# YG TAP ALU

**TC170 SERIES**

## UNF — Unified fine threads

- Unified Feingewinde
- UNF
- Unificato passo grosso

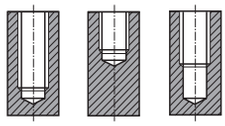
▶ Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

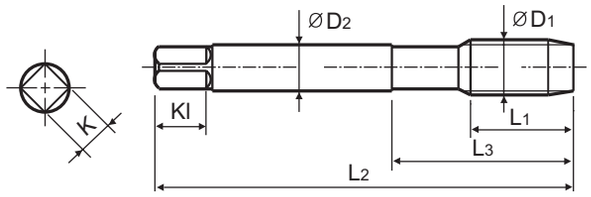
▶ Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

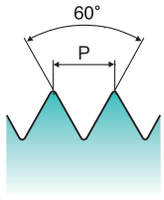
DIN 371

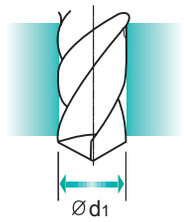
DIN 374

**Hole type**
2.5×D






Material groups **Al** | HSS-E | DIN 371/374 | 2B | 60° | C | Bright | R45

Machine taps
Maschinengewindebohrer

Recommended Cutting Page : P.252

Unit : mm

| SIZE ØD1 | TPI | EDP No. Bright | 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 | 48UNF | TC170182 | 6 | 56 | 18 | 3.5 | 2.7 | 6 | 2 | 2.4 |
| #5 | 44UNF | TC170222 | 7 | 56 | 18 | 3.5 | 2.7 | 6 | 2 | 2.7 |
| #6 | 40UNF | TC170262 | 7 | 56 | 20 | 4 | 3 | 6 | 2 | 3 |
| #8 | 36UNF | TC170302 | 8 | 63 | 21 | 4.5 | 3.4 | 6 | 2 | 3.5 |
| #10 | 32UNF | TC170342 | 10 | 70 | 25 | 6 | 4.9 | 8 | 2 | 4.1 |
| #12 | 28UNF | TC170382 | 10 | 80 | 30 | 6 | 4.9 | 8 | 2 | 4.7 |
| 1/4 | 28UNF | TC170422 | 10 | 80 | 30 | 7 | 5.5 | 8 | 2 | 5.5 |
| 5/16 | 24UNF | TC170462 | 10 | 90 | 35 | 8 | 6.2 | 9 | 2 | 6.9 |
| 3/8 | 24UNF | TC170502 | 10 | 100 | 39 | 9 | 7 | 10 | 2 | 8.5 |
| 7/16 | 20UNF | TC170542 | 13 | 100 | 40 | 8 | 6.2 | 9 | 2 | 9.9 |
| 1/2 | 20UNF | TC170582 | 13 | 100 | 40 | 9 | 7 | 10 | 2 | 11.5 |
| 9/16 | 18UNF | TC170622 | 15 | 100 | 40 | 11 | 9 | 12 | 3 | 12.9 |
| 5/8 | 18UNF | TC170662 | 15 | 100 | 40 | 12 | 9 | 12 | 3 | 14.5 |
| 3/4 | 16UNF | TC170722 | 17 | 110 | 44 | 14 | 11 | 14 | 3 | 17.5 |
| 7/8 | 14UNF | TC170762 | 17 | 125 | 50 | 18 | 14.5 | 17 | 3 | 20.5 |
| 1 | 12UNF | TC170802 | 20 | 140 | 54 | 18 | 14.5 | 17 | 3 | 23.25 |
| 1-1/8 | 12UNF | TC170842 | 22 | 150 | 60 | 22 | 18 | 21 | 3 | 26.5 |

▶DIN 371(#4~3/8) and DIN 374(7/16~1-1/8)

◎ : 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 | ◎ | ◎ | ◎ | ◎ | | | ○ | | | | | | | | | | | | | | |

# YG TAP ALU

## RECOMMENDED CUTTING CONDITIONS
## EMPFOHLENE SCHNEIDKONDITIONEN

| ISO | VDI 3323 | Material Description | HB | HRc | TC163 TC963 TC169 TC170 | TE953 | TC622 | TE943 | TC433 | TE433 | TY433 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Vc (m/min) | | | | | | |
| P | 1 | Non-alloy steel | 125 | | 15-20 | | 15-20 | | | | |
| | 2 | | 190 | 13 | 15-20 | | 15-20 | | | | |
| | 3 | | 250 | 25 | 12-18 | 12-18 | 12-18 | 12-18 | | | |
| | 4 | | 270 | 28 | | | | | | | |
| | 5 | | 300 | 32 | | | | | | | |
| | 6 | Low alloy steel | 180 | 10 | | | | | | | |
| | 7 | | 275 | 29 | | | | | | | |
| | 8 | | 300 | 32 | | | | | | | |
| | 9 | | 350 | 38 | | | | | | | |
| | 10 | High alloyed steel, and tool steel | 200 | 15 | | | | | | | |
| | 11 | | 325 | 35 | | | | | | | |
| M | 12 | Stainless steel | 200 | 15 | | | | | | | |
| | 13 | | 240 | 23 | | | | | | | |
| | 14 | | 180 | 10 | | | | | | | |
| K | 15 | Grey cast iron | 180 | 10 | | | | | | | |
| | 16 | | 260 | 26 | | | | | | | |
| | 17 | Nodular cast iron | 160 | 3 | | | | | | | |
| | 18 | | 250 | 25 | | | | | | | |
| | 19 | Malleable cast iron | 130 | | | | | | | | |
| | 20 | | 230 | 21 | | | | | | | |
| N | 21 | Aluminum-wrought alloy | 60 | | 10-15 | 10-15 | 10-15 | 10-15 | | | |
| | 22 | | 100 | | 10-15 | 10-15 | 10-15 | 10-15 | | | |
| | 23 | Aluminum-cast, alloyed | 75 | | 15-20 | 15-20 | 15-20 | 15-20 | | | |
| | 24 | | 90 | | 15-20 | 15-20 | 15-20 | 15-20 | | | |
| | 25 | | 130 | | | 10-15 | | 10-15 | | | |
| | 26 | Copper and Copper Alloys (Bronze / Brass) | 110 | | | | | | 25-35 | 25-35 | 35-40 |
| | 27 | | 90 | | 8-12 | | 8-12 | | 8-12 | 8-12 | 12-16 |
| | 28 | | 100 | | | | | | 15-20 | | 20-25 |
| | 29 | Non Metallic Materials | | | | | | | | | |
| | 30 | | | | | | | | | | |
| S | 31 | Heat Resistant Super Alloys | 200 | 15 | | | | | | | |
| | 32 | | 280 | 30 | | | | | | | |
| | 33 | | 250 | 25 | | | | | | | |
| | 34 | | 350 | 38 | | | | | | | |
| | 35 | | 320 | 34 | | | | | | | |
| | 36 | Titanium Alloys | 400 Rm | | | | | | | | |
| | 37 | | 1050 Rm | | | | | | | | |
| H | 38 | Hardened steel | 550 | 55 | | | | | | | |
| | 39 | | 630 | 60 | | | | | | | |
| | 40 | Chilled Cast Iron | 400 | 42 | | | | | | | |
| | 41 | Hardened Cast Iron | 550 | 55 | | | | | | | |

# SURFACE TREATMENT AND COATING

The applied High Speed Steels holds a grant of good wear resistance and toughness. Therefore YG-1 normally delivers taps with bright and unfinished surface. For certain materials, various surface treatments provide higher advantage in machining.

## STEAM TEMPERED - Vap

Steam Tempered is a Fe3O4-oxyd-coating which reduces friction between the tool and workpiece, also preventing cold welding.

## NITRIDING - NI

Recommend surface treatment for machining materials that affect wear abrasion, such as grey cast iron, alu-alloys with high Si-percentages (more than 10%).

Below are the various surface treatments for excellent finish surfaces suitable for many applications. The surface treatments are produced and developed within the company.

## TiN-COATING

TiN-coating yields a hardness of approx. 2,300 HV and also a heat resistant up to approx. 600°C. The current coating is an excellent all-round coating for normal applications.
Colour : Golden Coefficient of friction against steel : 0.4

## TiCN-COATING

TiCN takes place of TiN when the conditions require the coating to have a different hardness and toughness.
The TiCN brings advantages for machining very difficult steels or cutting interrupted bores.
The TiCN-coating has a hardness of approx. 3,000 HV, but is heat resistance only holds up to approx. 400°C, meaning that the TiCN needs an excellent cooling system for a long service life.
Colour : Blue-Grey Coefficient of friction against steel : 0.4

## TiAlN-COATING

A special coating for machining abrasive materials such as grey cast iron, alu-alloys with silicon, fiber reinforced plastics, etc., or machining at high temperatures with insufficient cooling, or at high speeds ≥ 600m/min. TiAlN has a hardness of approx. 3,000 HV and is heat resistant up to approx. 800°C.
Colour : Violet-Grey Coefficient of friction against steel : 0.4

## Hardslick-COATING

Hardslick combines the advantages of an extremely hard, thermally stable TiAlN-coating with the sliding and lubricating properties of an outer WC/C(Tungsten carbide/carbon)-coating in a novel way. The Hardslick coating has a hardness of approx. 3,000 HV and is temperature-resistant up to approx. 800°C.
Colour : Violet-Grey Coefficient of friction against steel : 0.2

**SELECTION GUIDE**

YG THREADING TOOLS

# HSS-E YG TAP ALU

For long-chipping Aluminum Wrought Alloys with Large Chip Gullets to Avoid Clogging in the Threading Operations

Please visit globalyg1.com/mat for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : P.252

| HOLE TYPE | | | Max. 2.5xD Blind Hole | |
|---|---|---|---|---|
| TOOL MATERIAL | | | HSS-E | |
| CHAMFER LEAD ACC. TO DIN2197 | | | C | C |
| FLUTE TYPE | | | Spiral Flute | Spiral Flute |
| SPIRAL FLUTE ANGLE | | | R45 | R40 |
| SERIES | M | DIN371/376 | TC163 (P.242) | TE953 (P.243) |
| | | DIN352 | | |
| | | DIN357/LONG | | |
| | MF | DIN374 | TC963 (P.244) | |
| | | DIN2181 | | |
| | UNC | DIN371/376 | TC169 (P.245) | |
| | | DIN351 | | |
| | UNF | DIN371/374 | TC170 (P.246) | |
| | | DIN2181 | | |
| | BSW | DIN2182/2183 | | |
| | | DIN351 | | |
| | G(BSP) | DIN5156/5157 | | |
| | EG-M | DIN371/376 | | |
| | EG-UNC | DIN371/376 | | |
| | EG-UNF | DIN371/374 | | |
| SURFACE TREATMENT | | | Bright | NI |
| MODEL | | |  |  |

| ISO | VDI 3323 | Material Description | Composition / Structure / Heat Treatment | | HB | HRc | | |
|---|---|---|---|---|---|---|---|---|
| P | 1 | Non-alloy steel | About 0.15% C | Annealed | 125 | | ○ | |
| | 2 | | About 0.45% C | Annealed | 190 | 13 | ○ | |
| | 3 | | About 0.45% C | Quenched & Tempered | 250 | 25 | ○ | ○ |
| | 4 | | About 0.75% C | Annealed | 270 | 28 | | |
| | 5 | | About 0.75% C | Quenched & Tempered | 300 | 32 | | |
| | 6 | Low alloy steel | | Annealed | 180 | 10 | | |
| | 7 | | | Quenched & Tempered | 275 | 29 | | |
| | 8 | | | Quenched & Tempered | 300 | 32 | | |
| | 9 | | | Quenched & Tempered | 350 | 38 | | |
| | 10 | High alloyed steel, and tool steel | | Annealed | 200 | 15 | | |
| | 11 | | | Quenched & Tempered | 325 | 35 | | |
| M | 12 | Stainless steel | Ferritic / Martensitic | Annealed | 200 | 15 | | |
| | 13 | | Martensitic | Quenched & Tempered | 240 | 23 | | |
| | 14 | | Austenitic | | 180 | 10 | | |
| K | 15 | Grey cast iron | Pearlitic / ferritic | | 180 | 10 | | |
| | 16 | | Pearlitic (Martensitic) | | 260 | 26 | | |
| | 17 | Nodular cast iron | Ferritic | | 160 | 3 | | |
| | 18 | | Pearlitic | | 250 | 25 | | |
| | 19 | Malleable cast iron | Ferritic | | 130 | | | |
| | 20 | | Pearlitic | | 230 | 21 | | |
| N | 21 | Aluminum-wrought alloy | Not Curable | | 60 | | ◎ | ○ |
| | 22 | | Curable | Hardened | 100 | | ◎ | ○ |
| | 23 | Aluminum-cast, alloyed | ≤ 12% Si, Not Curable | | 75 | | ◎ | ○ |
| | 24 | | ≤ 12% Si, Curable | Hardened | 90 | | ◎ | ○ |
| | 25 | | > 12% Si, Not Curable | | 130 | | | ◎ |
| | 26 | Copper and Copper Alloys (Bronze / Brass) | Cutting Alloys, PB>1% | | 110 | | | |
| | 27 | | CuZn, CuSnZn (Brass) | | 90 | | ○ | |
| | 28 | | CuSn, lead-free copper and electrolytic copper | | 100 | | | |
| | 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 | | |