12-... |

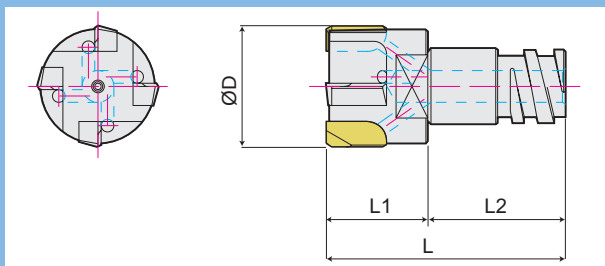
\* For high speed machining, ceramic guide is available on request.

# Ingersoll

## BTA REAMER HEAD - SHANK SYSTEM BTRM

### Diameters

0.236 - 0.984



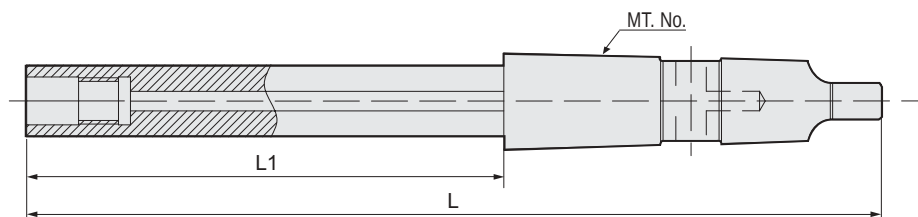
| Designation     | Diameter      | L    | L1   | L2   | Bar       |
|-----------------|---------------|------|------|------|-----------|
| BTRM xx.xxx 041 | 0.236 - 0.305 | 0.94 | 0.51 | 0.43 | BTR04-... |
| BTRM xx.xxx 051 | 0.305 - 0.344 | 0.98 | 0.51 | 0.47 | BTR05-... |
| BTRM xx.xxx 061 | 0.344 - 0.383 | 1.06 | 0.55 | 0.51 | BTR06-... |
| BTRM xx.xxx 071 | 0.384 - 0.433 | 1.14 | 0.59 | 0.55 | BTR07-... |
| BTRM xx.xxx 081 | 0.433 - 0.472 | 1.14 | 0.59 | 0.55 | BTR08-... |
| BTRM xx.xxx 091 | 0.472 - 0.511 | 1.18 | 0.59 | 0.59 | BTR09-... |
| BTRM xx.xxx 092 | 0.512 - 0.590 | 1.18 | 0.59 | 0.59 | BTR09-... |
| BTRM xx.xxx 101 | 0.591 - 0.630 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRM xx.xxx 102 | 0.630 - 0.669 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRM xx.xxx 103 | 0.669 - 0.708 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRM xx.xxx 104 | 0.709 - 0.748 | 1.26 | 0.63 | 0.63 | BTR10-... |
| BTRM xx.xxx 121 | 0.748 - 0.787 | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRM xx.xxx 122 | 0.787 - 0.866 | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRM xx.xxx 123 | 0.866 - 0.944 | 1.46 | 0.63 | 0.83 | BTR12-... |
| BTRM xx.xxx 124 | 0.945 - 0.984 | 1.46 | 0.63 | 0.83 | BTR12-... |

\* For high speed machining, ceramic guide is available on request.

## SHANKS - BTA REAMER HEADS BT REAMER BAR

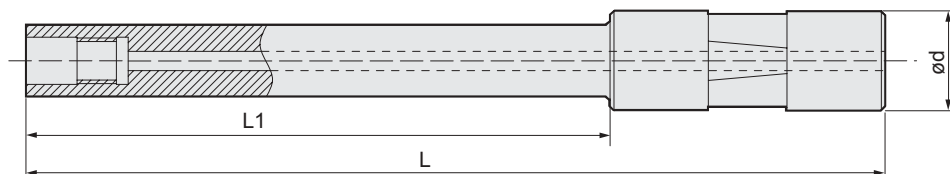
**Diameters**  
0.260 - 0.984

### MT Shank



| Part No.      | Diameter      | L    | L1   | MT. No. | Corresponding Reaming Head      |
|---------------|---------------|------|------|---------|---------------------------------|
| BTR04-090-MT1 | 0.236 - 0.305 | 6.12 | 3.54 | 1       | BTRW/S/M XX.XxX 041             |
| BTR05-100-MT1 | 0.305 - 0.344 | 6.52 | 3.94 | 1       | BTRW/S/M XX.XxX 051             |
| BTR06-100-MT1 | 0.344 - 0.383 | 6.52 | 3.94 | 1       | BTRW/S/M XX.XxX 061             |
| BTR07-120-MT2 | 0.384 - 0.433 | 7.87 | 4.72 | 2       | BTRW/S/M XX.XxX 071             |
| BTR08-120-MT2 | 0.433 - 0.472 | 7.87 | 4.72 | 2       | BTRW/S/M XX.XxX 081             |
| BTR09-120-MT2 | 0.472 - 0.590 | 7.87 | 4.72 | 2       | BTRW/S/M XX.XxX 091,092         |
| BTR10-150-MT3 | 0.591 - 0.748 | 9.06 | 5.91 | 2       | BTRW/S/M XX.XxX 101,102,103,104 |
| BTR12-150-MT3 | 0.748 - 0.984 | 9.80 | 5.91 | 3       | BTRW/S/M XX.XxX 121,122,123,124 |

### ST Shank



| Part No.       | Diameter      | L    | L1   | d     | Corresponding Reaming Head      |
|----------------|---------------|------|------|-------|---------------------------------|
| BTR04-040-ST20 | 0.236 - 0.305 | 4.33 | 1.57 | 0.787 | BTRW/S/M XX.XxX 041             |
| BTR05-050-ST20 | 0.305 - 0.344 | 4.72 | 1.97 | 0.787 | BTRW/S/M XX.XxX 051             |
| BTR06-050-ST20 | 0.344 - 0.383 | 4.72 | 1.97 | 0.787 | BTRW/S/M XX.XxX 061             |
| BTR07-060-ST20 | 0.384 - 0.433 | 5.12 | 2.36 | 0.787 | BTRW/S/M XX.XxX 071             |
| BTR08-060-ST20 | 0.433 - 0.472 | 5.12 | 2.36 | 0.787 | BTRW/S/M XX.XxX 081             |
| BTR09-060-ST20 | 0.472 - 0.590 | 5.12 | 2.36 | 0.787 | BTRW/S/M XX.XxX 091,092         |
| BTR10-080-ST25 | 0.591 - 0.748 | 5.91 | 3.15 | 0.984 | BTRW/S/M XX.XxX 101,102,103,104 |
| BTR12-100-ST25 | 0.748 - 0.984 | 6.69 | 3.94 | 0.984 | BTRW/S/M XX.XxX 121,122,123,124 |



# Ingersoll



CUTTING TOOLS  
CUTTING TOOLS

# BTA DRILLS

*Cutting Tools*

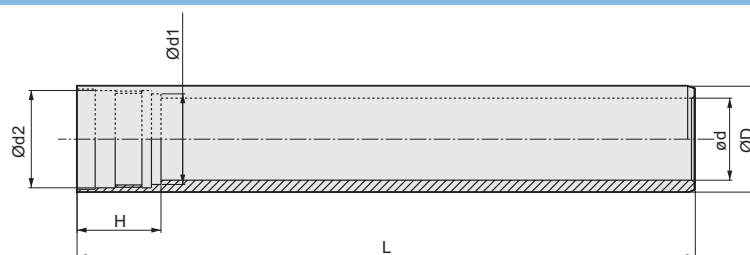
## Drill Tubes

Single Tube System (STS)

Double Tube System (DTS)



**Drill Range**  
0.496 - 9.606

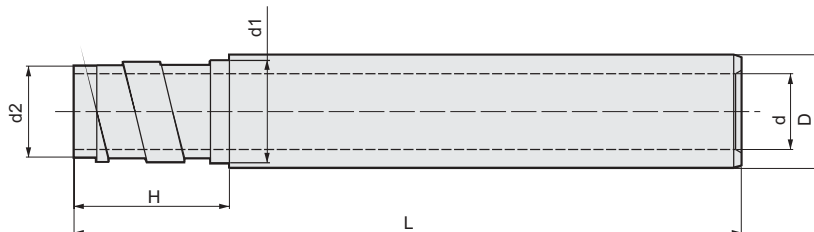


| Drill Range   | Designation | Dimension |       |       |       |      |      |
|---------------|-------------|-----------|-------|-------|-------|------|------|
|               |             | D         | d     | d1    | d2    | H    | S    |
| 0.496 - 0.535 | BTSI 011*   | 0.433     | 0.276 | 0.323 | 0.378 | 0.87 | 0.24 |
| 0.536 - 0.575 | BTSI 012*   | 0.472     | 0.315 | 0.362 | 0.417 | 0.87 | 0.24 |
| 0.575 - 0.614 | BTSI 013*   | 0.512     | 0.335 | 0.402 | 0.457 | 0.87 | 0.24 |
| 0.614 - 0.657 | BTSI 014    | 0.551     | 0.354 | 0.425 | 0.496 | 0.83 | 0.31 |
| 0.658 - 0.697 | BTSI 015    | 0.591     | 0.394 | 0.465 | 0.535 | 0.83 | 0.31 |
| 0.697 - 0.744 | BTSI 016    | 0.630     | 0.413 | 0.492 | 0.571 | 0.87 | 0.31 |
| 0.744 - 0.787 | BTSI 017    | 0.669     | 0.453 | 0.531 | 0.610 | 0.87 | 0.31 |
| 0.788 - 0.858 | BTSI 018    | 0.709     | 0.472 | 0.551 | 0.630 | 1.08 | 0.39 |
| 0.859 - 0.949 | BTSI 020    | 0.787     | 0.512 | 0.630 | 0.709 | 1.18 | 0.47 |
| 0.949 - 1.039 | BTSI 022    | 0.866     | 0.551 | 0.689 | 0.768 | 1.18 | 0.47 |
| 1.040 - 1.130 | BTSI 024    | 0.945     | 0.610 | 0.748 | 0.827 | 1.18 | 0.47 |
| 1.130 - 1.220 | BTSI 026    | 1.024     | 0.669 | 0.827 | 0.925 | 1.30 | 0.63 |
| 1.221 - 1.311 | BTSI 028    | 1.102     | 0.728 | 0.906 | 1.004 | 1.30 | 0.63 |
| 1.311 - 1.425 | BTSI 030    | 1.181     | 0.787 | 1.004 | 1.102 | 1.30 | 0.63 |
| 1.426 - 1.559 | BTSI 033    | 1.299     | 0.906 | 1.063 | 1.181 | 1.57 | 0.79 |
| 1.559 - 1.693 | BTSI 036    | 1.417     | 1.004 | 1.181 | 1.299 | 1.57 | 0.79 |
| 1.693 - 1.850 | BTSI 039    | 1.535     | 1.102 | 1.299 | 1.417 | 1.57 | 0.79 |
| 1.851 - 2.035 | BTSI 043    | 1.693     | 1.220 | 1.417 | 1.535 | 1.57 | 0.79 |
| 2.036 - 2.213 | BTSI 047    | 1.850     | 1.378 | 1.555 | 1.693 | 1.73 | 0.94 |
| 2.213 - 2.386 | BTSI 051    | 2.008     | 1.535 | 1.713 | 1.850 | 1.73 | 0.94 |
| 2.386 - 2.559 | BTSI 056A   | 2.205     | 1.693 | 1.870 | 2.008 | 1.73 | 0.94 |
| 2.559 - 2.637 | BTSI 056B   | 2.205     | 1.693 | 1.850 | 2.047 | 2.95 | 1.26 |
| 2.638 - 2.874 | BTSI 062    | 2.441     | 1.890 | 2.087 | 2.283 | 2.95 | 1.26 |
| 2.874 - 3.149 | BTSI 068    | 2.677     | 2.087 | 2.283 | 2.480 | 2.95 | 1.26 |
| 3.150 - 3.425 | BTSI 075    | 2.953     | 2.323 | 2.520 | 2.756 | 3.82 | 1.73 |
| 3.425 - 3.937 | BTSI 082    | 3.228     | 2.598 | 2.795 | 3.031 | 3.82 | 1.73 |
| 3.937 - 4.409 | BTSI 094    | 3.701     | 3.071 | 3.268 | 3.504 | 3.82 | 1.73 |
| 4.409 - 4.881 | BTSI 106    | 4.173     | 3.543 | 3.740 | 3.976 | 4.65 | 2.36 |
| 4.882 - 5.354 | BTSI 118    | 4.646     | 3.622 | 4.213 | 4.449 | 4.65 | 2.36 |
| 5.354 - 5.826 | BTSI 130    | 5.118     | 4.094 | 4.685 | 4.921 | 4.65 | 2.36 |
| 5.827 - 6.299 | BTSI 142    | 5.591     | 4.567 | 5.157 | 5.394 | 5.47 | 2.83 |
| 6.299 - 6.771 | BTSI 154    | 6.063     | 5.039 | 5.630 | 5.866 | 5.47 | 2.83 |
| 6.772 - 7.244 | BTSI 166    | 6.535     | 5.512 | 6.102 | 6.339 | 5.47 | 2.83 |
| 7.244 - 7.716 | BTSI 178    | 7.008     | 5.984 | 6.575 | 6.811 | 5.67 | 3.15 |
| 7.717 - 8.189 | BTSI 190    | 7.480     | 6.063 | 7.047 | 7.283 | 5.67 | 3.15 |
| 8.189 - 8.661 | BTSI 202    | 7.953     | 6.535 | 7.520 | 7.756 | 5.67 | 3.15 |
| 8.661 - 9.133 | BTSI 214    | 8.425     | 7.008 | 7.913 | 8.189 | 6.46 | 3.62 |
| 9.134 - 9.606 | BTSI 226    | 8.898     | 7.480 | 8.386 | 8.661 | 6.46 | 3.62 |

1) Please indicate overall length (L) when ordering.

\* Indicates parts are outer two start thread

**Drill Range**  
0.571 - 9.685

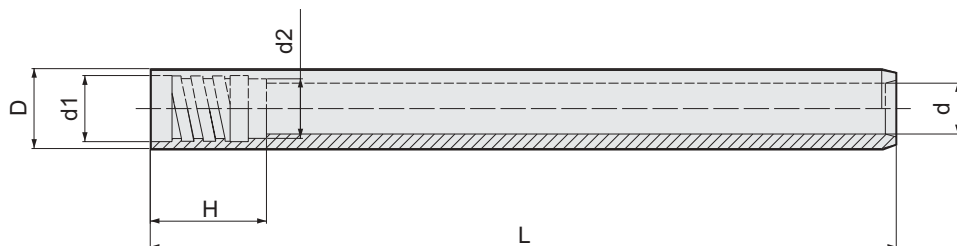


| Drill Range   | Designation | Dimension |       |      |       |       |      |
|---------------|-------------|-----------|-------|------|-------|-------|------|
|               |             | D         | d     | H    | d1    | d2    | S    |
| 0.571 - 0.591 | BTSE 012A   | 0.472     | 0.315 | 0.91 | 0.453 | 0.390 | 0.24 |
| 0.591 - 0.610 | BTSE 012B   | 0.472     | 0.315 | 0.91 | 0.465 | 0.402 | 0.24 |
| 0.611 - 0.630 | BTSE 013A   | 0.512     | 0.335 | 0.91 | 0.488 | 0.425 | 0.24 |
| 0.630 - 0.650 | BTSE 013B   | 0.512     | 0.335 | 0.91 | 0.500 | 0.437 | 0.24 |
| 0.650 - 0.679 | BTSE 014A   | 0.551     | 0.354 | 0.91 | 0.528 | 0.465 | 0.24 |
| 0.680 - 0.709 | BTSE 014B   | 0.551     | 0.354 | 0.91 | 0.539 | 0.476 | 0.24 |
| 0.709 - 0.748 | BTSE 015    | 0.591     | 0.394 | 0.91 | 0.567 | 0.504 | 0.24 |
| 0.748 - 0.787 | BTSE 016.5  | 0.650     | 0.433 | 0.91 | 0.606 | 0.543 | 0.24 |
| 0.787 - 0.866 | BTSE 018    | 0.709     | 0.472 | 1.02 | 0.650 | 0.571 | 0.39 |
| 0.866 - 0.984 | BTSE 020    | 0.787     | 0.512 | 1.02 | 0.748 | 0.630 | 0.39 |
| 0.984 - 1.063 | BTSE 022    | 0.866     | 0.551 | 1.02 | 0.787 | 0.669 | 0.39 |
| 1.063 - 1.181 | BTSE 024    | 0.945     | 0.610 | 1.02 | 0.866 | 0.748 | 0.39 |
| 1.181 - 1.259 | BTSE 026    | 1.024     | 0.669 | 1.02 | 0.945 | 0.827 | 0.39 |
| 1.260 - 1.338 | BTSE 028    | 1.102     | 0.728 | 1.02 | 1.024 | 0.906 | 0.39 |
| 1.339 - 1.456 | BTSE 030    | 1.181     | 0.787 | 1.61 | 1.063 | 0.945 | 0.79 |
| 1.457 - 1.574 | BTSE 033    | 1.299     | 0.906 | 1.61 | 1.181 | 1.063 | 0.79 |
| 1.575 - 1.732 | BTSE 036    | 1.417     | 1.004 | 1.61 | 1.299 | 1.181 | 0.79 |
| 1.732 - 1.850 | BTSE 039    | 1.535     | 1.102 | 1.61 | 1.457 | 1.339 | 0.79 |
| 1.850 - 2.047 | BTSE 043    | 1.693     | 1.220 | 1.61 | 1.614 | 1.457 | 0.79 |
| 2.047 - 2.244 | BTSE 047    | 1.850     | 1.378 | 1.61 | 1.732 | 1.575 | 0.79 |
| 2.244 - 2.401 | BTSE 051    | 2.008     | 1.535 | 1.61 | 1.929 | 1.772 | 0.79 |
| 2.402 - 2.677 | BTSE 056    | 2.205     | 1.693 | 1.61 | 2.087 | 1.929 | 0.79 |
| 2.677 - 2.952 | BTSE 062    | 2.441     | 1.890 | 1.61 | 2.323 | 2.126 | 0.79 |
| 2.953 - 3.189 | BTSE 068    | 2.677     | 2.087 | 2.80 | 2.559 | 2.362 | 1.57 |
| 3.189 - 3.582 | BTSE 075    | 2.953     | 2.323 | 2.80 | 2.795 | 2.598 | 1.57 |
| 3.583 - 3.897 | BTSE 082    | 3.228     | 2.598 | 2.80 | 3.110 | 2.913 | 1.57 |
| 3.898 - 4.370 | BTSE 094    | 3.701     | 3.071 | 2.80 | 3.543 | 3.346 | 1.57 |
| 4.370 - 4.842 | BTSE 106    | 4.173     | 3.543 | 2.80 | 4.016 | 3.819 | 1.57 |
| 4.843 - 5.315 | BTSE 118    | 4.646     | 4.016 | 2.80 | 4.488 | 4.291 | 1.57 |
| 5.315 - 5.866 | BTSE 130    | 5.118     | 4.488 | 2.80 | 4.961 | 4.764 | 1.57 |
| 5.866 - 6.378 | BTSE 142    | 5.591     | 4.961 | 2.80 | 5.472 | 5.276 | 1.57 |
| 6.378 - 6.850 | BTSE 154    | 6.063     | 5.433 | 3.39 | 5.945 | 5.709 | 2.20 |
| 6.850 - 7.322 | BTSE 166    | 6.535     | 5.906 | 3.39 | 6.417 | 6.181 | 2.20 |
| 7.323 - 7.795 | BTSE 178    | 7.008     | 6.378 | 3.39 | 6.890 | 6.654 | 2.20 |
| 7.795 - 8.267 | BTSE 190    | 7.480     | 6.850 | 3.39 | 7.362 | 7.126 | 2.20 |
| 8.268 - 8.740 | BTSE 202    | 7.953     | 7.323 | 3.39 | 7.835 | 7.598 | 2.20 |
| 8.740 - 9.212 | BTSE 214    | 8.425     | 7.795 | 3.39 | 8.307 | 8.071 | 2.20 |
| 9.213 - 9.685 | BTSE 226    | 8.898     | 8.268 | 3.39 | 8.780 | 8.543 | 2.20 |

1) Please indicate overall length (L) when ordering.

## TUBE SINGLE TUBE SYSTEM - INNER SINGLE START THREAD

**Drill Range**  
0.315 - 0.570

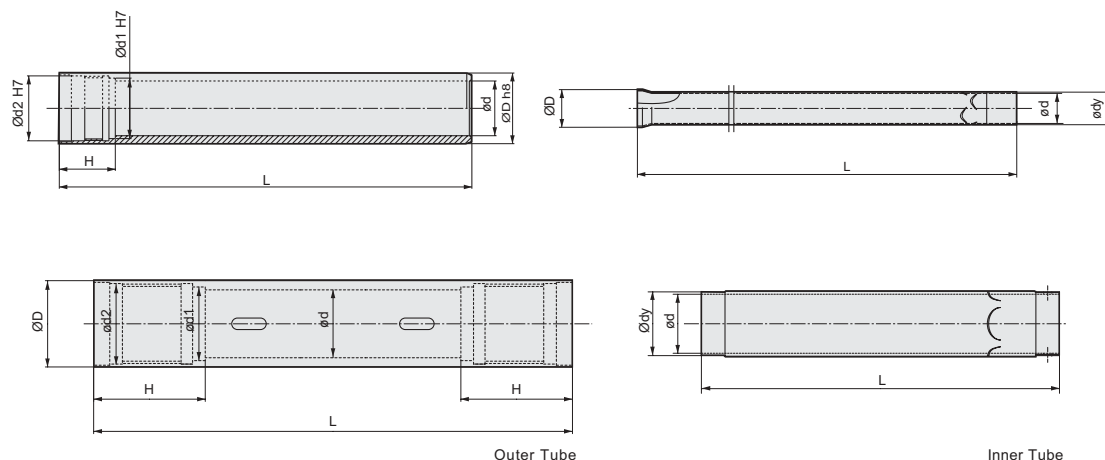


| Drill Range   | Designation | Dimension |       |       |       |      |      |
|---------------|-------------|-----------|-------|-------|-------|------|------|
|               |             | D         | d     | d1    | d2    | H    | S    |
| 0.315 - 0.350 | BTSO 071    | 0.280     | 0.177 | 0.236 | 0.213 | 0.63 | 0.16 |
| 0.354 - 0.393 | BTSO 083    | 0.327     | 0.197 | 0.283 | 0.248 | 0.63 | 0.16 |
| 0.394 - 0.433 | BTSO 090    | 0.354     | 0.217 | 0.299 | 0.264 | 0.63 | 0.16 |
| 0.433 - 0.472 | BTSO 100    | 0.394     | 0.256 | 0.339 | 0.303 | 0.63 | 0.16 |
| 0.472 - 0.531 | BTSO 110    | 0.433     | 0.276 | 0.358 | 0.323 | 0.63 | 0.24 |
| 0.531 - 0.570 | BTSO 120    | 0.472     | 0.315 | 0.425 | 0.370 | 0.63 | 0.24 |

1) Please indicate overall length (L) when ordering.

# TUBE DOUBLE TUBE SYSTEM - INNER FOUR START THREAD

**Drill Range**  
0.725 - 6.771



| Drill Range   | Outer Tube | Dimension |       |       |       |      |      | Inner Tube | Dimension |       |       |
|---------------|------------|-----------|-------|-------|-------|------|------|------------|-----------|-------|-------|
|               |            | D         | d     | d1    | d2    | H    | S    |            | D         | dy    | d     |
| 0.725 - 0.787 | BTDO 018   | 0.709     | 0.472 | 0.551 | 0.630 | 1.08 | 0.39 | BTDI 012   | 0.472     | 0.394 | 0.354 |
| 0.788 - 0.858 | BTDO 019.5 | 0.768     | 0.551 | 0.630 | 0.709 | 1.18 | 0.47 | BTDI 014   | 0.551     | 0.472 | 0.433 |
| 0.859 - 0.949 | BTDO 021.5 | 0.846     | 0.591 | 0.689 | 0.768 | 1.18 | 0.47 | BTDI 015   | 0.591     | 0.512 | 0.472 |
| 0.949 - 1.039 | BTDO 023.5 | 0.925     | 0.630 | 0.748 | 0.827 | 1.18 | 0.47 | BTDI 016   | 0.630     | 0.551 | 0.512 |
| 1.040 - 1.130 | BTDO 026   | 1.024     | 0.709 | 0.827 | 0.925 | 1.30 | 0.63 | BTDI 018   | 0.709     | 0.630 | 0.551 |
| 1.130 - 1.220 | BTDO 028   | 1.102     | 0.787 | 0.906 | 1.004 | 1.30 | 0.63 | BTDI 020   | 0.787     | 0.709 | 0.630 |
| 1.221 - 1.311 | BTDO 030.5 | 1.201     | 0.866 | 1.004 | 1.102 | 1.30 | 0.63 | BTDI 022   | 0.866     | 0.787 | 0.709 |
| 1.311 - 1.425 | BTDO 033   | 1.299     | 0.945 | 1.063 | 1.181 | 1.57 | 0.79 | BTDI 024   | 0.945     | 0.866 | 0.787 |
| 1.426 - 1.559 | BTDO 035.5 | 1.398     | 1.024 | 1.181 | 1.299 | 1.57 | 0.79 | BTDI 026   | 1.024     | 0.945 | 0.866 |
| 1.559 - 1.693 | BTDO 039   | 1.535     | 1.142 | 1.299 | 1.417 | 1.57 | 0.79 | BTDI 029   | 1.142     | 1.063 | 0.984 |
| 1.693 - 1.850 | BTDO 042.5 | 1.673     | 1.260 | 1.417 | 1.535 | 1.57 | 0.79 | BTDI 032   | 1.260     | 1.181 | 1.102 |
| 1.851 - 2.035 | BTDO 046.5 | 1.831     | 1.378 | 1.555 | 1.693 | 1.73 | 0.94 | BTDI 035   | 1.378     | 1.260 | 1.181 |
| 2.036 - 2.213 | BTDO 051   | 2.008     | 1.535 | 1.713 | 1.850 | 1.73 | 0.94 | BTDI 039   | 1.535     | 1.417 | 1.339 |
| 2.213 - 2.559 | BTDO 055.5 | 2.185     | 1.693 | 1.870 | 2.008 | 1.73 | 0.94 | BTDI 043A  | 1.693     | 1.575 | 1.496 |
| 2.559 - 2.756 | BTDO 056   | 2.205     | 1.693 | 1.850 | 2.047 | 2.95 | 1.26 | BTDI 043B  | -         | 1.575 | 1.496 |
| 2.756 - 2.874 | BTDO 062   | 2.441     | 1.890 | 2.087 | 2.283 | 2.95 | 1.26 | BTDI 048   | -         | 1.732 | 1.614 |
| 2.874 - 3.149 | BTDO 068   | 2.677     | 2.087 | 2.283 | 2.480 | 2.95 | 1.26 | BTDI 053   | -         | 1.890 | 1.772 |
| 3.150 - 3.425 | BTDO 075   | 2.953     | 2.323 | 2.520 | 2.756 | 3.82 | 1.73 | BTDI 059   | -         | 2.126 | 1.969 |
| 3.425 - 3.937 | BTDO 082   | 3.228     | 2.598 | 2.795 | 3.031 | 3.82 | 1.73 | BTDI 066   | -         | 2.362 | 2.205 |
| 3.937 - 4.409 | BTDO 094   | 3.701     | 3.071 | 3.228 | 3.504 | 3.82 | 1.73 | BTDI 078   | -         | 2.756 | 2.598 |
| 4.409 - 4.881 | BTDO 106   | 4.173     | 3.543 | 3.740 | 3.976 | 4.65 | 2.36 | BTDI 090   | -         | 3.150 | 2.992 |
| 4.882 - 5.354 | BTDO 118   | 4.646     | 3.622 | 4.213 | 4.449 | 4.65 | 2.36 | BTDI 092   | -         | 3.150 | 2.992 |
| 5.354 - 5.826 | BTDO 130   | 5.118     | 4.094 | 4.685 | 4.921 | 4.65 | 2.36 | BTDI104    | -         | 3.740 | 3.583 |
| 5.827 - 6.299 | BTDO 142   | 5.591     | 4.567 | 5.157 | 5.394 | 5.47 | 2.83 | BTDI 116   | -         | 3.937 | 3.780 |
| 6.299 - 6.771 | BTDO 154   | 6.063     | 6.220 | 5.630 | 5.866 | 5.47 | 2.83 | BTDI 128   | -         | 4.724 | 4.567 |

1) Please indicate overall length(L) when ordering.

\*For diameter range 0.725- 2.559 (OT13) the inner tube should be ordered 1.181 longer than the outer tube.

\*For diameter range 2.559- 4.881 (OT14 - OT20) the inner tube should be ordered 7.480 longer than outer tube.

\*For diameter range 4.882- 7.244 (OT21 - OT25) the inner tube should be ordered 8.661 longer than the outer tube.

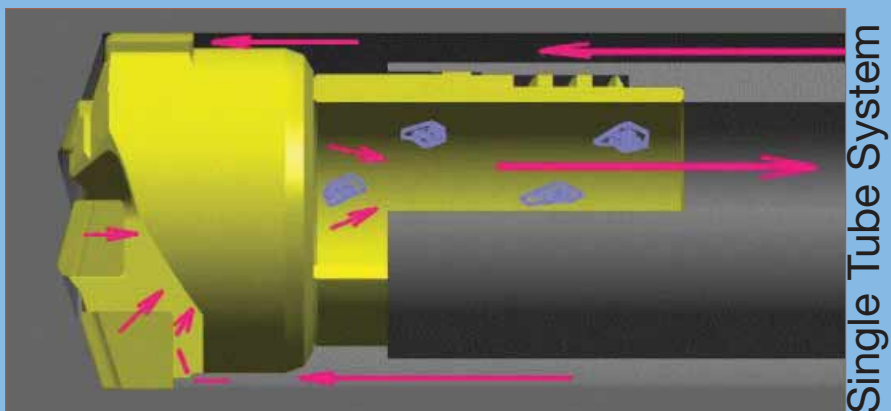
# Ingersoll



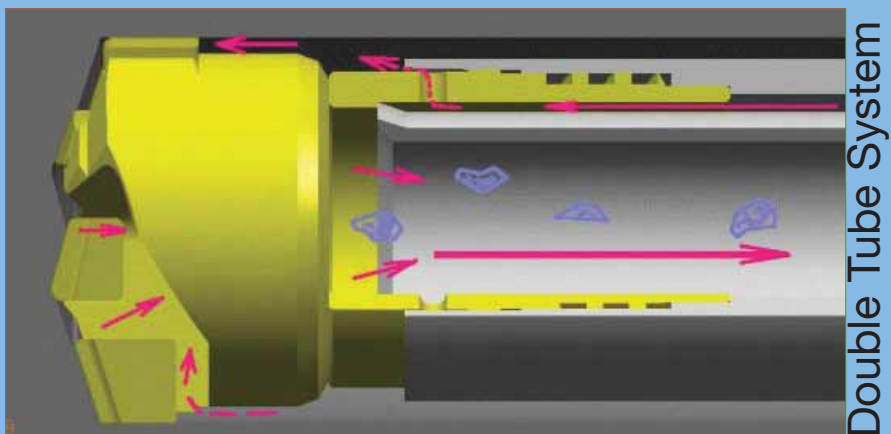
# USERS GUIDE

*Cutting Tools*

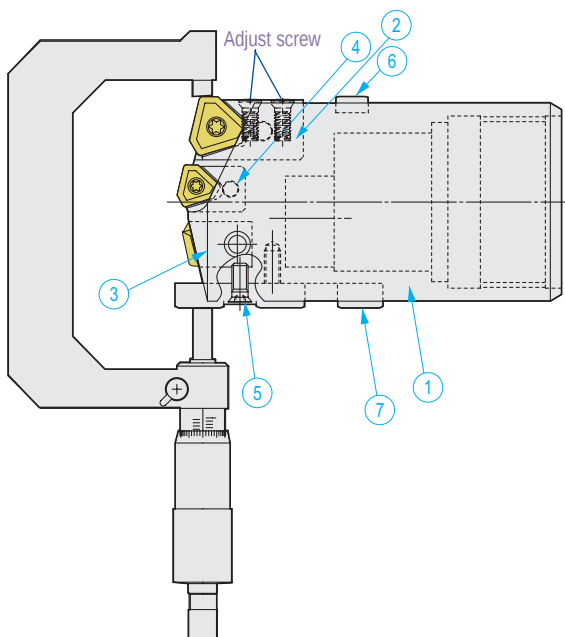
Single Tube System



Double Tube System



## Setting the diameter when indexing and replacing inserts



1. Head Shank
2. Outer Cartridge & Lock Screw
3. Inner Cartridge & Lock Screw
4. Center Cartridge & Lock Screw
5. Guide pad & Lock Screw
6. Sub Guide Pad & Lock Screw
7. Guide Pad Protector & Lock Screw

- STEP 1: Slide the Guide Pad (5) forward as shown in the diagram  
- locate the lock screw (5) as shown and tighten
- STEP 2: Loosen the adjust screws and the lock screw of the outer cartridge (2)
- STEP 3: Firmly push the outer cartridge toward the center of the head.
- STEP 4: Slightly tighten the lock screw (2) and adjust the diameter with the two adjust screws.
- STEP 5: When adjustment is completed, firmly tighten the lock screw (2).

## Replacing Inserts:

Clean insert pockets carefully and remove even the smallest foreign particles from insert pocket.  
Fasten insert securely in the cartridge and ensure it is completely seated.

## Replacing Guide Pad:

Guide pad pockets are precisely produced and are back tapered, therefore the guide pads may be reversed and used again when excessive wear occurs on the corner.

Guide pads are ground to size for immediate use.

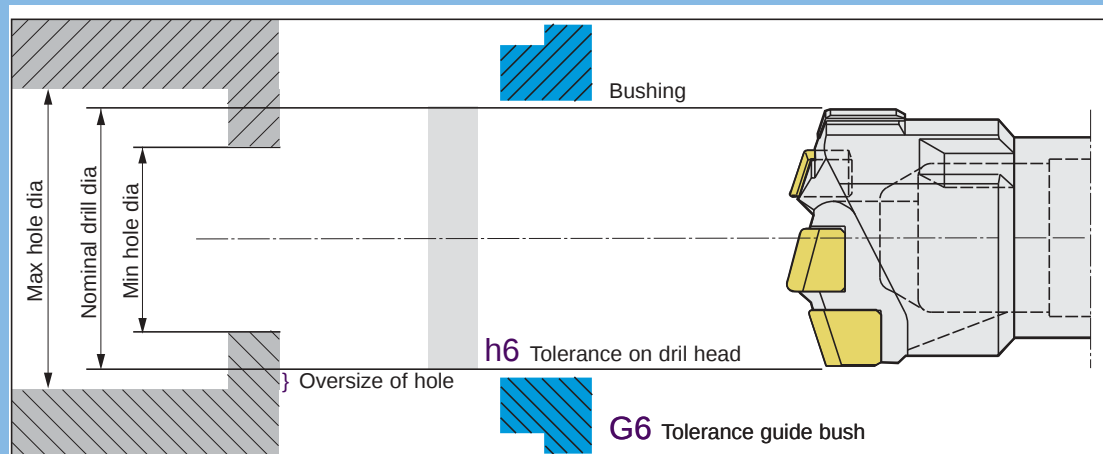
## Special precaution:

Use the correct spanner when attaching or detaching the drill head from boring bar.  
Use of a pipe wrench or other improper equipment will permanently damage the drill head shank, threading and boring bar threads.

## Note:

Although lock screws have been treated with an anti-friction lubricant, please re-apply a suitable anti-friction lubricant regularly to avoid "lock-up".

**Applicaton:** BTA & BTS Type  
**Drill dia:** 0.496 - 2.559  
**Hole Tolerance:** IT9  
**Surface finish:** Ra 2µm  
**Coolant:** Neat or soluble oil



Nominal drill dia = Min hole dia + 2/3 X (Max hole dia - Min hole dia)

Max hole dia - Tool dia > 0.002

Finish ground to the desired diameter to tolerance ISO h6.

\*Normally the drill diameter set at the lower limit plus(+) two third(2/3) of tolerance.  
 It is important to set the drill diameter -0.002 below the upper limit of the hole diameter

## G6 Tolerance (for Guide bush)

| Guide bush dia (ø in) | Tolerance (in)      |
|-----------------------|---------------------|
| 0.394 - 0.709         | +0.00024 - +0.00067 |
| 0.709 - 1.181         | +0.00028 - +0.00079 |
| 1.181 - 1.969         | +0.00035 - +0.00098 |
| 1.969 - 2.559         | +0.00039 - +0.00114 |

## h6 Tolerance (for Drill dia)

| Drill dia (ø in) | Tolerance (in) |
|------------------|----------------|
| 0.394 - 0.709    | -0.00024 - 0   |
| 0.709 - 1.181    | -0.00051 - 0   |
| 1.181 - 1.969    | -0.00063 - 0   |
| 1.969 - 2.559    | -0.00075 - 0   |



| ISO | Material                                                                 | Condition                                       | Tensile Strength<br>Rm(N/mm <sup>2</sup> ) | Hardness<br>HB | Ground Brazed Solid Drill Heads             |                         |               |               |               |               | Adjustable Solid Drill Heads            |                         |               |
|-----|--------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------|----------------|---------------------------------------------|-------------------------|---------------|---------------|---------------|---------------|-----------------------------------------|-------------------------|---------------|
|     |                                                                          |                                                 |                                            |                | BTA(ø0.496 - ø2.559) , BTS(ø0.315 - ø0.787) |                         |               |               |               |               | TBTA-B(ø0.630 - ø1.122)<br>No Cartridge |                         |               |
|     |                                                                          |                                                 |                                            |                | Cutting Speed                               | Feed Rate<br>f (in/rev) |               |               |               |               | Cutting Speed                           | Feed Rate<br>f (in/rev) |               |
|     |                                                                          |                                                 |                                            |                | SFM                                         | 0.31 - 0.79 *1          | 0.22 - 0.79   | 0.79 - 1.22   | 1.22 - 1.69   | 1.69 - 2.56   | SFM                                     | 0.63 - 0.87             | 0.87 - 1.12   |
| P   | Non-alloy steel,                                                         | 0.1 - 0.25 %C Annealed                          | 420                                        | 125            | 230-394                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     |                                                                          | 0.25 - 0.25 %C Annealed                         | 650                                        | 190            | 230-394                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     |                                                                          | cast steel, free                                | 850                                        | 250            | 131-230                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     |                                                                          | cutting steel                                   | 750                                        | 220            | 230-394                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     |                                                                          | 0.55 - 0.80 %C Quenched and tempered            | 1000                                       | 300            | 180-328                                     | 0.002 - 0.004           | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.011 | 164-328                                 | 0.003 - 0.004           | 0.004 - 0.005 |
|     | Low alloy steel<br>and cast steel<br>(less than 5%<br>alloying elements) | Annealed                                        | 600                                        | 200            | 230-328                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 164-328                                 | 0.003 - 0.004           | 0.004 - 0.006 |
|     |                                                                          |                                                 | 930                                        | 275            | 180-328                                     | 0.002 - 0.004           | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.011 | 164-328                                 | 0.003 - 0.004           | 0.004 - 0.005 |
|     |                                                                          | Quenched and tempered                           | 1000                                       | 300            | 180-328                                     | 0.002 - 0.004           | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.011 | 164-328                                 | 0.003 - 0.004           | 0.004 - 0.005 |
|     |                                                                          |                                                 | 1200                                       | 350            | 180-328                                     | 0.002 - 0.004           | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.011 | 164-328                                 | 0.003 - 0.004           | 0.004 - 0.005 |
|     |                                                                          | High alloy steel, cast steel and<br>tool steel. | 680                                        | 200            | 164-279                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.006 |
| M   | Stainless steel<br>and cast steel                                        | Ferritic/martensitic                            | 680                                        | 200            | 197-328                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.011 | 0.005 - 0.012 | 0.006 - 0.014 | 131-262                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     |                                                                          | Martensitic                                     | 820                                        | 240            | 197-328                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.011 | 0.005 - 0.012 | 0.006 - 0.014 | 131-262                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     |                                                                          | Austenitic                                      | 600                                        | 180            | 197-328                                     | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.010 | 0.004 - 0.011 | 0.006 - 0.013 | 98-197                                  | 0.002 - 0.004           | 0.003 - 0.006 |
| K   | Cast iron nodular<br>(GGG)                                               | Ferritic/pearlitic                              |                                            | 180            | 262-328                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 230-328                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     |                                                                          | Pearlitic                                       |                                            | 260            | 262-328                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.007 | 0.005 - 0.008 | 0.006 - 0.012 | 230-328                                 | 0.003 - 0.005           | 0.004 - 0.006 |
|     | Gray cast iron<br>(GG)                                                   | Ferritic                                        |                                            | 160            | 197-328                                     | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.007 | 0.004 - 0.008 | 0.006 - 0.010 | 164-295                                 | 0.002 - 0.005           | 0.003 - 0.006 |
|     |                                                                          | Pearlitic                                       |                                            | 250            | 197-328                                     | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.007 | 0.004 - 0.008 | 0.006 - 0.010 | 164-262                                 | 0.002 - 0.005           | 0.003 - 0.006 |
|     | Malleable cast iron                                                      | Ferritic                                        |                                            | 130            | 164-328                                     | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.007 | 0.004 - 0.008 | 0.006 - 0.010 | 164-295                                 | 0.002 - 0.005           | 0.003 - 0.006 |
| N   | Aluminum-<br>wrought alloy                                               | Not cureable                                    |                                            | 60             | 213-426                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     |                                                                          | Cured                                           |                                            | 100            | 213-328                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-295                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     | Aluminum-<br>cast, alloyed                                               | ≤12% Si Not cureable                            |                                            | 75             | 213-426                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     |                                                                          | Cured                                           |                                            | 90             | 213-426                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     |                                                                          | >12% Si High temp.                              |                                            | 130            | 213-426                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     | Copper alloys                                                            | >1% Pb Free cutting                             |                                            | 110            | 213-426                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     |                                                                          | Brass                                           |                                            | 90             | 213-426                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     |                                                                          | Electrolytic copper                             |                                            | 100            | 213-426                                     | 0.002 - 0.005           | 0.003 - 0.006 | 0.004 - 0.008 | 0.006 - 0.010 | 0.006 - 0.012 | 197-394                                 | 0.003 - 0.005           | 0.004 - 0.007 |
|     | Super alloys                                                             | High temp. alloys Fe based Annealed             |                                            | 200            | 33-164                                      | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.006 | 0.005 - 0.007 | 0.006 - 0.010 | 66-164                                  | 0.002 - 0.004           | 0.003 - 0.006 |
|     |                                                                          | Cured                                           |                                            | 280            | 33-164                                      | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.006 | 0.005 - 0.007 | 0.006 - 0.010 | 66-164                                  | 0.002 - 0.004           | 0.003 - 0.006 |
|     |                                                                          | Ni or Co based Annealed                         |                                            | 250            | 33-164                                      | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.006 | 0.005 - 0.007 | 0.006 - 0.010 | 66-164                                  | 0.002 - 0.004           | 0.003 - 0.006 |
|     |                                                                          | Cured                                           |                                            | 350            | 33-164                                      | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.006 | 0.005 - 0.007 | 0.006 - 0.010 | 66-164                                  | 0.002 - 0.004           | 0.003 - 0.006 |
|     |                                                                          | Cast                                            |                                            | 320            | 33-164                                      | 0.002 - 0.005           | 0.002 - 0.005 | 0.003 - 0.006 | 0.005 - 0.007 | 0.006 - 0.010 | 66-164                                  | 0.002 - 0.004           | 0.003 - 0.006 |
| S   | Titanium,<br>Ti alloys                                                   |                                                 | Rm 400                                     |                | 98-164                                      | 0.002 - 0.004           | 0.002 - 0.004 | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 66-164                                  | 0.002 - 0.004           | 0.003 - 0.004 |
|     |                                                                          | Alpha+beta alloys cured                         | Rm 1050                                    |                | 98-164                                      | 0.002 - 0.004           | 0.002 - 0.004 | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.008 | 66-164                                  | 0.002 - 0.004           | 0.003 - 0.004 |
|     | Hardened steel                                                           | Hardened                                        |                                            | 55 HRc         |                                             |                         |               |               |               |               |                                         |                         |               |
|     |                                                                          | Hardened                                        |                                            | 60 HRc         |                                             |                         |               |               |               |               |                                         |                         |               |
| H   | Chilled cast iron                                                        | Cast                                            |                                            | 400            |                                             |                         |               |               |               |               |                                         |                         |               |
|     | Cast iron                                                                | Hardened                                        |                                            | 55 HRc         |                                             |                         |               |               |               |               |                                         |                         |               |

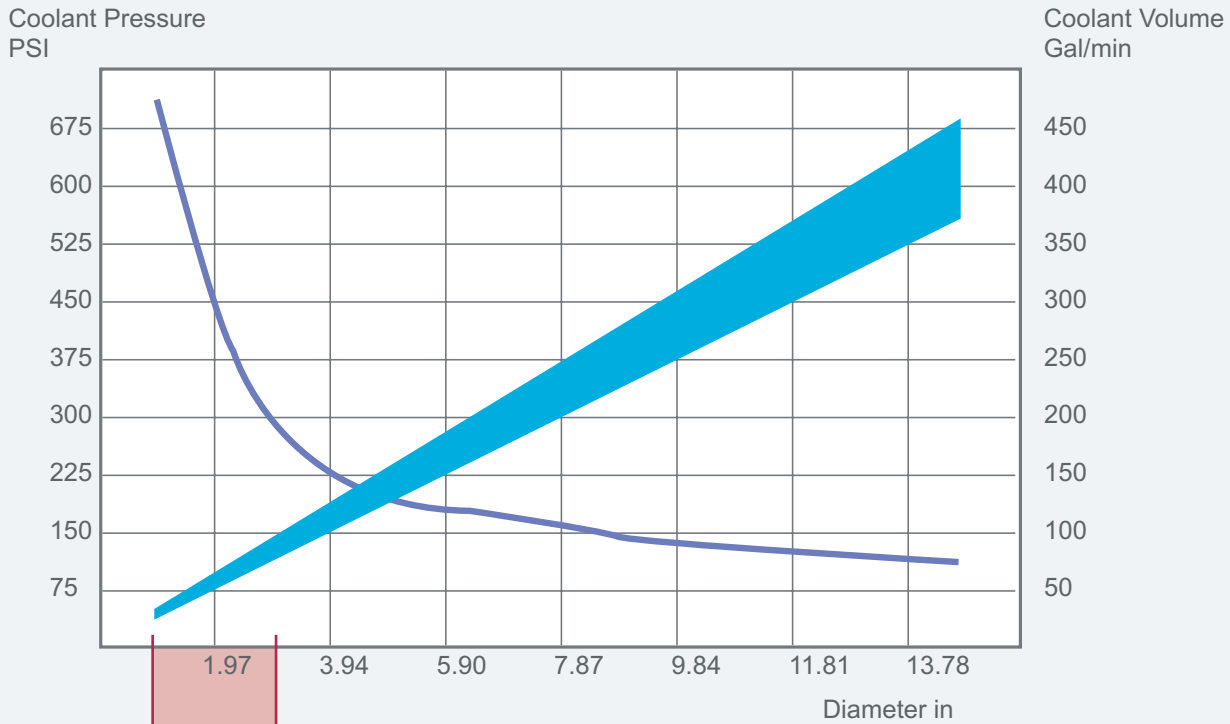
# USER GUIDE RECOMMENDED CUTTING CONDITION – FOR BTA BRAZED & TBTA INDEXABLE

| ISO | Material                                                        | Condition                                   | Tensile Strength<br>Rm(N/mm2) | Hardness<br>HB | No Cartridge Solid Drill Heads |                         |                        |                         |               | Adjustable Solid Drill Heads |               |               |               |               |                         |
|-----|-----------------------------------------------------------------|---------------------------------------------|-------------------------------|----------------|--------------------------------|-------------------------|------------------------|-------------------------|---------------|------------------------------|---------------|---------------|---------------|---------------|-------------------------|
|     |                                                                 |                                             |                               |                | TBTA-C(ø0.984- ø2.094)         |                         | TBTA-D(ø1.181- ø2.559) |                         | Cutting Speed | TBTA3/5/7(ø1.496 - ø9.685)   |               |               |               |               | Feed Rate<br>f (in/rev) |
|     |                                                                 |                                             |                               |                | Cutting Speed                  | Feed Rate<br>f (in/rev) | Cutting Speed          | Feed Rate<br>f (in/rev) |               | SFM                          | 1.50 - 1.57   | 1.57 - 2.05   | 2.05 - 2.52   | 2.52 - 3.35   | 3.35-                   |
| P   | Non-alloy steel, cast steel, free cutting steel                 | 0.1 - 0.25 %C Annealed                      | 420                           | 125            | 230-426                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-394                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | 0.25 - 0.25 %C Annealed                     | 650                           | 190            | 230-426                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-394                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | 0.25 - 0.25 %C Quenched and tempered        | 850                           | 250            | 230-426                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-394                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | 0.55 - 0.80 %C Annealed                     | 750                           | 220            | 230-426                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-394                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | 0.55 - 0.80 %C Quenched and tempered        | 1000                          | 300            | 230-426                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-394                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     | Low alloy steel and cast steel (less than 5% alloying elements) | Annealed                                    | 600                           | 200            | 230-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-328                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 |                                             | 930                           | 275            | 197-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-328                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Quenched and tempered                       | 1000                          | 300            | 197-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 164-328                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 |                                             | 1200                          | 350            | 197-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 168-328                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | High alloy steel, cast steel and tool steel | 680                           | 200            | 230-426                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-394                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
| M   | Stainless steel and cast steel                                  | Ferritic/martensitic                        | 680                           | 200            | 131-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-361                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Martensitic                                 | 820                           | 240            | 131-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-361                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Austenitic                                  | 600                           | 180            | 131-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-361                      | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
| K   | Cast iron nodular (GGG)                                         | Ferritic/pearlitic                          |                               | 180            | 164-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-328                      | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.008 | 0.007 - 0.009           |
|     |                                                                 | Pearlitic                                   |                               | 260            | 164-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-328                      | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.008 | 0.007 - 0.009           |
|     | Gray cast iron (GG)                                             | Ferritic                                    |                               | 160            | 197-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-328                      | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.008 | 0.007 - 0.009           |
|     |                                                                 | Pearlitic                                   |                               | 250            | 197-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-328                      | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.008 | 0.007 - 0.009           |
|     | Malleable cast iron                                             | Ferritic                                    |                               | 130            | 230-361                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-328                      | 0.003 - 0.005 | 0.004 - 0.006 | 0.005 - 0.007 | 0.006 - 0.008 | 0.007 - 0.009           |
| N   | Aluminum-wrought alloy                                          | Not cureable                                |                               | 60             | 213-426                        | 0.004 - 0.008           | 0.005 - 0.012          | 0.004 - 0.010           | 0.005 - 0.014 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     |                                                                 | Cured                                       |                               | 100            | 213-426                        | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     | Aluminum-cast, alloyed                                          | <=12% Si Not cureable                       |                               | 75             | 213-426                        | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     |                                                                 | Cured                                       |                               | 90             | 213-426                        | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     |                                                                 | >12% Si High temp.                          |                               | 130            | 213-426                        | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     |                                                                 | >1% Pb Free cutting                         |                               | 110            | 213-426                        | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     | Copper alloys                                                   | Brass                                       |                               | 90             | 213-426                        | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     |                                                                 | Electrolytic copper                         |                               | 100            | 213-426                        | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 197-426                      | 0.003 - 0.008 | 0.004 - 0.010 | 0.005 - 0.011 | 0.006 - 0.012 | 0.007 - 0.013           |
|     | Super alloys                                                    | High temp. alloys Fe based Annealed         |                               | 200            | 66-164                         | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 66-213                       | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Cured                                       |                               | 280            | 66-164                         | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 66-213                       | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Ni or Co based Annealed                     |                               | 250            | 66-164                         | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 66-213                       | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Cured                                       |                               | 350            | 66-164                         | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 66-213                       | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Cast                                        |                               | 320            | 66-164                         | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 66-213                       | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
| S   | Titanium, Ti alloys                                             |                                             | Rm 400                        |                | 98-197                         | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 98-328                       | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
|     |                                                                 | Alpha+beta alloys cured                     | Rm 1050                       |                | 98-197                         | 0.003 - 0.007           | 0.005 - 0.009          | 0.003 - 0.009           | 0.005 - 0.011 | 98-328                       | 0.003 - 0.006 | 0.004 - 0.008 | 0.005 - 0.009 | 0.006 - 0.010 | 0.007 - 0.012           |
| H   | Hardened steel                                                  | Hardened                                    |                               | 55 HRc         |                                |                         |                        |                         |               |                              |               |               |               |               |                         |
|     |                                                                 | Hardened                                    |                               | 60 HRc         |                                |                         |                        |                         |               |                              |               |               |               |               |                         |
|     | Chilled cast iron                                               | Cast                                        |                               | 400            |                                |                         |                        |                         |               |                              |               |               |               |               |                         |
|     | Cast iron                                                       | Hardened                                    |                               | 55 HRc         |                                |                         |                        |                         |               |                              |               |               |               |               |                         |

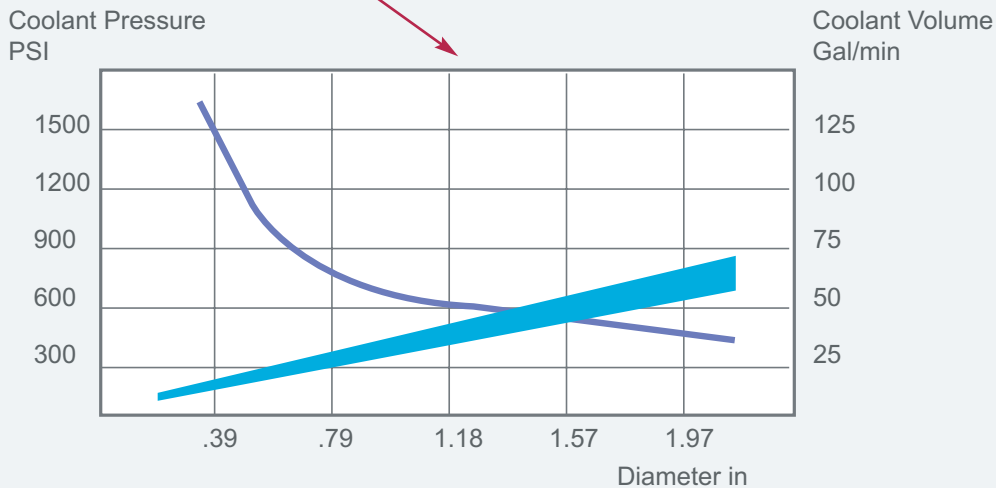
| No. | Problem              | Causes                                                             | Solutions                                      |
|-----|----------------------|--------------------------------------------------------------------|------------------------------------------------|
| 1   | Chips too small      | improper cutting conditions                                        | adjust speed and feed                          |
|     |                      | chipbreaker or CB radius too small and deep                        | amend chip breaker                             |
|     |                      | faulty tool geometry                                               | use correct geometry                           |
|     |                      | misalignment of shank and spindle                                  | correct misalignment                           |
|     |                      | material variation                                                 | try to adjust by altering speeds and feeds     |
|     |                      | loose or oversize guide bushes                                     | change bushing                                 |
|     |                      | poor starting conditions (workpiece not centered)                  | center workpiece                               |
| 2   | Chips too large      | improper cutting conditions                                        | adjust speed and feed                          |
|     |                      | chipbreaker or CB radius too large and shallow                     | amend chip breaker                             |
|     |                      | oversized guide bush or guide bush misalignment                    | correct misalignment or change bush            |
| 3   | Erratic chip pattern | lack of uniformity in workpiece material                           | adjust speeds & feeds or amend CB              |
|     |                      | faulty feed mechanism (likely to occur with hydraulic feed system) | consult machine builder or sales engineer      |
|     |                      | incorrect carbide grade                                            | check grade charts for guidelines              |
|     |                      | chips jamming because of inadequate coolant supply                 | increase coolant supply                        |
|     |                      | pressure or incorrect tool geometry                                | correct tool geometry                          |
|     |                      | misalignment of shank and spindle                                  | correct misalignment                           |
|     |                      | excessive vibration due to insufficient workpiece/tool rigidity    | contact machine builder or tool manufacturer   |
|     |                      | wrong choice of coolant                                            | consult with tool manufacturer                 |
|     |                      | under or oversized guide bushing                                   | change bushing                                 |
| 4   | Stringy chips        | incorrect tip geometry                                             | amend chip breaker                             |
|     |                      | lack of uniformity in workpiece material                           | adjust with speed & feed or amend CB           |
|     |                      | faulty feed mechanism (likely to occur with hydraulic feed system) | consult with machine builder or sales engineer |
|     |                      | cooling contaminated with fines                                    | clean coolant                                  |
|     |                      | chemical affinity between workpiece and carbide                    | check possibility of changing grade            |
|     |                      | chipped cutting edge                                               | replace drill                                  |
|     |                      | feedrate too low                                                   | increase feed                                  |

| No. | Problem              | Causes                                          | Solutions                                  |
|-----|----------------------|-------------------------------------------------|--------------------------------------------|
| 5   | Carbide tip breakage | dull tool                                       | hone cutting edges if required             |
|     |                      | inadequate coolant                              | check volume and pressure                  |
|     |                      | contaminated coolant                            | check coolant                              |
|     |                      | guide bush tolerance too tight                  | replace if necessary or undersize drill    |
|     |                      | misalignment of shank and spindle               | correct misalignment                       |
|     |                      | tool geometry error                             | correct geometry                           |
|     |                      | material variation                              | try to adjust by altering speeds and feeds |
| 6   | Short tool life      | improper speed or feed                          | adjust accordingly                         |
|     |                      | incorrect carbide grade                         | choose proper grade for material           |
|     |                      | worn guide bushes                               | replace guide bush                         |
|     |                      | excessively warm coolant                        | check coolant temperature & system         |
|     |                      | incorrect cutting fluid                         | replace if possible                        |
|     |                      | misalignment of shank and spindle               | correct misalignment                       |
|     |                      | tool geometry error                             | correct geometry                           |
|     |                      | material variation                              | try to adjust by altering speeds and feeds |
| 7   | Poor surface finish  | misalignment                                    | check and adjust                           |
|     |                      | inadequate dampening of shank causing vibration | provide vibration dampers                  |
|     |                      | CB too far above or below center line           | correct chip breaker                       |
|     |                      | faulty cutter or guide pad geometry             | correct geometry                           |
|     |                      | misalignment between workpiece and drill        | correct misalignment                       |
|     |                      | workpiece deflection                            | improve clamping and rigidity              |
|     |                      | excessive vibration                             | contact tool or machine manufacturer       |
|     |                      | tool geometry error                             | correct geometry                           |
|     |                      | cutting speed too low                           | increase cutting speed                     |
|     |                      | feed too light especially in hardened material  | increase feed                              |
|     |                      | uneven feed                                     | correct feed mechanism                     |
|     |                      | none of above or unsolved problems              | contact tool manufacturer                  |

Coolant Volume Gal/min  
Coolant Pressure PSI

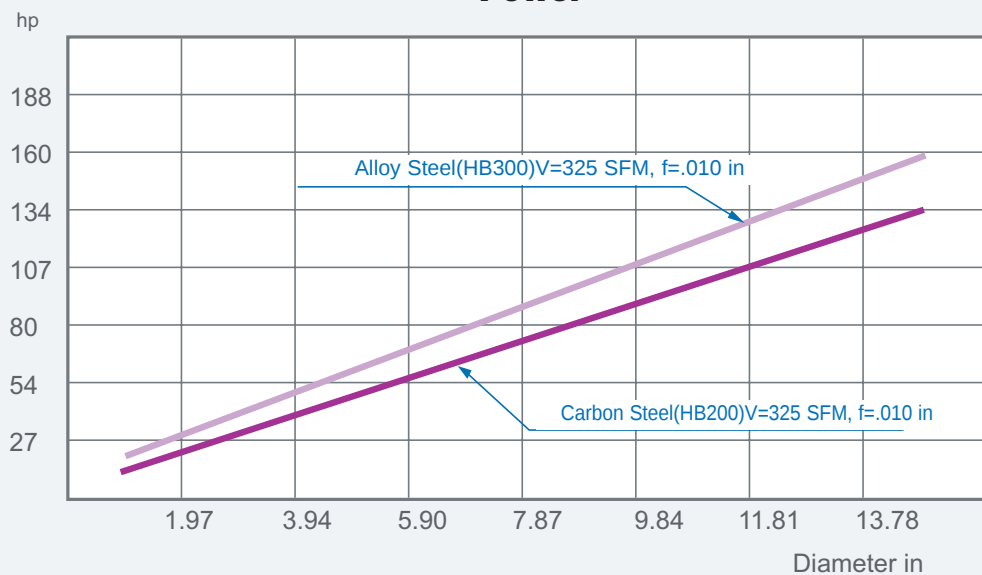


Small Diameter

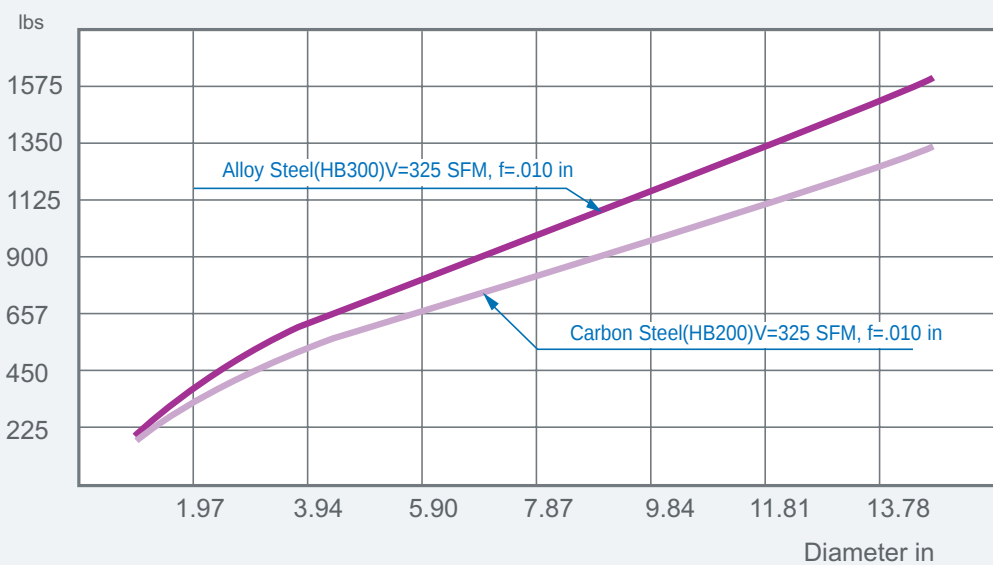


Coolant Volume Gal/min  
Coolant Pressure PSI

### Power



### Thrust Force



## DEEP HOLE DRILLING QUESTIONNAIRE

Company Name

Inquiry Number

Address

Inquiry Date

Contact person

Customer No

### WORKPIECE

(If possible, please attach a drawing)

|                             |      |
|-----------------------------|------|
| Product Name                |      |
| Hole diameter(ø)            | (in) |
| Hole depth(drilling length) | (in) |
| No. of holes                |      |
| Tolerance(of hole)          |      |
| Surface finish(Rz, Ra...)   |      |
| Deviation(mm/100)           |      |
| Straightness(mm/100)        |      |

### Material

|                             |                                                                                                       |
|-----------------------------|-------------------------------------------------------------------------------------------------------|
| Material(DIN, AISI, JIS...) |                                                                                                       |
| Hardness(HB, HS, HRC...)    |                                                                                                       |
| Condition *                 | <input type="checkbox"/> Annealed <input type="checkbox"/> Quenched <input type="checkbox"/> Tempered |
|                             | <input type="checkbox"/> Cast <input type="checkbox"/>                                                |
|                             | <input type="checkbox"/> Other <input type="checkbox"/>                                               |

### MACHINE

|                        |                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------|
| Machine supplier name  |                                                                                               |
| Machine type/model     |                                                                                               |
| Rigidity               | <input type="checkbox"/> Good <input type="checkbox"/> Normal <input type="checkbox"/> Bad    |
| Date of manufacture    |                                                                                               |
| Retrofitted            | <input type="checkbox"/> NC lathe <input type="checkbox"/> M/C <input type="checkbox"/> Other |
| Double rotation(TR/WR) | <input type="checkbox"/> Tool and Workpiece                                                   |
| Rotating workpiece(WR) | <input type="checkbox"/>                                                                      |
| Rotating tool(TR)      | <input type="checkbox"/>                                                                      |
| Safety devices         |                                                                                               |
| Motors power           |                                                                                               |

### TYPE OF COOLANT

|                       |                                                                      |
|-----------------------|----------------------------------------------------------------------|
| Coolant supplier name |                                                                      |
| Water based           | <input type="checkbox"/> Soluble <input type="checkbox"/> Emulsion % |
| Oil based             | <input type="checkbox"/>                                             |
| Coolant Pressure      |                                                                      |
| Coolant Volume        |                                                                      |

### TOOL

#### Drill Head

|                          |                                                                                                                                                                                   |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drill diameter(ø)        | (in)                                                                                                                                                                              |
| Thread                   | <input type="checkbox"/> Inner <input type="checkbox"/> Outer                                                                                                                     |
| Brazed                   | <input type="checkbox"/>                                                                                                                                                          |
| Indexable                | <input type="checkbox"/> Adjustable <input type="checkbox"/> Direct mount <input type="checkbox"/>                                                                                |
| Coating                  | <input type="checkbox"/> Coated <input type="checkbox"/> Uncoated                                                                                                                 |
| Coating type             | <input type="checkbox"/> TiN <input type="checkbox"/> TiAlN <input type="checkbox"/> Other                                                                                        |
| • Solid drilling         | <input type="checkbox"/>                                                                                                                                                          |
| • Counterboring          | <input type="checkbox"/>                                                                                                                                                          |
| Cutting angle*           | brazed <input type="checkbox"/> 20° <input type="checkbox"/> 45° <input type="checkbox"/><br>indexable <input type="checkbox"/> normal angle <input type="checkbox"/> close angle |
| Pre-bored size(per side) | (in)                                                                                                                                                                              |
| Bottom finishing *       | <input type="checkbox"/> Fullball R <input type="checkbox"/> Flatbottom R <input type="checkbox"/> Corner R<br><input type="checkbox"/> Compound R                                |
| • Trepanning             | <input type="checkbox"/>                                                                                                                                                          |
| Core size(ø)             | (in) <input type="checkbox"/>                                                                                                                                                     |
| Tube inner dia(ø)        | (in)                                                                                                                                                                              |
| Tube outer dia(ø)        | (in)                                                                                                                                                                              |

#### Tube

|                   |                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------|
| Outside Dia(ø)    | (in)                                                                                                 |
| Total Length(L)   | (in)                                                                                                 |
| Internal Thread   | <input type="checkbox"/>                                                                             |
| External Thread   | <input type="checkbox"/> 4 Starts <input type="checkbox"/> 2 Starts <input type="checkbox"/> 1 Start |
| Tube thread       | <input type="checkbox"/> 1 end <input type="checkbox"/> Both ends                                    |
| Inner Tube Length | (in)                                                                                                 |
| Inner Tube Slit   | <input type="checkbox"/> 1 End <input type="checkbox"/> Both ends                                    |

### DRILLING SYSTEM

|                    |                              |
|--------------------|------------------------------|
| Single tube system | <input type="checkbox"/> STS |
| Double tube system | <input type="checkbox"/> DTS |

### BORING CONDITIONS

|                       |                          |
|-----------------------|--------------------------|
| Through hole drilling | <input type="checkbox"/> |
| Blind hole drilling   | <input type="checkbox"/> |
| Cross hole drilling*  | <input type="checkbox"/> |

### GENERAL INFORMATION

#### Production

Quantity per year:

Present Performance Status:

grade, tool life, etc:

Cutting Data: Vc= SFM, N= rpm  
f= in/re, F= in/min



### **Ingersoll Cutting Tools for the Americas**

#### **Marketing & Technology Center**

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