



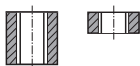
# SPIRAL FLUTE TAPS

**TC211** SERIES

## M ISO metric coarse threads DIN 13 Metrisches ISO-Gewinde DIN 13

► Left spiral flute and right hand thread tap to push chips ahead in powerful than spiral point taps.

► Rechtsschneidender Gewindebohrer mit Linksdrall um kraftvoller nach vorne zu entspannen als mit Gewindebohrern mit Rechtsdrall.

**Hole type**


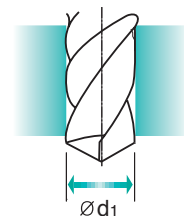
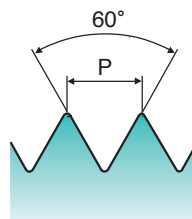
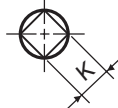
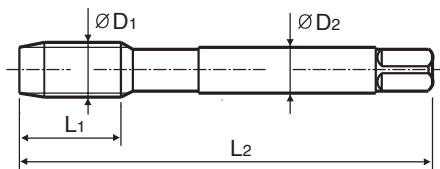
DIN 371



DIN 376


**HSS-E**
**DIN 371/376**
**6H**

**Bright**

Machine taps  
Maschinengewindebohrer


Unit : mm

| SIZE   | Pitch  | EDP No.  | Thread Length | Overall Length | Shank Diameter | Square Size | Tapping Drill Diameter |
|--------|--------|----------|---------------|----------------|----------------|-------------|------------------------|
| ØD1    | P      |          | L1            | L2             | ØD2            | K           | Ød1                    |
| M2     | × 0.4  | TC211136 | 8             | 45             | 2.8            | 2.1         | 1.6                    |
| M2.2   | × 0.45 | TC211156 | 8             | 45             | 2.8            | 2.1         | 1.75                   |
| * M2.3 | × 0.4  | TC211196 | 8             | 45             | 2.8            | 2.1         | 1.9                    |
| M2.5   | × 0.45 | TC211176 | 9             | 50             | 2.8            | 2.1         | 2.05                   |
| * M2.6 | × 0.45 | TC211496 | 9             | 50             | 2.8            | 2.1         | 2.1                    |
| M3     | × 0.5  | TC211206 | 11            | 56             | 3.5            | 2.7         | 2.5                    |
| M3.5   | × 0.6  | TC211226 | 12            | 56             | 4              | 3           | 2.9                    |
| M4     | × 0.7  | TC211246 | 13            | 63             | 4.5            | 3.4         | 3.3                    |
| M4.5   | × 0.75 | TC211266 | 14            | 70             | 6              | 4.9         | 3.7                    |
| M5     | × 0.8  | TC211286 | 15            | 70             | 6              | 4.9         | 4.2                    |
| M6     | × 1    | TC211316 | 17            | 80             | 6              | 4.9         | 5                      |
| M7     | × 1    | TC211346 | 17            | 80             | 7              | 5.5         | 6                      |
| M8     | × 1.25 | TC211366 | 20            | 90             | 8              | 6.2         | 6.8                    |
| M9     | × 1.25 | TC211396 | 20            | 90             | 9              | 7           | 7.8                    |
| M10    | × 1.5  | TC211426 | 22            | 100            | 10             | 8           | 8.5                    |
| M11    | × 1.5  | TC211466 | 22            | 100            | 8              | 6.2         | 9.5                    |
| M12    | × 1.75 | TC211506 | 24            | 110            | 9              | 7           | 10.2                   |
| M14    | × 2    | TC211546 | 26            | 110            | 11             | 9           | 12                     |
| M16    | × 2    | TC211606 | 27            | 110            | 12             | 9           | 14                     |
| M18    | × 2.5  | TC211656 | 30            | 125            | 14             | 11          | 15.5                   |
| M20    | × 2.5  | TC211706 | 32            | 140            | 16             | 12          | 17.5                   |
| M22    | × 2.5  | TC211746 | 32            | 140            | 18             | 14.5        | 19.5                   |
| M24    | × 3    | TC211786 | 34            | 160            | 18             | 14.5        | 21                     |
| M27    | × 3    | TC211866 | 36            | 160            | 20             | 16          | 24                     |
| M30    | × 3.5  | TC211946 | 40            | 180            | 22             | 18          | 26.5                   |

► DIN 371(M2~M10) and DIN 376(M11~M30)

► \* DIN profile not ISO

Unit : N/mm²

◎ : Excellent ○ : Good

| Steel < 400     | Steel < 700 | Steel < 850    | St. Alloy < 850 | St. Alloy ≤ 1200 | St. Alloy > 1200 | INOX Free < 850 | INOX Aust. < 850 | INOX < 1000   | GG Cast < 500 | GG Cast < 1000 | GGG Cast < 700 | GGG Cast < 1000    | Ti < 700          | Ti Alloy < 900 |
|-----------------|-------------|----------------|-----------------|------------------|------------------|-----------------|------------------|---------------|---------------|----------------|----------------|--------------------|-------------------|----------------|
| ◎               | ◎           | ◎              | ◎               | ◎                | ◎                | ◎               | ◎                | ◎             | ◎             | ◎              | ◎              | ◎                  | ◎                 | ◎              |
| Ti Alloy ≤ 1300 | Ni < 500    | Ni Alloy < 900 | Ni Alloy ≤ 1400 | Cu < 350         | Cu Alloy Short   | Cu Alloy Long   | Cu-Al-Fe < 1500  | Al / Mg < 350 | Al Wrought    | Al Si ≤ 10%    | Al Si > 10%    | Plastic Thermosoft | Plastic Thermoset | Plastic FRP    |
| ◎               | ◎           | ◎              | ◎               | ◎                | ◎                | ◎               | ◎                | ◎             | ◎             | ◎              | ◎              | ◎                  | ◎                 | ◎              |

## MACHINE TAPS

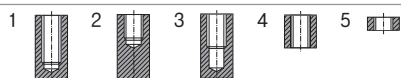
## RECOMMENDATION TABLE



## USE

⊙ = EXCELLENT

○ = GOOD



## MATERIAL GROUPS

|                             |                 |                   |                  |                  |                    |
|-----------------------------|-----------------|-------------------|------------------|------------------|--------------------|
| DIN 371/376                 | <b>M</b>        | EDP No.<br>(Page) | TC804<br>(p.375) | TD804<br>(p.375) | TC804-C<br>(p.378) |
| DIN 371/376                 | <b>EG-M</b>     | EDP No.<br>(Page) |                  |                  |                    |
| DIN 352                     | <b>M</b>        | EDP No.<br>(Page) |                  |                  |                    |
| DIN 374                     | <b>MF</b>       | EDP No.<br>(Page) | TC844<br>(p.376) | TD844<br>(p.376) |                    |
| DIN 371/376                 | <b>UNC</b>      | EDP No.<br>(Page) | TC824<br>(p.384) | TD824<br>(p.384) |                    |
| DIN 371/376                 | <b>EG-UNC</b>   | EDP No.<br>(Page) |                  |                  |                    |
| DIN 371/374                 | <b>UNF</b>      | EDP No.<br>(Page) | TC864<br>(p.385) | TD864<br>(p.385) |                    |
| DIN 371/376                 | <b>EG-UNF</b>   | EDP No.<br>(Page) |                  |                  |                    |
| DIN 2182/2183               | <b>BSW</b>      | EDP No.<br>(Page) |                  |                  |                    |
| DIN 357/5156                | <b>M/G(BSP)</b> | EDP No.<br>(Page) |                  |                  |                    |
| LONG                        | <b>M</b>        | EDP No.<br>(Page) |                  |                  |                    |
| SURFACE TREATMENT / COATING |                 |                   | Bright           | TiN              | Bright             |
| SPIRAL FLUTE ANGLE          |                 |                   | R40              | R40              | R40                |
| CHAMFER LEAD ACC. DIN 2197  |                 |                   | C                | C                | C                  |
| HOLE TYPE                   |                 |                   | 1-2-3            | 1-2-3            | 1-2-3              |

## COOLANT

A = Cutting Oil  
T = Oil Emulsion  
X = Cutting Oil/Oil Emulsion  
S = Dry  
Z = Dry/Oil Emulsion

| MATERIAL GROUPS                    |    |                   | LIST OF MATERIALS                          | HB    | Rm<br>N/mm² |              | Vc<br>m/min |   |  |  |  |
|------------------------------------|----|-------------------|--------------------------------------------|-------|-------------|--------------|-------------|---|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 10.<br>STEELS                      | 11 | Steel < 400       | Magnetic soft steels                       | < 120 | < 400       | Extra long   | 15-20       | T |  |  |  |
|                                    | 12 | Steel < 700       | Structure steels                           | < 200 | < 700       | Medium/long  | 15-20       | T |  |  |  |
|                                    | 13 | Steel < 850       | Plain carbon steels                        | < 250 | < 850       | Long         | 12-18       | T |  |  |  |
|                                    | 14 | St. Alloy < 850   | Alloy steels                               | < 250 | < 850       | Long         | 10-15       | X |  |  |  |
|                                    | 15 | St. Alloy ≤ 1,200 | Alloy steels, Hardened steels              | < 350 | ≤ 1,200     | Long         | 6-10        | X |  |  |  |
|                                    | 16 | St. Alloy > 1,200 | Alloy steels, Hardened steels              | > 350 | > 1,200     | Long         | 3-5         | A |                                                                                       |                                                                                       |                                                                                       |
| 20.<br>STAINLESS<br>STEELS         | 21 | INOX Free < 850   | Free machining                             | < 250 | < 850       | Medium       | 7-10        | A |  |  |  |
|                                    | 22 | INOX Aust.< 850   | Austenitic                                 | < 250 | < 850       | Long         | 5-8         | A |  |  |  |
|                                    | 23 | INOX < 1,100      | Ferritic, Ferritic+Austenitic, Martensitic | < 300 | < 1,100     | Long         | 4-6         | A |  |  |  |
| 30.<br>CAST IRON                   | 31 | GG Cast < 500     | Grey cast iron                             | < 150 | < 500       | Extra short  | 10-15       | X |  |  |  |
|                                    | 32 | GG Cast < 1,000   | Grey cast iron                             | < 300 | < 1,000     | Extra short  | 5-8         | T |  |  |  |
|                                    | 33 | GGG Cast < 700    | Nodular graphite, Malleable cast iron      | < 200 | < 700       | Short        | 10-15       | X |  |  |  |
|                                    | 34 | GGG Cast < 1,000  | Nodular graphite, Malleable cast iron      | < 300 | < 1,000     | Short        | 5-8         | X |  |  |  |
| 40.<br>TITANIUM                    | 41 | Ti < 700          | Titanium, Unalloyed                        | < 200 | < 700       | Extra long   | 10-15       | T |  |  |  |
|                                    | 42 | Ti Alloy < 900    | Titanium, Alloyed                          | < 270 | < 900       | Medium/Short | 8-12        | A |  |  |  |
|                                    | 43 | Ti Alloy ≤ 1,300  | Titanium, Alloyed                          | < 350 | ≤ 1,300     | Medium/Short | 4-6         | A |                                                                                       |                                                                                       |                                                                                       |
| 50.<br>NICKEL                      | 51 | Ni < 500          | Nickel, Unalloyed                          | < 150 | < 500       | Extra long   | 8-12        | A |  |  |  |
|                                    | 52 | Ni Alloy < 900    | Nickel, Alloyed                            | < 270 | < 900       | Long         | 10-15       | A |  |  |  |
|                                    | 53 | Ni Alloy ≤ 1,400  | Nickel, Alloyed                            | < 410 | ≤ 1,400     | Long         | 2-4         | A |                                                                                       |                                                                                       |                                                                                       |
| 60.<br>COPPER,<br>BRASS,<br>BRONZE | 61 | Cu < 350          | Copper, Unalloyed                          | < 100 | < 350       | Extra long   | 8-12        | T |  |  |  |
|                                    | 62 | Cu Alloy (Short)  | Short chip Brass, Bronze, Copper           | < 200 | < 700       | Medium/Short | 25-35       | T |  |  |  |
|                                    | 63 | Cu Alloy (Long)   | Long chip Brass, Bronze, Copper            | < 200 | < 700       | Long         | 15-20       | T |  |  |  |
|                                    | 64 | Cu-Al-Fe < 1,500  | Cu-Al-Fe alloys                            | < 470 | < 1,500     | Short        | 3-5         | A |                                                                                       |                                                                                       |                                                                                       |
| 70.<br>ALUMINUM                    | 71 | Al/Mg < 350       | Aluminum, Magnesium, Unalloyed             | < 100 | < 350       | Extra long   | 10-15       | T |                                                                                       |                                                                                       |                                                                                       |
|                                    | 72 | Al Wrought        | Aluminum, Alloyed Si < 0.5%                | < 150 | < 500       | Medium       | 25-35       | T |  |  |  |
|                                    | 73 | Al (Si ≤ 10%)     | Aluminum, Alloyed, Si ≤ 10%                | < 120 | < 400       | Medium/Short | 15-20       | T |  |  |  |
|                                    | 74 | Al (Si > 10%)     | Aluminum, Alloyed, Si > 10%                | < 120 | < 400       | Short        | 10-15       | T |  |  |  |
| 80.<br>PLASTICS                    | 81 | Thermosoft.       | Thermoplastics                             |       |             | Extra long   | 20-30       | T |                                                                                       |                                                                                       |                                                                                       |
|                                    | 82 | Thermoset.        | Thermosetting Plastics                     |       |             | Short        | 8-12        | Z |                                                                                       |                                                                                       |                                                                                       |
|                                    | 83 | FRP               | Fiber Reinforced Plastics                  |       |             | Extra short  | 5-7         | Z |                                                                                       |                                                                                       |                                                                                       |

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# CUTTING SPEED TABLE

## CUTTING SPEED TABLE    SCHNITTGESCHWINDIGKEITSTABELLE

Cutting Speeds m/min. into revolutions per minute

| TOOL R.P.M.(rev/min) |                       |     |     |      |      |      |      |      |      |      |      |      |      |       |       |       |
|----------------------|-----------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| Tool Dia.            | Cutting Speed (m/min) |     |     |      |      |      |      |      |      |      |      |      |      |       |       |       |
|                      | 1                     | 2   | 3   | 4    | 5    | 6    | 8    | 10   | 12   | 15   | 20   | 25   | 30   | 40    | 50    | 60    |
| 1                    | 318                   | 637 | 955 | 1274 | 1592 | 1910 | 2548 | 3185 | 3822 | 4777 | 6396 | 7962 | 9554 | 12739 | 15924 | 19108 |
| 2                    | 159                   | 318 | 478 | 637  | 796  | 955  | 1274 | 1592 | 1911 | 2388 | 3185 | 3981 | 4777 | 6369  | 7962  | 9554  |
| 3                    | 106                   | 212 | 318 | 425  | 531  | 637  | 849  | 1062 | 1274 | 1592 | 2123 | 2654 | 3185 | 4246  | 5308  | 6369  |
| 4                    | 80                    | 159 | 239 | 318  | 398  | 478  | 637  | 796  | 955  | 1194 | 1592 | 1990 | 2389 | 3185  | 3981  | 4777  |
| 5                    | 64                    | 127 | 191 | 255  | 318  | 382  | 510  | 637  | 764  | 955  | 1274 | 1592 | 1911 | 2548  | 3185  | 3822  |
| 6                    | 53                    | 106 | 159 | 212  | 265  | 318  | 425  | 531  | 637  | 796  | 1062 | 1327 | 1592 | 2123  | 2653  | 3185  |
| 8                    | 40                    | 80  | 119 | 159  | 199  | 239  | 318  | 398  | 478  | 597  | 796  | 955  | 1194 | 1592  | 1990  | 2388  |
| 10                   | 31                    | 64  | 96  | 127  | 159  | 191  | 255  | 318  | 382  | 478  | 637  | 796  | 955  | 1274  | 1592  | 1911  |
| 12                   | 26                    | 53  | 80  | 106  | 133  | 159  | 212  | 265  | 318  | 398  | 531  | 663  | 796  | 1062  | 1327  | 1592  |
| 14                   | 23                    | 45  | 68  | 91   | 114  | 136  | 182  | 227  | 273  | 341  | 455  | 569  | 682  | 910   | 1137  | 1365  |
| 16                   | 20                    | 40  | 60  | 80   | 100  | 119  | 159  | 199  | 239  | 299  | 398  | 498  | 597  | 796   | 995   | 1194  |
| 18                   | 18                    | 35  | 53  | 71   | 88   | 106  | 142  | 177  | 212  | 265  | 354  | 442  | 531  | 708   | 885   | 1062  |
| 20                   | 16                    | 32  | 48  | 64   | 80   | 96   | 127  | 159  | 191  | 239  | 318  | 398  | 478  | 637   | 796   | 955   |
| 25                   | 13                    | 25  | 38  | 51   | 64   | 76   | 102  | 127  | 153  | 191  | 255  | 318  | 382  | 510   | 637   | 764   |
| 30                   | 11                    | 21  | 32  | 42   | 53   | 64   | 85   | 106  | 127  | 159  | 212  | 265  | 318  | 425   | 531   | 637   |
| 35                   | 9                     | 18  | 27  | 36   | 45   | 55   | 73   | 91   | 109  | 136  | 182  | 227  | 273  | 364   | 455   | 546   |
| 40                   | 8                     | 16  | 24  | 32   | 40   | 48   | 64   | 80   | 96   | 119  | 159  | 199  | 239  | 318   | 398   | 478   |

RPM = rev/min

V = m/min

D = Dia.(mm)

$$V = \frac{RPM \cdot \pi \cdot D}{1000}$$

$$RPM = \frac{1000 \cdot V}{\pi \cdot D}$$