



TOOL-FLO



BALL NOSE

End Mills

BALLNOSE



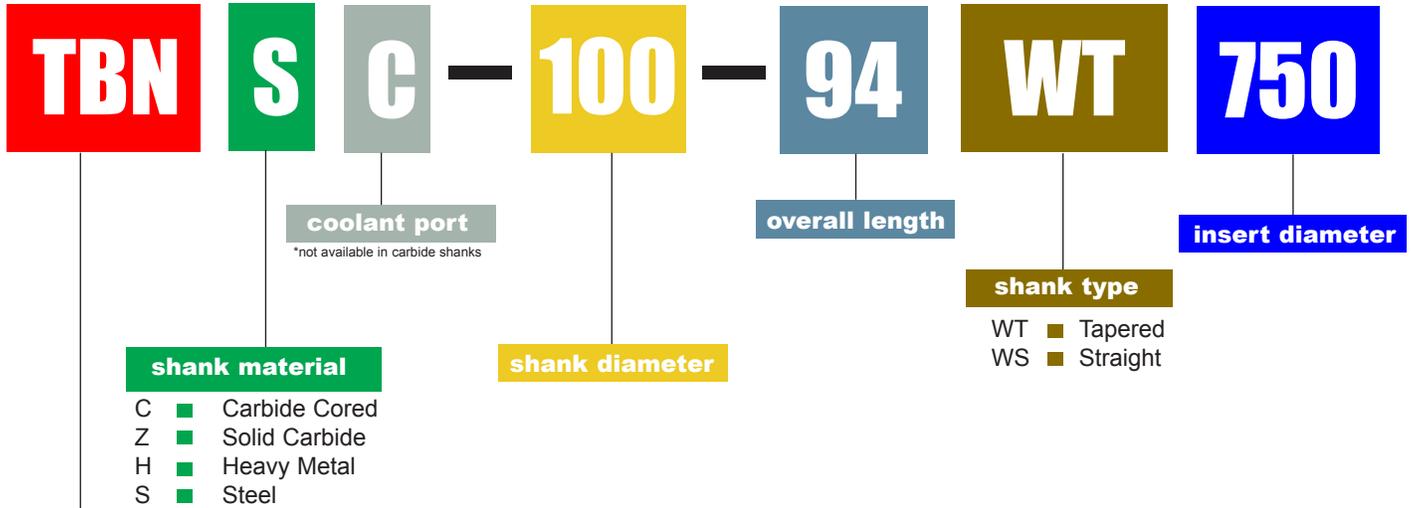
Ball Nose End Mills

RIGID-LOCK
SERRATED LOCKING SYSTEM



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Rigid-Lock Ball Nose Cutter Nomenclature Chart



end mill style

TBNS

- Finishing style ballnose end mill for precision milling applications
- Inserts are CNC ground to tolerance of +/- .0005 effective in the cutter
- Run at high speeds to reduce machining time by as much as 50%

TBDS

- Flat bottom/Back draft style for parts where square shoulders are required
- Inserts are CNC ground to tolerance of +/- .0005 effective in the cutter
- Run at high speeds to reduce machining time by as much as 50%

TOOL-FLO GUARANTEE

All above endmills feature our patented **RIGID-LOCK** serrated locking system. Precision ground serrations provide increased stability in the pocket and allow for increased speeds/feeds while preventing insert movement in the pocket. No insert movement means longer insert life as well as longer cutter body life. **Tool-Flo Mfg will replace any cutter body that experiences pocket wear***

*excludes insert screw wear, or tools that have been crashed.



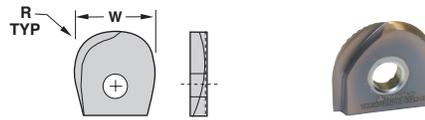
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TBNR-N

Neutral-Rake Finishing Inserts

■ For cutter bodies see pg. 38, 39



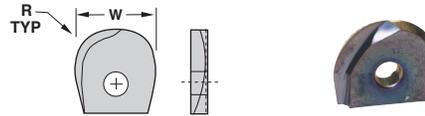
| Insert Description | EDP Code | Dia | R | Coating | | | | | | |
|--------------------|-----------|-------|------|---------|------|-------|------|-----|-------|-------------|
| | | | | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CBN Tipped* |
| TBNR-250-N | TBNR250N | .250 | .125 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-312-N | TBNR312N | .312 | .156 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-375-N | TBNR375N | .375 | .187 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-500-N | TBNR500N | .500 | .250 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-625-N | TBNR625N | .625 | .312 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-750-N | TBNR750N | .750 | .375 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1000-N | TBNR1000N | 1.000 | .500 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1250-N | TBNR1250N | 1.250 | .625 | ● | ● | ● | ● | ● | ● | ● |

*CBN tipped inserts must run in machine with head tilted at 5° minimum

TBNR-P

Positive-Rake Finishing Inserts

■ For cutter bodies see pg. 38, 39



| Insert Description | EDP Code | Dia | R | Coating | | | | | | |
|--------------------|-----------|-------|-------|---------|------|-------|------|-----|-------|-------|
| | | | | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
| TBNR-250-P | TBNR250P | .250 | .125 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-312-P | TBNR312P | .312 | .156 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-375-P | TBNR375P | .375 | .187 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-500-P | TBNR500P | .500 | .250 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-625-P | TBNR625P | .625 | .312 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-750-P | TBNR750P | .750 | .375 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-875-P | TBNR875P | .875 | .437 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1000-P | TBNR1000P | 1.000 | .500 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1125-P* | TBNR1125P | 1.125 | .562 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1250-P | TBNR1250P | 1.250 | .625 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1500-P | TBNR1500P | 1.500 | .750 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1625-P | TBNR1625P | 1.625 | .812 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-1750-P | TBNR1750P | 1.750 | .875 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-2000-P | TBNR2000P | 2.000 | 1.000 | ● | ● | ● | ● | ● | ● | ● |
| TBNR-2500-P | TBNR2500P | 2.500 | 1.250 | ● | ● | ● | ● | ● | ● | ● |

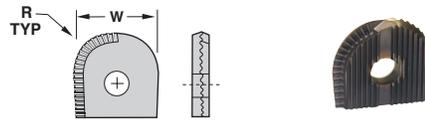
*Use in cutter for TBNR-1000P

TBXR-N

Neutral-Rake Roughing Inserts

Special Design for Roughing!

■ For cutter bodies see pg. 38, 39



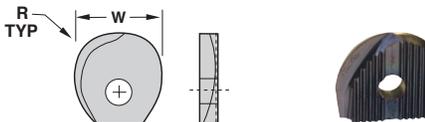
| Insert Description | EDP Code | Dia | R | Coating | | | | | | |
|--------------------|-----------|-------|------|---------|------|-------|------|-----|-------|-------|
| | | | | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
| TBXR-500-N | TBXR500N | .500 | .250 | ● | ● | ● | ● | ● | ● | ● |
| TBXR-625-N | TBXR625N | .625 | .312 | ● | ● | ● | ● | ● | ● | ● |
| TBXR-750-N | TBXR750N | .750 | .375 | ● | ● | ● | ● | ● | ● | ● |
| TBXR-875-N | TBXR875N | .875 | .437 | ● | ● | ● | ● | ● | ● | ● |
| TBXR-1000-N | TBXR1000N | 1.000 | .500 | ● | ● | ● | ● | ● | ● | ● |
| TBXR-1250-N | TBXR1250N | 1.250 | .625 | ● | ● | ● | ● | ● | ● | ● |
| TBXR-1500-N | TBXR1500N | 1.500 | .750 | ● | ● | ● | ● | ● | ● | ● |

SPHEROID STYLE

TBRR-P

Positive-Rake Finishing Inserts

■ For cutter bodies see pg. 38, 39



| Insert Description | EDP Code | Dia | R | Coating | | | | | | |
|--------------------|-----------|-------|------|---------|------|-------|------|-----|-------|-------|
| | | | | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
| TBRR-250-P | TBRR250P | .250 | .125 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-312-P | TBRR312P | .312 | .156 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-375-P | TBRR375P | .375 | .187 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-500-P | TBRR500P | .500 | .250 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-625-P | TBRR625P | .625 | .312 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-750-P | TBRR750P | .750 | .375 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-875-P | TBRR875P | .875 | .437 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-1000-P | TBRR1000P | 1.000 | .500 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-1125-P* | TBRR1125P | 1.125 | .562 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-1250-P | TBRR1250P | 1.250 | .625 | ● | ● | ● | ● | ● | ● | ● |
| TBRR-1500-P | TBRR1500P | 1.500 | .750 | ● | ● | ● | ● | ● | ● | ● |

*Use in cutter for TBRR-1000P

In an effort to improve our stock standard grade offering, there are periodic changes. Please see current price list for up-to-date grade offering.

- High performance choice in optimal conditions.
- ▲ Recommended grade under general conditions.

| | | | | | | | | | | |
|---------------------|--|--|--|---|--|--|--|--|---|--|
| Cast Iron | | | | | | | | | ● | |
| Non-Ferrous | | | | ▲ | | | | | ● | |
| Stainless/High Temp | | | | | | | | | ● | |
| Steel | | | | | | | | | ● | |
| Hardened Material | | | | | | | | | ▲ | |
| Composite | | | | | | | | | ▲ | |

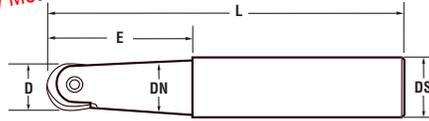
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BALL NOSE TBNS-WT

Tapered neck holders (Inch) w/coolant port

Available in Steel, Carbide Cored & Heavy Metal.



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|--------|--------------------|------------------|-------|-------|-------|-------|----------|--------------|--------|--------|
| 3/4" | TBNSC-100-75WT750 | TBNSC10075WT750 | .750 | 3.000 | 7.500 | 1.000 | 3° Taper | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNSC-100-94WT750 | TBNSC10094WT750 | .750 | 3.000 | 9.437 | 1.000 | 3° Taper | TBNR/RR-750 | STBN-6 | K4 |
| 1" | TBNSC-125-82WT1000 | TBNSC12582WT1000 | 1.000 | 3.875 | 8.250 | 1.250 | 3° Taper | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNSC-125-94WT1000 | TBNSC12594WT1000 | 1.000 | 3.875 | 9.437 | 1.250 | 3° Taper | TBNR/RR-1000 | STBN-7 | K5 |
| 1-1/4" | TBNSC-150-94WT1250 | TBNSC15094WT1250 | 1.250 | 4.750 | 9.437 | 1.500 | 3° Taper | TBNR/RR-1250 | STBN-8 | K6 |

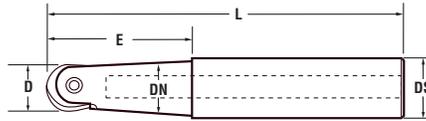
Tapered neck holders (Inch) without coolant port

| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|--------|-------------------|-----------------|-------|-------|-------|-------|----------|--------------|---------|--------|
| 1/4" | TBNS-375-40WT250 | TBNS37540WT250 | .250 | 1.375 | 4.000 | .375 | 3° Taper | TBNR/RR-250 | STBN-1A | K2 |
| 5/16" | TBNS-500-50WT312 | TBNS50050WT312 | .312 | 1.906 | 5.000 | .500 | 3° Taper | TBNR/RR-312 | STBN-2 | K3 |
| 3/8" | TBNS-500-50WT375 | TBNS50050WT375 | .375 | 1.375 | 5.000 | .500 | 3° Taper | TBNR/RR-375 | STBN-3 | K3 |
| 1/2" | TBNS-625-60WT500 | TBNS62560WT500 | .500 | 2.312 | 6.000 | .625 | 3° Taper | TBNR/RR-500 | STBN-4 | K3 |
| 5/8" | TBNS-750-68WT625 | TBNS75068WT625 | .625 | 2.562 | 6.875 | .750 | 3° Taper | TBNR/RR-625 | STBN-5 | K3 |
| 3/4" | TBNS-100-75WT750 | TBNS10075WT750 | .750 | 3.000 | 7.500 | 1.000 | 3° Taper | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNS-100-94WT750 | TBNS10094WT750 | .750 | 3.000 | 9.437 | 1.000 | 3° Taper | TBNR/RR-750 | STBN-6 | K4 |
| 1" | TBNS-125-82WT1000 | TBNS12582WT1000 | 1.000 | 3.875 | 8.250 | 1.250 | 3° Taper | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNS-125-94WT1000 | TBNS12594WT1000 | 1.000 | 3.875 | 9.437 | 1.250 | 3° Taper | TBNR/RR-1000 | STBN-7 | K5 |
| 1-1/4" | TBNS-150-94WT1250 | TBNS15094WT1250 | 1.250 | 4.750 | 9.437 | 1.500 | 3° Taper | TBNR/RR-1250 | STBN-8 | K6 |

TBNC-WT

Carbide Cored Shank

Tapered neck holders (Inch) without coolant port

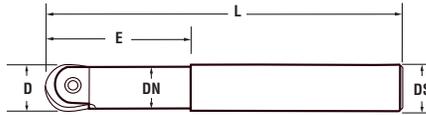


| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|--------|-------------------|-----------------|-------|-------|-------|-------|----------|--------------|--------|--------|
| 5/8" | TBNC-750-68WT625 | TBNC75068WT625 | .625 | 2.562 | 6.875 | .750 | 3° Taper | TBNR/RR-625 | STBN-5 | K3 |
| 3/4" | TBNC-100-75WT750 | TBNC10075WT750 | .750 | 3.000 | 7.500 | 1.000 | 3° Taper | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNC-100-94WT750 | TBNC10094WT750 | .750 | 3.000 | 9.437 | 1.000 | 3° Taper | TBNR/RR-750 | STBN-6 | K4 |
| 1" | TBNC-125-82WT1000 | TBNC12582WT1000 | 1.000 | 3.875 | 8.250 | 1.250 | 3° Taper | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNC-125-94WT1000 | TBNC12594WT1000 | 1.000 | 3.875 | 9.437 | 1.250 | 3° Taper | TBNR/RR-1000 | STBN-7 | K5 |
| 1-1/4" | TBNC-150-94WT1250 | TBNC15094WT1250 | 1.250 | 4.750 | 9.437 | 1.500 | 3° Taper | TBNR/RR-1250 | STBN-8 | K6 |

TBNS-WS

Available in Steel, Carbide Cored & Heavy Metal.

Straight neck holders (Inch) w/coolant port



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|--------|--------------------|------------------|-------|-------|--------|-------|-------|--------------|--------|--------|
| 3/4" | TBNSC-750-45WS750 | TBNSC75045WS750 | .750 | 1.750 | 6.750 | .750 | .690 | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNSC-750-67WS750 | TBNSC75067WS750 | .750 | 2.375 | 6.750 | .750 | .690 | TBNR/RR-750 | STBN-6 | K4 |
| 1" | TBNSC-100-62WS1000 | TBNSC10062WS1000 | 1.000 | 1.750 | 6.281 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNSC-100-75WS1000 | TBNSC10075WS1000 | 1.000 | 2.750 | 7.500 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1-1/4" | TBNSC-125-10WS1250 | TBNSC12510WS1250 | 1.250 | 3.850 | 10.000 | 1.250 | 1.142 | TBNR/RR-1250 | STBN-8 | K6 |

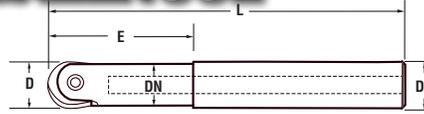
Straight neck holders (Inch) without coolant port

| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|--------|-------------------|-----------------|-------|-------|--------|-------|-------|--------------|---------|--------|
| 1/4" | TBNS-375-40WS250 | TBNS37540WS250 | .250 | .750 | 4.000 | .375 | .225 | TBNR/RR-250 | STBN-1A | K2 |
| 5/16" | TBNS-375-40WS312 | TBNS37540WS312 | .312 | .750 | 4.000 | .375 | .281 | TBNR/RR-312 | STBN-2 | K3 |
| 3/8" | TBNS-500-35WS375 | TBNS50035WS375 | .375 | 1.344 | 3.562 | .500 | .355 | TBNR/RR-375 | STBN-3 | K3 |
| 1/2" | TBNS-500-35WS500 | TBNS50035WS500 | .500 | 1.250 | 3.562 | .500 | .470 | TBNR/RR-500 | STBN-4 | K3 |
| 1/2" | TBNS-500-50WS500 | TBNS50050WS500 | .500 | 1.250 | 5.000 | .500 | .470 | TBNR/RR-500 | STBN-4 | K3 |
| 5/8" | TBNS-625-55WS625 | TBNS62555WS625 | .625 | 1.375 | 5.500 | .625 | .551 | TBNR/RR-625 | STBN-5 | K3 |
| 5/8" | TBNS-625-62WS625 | TBNS62562WS625 | .625 | 2.000 | 6.281 | .625 | .551 | TBNR/RR-625 | STBN-5 | K3 |
| 3/4" | TBNS-750-45WS750 | TBNS75045WS750 | .750 | 1.750 | 4.500 | .750 | .690 | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNS-750-62WS750 | TBNS75062WS750 | .750 | 1.750 | 6.281 | .750 | .690 | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNS-750-67WS750 | TBNS75067WS750 | .750 | 2.375 | 6.750 | .750 | .690 | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNS-750-82WS750 | TBNS75082WS750 | .750 | 2.375 | 8.250 | .750 | .690 | TBNR/RR-750 | STBN-6 | K4 |
| 7/8" | TBNS-100-62WS875 | TBNS10062WS875 | .875 | 1.750 | 6.281 | 1.000 | .794 | TBNR/RR-875 | STBN-7 | K5 |
| 1" | TBNS-100-62WS1000 | TBNS10062WS1000 | 1.000 | 1.750 | 6.281 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNS-100-75WS1000 | TBNS10075WS1000 | 1.000 | 2.750 | 7.500 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNS-100-90WS1000 | TBNS10090WS1000 | 1.000 | 3.125 | 9.062 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1-1/4" | TBNS-125-10WS1250 | TBNS12510WS1250 | 1.250 | 3.875 | 10.000 | 1.250 | 1.125 | TBNR/RR-1250 | STBN-8 | K6 |
| 1-1/2" | TBNS-150-12WS1500 | TBNS15012WS1500 | 1.500 | 4.000 | 12.000 | 1.500 | 1.375 | TBNR/RR-1500 | STBN-8 | K6 |
| 1-5/8" | TBNS-162-12WS1625 | TBNS16212WS1625 | 1.625 | 4.000 | 12.000 | 1.625 | 1.375 | TBNR/RR-1625 | STBN-9 | K7 |
| 1-3/4" | TBNS-175-14WS1750 | TBNS17514WS1750 | 1.750 | 5.000 | 14.000 | 1.750 | 1.500 | TBNR/RR-1750 | STBN-9 | K7 |
| 2" | TBNS-200-16WS2000 | TBNS20016WS2000 | 2.000 | 6.000 | 16.000 | 2.000 | 1.625 | TBNR/RR-2000 | STBN-10 | K8 |
| 2-1/2" | TBNS-250-16WS2500 | TBNS25016WS2500 | 2.500 | 6.000 | 16.000 | 2.500 | 2.125 | TBNR/RR-2500 | STBN-10 | K8 |



Carbide Cored Shank

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TBNC-WS

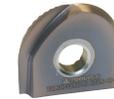
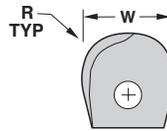
Straight neck holders (Inch) without coolant port

| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|--------|-------------------|-----------------|-------|-------|--------|-------|-------|--------------|---------|--------|
| 1/2" | TBNC-500-35WS500 | TBNC50035WS500 | .500 | 1.250 | 3.562 | .500 | .470 | TBNR/RR-500 | STBN-4 | K3 |
| 1/2" | TBNC-500-50WS500 | TBNC50050WS500 | .500 | 1.250 | 5.000 | .500 | .470 | TBNR/RR-500 | STBN-4 | K3 |
| 5/8" | TBNC-625-55WS625 | TBNC62555WS625 | .625 | 1.375 | 5.500 | .625 | .551 | TBNR/RR-625 | STBN-5 | K3 |
| 5/8" | TBNC-625-62WS625 | TBNC62562WS625 | .625 | 2.000 | 6.281 | .625 | .551 | TBNR/RR-625 | STBN-5 | K3 |
| 3/4" | TBNC-750-45WS750 | TBNC75045WS750 | .750 | 1.750 | 4.500 | .750 | .709 | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNC-750-62WS750 | TBNC75062WS750 | .750 | 1.750 | 6.281 | .750 | .709 | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNC-750-67WS750 | TBNC75067WS750 | .750 | 2.375 | 6.750 | .750 | .709 | TBNR/RR-750 | STBN-6 | K4 |
| 3/4" | TBNC-750-82WS750 | TBNC75082WS750 | .750 | 2.375 | 8.250 | .750 | .709 | TBNR/RR-750 | STBN-6 | K4 |
| 7/8" | TBNC-100-62WS875 | TBNC10062WS875 | .875 | 1.750 | 6.281 | 1.000 | .810 | TBNR/RR-875 | STBN-7 | K5 |
| 1" | TBNC-100-62WS1000 | TBNC10062WS1000 | 1.000 | 1.750 | 6.281 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNC-100-75WS1000 | TBNC10075WS1000 | 1.000 | 2.750 | 7.500 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1" | TBNC-100-90WS1000 | TBNC10090WS1000 | 1.000 | 3.125 | 9.062 | 1.000 | .906 | TBNR/RR-1000 | STBN-7 | K5 |
| 1-1/4" | TBNC-125-10WS1250 | TBNC12510WS1250 | 1.250 | 3.875 | 10.000 | 1.250 | 1.125 | TBNR/RR-1250 | STBN-8 | K6 |
| 1-1/2" | TBNC-150-12WS1500 | TBNC15012WS1500 | 1.500 | 4.000 | 12.000 | 1.500 | 1.375 | TBNR/RR-1500 | STBN-8 | K6 |
| 1-5/8" | TBNC-162-12WS1625 | TBNC16212WS1625 | 1.625 | 4.000 | 12.000 | 1.625 | 1.375 | TBNR/RR-1625 | STBN-9 | K7 |
| 1-3/4" | TBNC-175-14WS1750 | TBNC17514WS1750 | 1.750 | 5.000 | 14.000 | 1.750 | 1.500 | TBNR/RR-1750 | STBN-9 | K7 |
| 2" | TBNC-200-16WS2000 | TBNC20016WS2000 | 2.000 | 6.000 | 16.000 | 2.000 | 1.625 | TBNR/RR-2000 | STBN-10 | K8 |
| 2-1/2" | TBNC-250-16WS2500 | TBNC25016WS2500 | 2.500 | 6.000 | 16.000 | 2.500 | 2.125 | TBNR/RR-2500 | STBN-10 | K8 |

TBNR-M-N

Neutral Rake - Finishing Insert (METRIC)

Cutter: TBNSC/TBNS/TBNC



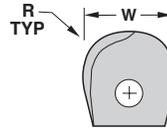
| Insert Description | EDP Code | Dia | R | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
|--------------------|----------|------|------|------|------|-------|------|-----|-------|-------|
| TBNR-10M-N | TBNR10MN | 10,0 | 5,0 | ● | ● | ● | ● | ● | | |
| TBNR-12M-N | TBNR12MN | 12,0 | 6,0 | ● | ● | ● | ● | ● | | |
| TBNR-16M-N | TBNR16MN | 16,0 | 8,0 | ● | ● | ● | ● | ● | | |
| TBNR-20M-N | TBNR20MN | 20,0 | 10,0 | ● | ● | ● | ● | ● | | |
| TBNR-25M-N | TBNR25MN | 25,0 | 12,5 | ● | ● | ● | ● | ● | | |
| TBNR-30M-N | TBNR30MN | 30,0 | 15,0 | ● | ● | ● | ● | ● | | |
| TBNR-32M-N | TBNR32MN | 32,0 | 16,0 | ● | ● | ● | ● | ● | | |

*CBN tipped inserts must run in machine with head tilted at 5° minimum

TBNR-M-P

Positive Rake - Finishing Insert (METRIC)

Cutter: TBNSC/TBNS/TBNC



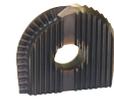
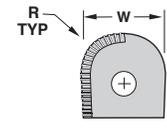
| Insert Description | EDP Code | Dia | R | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
|--------------------|----------|------|------|------|------|-------|------|-----|-------|-------|
| TBNR-8M-P | TBNR8MP | 8,0 | 4,0 | ● | ● | ● | ● | ● | | |
| TBNR-10M-P | TBNR10MP | 10,0 | 5,0 | ● | ● | ● | ● | ● | | |
| TBNR-12M-P | TBNR12MP | 12,0 | 6,0 | ● | ● | ● | ● | ● | | |
| TBNR-16M-P | TBNR16MP | 16,0 | 8,0 | ● | ● | ● | ● | ● | | |
| TBNR-20M-P | TBNR20MP | 20,0 | 10,0 | ● | ● | ● | ● | ● | | |
| TBNR-25M-P | TBNR25MP | 25,0 | 12,5 | ● | ● | ● | ● | ● | | |
| TBNR-30M-P | TBNR30MP | 30,0 | 15,0 | ● | ● | ● | ● | ● | | |
| TBNR-32M-P | TBNR32MP | 32,0 | 16,0 | ● | ● | ● | ● | ● | | |
| TBNR-40M-P | TBNR40MP | 40,0 | 20,0 | ● | ● | ● | ● | ● | | |
| TBNR-50M-P | TBNR50MP | 50,0 | 25,0 | ● | ● | ● | ● | ● | | |
| TBNR-65M-P | TBNR65MP | 65,0 | 32,5 | ● | ● | ● | ● | ● | | |

TBXR-M-N

Special Design for Roughing!

Neutral Rake - Roughing Insert (METRIC)

Cutter: TBNSC/TBNS/TBNC



| Insert Description | EDP Code | Dia | R | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
|--------------------|----------|------|------|------|------|-------|------|-----|-------|-------|
| TBXR-16M-N | TBXR16MN | 16,0 | 8,0 | ● | ● | ● | ● | ● | | |
| TBXR-20M-N | TBXR20MN | 20,0 | 10,0 | ● | ● | ● | ● | ● | | |
| TBXR-25M-N | TBXR25MN | 25,0 | 12,5 | ● | ● | ● | ● | ● | | |
| TBXR-30M-N | TBXR30MN | 30,0 | 15,0 | ● | ● | ● | ● | ● | | |
| TBXR-32M-N | TBXR32MN | 32,0 | 16,0 | ● | ● | ● | ● | ● | | |
| TBXR-40M-N | TBXR40MN | 40,0 | 20,0 | ● | ● | ● | ● | ● | | |

In an effort to improve our stock standard grade offering, there are periodic changes. Please see current price list for up-to-date grade offering.

- High performance choice in optimal conditions.
- ▲ Recommended grade under general conditions.

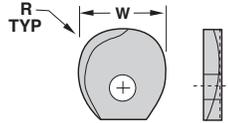
| | | | | | | | | | | |
|---------------------|--|--|--|--|---|--|--|--|---|--|
| Cast Iron | | | | | | | | | ● | |
| Non-Ferrous | | | | | ▲ | | | | ● | |
| Stainless/High Temp | | | | | | | | | ● | |
| Steel | | | | | | | | | ● | |
| Hardened Material | | | | | | | | | ▲ | |
| Composite | | | | | | | | | | |



SPHEROID STYLE TBRR-M-P

Positive-Rake Finishing Insert - **METRIC**

Cutter: TBNSC/TBNS/TBNC

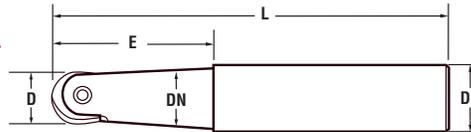


| Insert Description | EDP Code | Dia | R | C26S | Uncoated | TIN Coated | ZS26S | AlTiN Coated | AC3 | PCD Coated | CBN Tipper* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------|------|------|---|----------|---|-------|--------------|-----|------------|-------------|-----------|--|--|--|--|---|--|-------------|---|--|--|--|--|--|---------------------|--|--|--|--|---|--|-------|--|--|--|--|---|--|-------------------|--|--|--|---|--|---|-----------|--|--|--|---|---|--|
| TBRR-8M-P | TBRR8MP | 8,0 | 4,0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TBRR-10M-P | TBRR10MP | 10,0 | 5,0 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TBRR-12M-P | TBRR12MP | 12,0 | 6,0 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TBRR-16M-P | TBRR16MP | 16,0 | 8,0 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TBRR-20M-P | TBRR20MP | 20,0 | 10,0 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TBRR-25M-P | TBRR25MP | 25,0 | 12,5 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TBRR-30M-P | TBRR30MP | 30,0 | 15,0 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TBRR-32M-P | TBRR32MP | 32,0 | 16,0 | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>In an effort to improve our stock standard grade offering, there are periodic changes. Please see current price list for up-to-date grade offering.</p> | | | | <p>● High performance choice in optimal conditions. ▲ Recommended grade under general conditions.</p> | | <table border="1"> <tr><td>Cast Iron</td><td></td><td></td><td></td><td></td><td>●</td><td></td></tr> <tr><td>Non-Ferrous</td><td>▲</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Stainless/High Temp</td><td></td><td></td><td></td><td></td><td>●</td><td></td></tr> <tr><td>Steel</td><td></td><td></td><td></td><td></td><td>●</td><td></td></tr> <tr><td>Hardened Material</td><td></td><td></td><td></td><td>▲</td><td></td><td>●</td></tr> <tr><td>Composite</td><td></td><td></td><td></td><td>▲</td><td>●</td><td></td></tr> </table> | | | | | | Cast Iron | | | | | ● | | Non-Ferrous | ▲ | | | | | | Stainless/High Temp | | | | | ● | | Steel | | | | | ● | | Hardened Material | | | | ▲ | | ● | Composite | | | | ▲ | ● | |
| Cast Iron | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-Ferrous | ▲ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stainless/High Temp | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Steel | | | | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hardened Material | | | | ▲ | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Composite | | | | ▲ | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TBNS-WT

Tapered Neck Holder (**METRIC**) w/coolant port

Available in Steel, Carbide Cored & Heavy Metal.



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|-------------------|-----------------|------|-------|-------|------|----------|-------------|--------|--------|
| 16mm | TBNSC-20M-175WT16 | TBNSC20M175WT16 | 16,0 | 60,0 | 175,0 | 20,0 | 3° Taper | TBNR/RR-16M | STBN-5 | K3 |
| 20mm | TBNSC-25M-200WT20 | TBNSC25M200WT20 | 20,0 | 80,0 | 200,0 | 25,0 | 3° Taper | TBNR/RR-20M | STBN-6 | K4 |
| 25mm | TBNSC-32M-225WT25 | TBNSC32M225WT25 | 25,0 | 100,0 | 225,0 | 32,0 | 3° Taper | TBNR/RR-25M | STBN-7 | K5 |
| 30mm | TBNSC-40M-225WT30 | TBNSC40M225WT30 | 30,0 | 120,0 | 225,0 | 40,0 | 3° Taper | TBNR/RR-30M | STBN-8 | K6 |
| 32mm | TBNSC-40M-225WT32 | TBNSC40M225WT32 | 32,0 | 120,0 | 225,0 | 40,0 | 3° Taper | TBNR/RR-32M | STBN-8 | K6 |

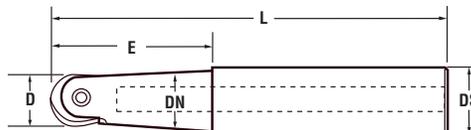
Tapered Neck Holder (**METRIC**) without coolant port

| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|------------------|----------------|------|-------|-------|------|----------|-------------|--------|--------|
| 8mm | TBNS-10M-125WT8 | TBNS10M125WT8 | 8,0 | 35,0 | 125,0 | 10,0 | 3° Taper | TBNR/RR-8M | STBN-2 | K3 |
| 10mm | TBNS-12M-125WT10 | TBNS12M125WT10 | 10,0 | 35,0 | 125,0 | 12,0 | 3° Taper | TBNR/RR-10M | STBN-3 | K3 |
| 12mm | TBNS-16M-160WT12 | TBNS16M160WT12 | 12,0 | 60,0 | 160,0 | 16,0 | 3° Taper | TBNR/RR-12M | STBN-4 | K3 |
| 16mm | TBNS-20M-180WT16 | TBNS20M180WT16 | 16,0 | 60,0 | 180,0 | 20,0 | 3° Taper | TBNR/RR-16M | STBN-5 | K3 |
| 20mm | TBNS-25M-190WT20 | TBNS25M190WT20 | 20,0 | 80,0 | 190,0 | 25,0 | 3° Taper | TBNR/RR-20M | STBN-6 | K4 |
| 20mm | TBNS-25M-230WT20 | TBNS25M230WT20 | 20,0 | 80,0 | 230,0 | 25,0 | 3° Taper | TBNR/RR-20M | STBN-6 | K4 |
| 25mm | TBNS-32M-210WT25 | TBNS32M210WT25 | 25,0 | 100,0 | 210,0 | 32,0 | 3° Taper | TBNR/RR-25M | STBN-7 | K5 |
| 25mm | TBNS-32M-240WT25 | TBNS32M240WT25 | 25,0 | 100,0 | 240,0 | 32,0 | 3° Taper | TBNR/RR-25M | STBN-7 | K5 |
| 30mm | TBNS-40M-250WT30 | TBNS40M250WT30 | 30,0 | 120,0 | 250,0 | 40,0 | 3° Taper | TBNR/RR-30M | STBN-8 | K6 |
| 32mm | TBNS-40M-250WT32 | TBNS40M250WT32 | 32,0 | 120,0 | 250,0 | 40,0 | 3° Taper | TBNR/RR-32M | STBN-8 | K6 |

TBNC-WT

Tapered Neck Holder (**METRIC**) without coolant port

Carbide Cored Shank



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|------------------|----------------|------|-------|-------|------|----------|-------------|--------|--------|
| 16mm | TBNC-20M-180WT16 | TBNC20M180WT16 | 16,0 | 60,0 | 180,0 | 20,0 | 3° Taper | TBNR/RR-16M | STBN-5 | K3 |
| 20mm | TBNC-25M-190WT20 | TBNC25M190WT20 | 20,0 | 80,0 | 190,0 | 25,0 | 3° Taper | TBNR/RR-20M | STBN-6 | K4 |
| 20mm | TBNC-25M-230WT20 | TBNC25M230WT20 | 20,0 | 80,0 | 230,0 | 25,0 | 3° Taper | TBNR/RR-20M | STBN-6 | K4 |
| 25mm | TBNC-32M-210WT25 | TBNC32M210WT25 | 25,0 | 100,0 | 210,0 | 32,0 | 3° Taper | TBNR/RR-25M | STBN-7 | K5 |
| 25mm | TBNC-32M-240WT25 | TBNC32M240WT25 | 25,0 | 100,0 | 240,0 | 32,0 | 3° Taper | TBNR/RR-25M | STBN-7 | K5 |
| 30mm | TBNC-40M-250WT30 | TBNC40M250WT30 | 30,0 | 120,0 | 250,0 | 40,0 | 3° Taper | TBNR/RR-30M | STBN-8 | K6 |
| 32mm | TBNC-40M-250WT32 | TBNC40M250WT32 | 32,0 | 120,0 | 250,0 | 40,0 | 3° Taper | TBNR/RR-32M | STBN-8 | K6 |

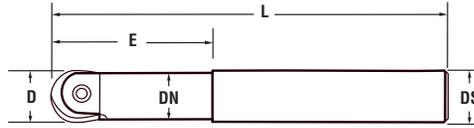


BALLNOSE

TBNS-WS

Straight Neck Holder (**METRIC**) w/coolant port (RH only)

Available in Steel, Carbide Cored & Heavy Metal.



BALLNOSE

| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|-------------------|-----------------|------|------|-------|------|------|-------------|--------|--------|
| 20mm | TBNSC-20M-175WS20 | TBNSC20M175WS20 | 20,0 | 45,0 | 175,0 | 20,0 | 18,0 | TBNR/RR-20M | STBN-6 | K4 |
| 25mm | TBNSC-25M-190WS25 | TBNSC25M190WS25 | 25,0 | 70,0 | 190,0 | 25,0 | 23,0 | TBNR/RR-25M | STBN-7 | K5 |
| 32mm | TBNSC-32M-210WS32 | TBNSC32M210WS32 | 32,0 | 80,0 | 210,0 | 32,0 | 27,2 | TBNR/RR-32M | STBN-8 | K6 |

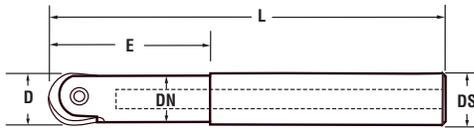
Straight Neck Holder (**METRIC**) without coolant port (RH only)

| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|------------------|----------------|------|-------|-------|------|------|-------------|---------|--------|
| 8mm | TBNS-8M-100WS8 | TBNS8M100WS8 | 8,0 | 19,0 | 100,0 | 8,0 | 7,5 | TBNR/RR-8M | STBN-2 | K3 |
| 10mm | TBNS-10M-100WS10 | TBNS10M100WS10 | 10,0 | 19,0 | 100,0 | 10,0 | 9,0 | TBNR/RR-10M | STBN-3 | K3 |
| 12mm | TBNS-12M-130WS12 | TBNS12M130WS12 | 12,0 | 36,0 | 130,0 | 12,0 | 10,5 | TBNR/RR-12M | STBN-4 | K3 |
| 12mm | TBNS-12M-150WS12 | TBNS12M150WS12 | 12,0 | 46,0 | 150,0 | 12,0 | 10,5 | TBNR/RR-12M | STBN-4 | K3 |
| 16mm | TBNS-16M-140WS16 | TBNS16M140WS16 | 16,0 | 36,0 | 140,0 | 16,0 | 14,0 | TBNR/RR-16M | STBN-5 | K3 |
| 16mm | TBNS-16M-160WS16 | TBNS16M160WS16 | 16,0 | 36,0 | 160,0 | 16,0 | 14,0 | TBNR/RR-16M | STBN-5 | K3 |
| 20mm | TBNS-20M-160WS20 | TBNS20M160WS20 | 20,0 | 45,0 | 160,0 | 20,0 | 18,0 | TBNR/RR-20M | STBN-6 | K4 |
| 20mm | TBNS-20M-175WS20 | TBNS20M175WS20 | 20,0 | 45,0 | 175,0 | 20,0 | 18,0 | TBNR/RR-20M | STBN-6 | K4 |
| 25mm | TBNS-25M-160WS25 | TBNS25M160WS25 | 25,0 | 45,0 | 160,0 | 25,0 | 23,0 | TBNR/RR-25M | STBN-7 | K5 |
| 25mm | TBNS-25M-190WS25 | TBNS25M190WS25 | 25,0 | 70,0 | 190,0 | 25,0 | 23,0 | TBNR/RR-25M | STBN-7 | K5 |
| 30mm | TBNS-30M-175WS30 | TBNS30M175WS30 | 30,0 | 56,0 | 175,0 | 30,0 | 27,2 | TBNR/RR-30M | STBN-8 | K6 |
| 30mm | TBNS-30M-210WS30 | TBNS30M210WS30 | 30,0 | 80,0 | 210,0 | 30,0 | 27,2 | TBNR/RR-30M | STBN-8 | K6 |
| 32mm | TBNS-32M-175WS32 | TBNS32M175WS32 | 32,0 | 56,0 | 175,0 | 32,0 | 27,2 | TBNR/RR-32M | STBN-8 | K6 |
| 32mm | TBNS-32M-210WS32 | TBNS32M210WS32 | 32,0 | 80,0 | 210,0 | 32,0 | 27,2 | TBNR/RR-32M | STBN-8 | K6 |
| 40mm | TBNS-40M-305WS40 | TBNS40M305WS40 | 40,0 | 101,0 | 305,0 | 32,0 | 35,0 | TBNR/RR-40M | STBN-8 | K6 |
| 50mm | TBNS-50M-406WS50 | TBNS50M406WS50 | 50,0 | 152,0 | 406,0 | 50,0 | 41,0 | TBNR/RR-50M | STBN-10 | K8 |
| 65mm | TBNS-65M-406WS65 | TBNS65M406WS65 | 65,0 | 152,0 | 406,0 | 65,0 | 54,0 | TBNR/RR-65M | STBN-10 | K8 |

TBNC-WS

Straight Neck Holder (**METRIC**) without coolant port (RH only)

Carbide Cored Shank



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|------------------|----------------|------|------|-------|------|------|-------------|--------|--------|
| 12mm | TBNC-12M-130WS12 | TBNC12M130WS12 | 12,0 | 36,0 | 130,0 | 12,0 | 10,5 | TBNR/RR-12M | STBN-4 | K3 |
| 12mm | TBNC-12M-150WS12 | TBNC12M150WS12 | 12,0 | 46,0 | 150,0 | 12,0 | 10,5 | TBNR/RR-12M | STBN-4 | K3 |
| 16mm | TBNC-16M-140WS16 | TBNC16M140WS16 | 16,0 | 36,0 | 140,0 | 16,0 | 14,0 | TBNR/RR-16M | STBN-5 | K3 |
| 16mm | TBNC-16M-160WS16 | TBNC16M160WS16 | 16,0 | 36,0 | 160,0 | 16,0 | 14,0 | TBNR/RR-16M | STBN-5 | K3 |
| 20mm | TBNC-20M-160WS20 | TBNC20M160WS20 | 20,0 | 45,0 | 160,0 | 20,0 | 18,0 | TBNR/RR-20M | STBN-6 | K4 |
| 20mm | TBNC-20M-175WS20 | TBNC20M175WS20 | 20,0 | 45,0 | 175,0 | 20,0 | 18,0 | TBNR/RR-20M | STBN-6 | K4 |
| 25mm | TBNC-25M-160WS25 | TBNC25M160WS25 | 25,0 | 45,0 | 160,0 | 25,0 | 23,0 | TBNR/RR-25M | STBN-7 | K5 |
| 25mm | TBNC-25M-190WS25 | TBNC25M190WS25 | 25,0 | 70,0 | 190,0 | 25,0 | 23,0 | TBNR/RR-25M | STBN-7 | K5 |
| 30mm | TBNC-30M-175WS30 | TBNC30M175WS30 | 30,0 | 56,0 | 175,0 | 30,0 | 27,2 | TBNR/RR-30M | STBN-8 | K6 |
| 30mm | TBNC-30M-210WS30 | TBNC30M210WS30 | 30,0 | 80,0 | 210,0 | 30,0 | 27,2 | TBNR/RR-30M | STBN-8 | K6 |
| 32mm | TBNC-32M-175WS32 | TBNC32M175WS32 | 32,0 | 56,0 | 175,0 | 32,0 | 27,2 | TBNR/RR-32M | STBN-8 | K6 |
| 32mm | TBNC-32M-210WS32 | TBNC32M210WS32 | 32,0 | 80,0 | 210,0 | 32,0 | 27,2 | TBNR/RR-32M | STBN-8 | K6 |

BALLNOSE

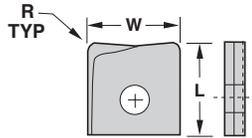


FLAT BOTTOM STYLE

TBFI

Neutral Rake Finishing Insert - INCH

Cutter: TBDS & TBDC



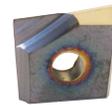
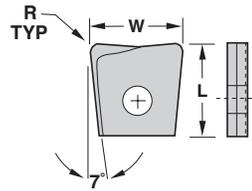
| Size | Insert Description | EDP Code | W | R | L | C26S | Uncoated | TIN Coated | AlTiN Coated | PCD Coated | CBN Tipped* |
|------|--------------------|------------|-------|------|------|------|----------|------------|--------------|------------|-------------|
| | | | | | | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
| 1/2" | TBFI-500-02 | TBDI50002 | .500 | .032 | .500 | ● | ● | ● | ● | ● | ● |
| 1/2" | TBFI-500-04 | TBFI50004 | .500 | .063 | .500 | ● | ● | ● | ● | ● | ● |
| 5/8" | TBFI-625-02 | TBFI62502 | .625 | .032 | .580 | ● | ● | ● | ● | ● | ● |
| 5/8" | TBFI-625-04 | TBFI62504 | .625 | .063 | .580 | ● | ● | ● | ● | ● | ● |
| 3/4" | TBFI-750-02 | TBFI75002 | .750 | .032 | .642 | ● | ● | ● | ● | ● | ● |
| 3/4" | TBFI-750-04 | TBFI75004 | .750 | .063 | .642 | ● | ● | ● | ● | ● | ● |
| 1" | TBFI-1000-02 | TBFI100002 | 1.000 | .032 | .867 | ● | ● | ● | ● | ● | ● |
| 1" | TBFI-1000-04 | TBFI100004 | 1.000 | .063 | .867 | ● | ● | ● | ● | ● | ● |
| 1" | TBFI-1000-08 | TBFI100008 | 1.000 | .125 | .867 | ● | ● | ● | ● | ● | ● |

BACK DRAFT STYLE

TBDI

Neutral Rake Finishing Insert - INCH

Cutter: TBDS & TBDC



| Size | Insert Description | EDP Code | W | R | L | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
|------|--------------------|------------|-------|------|------|------|------|-------|------|-----|-------|-------|
| 1/2" | TBDI-500-02 | TBDI50002 | .500 | .032 | .500 | ● | ● | ● | ● | ● | ● | ● |
| 1/2" | TBDI-500-04 | TBDI50004 | .500 | .063 | .500 | ● | ● | ● | ● | ● | ● | ● |
| 5/8" | TBDI-625-02 | TBDI62502 | .625 | .032 | .580 | ● | ● | ● | ● | ● | ● | ● |
| 5/8" | TBDI-625-04 | TBDI62504 | .625 | .063 | .580 | ● | ● | ● | ● | ● | ● | ● |
| 3/4" | TBDI-750-02 | TBDI75002 | .750 | .032 | .642 | ● | ● | ● | ● | ● | ● | ● |
| 3/4" | TBDI-750-04 | TBDI75004 | .750 | .063 | .642 | ● | ● | ● | ● | ● | ● | ● |
| 1" | TBDI-1000-02 | TBDI100002 | 1.000 | .032 | .867 | ● | ● | ● | ● | ● | ● | ● |
| 1" | TBDI-1000-04 | TBDI100004 | 1.000 | .063 | .867 | ● | ● | ● | ● | ● | ● | ● |
| 1" | TBDI-1000-08 | TBDI100008 | 1.000 | .125 | .867 | ● | ● | ● | ● | ● | ● | ● |

In an effort to improve our stock standard grade offering, there are periodic changes. Please see current price list for up to date grade offering.

- High performance choice in optimal conditions.
- ▲ Recommended grade under general conditions.

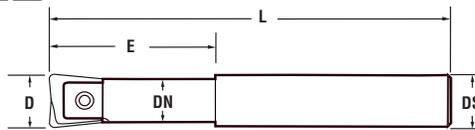
| | | | | | | | | | | | | |
|---------------------|--|---|--|--|---|---|--|--|--|--|---|--|
| Cast Iron | | | | | ● | | | | | | | |
| Non-Ferrous | | ▲ | | | ● | | | | | | | |
| Stainless/High Temp | | | | | ● | | | | | | | |
| Steel | | | | | ● | | | | | | | |
| Hardened Material | | | | | ▲ | | | | | | ● | |
| Composite | | | | | ▲ | ● | | | | | | |

FLAT BOTTOM/ BACK DRAFT STYLE

TBDS-WS

Straight Neck Holder (INCH)

Use TBDI & TBFI Inserts Only



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|-------------------|-----------------|-------|-------|-------|-------|------|----------------|--------|-----------|
| 1/2" | TBDS-500-59WS500 | TBDS50059WS500 | .500 | 1.890 | 5.980 | .500 | .413 | TBDI / FI-500 | STBN-4 | K3 / T-10 |
| 5/8" | TBDS-625-63WS625 | TBDS62563WS625 | .625 | 2.160 | 6.380 | .625 | .551 | TBDI / FI-625 | STBN-5 | K3 / T-10 |
| 3/4" | TBDS-750-68WS750 | TBDS75068WS750 | .750 | 2.480 | 6.890 | .750 | .709 | TBDI / FI-750 | STBN-6 | K4 / T-20 |
| 1" | TBDS-100-74WS1000 | TBDS10074WS1000 | 1.000 | 2.830 | 7.480 | 1.000 | .882 | TBDI / FI-1000 | STBN-7 | K5 / T-25 |

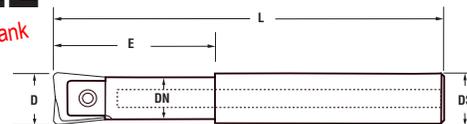
FLAT BOTTOM/ BACK DRAFT STYLE

TBDC-WS

Straight Neck Holder (INCH)

Carbide Cored Shank

Use TBDI & TBFI Inserts Only



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|-------------------|-----------------|-------|-------|-------|-------|------|----------------|--------|-----------|
| 1/2" | TBDC-500-59WS500 | TBDC50059WS500 | .500 | 1.890 | 5.980 | .500 | .413 | TBDI / FI-500 | STBN-4 | K3 / T-10 |
| 5/8" | TBDC-625-63WS625 | TBDC62563WS625 | .625 | 2.160 | 6.380 | .625 | .551 | TBDI / FI-625 | STBN-5 | K3 / T-10 |
| 3/4" | TBDC-750-68WS750 | TBDC75068WS750 | .750 | 2.480 | 6.890 | .750 | .709 | TBDI / FI-750 | STBN-6 | K4 / T-20 |
| 1" | TBDC-100-74WS1000 | TBDC10074WS1000 | 1.000 | 2.830 | 7.480 | 1.000 | .882 | TBDI / FI-1000 | STBN-7 | K5 / T-25 |

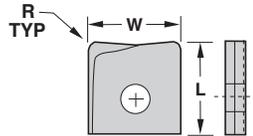


BALLNOSE

FLAT BOTTOM STYLE TBF1

Neutral Rake Finishing Insert - **METRIC**

Cutter: TBDS & TBDC



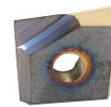
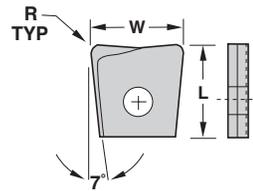
| Size | Insert Description | EDP Code | W | R | L | C26S | Uncoated | TIN Coated | AlTiN Coated | PCD Coated | CBN Tipped* |
|------|--------------------|-----------|------|-----------|------|------|----------|------------|--------------|------------|-------------|
| 8mm | TBF1-8M-02 | TBDI8M02 | 8,0 | (02) 0,81 | 12,7 | | | | | | |
| 8mm | TBF1-8M-04 | TBF18M04 | 8,0 | (04) 1,60 | 12,7 | | ● | | | | ● |
| 16mm | TBF1-16M-02 | TBF116M02 | 16,0 | (02) 0,81 | 14,7 | | ● | | | | |
| 16mm | TBF1-16M-04 | TBF116M04 | 16,0 | (04) 1,60 | 14,7 | | ● | | | | |
| 20mm | TBF1-20M-02 | TBF120M02 | 20,0 | (02) 0,81 | 16,3 | | ● | | | | ● |
| 20mm | TBF1-20M-04 | TBF120M04 | 20,0 | (04) 1,60 | 16,3 | | ● | | | | ● |
| 25mm | TBF1-25M-02 | TBF125M02 | 25,0 | (02) 0,81 | 22,0 | | ● | | | | |
| 25mm | TBF1-25M-04 | TBF125M04 | 25,0 | (04) 1,60 | 22,0 | | ● | | | | ● |
| 25mm | TBF1-25M-08 | TBF125M08 | 25,0 | (08) 3,18 | 22,0 | | ● | | | | ● |

BALLNOSE

BACK DRAFT STYLE TBD1

Neutral Rake Finishing Insert - **METRIC**

Cutter: TBDS & TBDC



| Size | Insert Description | EDP Code | W | R | L | C26S | GP26 | ZS26S | ZS26 | AC3 | DX200 | CB200 |
|------|--------------------|-----------|------|-----------|------|------|------|-------|------|-----|-------|-------|
| 8mm | TBD1-8M-02 | TBDI8M02 | 8,0 | (02) 0,81 | 12,7 | | ● | | | ● | | ● |
| 8mm | TBD1-8M-04 | TBF18M04 | 8,0 | (04) 1,60 | 12,7 | | ● | | | ● | | ● |
| 16mm | TBD1-16M-02 | TBF116M02 | 16,0 | (02) 0,81 | 14,7 | | ● | | | ● | | |
| 16mm | TBD1-16M-04 | TBF116M04 | 16,0 | (04) 1,60 | 14,7 | | ● | | | ● | | |
| 20mm | TBD1-20M-02 | TBF120M02 | 20,0 | (02) 0,81 | 16,3 | | ● | | | ● | | ● |
| 20mm | TBD1-20M-04 | TBF120M04 | 20,0 | (04) 1,60 | 16,3 | | ● | | | ● | | ● |
| 25mm | TBD1-25M-02 | TBF125M02 | 25,0 | (02) 0,81 | 22,0 | | ● | | | ● | | |
| 25mm | TBD1-25M-04 | TBF125M04 | 25,0 | (04) 1,60 | 22,0 | | ● | | | ● | | ● |
| 25mm | TBD1-25M-08 | TBF125M08 | 25,0 | (08) 3,18 | 22,0 | | ● | | | ● | | ● |

In an effort to improve our stock standard grade offering, there are periodic changes. Please see current price list for up to date grade offering.

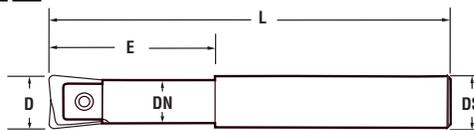
- High performance choice in optimal conditions.
- ▲ Recommended grade under general conditions.

| | | | | | | | |
|---------------------|--|---|--|--|---|---|---|
| Cast Iron | | | | | ● | | |
| Non-Ferrous | | ▲ | | | ● | | |
| Stainless/High Temp | | | | | ● | | |
| Steel | | | | | ● | | |
| Hardened Material | | | | | ▲ | | ● |
| Composite | | | | | ▲ | ● | |

FLAT BOTTOM/ BACK DRAFT STYLE TBDS-WS

Straight Neck Holder (**METRIC**)

Use TBD1 & TBF1 Inserts Only



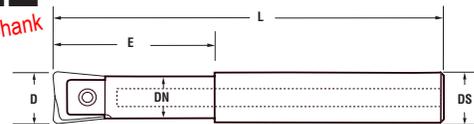
| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|-----------------|---------------|------|------|-------|------|------|---------------|--------|-----------|
| 8mm | TBDS-8M-59WS8 | TBDS8M59WS8 | 8,0 | 48,0 | 151,9 | 8,0 | 10,5 | TBD1 / FI-8M | STBN-4 | K3 / T-10 |
| 16mm | TBDS-16M-63WS16 | TBDS16M63WS16 | 16,0 | 54,9 | 162,1 | 16,0 | 13,9 | TBD1 / FI-16M | STBN-5 | K3 / T-10 |
| 20mm | TBDS-20M-68WS20 | TBDS20M68WS20 | 20,0 | 62,9 | 175,0 | 20,0 | 18,0 | TBD1 / FI-20M | STBN-6 | K4 / T-20 |
| 25mm | TBDS-25M-74WS25 | TBDS25M74WS25 | 25,0 | 71,8 | 189,9 | 25,0 | 17,3 | TBD1 / FI-25M | STBN-7 | K5 / T-25 |

FLAT BOTTOM/ BACK DRAFT STYLE TBDC-WS

Straight Neck Holder (**METRIC**)

Carbide Cored Shank

Use TBD1 & TBF1 Inserts Only



| Size | Description | EDP Code | D | E | L | DS | DN | Insert | Screw | Wrench |
|------|-----------------|---------------|------|------|-------|------|------|---------------|--------|-----------|
| 8mm | TBDS-8M-59WS8 | TBDS8M59WS8 | 8,0 | 48,0 | 151,9 | 8,0 | 10,5 | TBD1 / FI-8M | STBN-4 | K3 / T-10 |
| 16mm | TBDS-16M-63WS16 | TBDS16M63WS16 | 16,0 | 54,9 | 162,1 | 16,0 | 13,9 | TBD1 / FI-16M | STBN-5 | K3 / T-10 |
| 20mm | TBDS-20M-68WS20 | TBDS20M68WS20 | 20,0 | 62,9 | 175,0 | 20,0 | 18,0 | TBD1 / FI-20M | STBN-6 | K4 / T-20 |
| 25mm | TBDS-25M-74WS25 | TBDS25M74WS25 | 25,0 | 71,8 | 189,9 | 25,0 | 17,3 | TBD1 / FI-25M | STBN-7 | K5 / T-25 |



RIGID-LOCK

Trouble Shooting

| Problem | Solution | Problem | Solution | Problem | Solution | Problem | Solution | Problem | Solution |
|--------------------------------------|---|---------------------------|--|---------------------------------|---------------------------------|------------------------------------|--|---------------------------|--|
| Insert is wearing prematurely | Decrease speed Increase feed Increase DOC | Insert is chipping | Use ZS26 grade Increase speed Decrease feed Decrease DOC Use Tapered Shank Use Neutral insert | Insert has built up edge | Increase speed Increase feed | Insert is wearing at center | Increase feed by 10% Decrease speed | Toolholder failure | Reduce feed Decrease tool extension Reduce DOC |

RIGID-LOCK

Grade Description

| Grades | Descriptions |
|--------------|---|
| C26S | Uncoated, tough, fine grain substrate with sharp edge. Ideal for plastics and soft materials that produce little or no heat. |
| ZS26 | PVD AlTiN grade with a tough, fine grain substrate. FIRST CHOICE for general applications in steels, stainless, and high temp alloys. Excellent in low to high speeds and will handle interruptions and high feed rates. Coating provides highest resistance to oxidation, physical abrasion and chip welding. Dry machining capable. |
| ZS26S | Same as grade AT26 except with a sharper edge for light depths of cut in finishing operations. FIRST CHOICE for non-ferrous and composite materials at medium to high SFM. |
| CB400 | PCBN tip brazed onto a carbide insert. To be used for roughing to finishing in hardened steels greater than 45 HRC such as bearing steel, hot and cold work tool steels, high-speed steels, die steels, case hardened steels, nitrided irons and some hard coatings. |
| DX200 | CVD PCD coated grade. Excellent wear resistance in nonmetallic materials such as graphite, epoxy based resins and plastics. FIRST CHOICE in aluminum and composites at high SFM. |

Chart 1

Feed, Speed and Diameter Information

| Materials | Cast Iron | | Steels | | | | Stainless Steels | | Nickel Based Alloys | Titanium | Aluminum |
|------------------------|-------------|-------------|--------------------------|--|-------------------------------|-----------------------|------------------|-------------|-----------------------------|-------------|-------------------|
| | Grey | Nodular | Low Carbon up to 240 BHN | High Carbon Medium Tensile 240-300 BHN | High Alloy Tool Steel 300-400 | Hard Steels 48-65 HRC | 300 Series | 400 Series | Inconel Waspalloy Hastalloy | 6AL 4V | 6061 T6 7075 T6 |
| Insert Grades | ZS26 | ZS26 | ZS26 | ZS26 | ZS26 | ZS26 | ZS26 | ZS26 | ZS26 | ZS26 | ZS26S/C26S |
| Speed (SFPM) | 500-1000 | 400-800 | 500-1000 | 400-800 | 300-600 | 125-300 | 300-700 | 400-800 | 100-200 | 200-300 | 1500-5000 |
| Feed Rate (IPR) | .006/.020 | .006/.020 | .006/.016 | .006/.016 | .006/.016 | .003/.009 | .006/.012 | .006/.014 | .004/.010 | .004/.011 | .015/.035 |

Effective Cutting Diameter Information

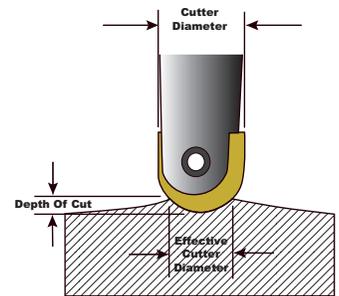
The charts listed below are applicable when the depth of cut is less than the radius of the tool. The IPR can be increased as the DOC is reduced.

Chart 2 Select the effective diameter of the insert based on DOC

| DOC | INSERT DIAMETER | | | | | | | |
|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|
| | 0.250 | 0.312 | 0.375 | 0.500 | 0.625 | 0.750 | 1.000 | 1.250 |
| 0.020 | 0.136 | 0.153 | 0.169 | 0.196 | 0.220 | 0.242 | 0.280 | 0.314 |
| 0.050 | 0.200 | 0.229 | 0.255 | 0.300 | 0.339 | 0.374 | 0.436 | 0.490 |
| 0.075 | 0.229 | 0.267 | 0.300 | 0.357 | 0.406 | 0.450 | 0.527 | 0.594 |
| 0.100 | 0.245 | 0.292 | 0.332 | 0.400 | 0.458 | 0.510 | 0.600 | 0.678 |
| 0.125 | 0.250 | 0.306 | 0.354 | 0.433 | 0.500 | 0.559 | 0.661 | 0.750 |
| 0.156 | | 0.312 | 0.370 | 0.463 | 0.541 | 0.609 | 0.726 | 0.826 |
| 0.188 | | | 0.375 | 0.484 | 0.573 | 0.650 | 0.781 | 0.893 |
| 0.250 | | | | 0.500 | 0.612 | 0.707 | 0.866 | 1.000 |
| 0.312 | | | | | 0.625 | 0.739 | 0.927 | 1.082 |
| 0.375 | | | | | | 0.750 | 0.968 | 1.146 |
| 0.500 | | | | | | | 1.000 | 1.225 |
| 0.625 | | | | | | | | 1.250 |

Effective diameters for standard inserts at various DOC's

$$RPM = SFM \times 3.82 / \text{Effective cutting diameter}$$



EXAMPLE

| EFFECTIVE DIAMETER | | |
|--------------------|------|--------------------|
| ACTUAL DIAMETER | DOC | EFFECTIVE DIAMETER |
| .750 | .100 | .510 |

EXAMPLE

| ADJUSTED FEED RATE FOR ABOVE | | |
|------------------------------|--------------------|--------------|
| CHART 1 IPR | CHART 3 MULTIPLIER | ADJUSTED IPR |
| .008 | 2.739 | .022 |

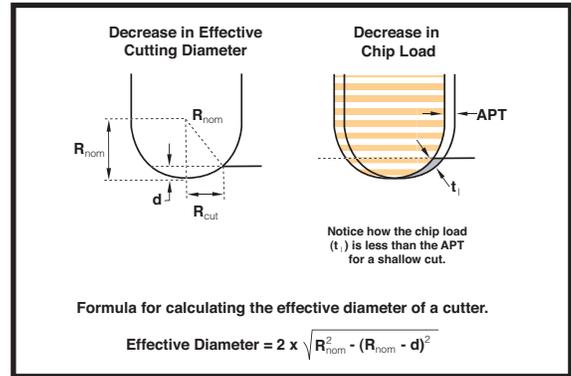
Chart 3 Feed - Multiply factor below times IPR in Chart 1 for adjusted IPR

| DOC | INSERT DIAMETER | | | | | | | |
|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|
| | 0.250 | 0.312 | 0.375 | 0.500 | 0.625 | 0.750 | 1.000 | 1.250 |
| 0.020 | 3.356 | 3.953 | 4.330 | 5.000 | 5.590 | 6.124 | 7.071 | 7.906 |
| 0.050 | 2.236 | 2.500 | 2.739 | 3.162 | 3.536 | 3.873 | 4.472 | 5.000 |
| 0.075 | 1.826 | 2.041 | 2.236 | 2.582 | 2.887 | 3.162 | 3.651 | 4.082 |
| 0.100 | 1.581 | 1.768 | 1.936 | 2.236 | 2.500 | 2.739 | 3.162 | 3.536 |
| 0.125 | 1.414 | 1.581 | 1.732 | 2.000 | 2.236 | 2.449 | 2.828 | 3.162 |
| 0.156 | | 1.415 | 1.550 | 1.790 | 2.002 | 2.193 | 2.532 | 2.831 |
| 0.188 | | | 1.414 | 1.633 | 1.826 | 2.000 | 2.309 | 2.582 |
| 0.250 | | | | 1.414 | 1.581 | 1.732 | 2.000 | 2.236 |
| 0.312 | | | | | 1.415 | 1.550 | 1.790 | 2.002 |
| 0.375 | | | | | | 1.414 | 1.633 | 1.826 |
| 0.500 | | | | | | | 1.414 | 1.581 |
| 0.625 | | | | | | | | 1.414 |



BALLNOSE

Shallow Cutting with Rigid-Lock Ball Nose End Mill



BALLNOSE

Using your Rigid-Lock Ball Nose End Mill

- Use Anti-seize grease every time an insert is changed.
- Use positive geometry inserts on stainless, aluminum, titanium and Inconel.
- Climb mill whenever possible.
- Step over should be greater than depth of cut
- Use TBF1 inserts if work piece has a draft angle on the walls. TBD1 inserts are for work pieces with straight walls.
- Balance chipload, RPM, feed rate, tool extension, and material.
- TBF1 and TBD1 inserts cannot plunge, ramp at 1° to 2° angle maximum.
- 1/4" and 5/16" endmills have a maximum feed rate of .006 to .008 per revolution and a .015 to .018 depth of cut.

Recommended torque specifications for Rigid-Lock insert screws

| | INSERT SIZE | | | TORQUE | |
|---------------------|-------------|--------|----------|--------------|------------|
| | inch | metric | wrench | Nm/inch lbs. | anti-seize |
| STBN-1 | 1/4" | 1/4" | K2/T-8 | Manual | Yes |
| STBN-2 | 5/16" | 8mm | K3/T-10 | Manual | Yes |
| STBN-3 | 3/8" | 10mm | K3/T-10 | Manual | Yes |
| STBN-4 | 1/2" | 12mm | K35/T-15 | 6.0/53 | Yes |
| STBN-5 | 5/8" | 16mm | K35/T-15 | 6.2/55 | Yes |
| STBN-6/TS352 | 3/4" | 20mm | K4/T-20 | 6.2/55 | Yes |
| STBN-7/TS41 | 1" | 25mm | K5/T-25 | 6.5/58 | Yes |
| STBN-8/TS50 | 1-1/4" | 32mm | K6/T-30 | 6.5/58 | Yes |
| STBN-8 | 1-1/2" | 38mm | K6/T-30 | 6.5/58 | Yes |
| STBN-8 | 2" | 55mm | K8/T-40 | 6.5/58 | Yes |
| STBN-10 | 2-1/2" | 63mm | K8/T-40 | 6.5/58 | Yes |

Using your Rigid-Lock Ball Nose End Mill for Roughing - TBXR

Adjust to your own cutting conditions.

Ex: Cutting 4140 material, 3/4 diameter ball nose insert, .010 chip load and .375 D.O.C.

Chip load per tooth: Should be a maximum of .007-.010.

Maximum Depth of Cut: Equal to half the radius of the insert.

Ex. If you are using a 1" diameter insert, then the D.O.C. would be up too 1/2".

For optimal tool life of our ballnose system, we recommend lighter feed rates and higher surface speeds.

