# UNC X-COATED HSS-PM SPIRAL FLUTE TAPS for MULTI-PURPOSE

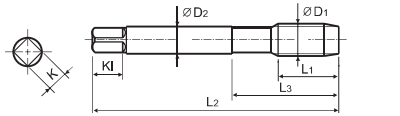
## Unified Coarse Threads

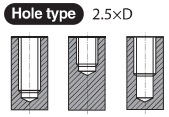
**TRE32 SERIES**

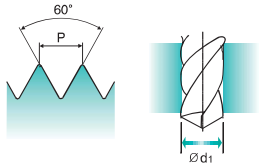
DIN 371

DIN 376

- High performance in various ductile materials
- Specially designed to prevent oversized threads and reduce gauging problems




Material groups **MU** | HSS PM | DIN 371/376 | 2BX | 60° | C | R45 | X Coating | p.7

**Machine Taps**

Unit : mm

| SIZE ØD1 | TPI | EDP No. X-coating | Thread Length L1 | Overall Length L2 | Neck Length L3 | Shank Diameter ØD2 | Square Size K | Square Length Kl | No. of Flute Z | Tapping Drill Diameter Ød1 |
|---|---|---|---|---|---|---|---|---|---|---|
| #4 | 40 UNC | TRE32162GS | 5.1 | 56.0 | 18.0 | 3.5 | 2.7 | 6.0 | 2 | 2.30 |
| #5 | 40 UNC | TRE32202GS | 5.1 | 56.0 | 18.0 | 3.5 | 2.7 | 6.0 | 3 | 2.60 |
| #6 | 32 UNC | TRE32242GS | 6.4 | 56.0 | 20.0 | 4.0 | 3.0 | 6.0 | 3 | 2.80 |
| #8 | 32 UNC | TRE32282GS | 6.4 | 63.0 | 21.0 | 4.5 | 3.4 | 6.0 | 3 | 3.40 |
| #10 | 24 UNC | TRE32322GS | 8.5 | 70.0 | 25.0 | 6.0 | 4.9 | 8.0 | 3 | 3.90 |
| #12 | 24 UNC | TRE32362GS | 8.5 | 80.0 | 30.0 | 6.0 | 4.9 | 8.0 | 3 | 4.50 |
| 1/4 | 20 UNC | TRE32402GS | 10.2 | 80.0 | 30.0 | 7.0 | 5.5 | 8.0 | 3 | 5.10 |
| 5/16 | 18 UNC | TRE32442GS | 14.2 | 90.0 | 35.0 | 8.0 | 6.2 | 9.0 | 3 | 6.60 |
| 3/8 | 16 UNC | TRE32482GS | 15.9 | 100.0 | 39.0 | 9.0 | 7.0 | 10.0 | 3 | 8.00 |
| 7/16 | 14 UNC | TRE32522GS | 18.2 | 100.0 | 40.0 | 8.0 | 6.2 | 9.0 | 3 | 9.40 |
| 1/2 | 13 UNC | TRE32562GS | 19.6 | 110.0 | 44.0 | 9.0 | 7.0 | 10.0 | 3 | 10.80 |
| 9/16 | 12 UNC | TRE32602GS | 21.2 | 110.0 | 44.0 | 11.0 | 9.0 | 12.0 | 3 | 12.20 |
| 5/8 | 11 UNC | TRE32642GS | 23.1 | 110.0 | 44.0 | 12.0 | 9.0 | 12.0 | 3 | 13.60 |
| 3/4 | 10 UNC | TRE32702GS | 25.4 | 125.0 | 50.0 | 14.0 | 11.0 | 14.0 | 4 | 16.50 |
| 7/8 | 9 UNC | TRE32742GS | 28.3 | 140.0 | 54.0 | 18.0 | 14.5 | 17.0 | 4 | 19.50 |
| 1 | 8 UNC | TRE32782GS | 31.8 | 160.0 | 60.0 | 20.0 | 16.0 | 19.0 | 4 | 22.20 |

▶ DIN 371(#4~3/8) and DIN 376(7/16~1)

◎ : Excellent ○ : Good

| ISO | P | | | | | | | | | | | M | | | | K | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Material Description | Non-alloy steel | | | | | Low alloy steel | | | | High alloyed steel, and tool steel | | Stainless steel | | | | Grey cast iron | | Nodular cast iron | | Malleable cast iron | |
| VDI 3323 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| HRc | | 13 | 25 | 28 | 32 | 10 | 29 | 32 | 38 | 15 | 35 | 15 | 23 | 10 | 10 | 26 | 3 | 25 | | 21 |
| HB | 125 | 190 | 250 | 270 | 300 | 180 | 275 | 300 | 350 | 200 | 325 | 200 | 240 | 180 | 180 | 260 | 160 | 250 | 130 | 230 |
| Recommended | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ◎ | | |

| ISO | N | | | | | | | | | | S | | | | | | | H | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Material Description | Aluminum-wrought alloy | | Aluminum-cast, alloyed | | | Copper and Copper Alloys (Bronze / Brass) | | | Non Metallic Materials | | Heat Resistant Super Alloys | | | | | Titanium Alloys | | Hardened steel | | Chilled Cast Iron | Hardened Cast Iron |
| VDI 3323 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc | | | | | | | | | | | 15 | 30 | 25 | 38 | 34 | | | 55 | 60 | 42 | 55 |
| HB | 60 | 100 | 75 | 90 | 130 | 110 | 90 | 100 | | | 200 | 280 | 250 | 350 | 320 | 400Rm | 1050Rm | 550 | 630 | 400 | 550 |
| Recommended | ○ | ○ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | | | | | | | | | | | | | |





# UNF X-COATED HSS-PM SPIRAL FLUTE TAPS for MULTI-PURPOSE

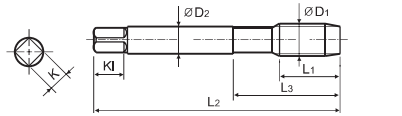
## Unified Fine Threads

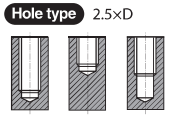
**TRE33 SERIES**

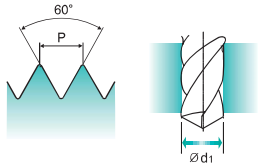
DIN 371

DIN 374

- High performance in various ductile materials
- Specially designed to prevent oversized threads and reduce gauging problems




Material groups **MU** | HSS PM | DIN 371/374 | 2BX | 60° | C | R45 | X Coating | p.7

**Machine Taps**

Unit : mm

| SIZE ØD1 | TPI | EDP No. X-coating | Thread Length L1 | Overall Length L2 | Neck Length L3 | Shank Diameter ØD2 | Square Size K | Square Length Kl | No. of Flute Z | Tapping Drill Diameter Ød1 |
|---|---|---|---|---|---|---|---|---|---|---|
| #4 | 48 UNF | TRE33182GS | 5.1 | 56.0 | 18.0 | 3.5 | 2.7 | 6.0 | 2 | 2.40 |
| #5 | 44 UNF | TRE33222GS | 5.1 | 56.0 | 18.0 | 3.5 | 2.7 | 6.0 | 3 | 2.70 |
| #6 | 40 UNF | TRE33262GS | 6.4 | 56.0 | 20.0 | 4.0 | 3.0 | 6.0 | 3 | 2.90 |
| #8 | 36 UNF | TRE33302GS | 6.4 | 63.0 | 21.0 | 4.5 | 3.4 | 6.0 | 3 | 3.50 |
| #10 | 32 UNF | TRE33342GS | 8.5 | 70.0 | 25.0 | 6.0 | 4.9 | 8.0 | 3 | 4.10 |
| #12 | 28 UNF | TRE33382GS | 8.5 | 80.0 | 30.0 | 6.0 | 4.9 | 8.0 | 3 | 4.60 |
| 1/4 | 28 UNF | TRE33422GS | 10.2 | 80.0 | 30.0 | 7.0 | 5.5 | 8.0 | 3 | 5.50 |
| 5/16 | 24 UNF | TRE33462GS | 10.6 | 90.0 | 35.0 | 8.0 | 6.2 | 9.0 | 3 | 6.90 |
| 3/8 | 24 UNF | TRE33502GS | 10.6 | 100.0 | 39.0 | 9.0 | 7.0 | 10.0 | 3 | 8.50 |
| 7/16 | 20 UNF | TRE33542GS | 12.7 | 100.0 | 40.0 | 8.0 | 6.2 | 9.0 | 3 | 9.90 |
| 1/2 | 20 UNF | TRE33582GS | 12.7 | 100.0 | 40.0 | 9.0 | 7.0 | 10.0 | 3 | 11.50 |
| 9/16 | 18 UNF | TRE33622GS | 14.2 | 100.0 | 40.0 | 11.0 | 9.0 | 12.0 | 3 | 12.90 |
| 5/8 | 18 UNF | TRE33662GS | 14.2 | 100.0 | 40.0 | 12.0 | 9.0 | 12.0 | 3 | 14.50 |
| 3/4 | 16 UNF | TRE33722GS | 15.9 | 110.0 | 44.0 | 14.0 | 11.0 | 14.0 | 4 | 17.50 |
| 7/8 | 14 UNF | TRE33762GS | 18.2 | 125.0 | 50.0 | 18.0 | 14.5 | 17.0 | 4 | 20.50 |
| 1 | 12 UNF | TRE33802GS | 21.2 | 140.0 | 54.0 | 20.0 | 16.0 | 19.0 | 4 | 23.20 |

▶ DIN 371(#4~3/8) and DIN 374(7/16~1)

◎ : Excellent ○ : Good

| ISO | P | | | | | | | | | | M | | | | | K | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Material Description | Non-alloy steel | | | | | Low alloy steel | | | | | High alloyed steel, and tool steel | | Stainless steel | | | Grey cast iron | | Nodular cast iron | | Malleable cast iron | |
| VDI 3323 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| HRc | | 13 | 25 | 28 | 32 | 10 | 29 | 32 | 38 | 15 | 35 | 15 | 23 | 10 | 10 | 26 | 3 | 25 | | 21 |
| HB | 125 | 190 | 250 | 270 | 300 | 180 | 275 | 300 | 350 | 200 | 325 | 200 | 240 | 180 | 180 | 260 | 160 | 250 | 130 | 230 |
| Recommended | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ◎ | | |

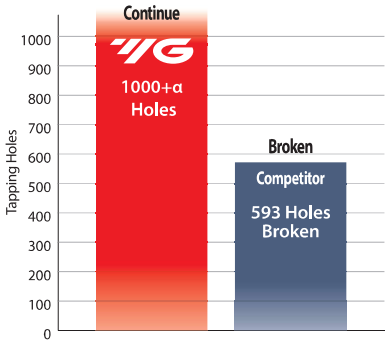
| ISO | N | | | | | | | | | | S | | | | | | | H | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Material Description | Aluminum-wrought alloy | | Aluminum-cast, alloyed | | | Copper and Copper Alloys (Bronze / Brass) | | | Non Metallic Materials | | Heat Resistant Super Alloys | | | | | Titanium Alloys | | Hardened steel | | Chilled Cast Iron | Hardened Cast Iron |
| VDI 3323 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc | | | | | | | | | | | 15 | 30 | 25 | 38 | 34 | | | 55 | 60 | 42 | 55 |
| HB | 60 | 100 | 75 | 90 | 130 | 110 | 90 | 100 | | | 200 | 280 | 250 | 350 | 320 | 400Rm | 1050Rm | 550 | 630 | 400 | 550 |
| Recommended | ○ | ○ | ◎ | ◎ | ○ | ◎ | ◎ | ◎ | | | | | | | | | | | | | |

# CASE STUDY

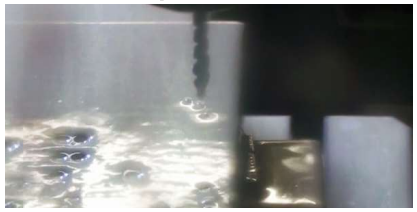
## TEST Ⅲ SPIRAL FLUTE TAP (M6x1.0)

### Cutting Condition

| | |
|---|---|
| Tool | Sprial Flute Tap |
| Size | M6x1.0 |
| Work Material | JIS: SUS304 / DIN: X16CrNi1810 / WR: 1.4350 |
| RPM | 531 rev/min. |
| Vc | 10 m/min. |
| Feed | 531 mm/min. |
| Tap Drill Size | 5.1mm |
| Tapping Depth | 12 mm |
| Tapping Holes | YG-1: 1000+α / Competitor: 593 |
| Coolant | Wet Cut |




**Prime Taps** (1000 Holes+α)



**Competitor** (593 Holes, Broken)

## TEST Ⅳ SPIRAL FLUTE TAP (M8x1.25)

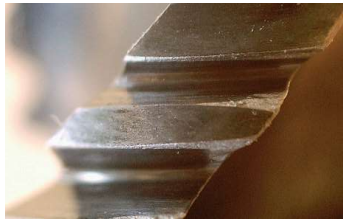
### Cutting Condition

| | |
|---|---|
| Tool | Sprial Flute Tap |
| Size | M8x1.25 |
| Work Material | JIS: S45C / DIN: CK45 / WR: 1.1191 |
| RPM | 796 rev/min |
| Vc | 20 m/min |
| Feed | 995 mm/min |
| Tap Drill Size | 6.8mm |
| Tapping Depth | 17 mm |
| Tapping Holes | YG-1: 1350+α / Competitor: 1350+α |
| Coolant | Wet Cut |


Comparison of Wear Resistance

**Prime Taps**

**Competitor**





## SELECTION GUIDE

YG THREADING TOOLS

# HSS-PM PRIME TAPS

Premium Spiral Point and Spiral Flute Taps
High Performance in Various Ductile Materials

| HOLE TYPE | | | Max. 2.5xD Blind Hole | | Max. 3.0xD Through Hole |
|---|---|---|---|---|---|
| TOOL MATERIAL | | | HSS-PM | | |
| CHAMFER LEAD ACC. TO DIN2197 | | | C | E | B |
| FLUTE TYPE | | | Spiral Flute | Spiral Flute | Spiral Point |
| SPIRAL FLUTE ANGLE | | | R45 | R45 | - |
| SERIES | M | DIN371/376 | TRE30 (p.8) | TRE34 (p.9) | TRJ15 (p.14) |
| | | DIN352 | | | |
| | | DIN357/LONG | | | |
| | MF | DIN374 | TRE31 (p.10) | | TRJ16 (p.15) |
| | | DIN2181 | | | |
| | UNC | DIN371/376 | TRE32 (p.12) | | TRJ17 (p.17) |
| | | DIN351 | | | |
| | UNF | DIN371/374 | TRE33 (p.13) | | TRJ18 (p.19) |
| | | DIN2181 | | | |
| | BSW | DIN2182/2183 | | | |
| | | DIN351 | | | |
| | G(BSP) | DIN5156/5157 | | | |
| | EG-M | DIN371/376 | | | |
| | EG-UNC | DIN371/376 | | | |
| | EG-UNF | DIN371/374 | | | |
| SURFACE TREATMENT | | | X-coating | | |
| MODEL | | |  |  |  |

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

| ISO | VDI 3323 | Material Description | Composition / Structure / Heat Treatment | | HB | HRc | Recommended cutting conditions Vc (m/min.) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | 1 | Non-alloy steel | About 0.15% C | Annealed | 125 | | ○ | 5-20 | ○ | 5-20 | ◎ | 15-45 |
| | 2 | | About 0.45% C | Annealed | 190 | 13 | ◎ | 10-50 | ◎ | 10-50 | ◎ | 10-55 |
| | 3 | | About 0.45% C | Quenched & Tempered | 250 | 25 | ◎ | 10-50 | ◎ | 10-50 | ◎ | 10-55 |
| | 4 | | About 0.75% C | Annealed | 270 | 28 | ◎ | 15-40 | ◎ | 15-40 | ◎ | 15-50 |
| | 5 | | About 0.75% C | Quenched & Tempered | 300 | 32 | ◎ | 15-40 | ◎ | 15-40 | ◎ | 15-50 |
| | 6 | Low alloy steel | | Annealed | 180 | 10 | ◎ | 8-30 | ◎ | 8-30 | ◎ | 8-30 |
| | 7 | | | Quenched & Tempered | 275 | 29 | ◎ | 8-30 | ◎ | 8-30 | ◎ | 8-30 |
| | 8 | | | Quenched & Tempered | 300 | 32 | ◎ | 8-30 | ◎ | 8-30 | ◎ | 8-30 |
| | 9 | | | Quenched & Tempered | 350 | 38 | ○ | 8-30 | ○ | 8-30 | ◎ | 8-30 |
| | 10 | High alloyed steel, and tool steel | | Annealed | 200 | 15 | ○ | 8-30 | ○ | 8-30 | ○ | 8-30 |
| | 11 | | | Quenched & Tempered | 325 | 35 | ○ | 8-30 | ○ | 8-30 | ○ | 8-30 |
| M | 12 | Stainless steel | Ferritic / Martensitic | Annealed | 200 | 15 | ◎ | 5-15 | ◎ | 5-15 | ◎ | 8-20 |
| | 13 | | Martensitic | Quenched & Tempered | 240 | 23 | ◎ | 5-15 | ◎ | 5-15 | ◎ | 8-20 |
| | 14 | | Austenitic | | 180 | 10 | ◎ | 5-15 | ◎ | 5-15 | ◎ | 8-20 |
| K | 15 | Grey cast iron | Pearlitic / ferritic | | 180 | 10 | ○ | 15-35 | ○ | 15-35 | ◎ | 15-35 |
| | 16 | | Pearlitic (Martensitic) | | 260 | 26 | ○ | 15-35 | ○ | 15-35 | ◎ | 15-35 |
| | 17 | Nodular cast iron | Ferritic | | 160 | 3 | ◎ | 15-35 | ◎ | 15-35 | ◎ | 15-35 |
| | 18 | | Pearlitic | | 250 | 25 | ◎ | 15-35 | ◎ | 15-35 | ◎ | 15-35 |
| | 19 | Malleable cast iron | Ferritic | | 130 | | | | | | | |
| | 20 | | Pearlitic | | 230 | 21 | | | | | | |
| N | 21 | Aluminum-wrought alloy | Not Curable | | 60 | | ○ | 15-35 | ○ | 15-35 | ○ | 15-35 |
| | 22 | | Curable | Hardened | 100 | | ○ | 15-35 | ○ | 15-35 | ○ | 15-35 |
| | 23 | Aluminum-cast, alloyed | ≤ 12% Si, Not Curable | | 75 | | ◎ | 15-35 | ◎ | 15-35 | ◎ | 15-35 |
| | 24 | | ≤ 12% Si, Curable | Hardened | 90 | | ◎ | 15-35 | ◎ | 15-35 | ◎ | 15-35 |
| | 25 | | > 12% Si, Not Curable | | 130 | | ○ | 15-35 | ○ | 15-35 | ○ | 15-35 |
| | 26 | Copper and Copper Alloys (Bronze / Brass) | Cutting Alloys, PB>1% | | 110 | | ◎ | 15-35 | ◎ | 15-35 | ◎ | 15-35 |
| | 27 | | CuZn, CuSnZn (Brass) | | 90 | | ◎ | 15-35 | ◎ | 15-35 | ◎ | 15-35 |
| | 28 | | CuSn, lead-free copper and electrolytic copper | | 100 | | ◎ | 15-35 | ◎ | 15-35 | ◎ | 15-35 |
| | 29 | Non Metallic Materials | Duroplastic, Fiber Reinforced Plastic | | | | | | | | | |
| | 30 | | Rubber, Wood, etc. | | | | | | | | | |
| S | 31 | Heat Resistant Super Alloys | Fe Based | Annealed | 200 | 15 | | | | | | |
| | 32 | | | Cured | 280 | 30 | | | | | | |
| | 33 | | Ni or Co Based | Annealed | 250 | 25 | | | | | | |
| | 34 | | | Cured | 350 | 38 | | | | | | |
| | 35 | | | Cast | 320 | 34 | | | | | | |
| | 36 | Titanium Alloys | Pure Titanium | | 400 Rm | | | | | | | |
| | 37 | | Alpha + Beta Alloys | Hardened | 1050 Rm | | | | | | | |
| H | 38 | Hardened steel | | Hardened | 550 | 55 | | | | | | |
| | 39 | | | Hardened | 630 | 60 | | | | | | |
| | 40 | Chilled Cast Iron | | Cast | 400 | 42 | | | | | | |
| | 41 | Hardened Cast Iron | | Hardened | 550 | 55 | | | | | | |