

NTK
CUTTING TOOLS

New and Unique
SWISS TOOLING

8000



Available on the
App Store

App for iOS

ANDROID APP ON
Google play

App for ANDROID

WATCH ON
YouTube

in

NTKCUTTINGTOOLS.com
youtube.com/NTKCUTTINGTOOLS

NTK's Recommendation for Swiss Tooling

Specific Application

| | | | | |
|---|---|---|--|---|
| 304SS | For up to .200" diameter material | PEEK / Non-ferrous material | Double / Triple lead Screw | HEXALOBULAR / HEX / SQUARE socket |
| ST4 Coating | CSV Series | KM1 insert | Thread Whirling | Shaper Duo |
|  |  |  |  |  |

General Tooling for Popular Materials

- Titanium
- 304SS
- Ti-6Al-4V
- 316SS
- Carbon steels
- Alloy steels
- Cobalt Chrome
- HRSA materials

Front Turning

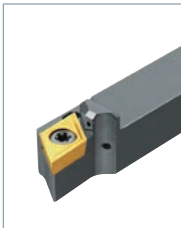
General Purpose

DM4-YL



Splash Series

Y-axis with Coolant Through



- DM4 has excellent heat resistance. It is the best grade to machine for Titanium Alloys, Cobalt Chrome, and HRSA materials.
- YL chipbreaker is designed for both sharpness and chip control. It can hold dimensions very well and evacuate chips smooth.
- AMX chipbreaker is optimized for very small DOC operations. It can perform very well in thin chip control situations.
- Use with a coolant through tool holder to help with chip evacuation. Y-axis coolant through toolholder is the best solution for chip control problems.

Up to .020 DOC

DM4-AMX



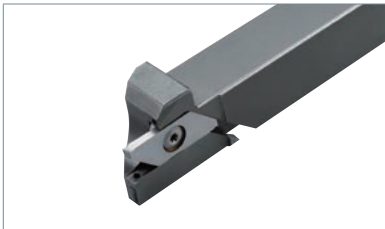
Cut-Off

Up to .472"

DM4-CTP-CX



Splash series



- CTP/CTPA style cut-off tool is a best-seller in the Swiss market. They have excellent rigidity and sharpness. Now NTK added the CX chipbreaker to them. 3D shaped CX chipbreaker can control chips extremely well.
- Use with coolant through toolholder for better chip evacuation.
- CTP style is designed for up to .472" material and CTPA is for up to .630".

Up to .630"

DM4-CTPA-CX



Up to 1.00"

CUT DUO



Splash series



- NTK recently added another coolant through cut-off toolholder for larger diameter materials.
- CTDH-OH toolholder can cut up to 1" materials and can control chips very well.

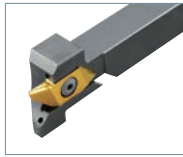
Back Turning

General Purpose

DM4-TBP / TBPA-BM



Splash Series



Y-axis with Coolant through



- NTK's TBP/TBPA back turning tools are solid and can provide stable machining even with heavy DOC operations.
- Now, NTK added a 3D chipbreaker named BM to this series. BM chipbreaker can manage chip direction. Just one pass is needed to get excellent face/OD finish.
- Use with coolant through tool holder to help with chip evacuation and the Y-axis coolant through toolholder is the best solution for chip problems.

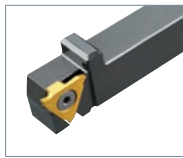
Grooving

General Purpose

DM4-GX



Splash Series



Y-axis with Coolant through



- NTK is expanding its triangle style grooving tools. Now NTK accommodates wide grooving widths from .012" to .125".
- GX chipbreaker can control chips very well, not only for grooving but also side-turning operations.
- Use with coolant through tool holder to help with chip evacuation and the Y-axis coolant through toolholder is the best solution for chip problems.

Threading

General Purpose

QM3-TTP



TTP



- NTK's side-clamping TTP inserts are rigid and produces high quality good threads. Various lineups are available for each specific threading operations.
- QM3 has good wear resistance and toughness and can cut most materials.

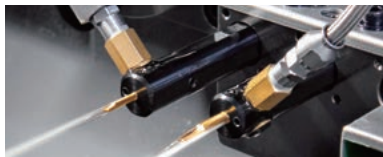
ID Boring

General Purpose

STICK DUO Hyper



STICK DUO SPLASH



- Stick Duo Splash are coolant through sleeves for ID operations. NTK has a variety of ID tooling inserts, bars for ID boring, ID back turning, ID grooving and ID threading to use with Stick Duo Splash.
- The sleeves are equipped with an adjustable overhang mechanism that allow you to index bars easily without length adjustment.



Mogul Bar



- Mogul Bar is a series name for boring tools with indexable inserts. The series starts from .197" minimum bore diameter and use with F-style chipbreaker which makes chip evacuate backward.
- They include a coolant through system that ensures better chip evacuation.

Endmill

General Purpose

DM4-BL



Indexable Endmill



- NTK has a variety of indexable type endmill tools for Swiss machines. The big head endmills can cut in close proximity to the Guide-bushing and provide excellent rigidity. Due to the big diameter, you can also run faster than small diameter endmills.

SPLASH Series

Coolant through toolholders



Features

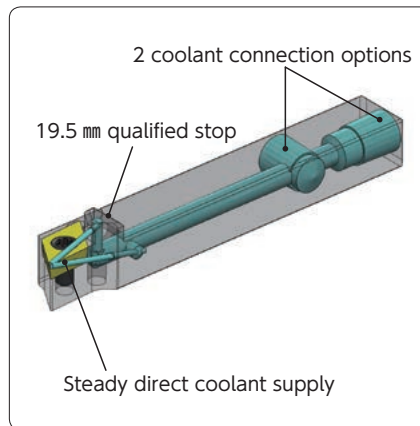
- Evacuates chips away from the cutting edge
- Reduces cutting tool temperature and helps keep the edge sharp
- Y-axis toolholders are available
- Improves part tolerance by steady coolant supply to the edge
- 19.5mm and 20mm qualified stop ensures repeatability



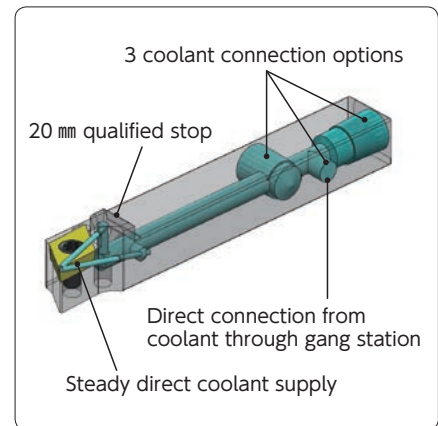
Square Shank Toolholders



OH Series



OH2 Series



Front Turning

| SCLC-OH2 / OH | SDJC-OH2 / OH | Y-SDJC-OH2 / OH | |
|---------------|---------------|-----------------|---------|
| | | | |
| SVJB-OH2 / OH | SVJC-OH2 / OH | Y-SVJC-OH2 / OH | TFT-OH2 |
| | | | |

Back Turning

| TBP-OH2 / OH | Y-TBP-OH2 / OH | TBPA-OH • CTPA-OH2 / OH |
|--------------|----------------|-------------------------|
| | | |

Cut Off

| CTP-OH2 / OH | CTPA-OH2 / OH | CTDP-OH2 / OH |
|--------------|---------------|---------------|
| | | |

Grooving / Side Turning

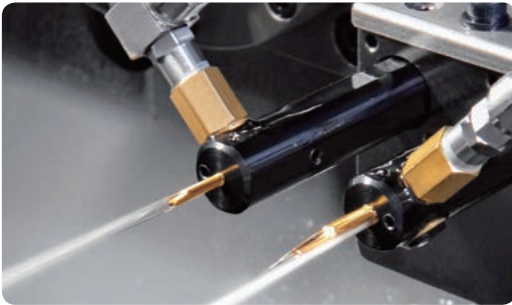
| GTT-OH2 / OH | Y-GTT-OH2 / OH | GTPA-OH | Y-GTPA-OH |
|--------------|----------------|---------|-----------|
| | | | |

STICK DUO SPLASH

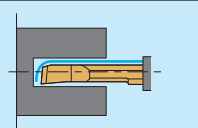
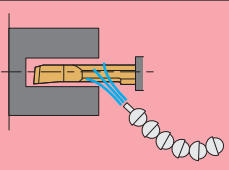


- Coolant through sleeves for ID Boring with Adjustable Overhang Mechanism -

Features

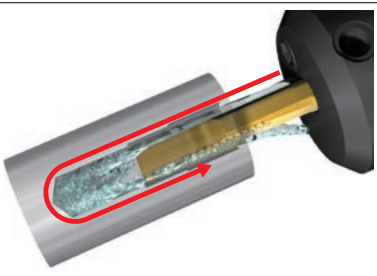
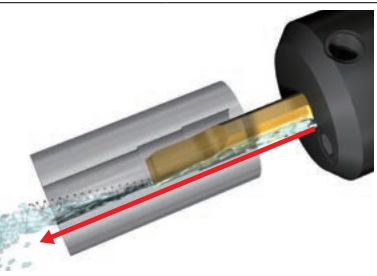


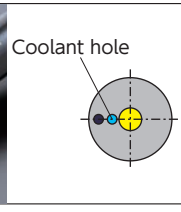
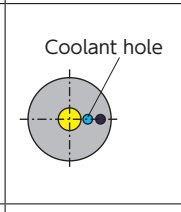

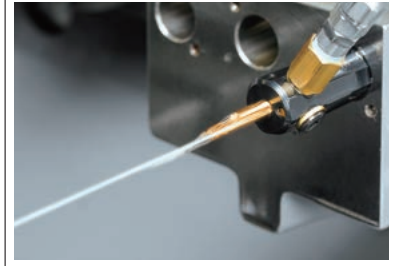
- Good chip control evacuation in ID machining
- Three coolant connection options
- Can choose from 2 coolant directions
- Adjustable overhang length



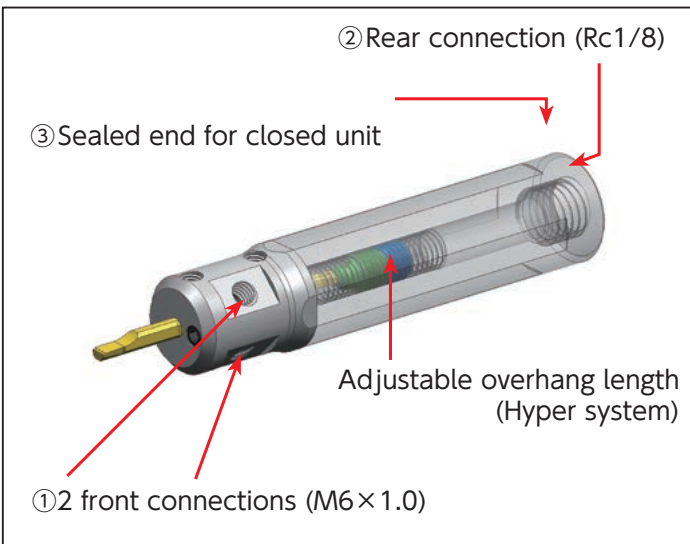
No chip problems

| STICK DUO SPLASH | External coolant |
|---|---|
|  |  |
|  |  |
| <i>No chip inside hole</i> | <i>Chip packed</i> |
| Material : 4140 Insert bar : SHFS040R005S Hole depth : .590" (15mm) Pilot hole : $\phi .201" \times 1.102" L (\phi 5.1 \times 28.0 \text{ mm } L)$ Coolant Pressure : 725psi (5MPa) | |

Choose from 2 coolant directions

| I) For Blind hole | II) For Through hole |
|--|---|
|  |  |
|  |  |
|  |  |
|  |  |
| Just rotated 180 degrees | |

3 coolant connection options



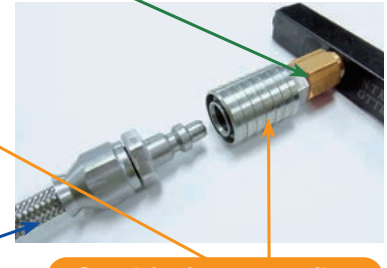
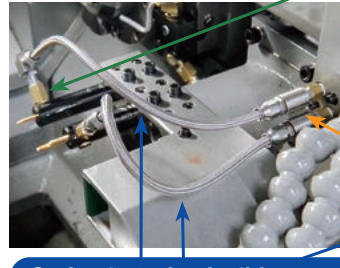
① Front Connection example



② Rear Connection example



Quick-change Coolant Components



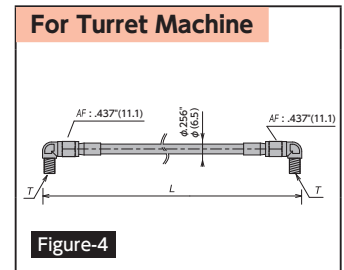
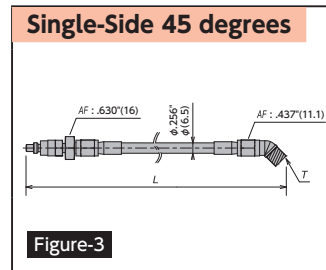
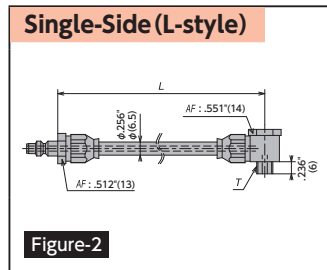
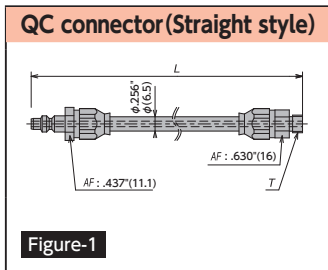
③ Conversion / Extension Joint

① Plug-in Style Flexible Hose

② Quick Change Coupling

- Up to 2900psi
- High quality flexible stainless steel braided hose
- Reduce machine downtime

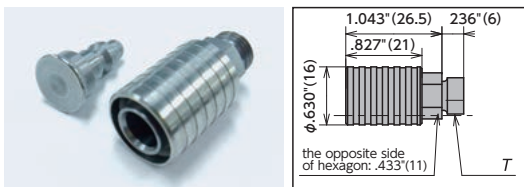
① Plug-in Style Flexible Hose



| Item Number | Figure | Stock | L (Inch) (mm) | End A | End B (T) | Comes with |
|-----------------------|--------|-------|---------------|------------------------|-----------------|---|
| HOSE-ST-1/8NPT-6IN | 1 | ● | 6.0 | Quick change connector | NPT1/8 | — |
| HOSE-ST-1/8NPT-10IN | 1 | ● | 10.0 | Quick change connector | NPT1/8 | — |
| HOSE-ST-M8*1 | 1 | ● | 11.8 300 | Quick change connector | M8x1 | Conversion adapters (M8x1 to M10x1) and b(M8x1 to G1/8) |
| HOSE-ST-1/8NPT-18IN | 1 | ● | 18.0 | Quick change connector | NPT1/8 | — |
| HOSE-AN-M8*1 | 2 | ● | 11.9 302 | Quick change connector | M8x1 | Conversion adapter a(M8x1 to M10x1) and b(M8x1 to G1/8) |
| HOSE-45DEG-1/8NPT-7IN | 3 | ● | 7.0 | Quick change connector | 45 Deg x NPT1/8 | — |
| HOSE-DA-1/8NPT2-6IN | 4 | ● | 6.0 | NPT1/8 | NPT1/8 | — |
| HOSE-DA-1/8NPT2-8IN | 4 | ● | 8.0 | NPT1/8 | NPT1/8 | — |
| HOSE-DA-1/8NPT2-10IN | 4 | ● | 10.0 | NPT1/8 | NPT1/8 | — |

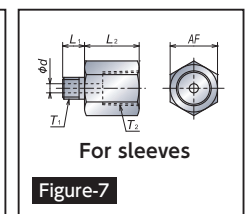
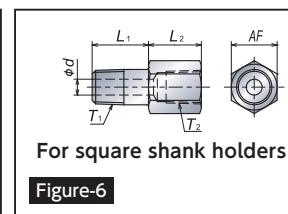
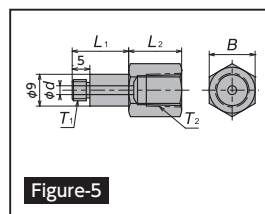


② Quick Change Coupling



| Item Number | Stock | End (T) | Comes with |
|-------------|-------|-----------|------------|
| COUP-M10*1 | ● | M10 × 1 | Seal Plug |
| COUP-NPT1/8 | ● | NPT 1/8 | Seal Plug |

③ Conversion / Extension Joint



| Item Number | Figure | Stock | T ₁ (mm) | T ₂ (mm) | L ₁ (mm) | L ₂ (mm) | AF (mm) | d (mm) |
|-------------------|--------|-------|---------------------|---------------------|---------------------|---------------------|---------|--------|
| SCJ-M6-RC1/8-L | 5 | ○ | M6 × 1 | Rc1/8 (PT1/8) | 16 | 15 | 13 | 2.5 |
| SCJ-NPT1/8-M10-L | 6 | ● | NPT1/8 | M10 × 1 | 16 | 12 | 13 | 4.5 |
| SCJ-R1/8-M10-L | 6 | ○ | R1/8 (PT1/8) | M10 × 1 | 16 | 12 | 13 | 4.5 |
| SCJ-R1/8-RC1/8-L | 6 | ○ | R1/8 (PT1/8) | Rc1/8 (PT1/8) | 16 | 15 | 13 | 4.5 |
| SCJ-R1/8-NPT1/8-L | 6 | ● | R1/8 (PT1/8) | NPT1/8 | 16 | 15 | 13 | 4.5 |
| SCJ-M6-M10 | 7 | ○ | M6 × 1 | M10 × 1 | 6 | 15 | 12 | 2.5 |
| SCJ-M6-RC1/8 | 7 | ○ | M6 × 1 | Rc1/8 (PT1/8) | 6 | 15 | 13 | 2.5 |
| SCJ-M6-NPT1/8 | 7 | ● | M6 × 1 | NPT1/8 | 6 | 15 | 13 | 2.5 |
| SCJ-M8-RC1/8 | 7 | ○ | M8 × 1 | Rc1/8 (PT1/8) | 6 | 15 | 13 | 3.5 |
| SCJ-R1/8-M10 | 7 | ○ | R1/8 (PT1/8) | M10 × 1 | 10 | 15 | 12 | 4.5 |
| SCJ-R1/8-NPT1/8 | 7 | ● | R1/8 (PT1/8) | NPT1/8 | 10 | 15 | 13 | 4.5 |

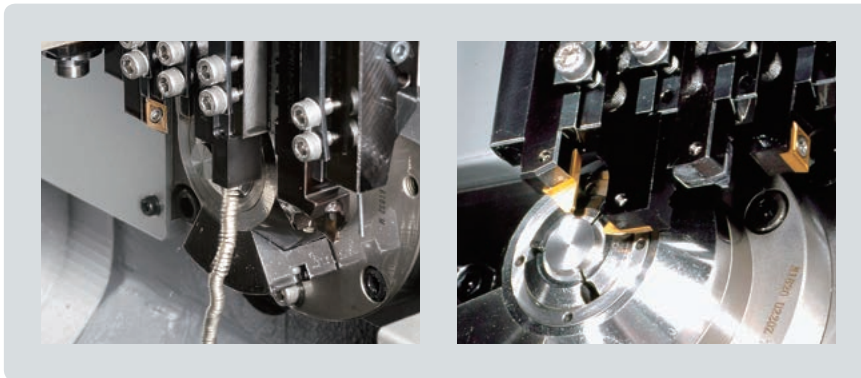
Y-axis Toolholders

Chip control by gravity



Features

- Chip drops down to the bed of the machine due to gravity, and chip control problem is solved
- Available in coolant through style
- Front turning, grooving, and back turning operations can be performed by utilizing Y-axis control



- Perfect solution for chip problems
- Less wear, more stable dimensions

Programming guidance

| Regular Toolholder | | | | | Y-axis Toolholder | | | |
|--------------------|--------|--------|--------|-------------------|-------------------|--------|--------|--------|
| ① T300 | | | | Select tool | ① T300 | | | |
| ② G0 | X .450 | Z .000 | T3 | Position tool | ② G0 | Y .450 | Z .000 | T3 |
| ③ | | | | | ③ | X .000 | | |
| ④ G1 | X .300 | | F .003 | Move to OD to cut | ④ G1 | Y .300 | | F .003 |
| ⑤ | | Z .200 | F .002 | Cut .200" length | ⑤ | | Z .200 | F .002 |
| ⑥ | X .400 | | | Cut face | ⑥ | Y .450 | | |
| ⑦ G0 | X .450 | | | | ⑦ G0 | X .450 | | |

Cut by X-axis

Cut by Y-axis

Note: Need Y-offset for holder shank size.

Thread Whirling

Features



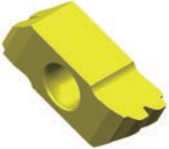
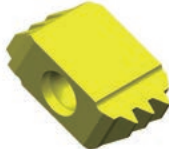


WATCH ON
New Double-lead video is on 

- NTK's unique patented design technology makes precise and correct inserts the first time, *without any redesign or remanufacture even if it is a multiple-lead thread*
- Sharp cutting edges produce a better surface finish and longer tool life than competitor's inserts

Form Double-lead or Multiple-lead with Single Pass

Patented

| | Double-lead threads | Triple-lead threads |
|-----------------------------|---|---|
| Work | Bone screw | Worm gear |
| Work material | Ti-6Al-4V ELI | brass |
| Work appearance |  |  |
| Insert appearance |  |  |
| Major Dia. | $\phi .157''(4.0\text{mm})$ | $\phi .278''(7.0\text{mm})$ |
| Minor Dia. | $\phi .094''(2.4\text{mm})$ | $\phi .185''(4.7\text{mm})$ |
| Lead [Pitch×No. of Lead] | $.135''(3.42\text{mm})$ [.067"×2(1.71mm×2)] | $.193''(4.9\text{mm})$ [.064"×3(1.63mm×3)] |

- Can reduce cycle time by more than half
- NTK can achieve what other competitors cannot

Double-lead Bone Screw Process Example

- 1 1st thread whirl at taper part
- 2 Rotate the bar 180° and whirl the 2nd thread on same part as **1**
- 3 Thread whirl whole straight part
- 4 Thread whirl at very last part to get two-exits, after back of bar has been backed up a half lead (one pitch) and rotated 180°

Special Item Capability

- Even though almost all bone screw shapes are special, NTK thread whirling inserts can make the correct shape of thread the first time, without any redesign or remanufacturing
- Inserts will be delivered in 5 weeks after the order is received
- Within a 3 week time period, expedite delivery is available with an expedite fee
- Basically NTK thread whirling inserts are ground with topping and coated

Recommended Cutting Conditions

| No. of teeth | | 9 | 6 | 4 | |
|-----------------|-----|----------------------------------|-------------|-------------|-----------------------------------|
| Conditions | | | | | |
| Main spindle | RPM | 10 - 40 | 10 - 25 | 7 - 15 | Faster RPM reduces machining time |
| | F | 5400 - 14400 | 3600 - 9000 | 2500 - 5400 | |
| Whirling cutter | RPM | 1500 - 4000 | | | |
| Feed Rate | | Same as thread-lead | | | |
| Bar stock | φ | ~φ .400" * | | ~φ .200" | * For cutter with φ 12mm ID |
| Work Material | | Ti-6Al-4V ELI / 316SS / Titanium | | | |

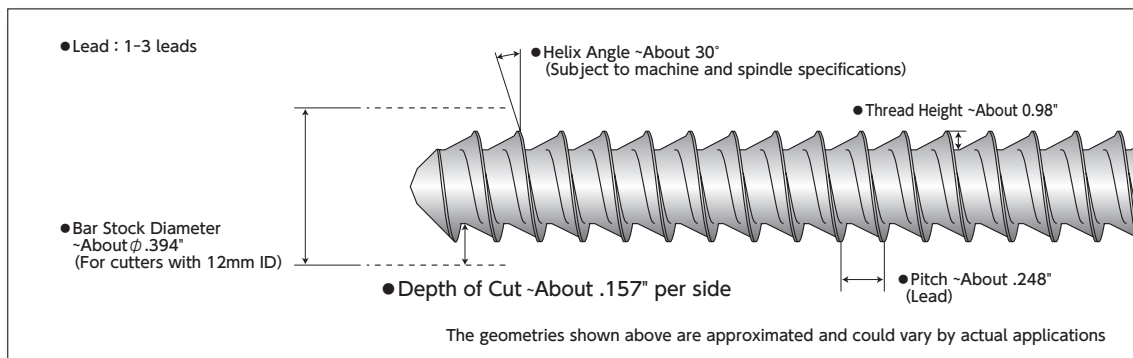
- Formula for calculating thread whirling process time

$$T \text{ (Seconds)} = \frac{60 \times \text{Thread length}}{\text{Main spindle rpm} \times \text{Feed rate (Thread lead)}}$$

Ex.) Double lead / 2" length / .100" lead (2×.050" pitch) / 30 rpm

$$T \text{ (Seconds)} = \frac{60 \times 2}{30 \times .100"} = 40 \text{ Seconds}$$

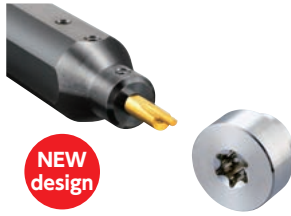
Applicable Thread Geometry (Approximated)



SHAPER DUO



Hexalobular Socket



Hexagon Socket




Square Socket



WATCH ON
YouTube


- Now available for Hexalobular(6-lobe) Socket
- Perfect fit for back spindle of Swiss machine
- Achieves good corner edge sharpness
- Less tool pressure than Rotary-Broaching
- Easy to adjust for correct dimension
- Economical double-ended insert bar (Except for Hexalobular)

Comparison Chart of Hexalobular Socket Machining

| | Tool Pressure | Cycle Time | Tool Cost | High speed spindle | Program | |
|---|---------------|------------|-----------|--------------------|-------------|---|
| Shaper Duo  | ◎ | ◎ | ◎ | Not necessary | Simple | <ul style="list-style-type: none"> • No high speed spindle needed • A lot less cycle time |
| End milling | ○ | × | △ | Necessary | Complicated | <ul style="list-style-type: none"> • Need high speed spindle • Time consuming process |

- Small diameter endmill driven by high-speed spindle is popular way to create Hexalobular(6-lobe) socket. It has some flexibility but needs high speed spindle unit and it is a time consuming process.
- SHAPER DUO can make Hexalobular(6-lobe) socket faster and simpler.

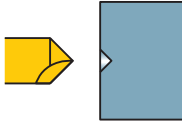
Comparison Chart of HEX Socket Machining

| | Tool Pressure | Cycle Time | Flexibility | Tool Cost | |
|---|---------------|--|-------------|-----------|--|
| Shaper Duo  | ◎ | △ * Can be off-set by over-wrapping operation | ○ | ◎ | <ul style="list-style-type: none"> • Less tool pressure-especially on small diameter parts • One size can cover several socket sizes |
| Broach Tool | △ | ○ | × | △ | <ul style="list-style-type: none"> • Need to have tools for each socket size |

- Rotary-broach is an efficient way for Hexagon socket. But tool pressure is high and often times it pushes part too hard.
- SHAPER DUO system enables less tool pressure and provides better tolerance with less cost.

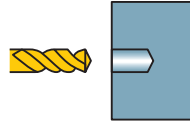
Process Chart

① Center drilling



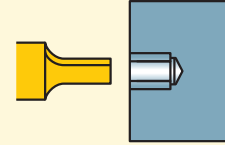
Make a center hole which is smaller than pilot hole drill.

② Drilling (Pilot hole)



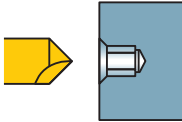
Select a drill with same or smaller (0~0.1mm) dia. as AF and machine a bit deeper because burrs may cause chipping on shaper insert

③ Shaper tool



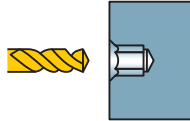
Machine socket rotating 60 degrees 6 times

④ Chamfering



Chamfer with the same pilot hole drill as ①

⑤ Deburring



Finish and deburr with the same drill as in process②
☆Reduce cutting conditions due to heavy interruption

SHAPER DUO Process Chart -Hexalobular-

| Socket Size | Tool | Pilot bore Dia. (mm) | Starting "X" position (mm) | Number of passes | | | Estimated cycle time * | | |
|-------------|--------------|-------------------------|-------------------------------|----------------------------|--------------------------|---------------------------|---|----------------------|--------------------|
| | | | | Final "X" position (mm) | Roughing pass 0.025mm | Finishing pass 0.005mm | ISO10664 Standard depth of Hexalobular hole (mm) | Whole process ①-⑤ | Process④ Shaper |
| T6 | SSP050N25T06 | 1.15 | 1.14 | 1.75 | 13 | 1 | 1.82 | 51 sec | 23.2 sec |
| T7 | SSP050N31T07 | 1.38 | 1.35 | 2.06 | 15 | 1 | 2.44 | 59 sec | 28.2 sec |
| T8 | SSP050N36T08 | 1.62 | 1.59 | 2.40 | 17 | 1 | 3.05 | 67 sec | 33.8 sec |
| T10 | SSP050N41T10 | 1.92 | 1.89 | 2.80 | 19 | 1 | 3.56 | 75 sec | 39.5 sec |
| T15 | SSP050N43T15 | 2.30 | 2.29 | 3.35 | 22 | 1 | 3.81 | 84 sec | 46.2 sec |
| T20 | SSP050N46T20 | 2.71 | 2.69 | 3.95 | 26 | 1 | 4.07 | 94 sec | 55.4 sec |
| T25 | SSP050N50T25 | 3.13 | 3.09 | 4.50 | 29 | 1 | 4.45 | 105 sec | 63.8 sec |
| T27 | SSP050N55T27 | 3.52 | 3.51 | 5.07 | 32 | 1 | 4.70 | 115 sec | 71.8 sec |
| T30 | SSP050N55T30 | 3.91 | 3.89 | 5.60 | 35 | 1 | 4.95 | 125 sec | 80.2 sec |

* Using Carbide drill

* Shaper cutting conditions

Feed : 3000 mm/min
DOC : 0.025 mm (Roughing), 0.005 mm (Finishing)

SHAPER DUO Process Chart -Hexagonal-

| HEX Standard | Tool | Pilot bore Dia. (mm) | Starting "X" position (mm) | Number of passes | | | Estimated cycle time * | | |
|--------------|---------------|-------------------------|-------------------------------|----------------------------|--------------------------|---------------------------|---|----------------------|--------------------|
| | | | | Final "X" position (mm) | Roughing pass 0.025mm | Finishing pass 0.005mm | ISO 2936 standard depth of Hex hole (mm) | Whole process ①-⑤ | Process④ Shaper |
| HEX 1.5 | SSP020N1130H | 1.5 | 1.47 | 1.73 | 6 | 1 | 2 | 39 sec | 14 sec |
| HEX 2.0 | SSP020N1430H | 2.0 | 1.95 | 2.31 | 8 | 1 | 2.5 | 44 sec | 16 sec |
| HEX 2.5 | SSP030N1940H | 2.5 | 2.48 | 2.89 | 9 | 1 | 3 | 50 sec | 20 sec |
| HEX 3.0 | SSP030N1940H | 3.0 | 2.95 | 3.46 | 11 | 1 | 3.5 | 55 sec | 23 sec |
| HEX 4.0 | SSP040N2450H | 4.0 | 3.96 | 4.62 | 14 | 1 | 5 | 73 sec | 33 sec |
| HEX 5.0 | SSP050N3260H | 5.0 | 4.96 | 5.77 | 17 | 1 | 6 | 90 sec | 46 sec |
| HEX 6.0 | SSP060N42120H | 6.0 | 5.97 | 6.93 | 20 | 1 | 8 | 117 sec | 63 sec |
| HEX 8.0 | SSP080N62160H | 8.0 | 7.98 | 9.24 | 26 | 1 | 10 | 155 sec | 92 sec |

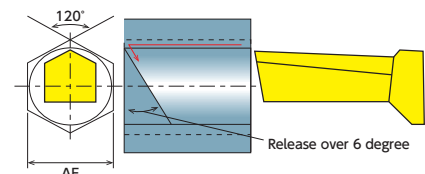
* Pilot bore diameter is same or smaller(0-0.1mm) as AF.
* Using Carbide drill

* Shaper cutting conditions

Feed : 3000 mm/min
DOC : 0.025 mm (Roughing), 0.005 mm (Finishing)

Recommended Cutting Conditions

Feed : 3000 mm/min (120 IPM)
DOC : Roughing ... 0.025 mm (.0010") + Finishing ... 0.005 mm (.0002")



S-MILL / Solid Carbide End-mill



Features

- The tool's sharpness creates a remarkable finish on machined surface.
- 2, 3, and 4 flute designs with a selection of diameters to cover a variety of applications. (2 flute available in 2mm ϕ)
- 40, 45, and 50mm lengths ideal for automatic lathes.

Two style



Three flute options



Surface finish

| | NTK (S-MILL) | Competitor A | Competitor B |
|--|--------------------------|--------------------|--------------|
| Magnified work material (side face) | | | |
| Magnified work material | | | |
| | Excellent surface finish | Bad surface finish | |
| 304 SS (ϕ 16mm) ϕ 6mm -2 flute 3,000 rpm, 11.8 IPM, 118" DOC, .047" width | | | |

Field Result

| 316 SS (D-cut) ϕ 6mm-2 flute | |
|---|-----------------------------|
| 3,200 rpm | |
| 5.5 IPM | |
| .024 DOC | |
| WET | |
| NTK : S-MILL | 12,000 pcs/corner+ α |
| Competitor's solid endmill | 10,000 pcs/corner |
| <small>The competitor's end mill showed an obvious decrease in surface finish quality as it reached the end of its tool life. NTK's S-MILL maintained a quality surface finish throughout the extent of its longer tool life.</small> | |

| 1045 (AF 8mm HEX) ϕ 6mm-2 flute | |
|---|-------------------------|
| 2,600 rpm | |
| 18.9 IPM | |
| .039 DOC | |
| WET | |
| NTK : S-MILL | 70 pcs/corner+ α |
| Competitor's solid endmill | 50 pcs/corner |
| <small>The S-MILL sharpness reduces the occurrence of burrs and tool life is increased; clear improvements over the competitor's tool. The sharp cutting edge also produces noticeably less sound than the current tooling.</small> | |

ST4

New coating optimized for 304SS



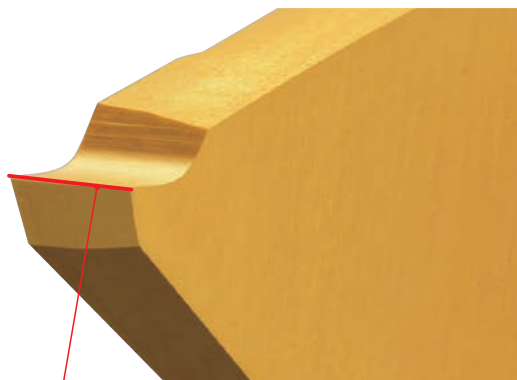
Features

- Optimized for 304SS
- Excellent adhesion and wear resistance

| Field Result | |
|-----------------------------|------------|
| Dia .236" (6mm) | |
| 304SS | |
| -187 SFM | |
| 10006 IPR | |
| NTK : ST4 | 27,000 pcs |
| Competitor's coated carbide | 18,000 pcs |

CTP-TH

Cut off style optimized for Stainless Steel



Strengthen edge

Features

- Specially designed cut off insert for stainless steel
- The combination of ST4 and CTP-TH provides best performance on 304 SS

| Field Result | |
|-----------------------------|------------|
| Dia .236" (6mm) | |
| 304SS | |
| -187 SFM | |
| 10006 IPR | |
| NTK : ST4 | 27,000 pcs |
| Competitor's coated carbide | 18,000 pcs |

Front Turning Chipbreaker Quartet

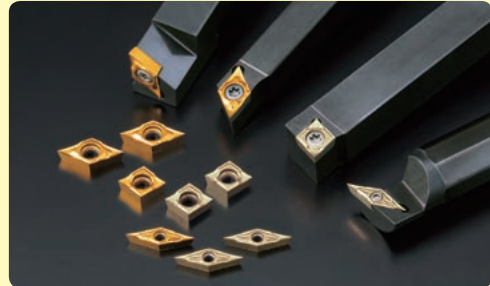
YL Chipbreaker



- Great combination of sharpness and toughness
- Covers extremely wide range
- Excellent chip control

WATCH ON
YouTube

CL Chipbreaker



- Sharpest molded Chipbreaker
- Excellent chip control
- Less tool pressure

WATCH ON
YouTube

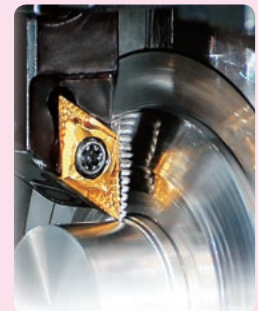


AM3 Chipbreaker



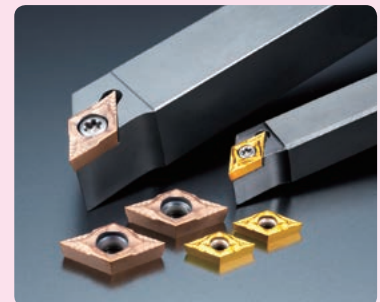
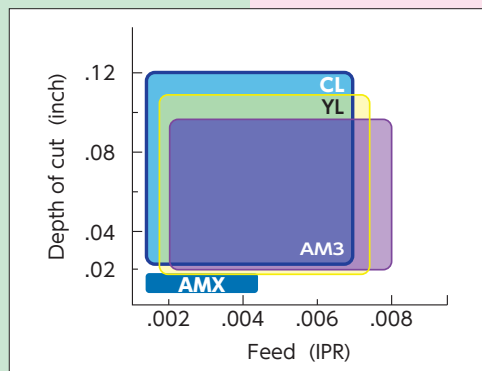
- All purpose chipbreaker
- Sharp edge with toughness

AMX Chipbreaker



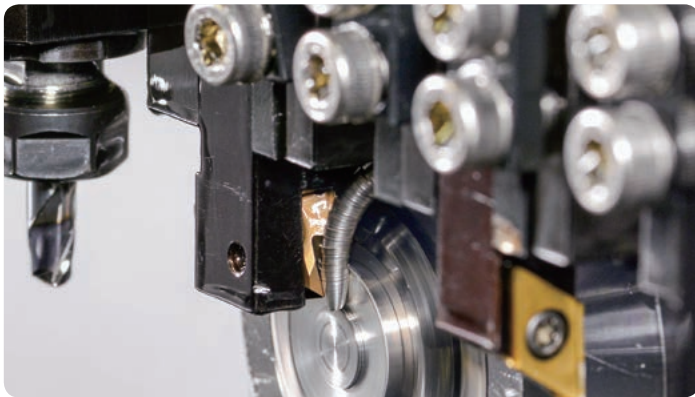
- Designed for very light depth of cut
- Exceptional sharpness

WATCH ON
YouTube



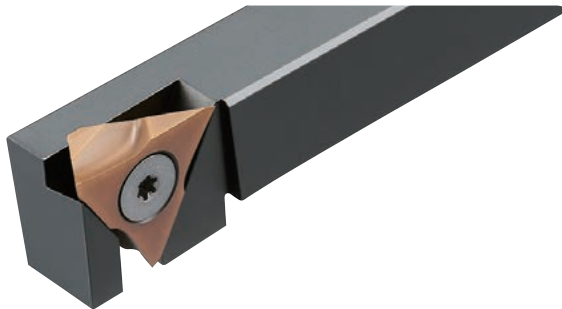
TFX insert

Front turning insert for large DOC



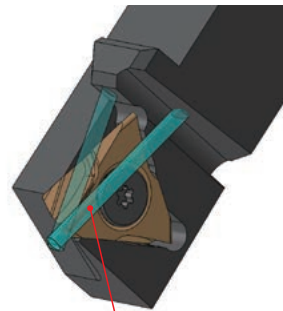
Features

- Up to .197" DOC capability
- Specially designed chipbreaker provides excellent chip control and sharpness
- Coolant through toolholder helps to evacuate chips

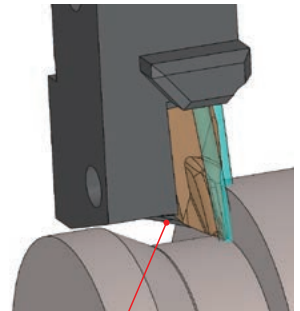


Available in wiper insert

Rigid side clamp

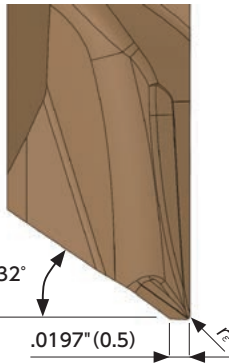


Coolant through tool holder is available

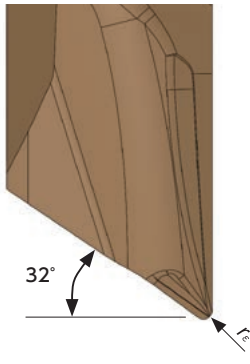


Can take 30° taper

With wiper

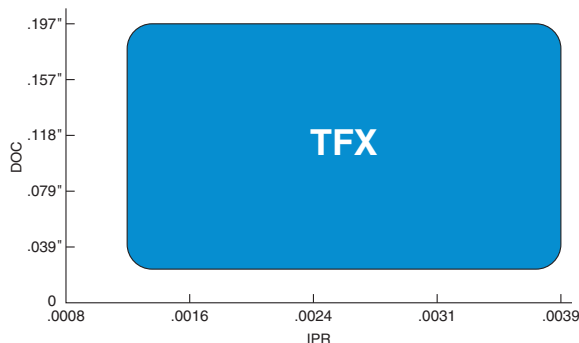
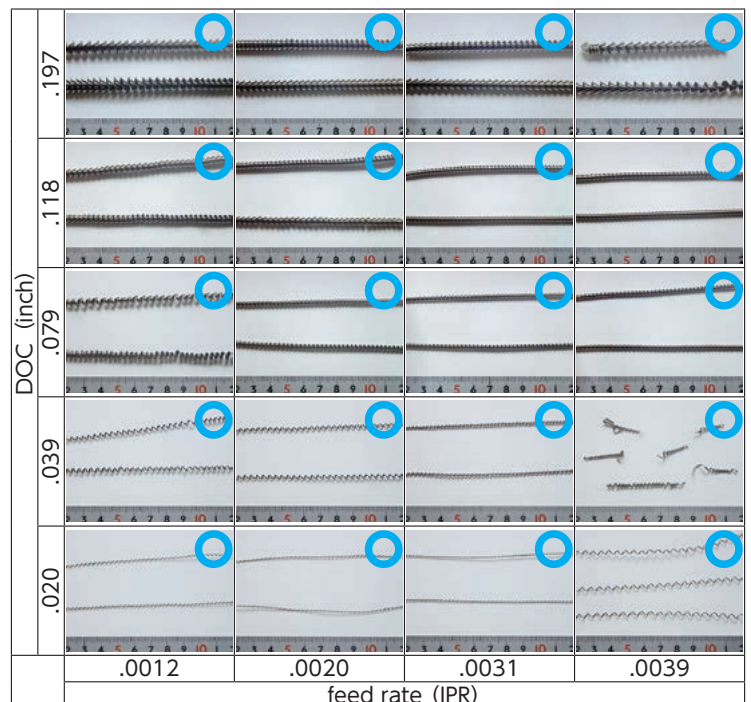


No wiper



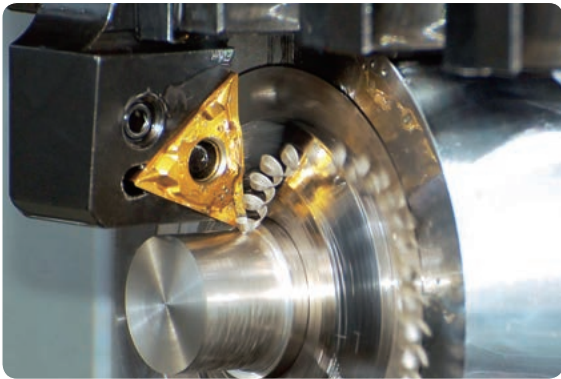
Excellent chip control

304 SS dia 16mm material, 260 SFM



UL Chipbreaker

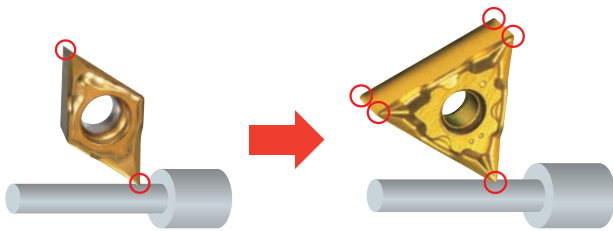
6 corner insert for Swiss machines



Features

- First negative style insert designed for Swiss machines
- Less tool pressure and good chip control

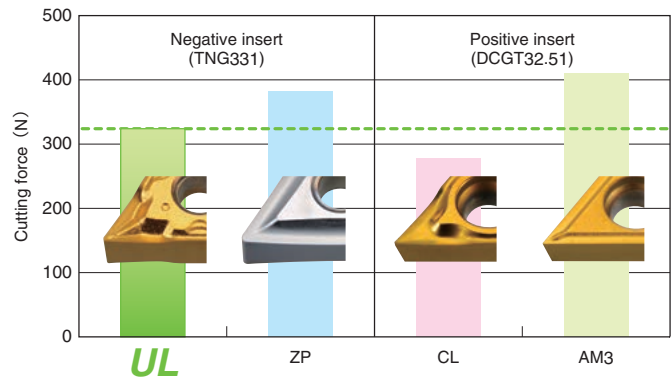
Reduce Cost in Swiss Machining



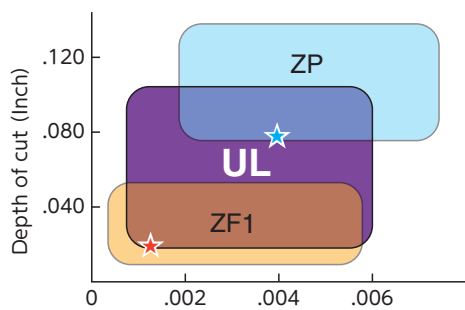
Positive insert with sharp cutting edge is required for Swiss machining.

With UL chipbreaker, negative insert provides sharp cutting edge AND more corners.

Cuts Like Positive Inserts



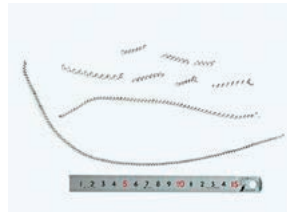
Covers a Wide Range of Cutting Conditions with Good Chip Control



《304 SS》 260 SFM WET

★ .001 IPR .020" DOC

★ .004 IPR .079" DOC

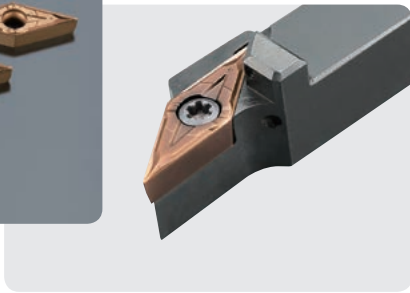
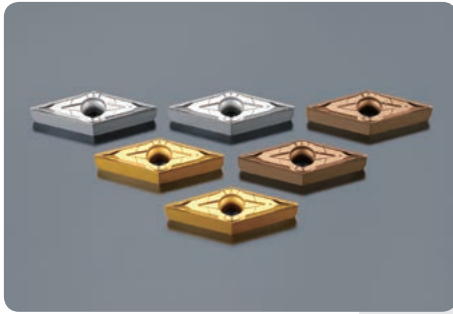


Toolholders for Swiss Machines



Available in ACH (Adjustable centerline height) toolholder

VBGT Tooling



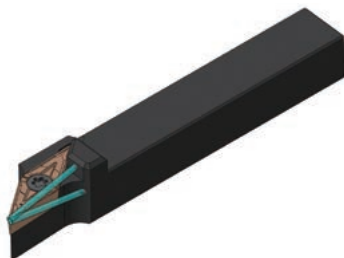
Features

- NTK developed the "VB" style chipbreaker with a unique combination of both sharpness and toughness
- Excellent chip control and covers a wide range of cutting conditions
- "G" tolerance inserts provide great surface finishes and stable part tolerances

Wide Chip Control Range

| 304SS (φ .630") 260SFM | | Feed (IPR) | | |
|---------------------------|-------|------------|-------|-------|
| | | .002" | .003" | .005" |
| Depth of cut (inch) | .118" | | | |
| | .079" | | | |
| | .039" | | | |
| | .020" | | | |

Coolant Through Toolholders Available



- Evacuates chips away from the cutting edge
- Reduces cutting tool temperature and keeps edge sharp even large depth of cut conditions
- Improves part tolerance by steady coolant supply to the edge

* Left-hand holders (SVJBL) are designed for Right-hand machines

DS-ACH Toolholders



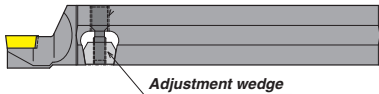
Features

- Adjust centerline height simply with a wrench

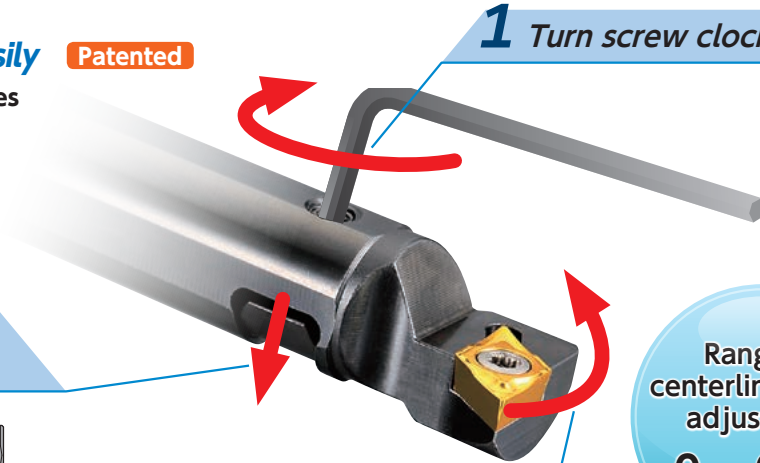
1 Adjust centerline height easily Patented

- Eliminate center boss on end faces
- Provide constant OD dimension
- Adjust easily in machine

2 Adjustment wedge goes down



3 Insert edge moves up

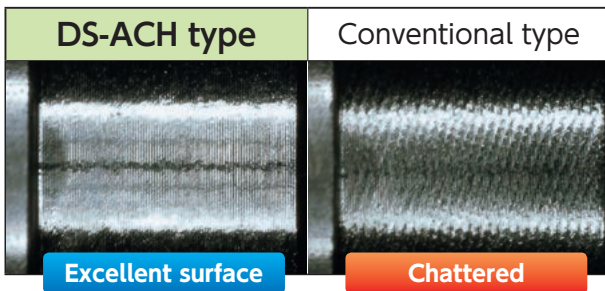


1 Turn screw clockwise

Range of centerline height adjustment
0 - .008"

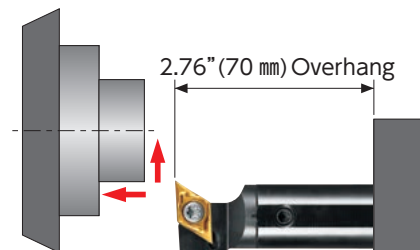
2 Optimized design reduces vibration

Improved chatter resistance.



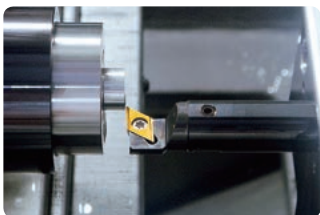
Tested cutting conditions (304 SS)

Work material : 304 SS
Holder : DS-SDUL19-11-ACH
Insert : DCGT32.508MCL TM4
Cutting condition : 250 SFM .002 IPR .079" DOC WET

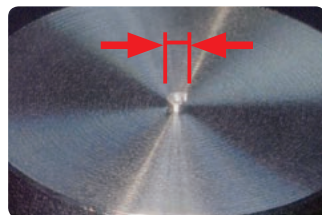


How to use

Insert moves in an upward direction only. (Loosen wedge screw before making any adjustment)



① Install the holder slightly below centerline. Then take a facing test cut.



② Measure the diameter of the centerboss.



③ Raise the center height by one half of the diameter of the boss. Adjustment references are available in the tool case.



④ Re-machine the end face.

*Adjustment instructions are supplied in the tool case

DS Sleeve

Features

- Prevents coolant and chips from damaging live tool stations
- Accepts DS Series holders to perform various back working
- Designed exclusively for 22mm(.866") and 34mm(1.339") round shank stations
- Compatible with 16mm(.630") / 22mm(.866") round shank DS Series holders

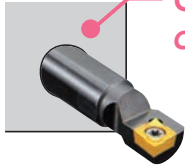
WATCH ON
YouTube



First Recommendation for Turning

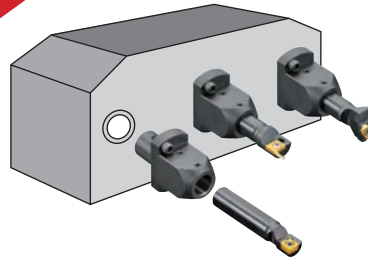


Coolant and chips sneak in.



When DS holders are used directly in live tool stations, coolant and chips sneak in from the flat of holders to damage the live stations

How it works

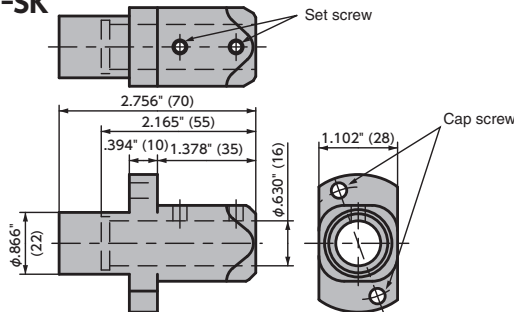


Stop coolant and chips from damaging live tool stations.

By using the DS Sleeve, you can use the DS Series holders without any worry about damaging live stations

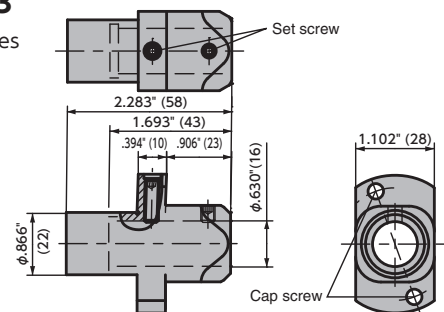
For Back 4-spindle unit

SS-DSU-SK



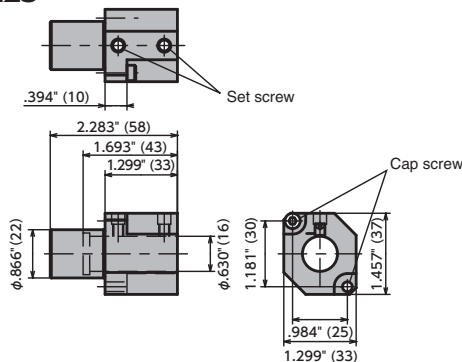
SS-DSU-L23

For DS-ACH series

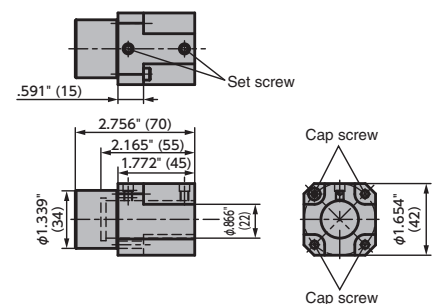


For Back 8-spindle unit

SS-DSU-B8L23



SS-DSU-B8D34



| Item number | Stock | Spare parts | | | | Coment |
|--------------|-------|-------------|--------|------------------|--------|------------------------|
| | | Cap screw | Wrench | Set screw | Wrench | |
| SS-DSU-SK | ● | CS0520 | LW-4 | SS0506 | LW-2.5 | |
| SS-DSU-L23 | ● | CS0520 | LW-4 | SS0506 SS0515 | LW-2.5 | For DS-ACH Series |
| SS-DSU-B8L23 | ● | CS0420 | LW-3 | SS0506 | LW-2.5 | Can take DS-ACH Series |
| SS-DSU-B8D34 | ● | CS0425 | LW-3 | SS0506 | LW-2.5 | |

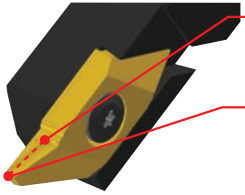
TBP-BM / TBPA-BM for Back Turning



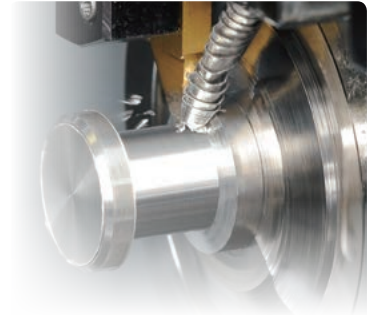
Features

- "Single Pass Back Turning" offers excellent surface finishes
- Up-right style insert and screw clamping provides high rigidity
- Wiper flat on cutting edge offers excellent surface finishes even under high feed cutting conditions

New BM chipbreaker

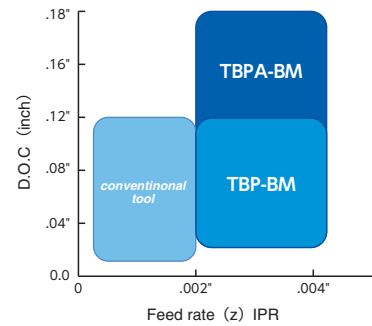
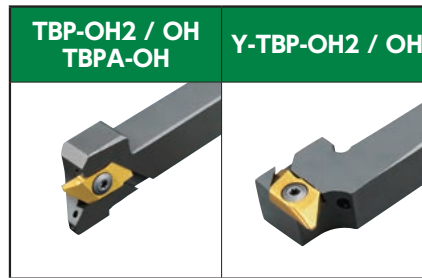


- Prevents the rough end face from hitting the chip
- Wiper flat on cutting edge creates excellent surface finishes



Best Solution for Chip Control

Coolant through toolholders now available



Superior Surface Finish

| 1Pass | BM chipbreaker | | Competitor's tool | |
|-----------|--------------------------|----------------------------------|----------------------|----------------------------------|
| | End face | OD | End face | OD |
| | | Ra : 0.72 μm Rz : 4.46 μm | | Ra : 1.65 μm Rz : 6.01 μm |
| | Excellent surface | | Rough surface | |

Material : 304 SS (φ.630") , 260 SFM , Feed X : .0008 IPR , Feed Z : .0031 IPR , .118"DOC , WET

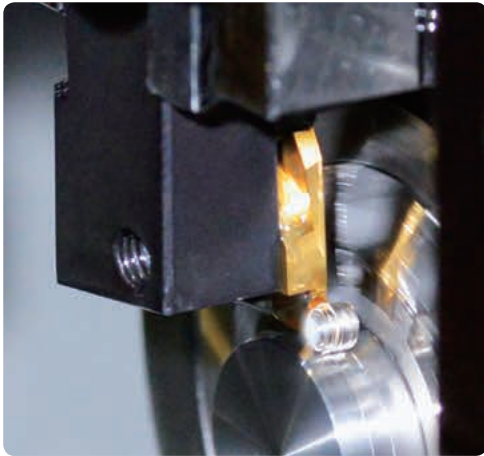
Excellent Chip Control

| D.O.C (inch) \ Feed rate (IPR) | BM chipbreaker | | Competitor | |
|--------------------------------|----------------|-------|------------|-------|
| | .002" | .003" | .002" | .003" |
| .020" | | | | |
| .120" | | | | |

Material : 304 SS (φ.630") , 260 SFM , WET

GTMH-GX for Grooving / Side Turning

WATCH ON
YouTube

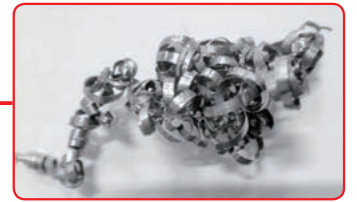


Features

- Can solve the problem of chips remaining in the grooves and bird's nest of chips
- Good surface finishes on groove side faces
- Up to .078" DOC side turning capability

Typical Grooving Problems

- Chips remain at the bottom of groove
- Bird's nest of chips



Excellent Chip Control

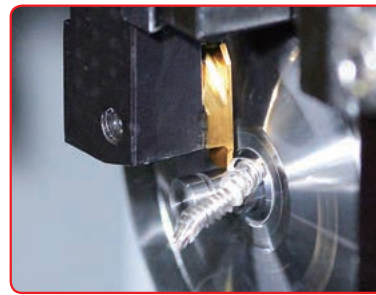
• Chipbreakers



Groove width .059"~



Groove width ~.039"



GX chipbreaker can solve these problems

• Grooving

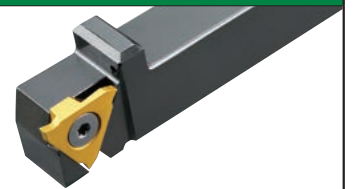
| DOC | Feed rate (IPR) | | |
|--------------------------|-----------------|--------|--------|
| | .0004" | .0011" | .0020" |
| GX chipbreaker | | | |
| Competitor's chipbreaker | | | |

Material : 304 SS (φ.630"), 260 SFM, .059" DOC

Best Solution for Chip Control

Coolant through toolholders now available

GTT-OH2 / OH



Y-GTT-OH2 / OH

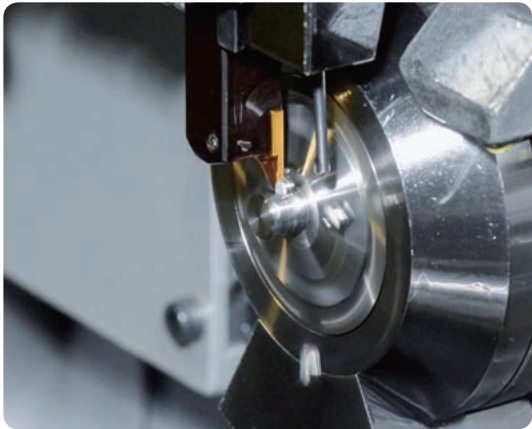


• Side Turning

| DOC | Feed rate (IPR) | | | |
|-------|-----------------|--------|--------|--------|
| | .0004" | .0011" | .0020" | .0031" |
| .010" | | | | |
| .020" | | | | |
| .030" | | | | |

Material : 304 SS (φ.630"), 260 SFM, .030" width insert

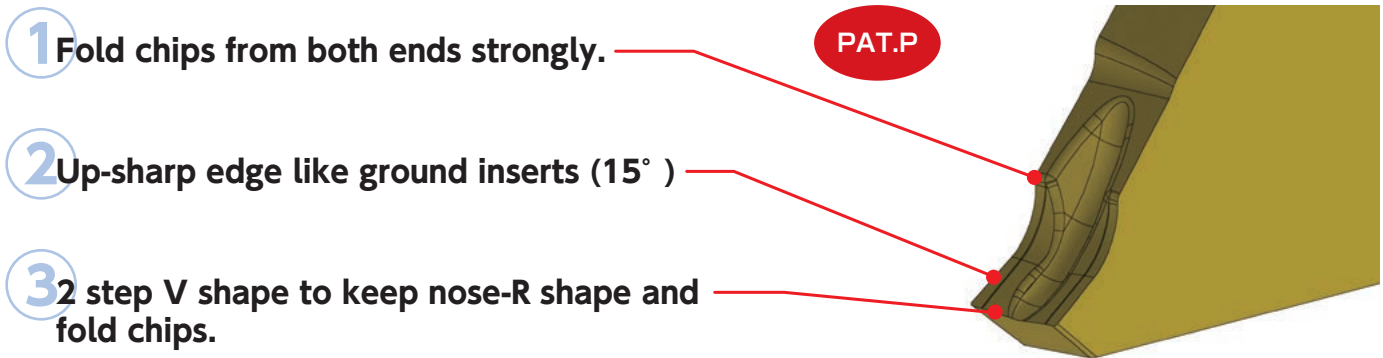
CTP-CX / CTPA-CX for Cut-off



Features

WATCH ON
YouTube

- New 3D molded chipbreaker on CTP style inserts
- Excellent chip control and straight-line stability with proprietary designed CX chipbreaker.
- Fold chips strongly from both ends result superior machined surface finish



With lead angle

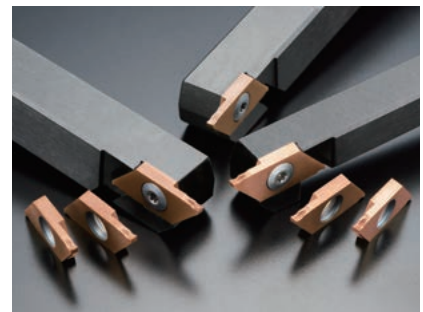
Neutral



Best Solution for Chip Control

Coolant through toolholders now available

CTP-OH2 / OH, CTPA-OH2 / OH



Superior Surface Finish and Excellent Chip control

| Feed IPR | CX chipbreaker | | Conventional (ground chipbreaker) | | Competitor (3D chipbreaker) | |
|----------|-----------------------------------|----------------|-----------------------------------|----------------|----------------------------------|----------------|
| | Chip | Surface finish | Chip | Surface finish | Chip | Surface finish |
| .0008 | | | | | | |
| .0020 | | | | | | |
| | Excellent machined surface finish | | Rough surface finish | | Vibration occurs by low rigidity | |

Material : 304 SS (φ .315"), 260 SFM , WET Holder : CTPR12 Insert : CTP15FRN-CX DM4

CUT MAX



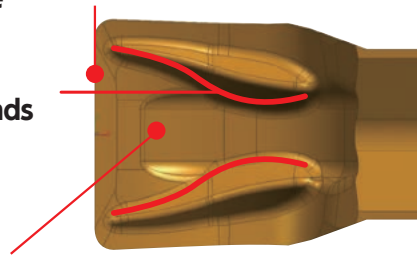
Features

- New double-edge cut-off tools with 3mm width for max. cut-off diameter of 42mm
- Original 'S' shape chipbreaker provides controlled chip evacuation

1 Chip control

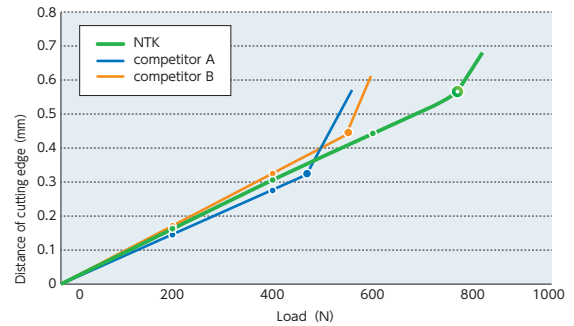
- Straight design improves toughness of cutting edge

- Folds chips from both ends strongly



- High rake angle for up-sharp edge

2 High rigidity



- Improved reliability and productivity on high-load cut-off application

Case study

| Feed IPR | CUT MAX | | Competitor A (3D molded low cutting force type chipbreaker) | | Competitor B (3D molded rigid type chipbreaker) | |
|----------|-----------------------------------|----------------|--|----------------|--|----------------|
| | Chip | Surface finish | Chip | Surface finish | Chip | Surface finish |
| .0012 | | | | | | |
| .0020 | | | | | | |
| .0039 | | | | | | |
| | Excellent machined surface finish | | In high feed rate area, rough surface finish | | In low feed rate area, rough surface finish | |

Cutting condition : 330SFM WET Material : 1045 (φ 1.653")
 Holder : CTWPR2020K-3D42 Insert : GWPFM300N02-GT DM4

CSV Series

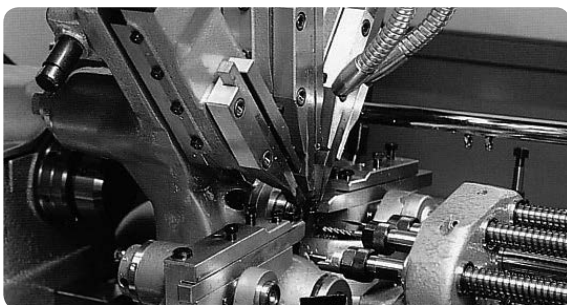
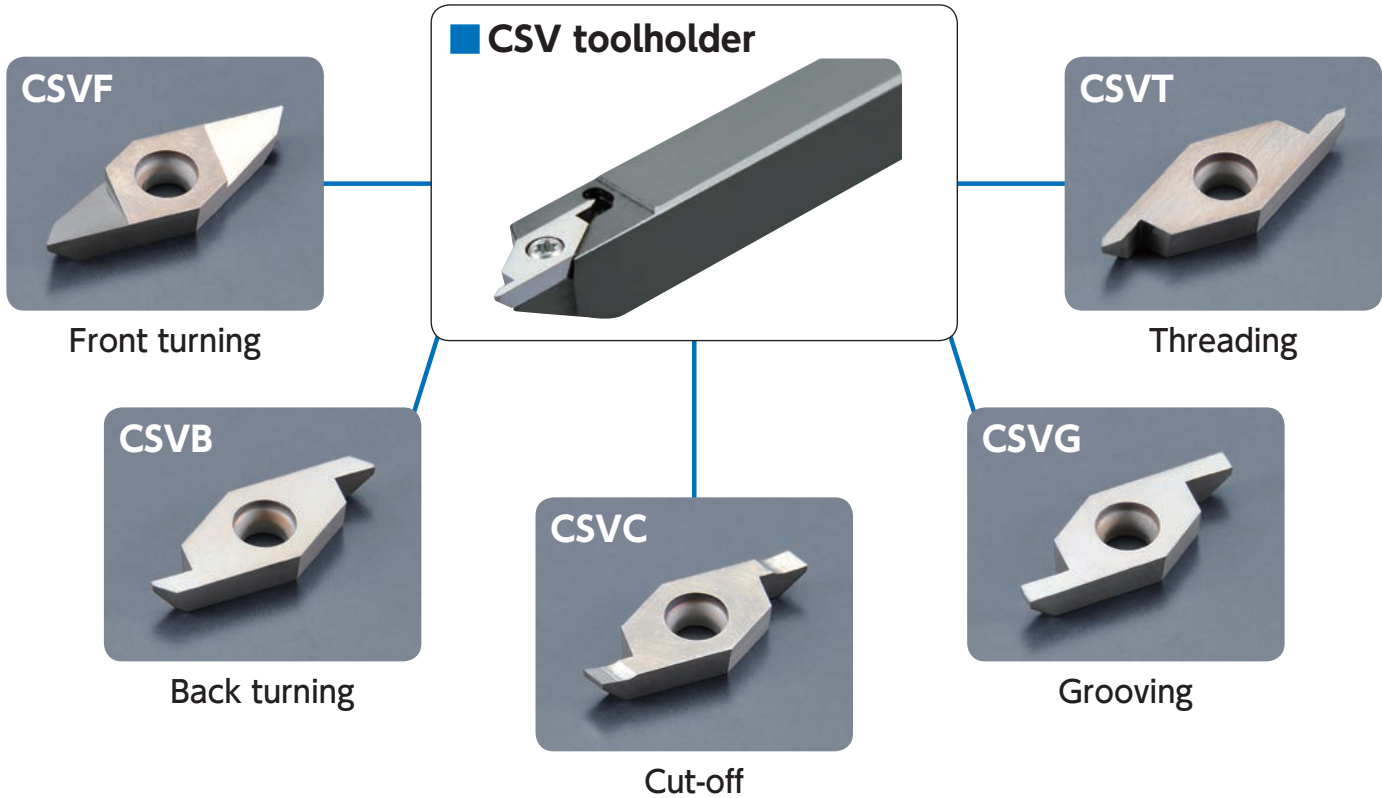
Tooling for small diameter parts

Best tool for up to .200" diameter materials



Features

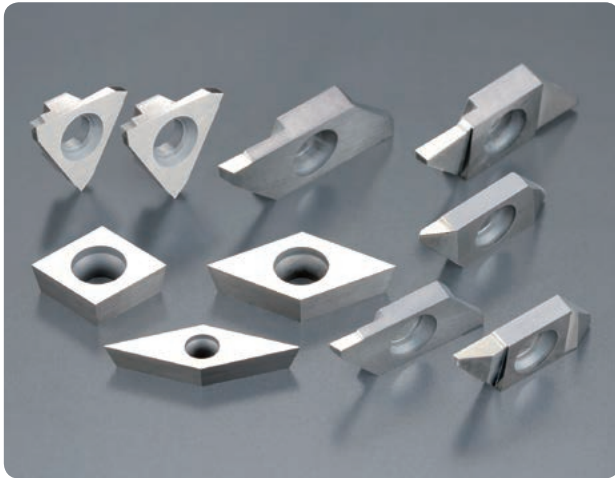
- Very up- sharp edge with mirror finish provides superior precise machining
- Interchangeable tool :
All the inserts can use the same toolholder
- Specially designed edge shape for small diameter machining



- Holders for Cam-style machine also available

KM1

Best tool for PEEK material



Features

- NTK's KM1 inserts are designed for other non-ferrous materials such as PEEK
- Extremely up-sharp edge and mirror insert surface creates excellent surface finishes
- R 0.0 corner radius inserts are available

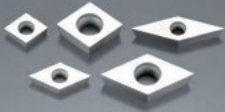


Mirror-finish / Up-sharp

R0.0 Insert

Cover all applications

Front turning



CC DC VC

Back turning



TBP

Cut-off



CTP CTPA

Grooving / side turning



GTMH GTPA

Threading

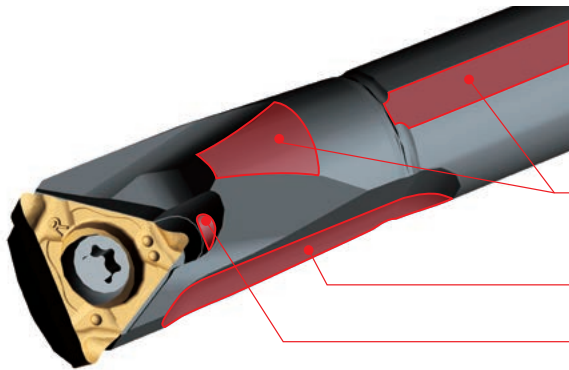


TTP

| Grade | Wark material | Application | Cutting Speed (SFM) | Feed (IPR) | Depth of Cut (inch) | DRY | WET |
|-------|---|-------------|----------------------|------------|---------------------|-----|-----|
| KM1 | PEEK Copper Brass Aluminum Plastics | Turning | 160-300 (160-650) | .0004-.004 | -.100 | ● | ● |

Mogul Bar

High rigidity boring bars



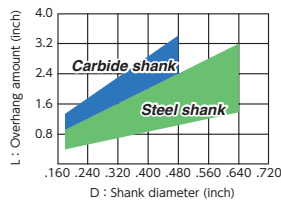
Features

- **High rigidity + Minimal flat widths**
Reduce vibration
- **Large clearance for improved chip evacuation**
- **All Mogul Bar boring bars are coolant through**

Recommended amount of overhang

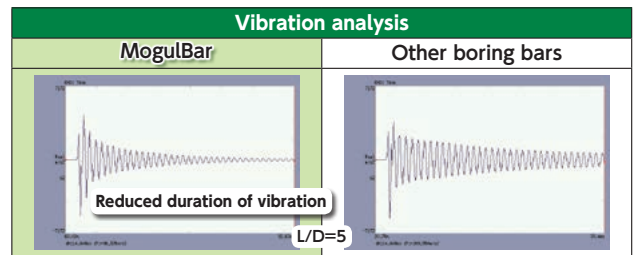
Steel Shank $L/D \leq 5$

Carbide Shank $L/D \leq 7$



L : Overhang
D : Shank diameter

[Cutting condition example]
Work materials: Alloy steel, stainless
260 SFM, .002 - .004 IPR, .004" - .020" DOC WET



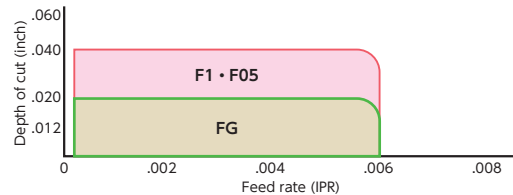
Note: Assuming a 100N load is applied. An equal amount of force was applied to both bars for vibration analysis.
Boring bar used in above analysis: S08H-STUPR09D10-OH

F Chipbreakers - Evacuate chips BACKWARD









- F chipbreakers allow chips to evacuate backward
- Combination of the F-chipbreakers and Mogul Bar delivers the best performance



Recommended Cutting Condition Range



F Chipbreakers - Features

| | DOC (inch) | Feed (IPR) | |
|--|------------|---|---|
| | | .002 | .004 |
| FG Chipbreaker <ul style="list-style-type: none"> • Best for finishing • Works for small DOC (.020" or less) • High rake angle  | .004 |  |  |
| | .012 |  |  |
| F1/F05 Chipbreakers <ul style="list-style-type: none"> • Cover wide condition range • Ground chipbreaker  | .020 |  |  |
| Note: Right-hand inserts with FG and F1 chipbreakers should be used with right-hand holders | | [Cutting condition example] 4140 Carbon Steel Diameter : $\phi.472$ " 260 SFM Depth of Bore : .787" Wet Holder : S10K-STUPR11D12-OH Insert : TPGH221 | |

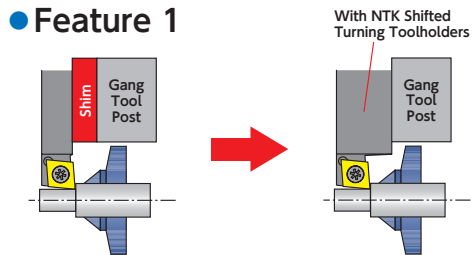
Shifted Toolholders Toolholders for extended guide-bushing



Two Major Features

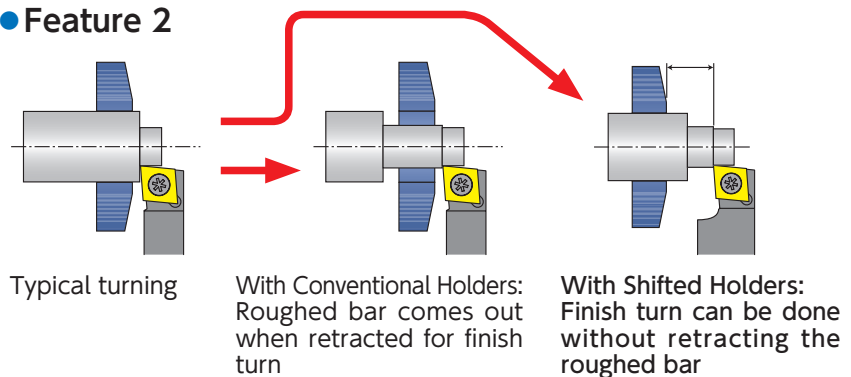
1. Eliminate shims for turning holders when extended guide bushing is used (especially in thread whirling)
2. Performs finish cut without retracting roughed section (bar) from guide bushing

● Feature 1



No shims required during thread whirling operation with an extended guide bushing

● Feature 2

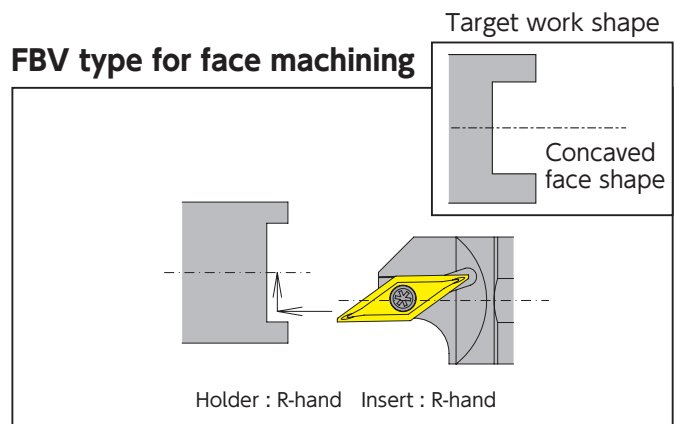
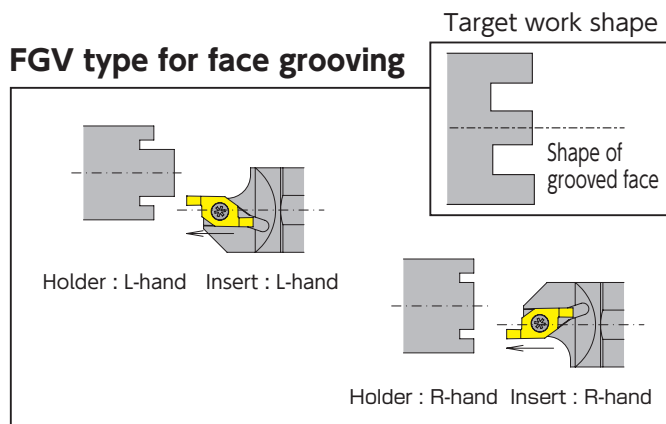


SATURN DUO Face turning / grooving tools



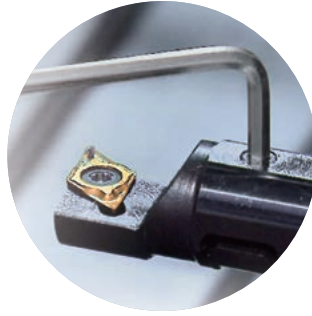
Features

- FGV type for face grooving and FBV type for face machining
- Economical double-corner specification
- Improved tool rigidity by optimizing the overhang and holder shape
- Selection includes : gang-type, front-gang-type and sleeve holder type



- Grooving possible under a wide range of cutting conditions due to strengthened rigidity of both insert and holder
- Minimum machining diameter of $\phi .236"$, and groove width of $.039"$
- Left-hand types available for machining work with a boss

- Further improved face machining efficiency
- Minimum machining diameter of $\phi .315"$



General Catalog



Advanced Cutting Tools



Swiss Tooling



NTK CUTTING TOOLS

Cutting tools play an integral part in any manufacturing process.

NTK offers a wide range of tooling products and inserts from Ceramics, CBNs, PCDs, Carbides to new materials like BIDEIMICS.

NGK | **NTK**
SPARK PLUGS | TECHNICAL CERAMICS

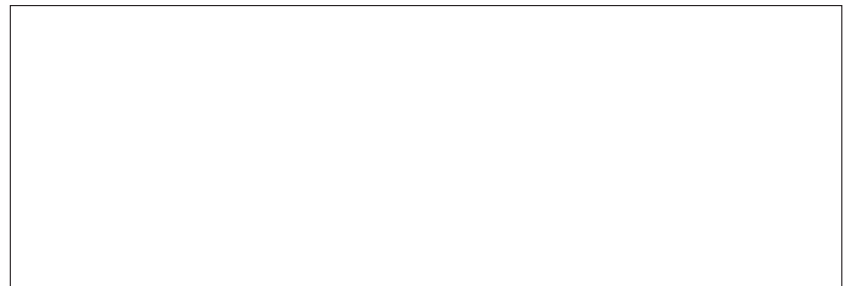
NGK SPARK PLUGS (USA), INC.

NTK Cutting Tools USA

a division of NGK SPARK PLUGS (U.S.A.), INC.
46929 Magellan Drive, Wixom, MI 48393, U.S.A.

www.ntkcuttingtools.com

DISTRIBUTED BY



[September.,2018]

