



*Quality. Consistency. Performance.*

# YMW TAPS USA

2016-2017

## Z-PRO

*Economical High Performance Taps*



Think threads with

# YAMAWA

# Yamawa's mission is to create high quality, high performance taps and cutting tools while supporting technical innovation in metal machining.

As rapid technical innovation unfolds in every field of industry, metal cutting and threading are faced with demands for higher quality and more efficient machining.

By developing and supplying more precise, high performance taps and center drills to meet these evolving needs, YAMAWA is contributing to the advancement of global machining.

## Product Line

### *Precision Cutting Tools*

- Taps
- Center Drills
- Gages
- Dies

### *Regrind Fixtures*

- Tap and Drill Sharpeners

### *Precision Pitch Diameter Measuring Machines*

- Three-wire measuring machine for highly accurate pitch diameter measurement

**YAMAWA products respond to a wide variety of technical demands, addressing a wide range of metal processing needs, including:**

#### Industry demand for high production and higher quality screw threads

High -speed high-precision, multi-function CNC machine tools in the field of metal machining, have provided the platforms for threading improvement. YAMAWA has been quick to respond to this emerging trend, leading the industry in the development and introduction of taps for CNC and high-speed and ultra high-speed machining. We continue to produce a steady stream of high-performance taps in response to today's increasingly high demand for quality threads at reduced tapping cost.

#### Environmental protection and increase efficiency

YAMAWA is actively engaged in finding solutions for the increasing important problems of coolant management. Our proprietary oil-less thread forming taps have eliminated the need for cutting oil during tapping for popular thread sizes. This not only enables cleaner threading but also makes the entire process more efficient by eliminating chips during threading and reducing the cleanup step.

#### Tapping hard-to-machine materials

Technological advances in the aerospace industry and other fields have prompted the use of various new light weight, heat resistant materials such as titanium and nickel base alloys. The extreme hardness and toughness of these materials accelerate wear on cutting tools making conventional taps inadequate. YAMAWA continues to develop specific high performance tap designs for such hard to machine materials. We supply a broad range of new products in response to evolving customer needs, supporting the cutting edge of the next generation of metal processing.

#### New tap innovation for aluminum

Yamawa has introduced new taps for high-performance threading of high-silicon aluminum and wrought aluminums.

YAMAWA is continuously updating tap designs based on meeting and exceeding our customers' tapping needs for increased quality at higher production rates.

**Yonezawa Plant (ISO9001: 1996)  
(ISO14001: 2003)**



Yonezawa is the main manufacturing plant of the Yamawa Group, this location is equipped with production lines and is the Quality Control Center. The plant obtained ISO 9001 certification in 1996. Of the four Yamawa plants, the Yonezawa location has the longest history of manufacturing and the highest production capacity. Products include roll taps, spiral pointed, pipe and hand taps.

The Yonezawa Plant stepped ahead of our competitors by receiving ISO 9001 before any other cutting tool manufacturing in Japan.

**Fukushima Plant (ISO9001: 2000)  
(ISO14001: 2002)**



The Fukushima plant provides both tap production lines and in house facilities for the manufacturing of specialized production machine tools to produce the exceptional high quality cutting tools. This plant develops and manufactures special tap and die production equipment. It also supplies these machines to our other manufacturing sites. Products include spiral fluted taps, dies and combined drill/countersinks as well as production machinery.

**Aizu Plant (ISO9001: 2000)  
(ISO14001: 2002)**



Equipped with the most sophisticated machine tools available, this plant is famous for its automation and robotized labor saving manufacturing processes. The plant is designed for mass production of the highest quality cutting tools and screw thread tools. Products include spiral fluted taps and carbide taps.

**Tsutsumi Plant (ISO9001: 2011)  
(ISO14001: 2011)**



The Tsutsumi plant is the main tool blank manufacturing operation of Yamawa group. This location is also the testing center where Yamawa executes the innovation in metal machining and performance tests of the products for the Yamawa group.

**Head Office (ISO9001: 2012)  
(ISO14001: 2003)**



Head office and export department.  
Address: Nakajima Gold Building  
No. 13-10,  
Kyobashi 3chome, Chuoh-ku,  
Tokyo, Japan 104-0031  
TEL: +81-3-3561-2717  
FAX: +81-3-3561-6838

**Quality, Consistency, Performance and Product Development.** All of the 800 Yamawa employees are committed to these principles and these are reflected in each tool we produce.

## Origin of our corporate name, "YA" "MA" "WA"

Mr. Jokichi Watanabe, the founder of the company, decided to use the shop name "YA" "MA" "WA", which he had been using in his family business instead of using his personal family name. He gave his company the name "YA" "MA" "WA" by adapting these lucky words and using the connotation "YAMAWA" from the ancient Japanese characters, MANYOGANA. The meaning of YAMAWA is "Greater prosperity, More united". In this phrase, he put his wish "as the company becomes prosperous, the harmony among employees becomes more precious".

## 90 years' experience in threading application

YAMAWA was founded in 1923. For more than 90 years, YAMAWA has been improving the quality of Taps and Dies in order to meet the customers needs. Our chief goal is to provide our customers with "Reliable Screw Threads".

## 90% of all the grinding machines are built in-house.

More than 90 % of the grinding machines used in manufacturing at the YAMAWA factories are built in-house by YAMAWA. This enables YAMAWA to always maintain the highest level of accuracy with these in-house grinding machines and continue to supply our customers worldwide with the highest quality of taps. These machines lead to consistency of the taps performance.



## 100% quality inspection

Taps produce thousands of internal screw threads. One defective tap could produce thousands of defective parts. In order to prevent this from happening, YAMAWA conducts 100% final inspection of each single tap as well as intermediate inspection after each grinding process.





YMAWA's motto is "Reliable Screw Threads". We enrich the manufacturing industry by producing the highest quality taps. In addition to taps, we also manufacture threading dies, drills, countersinks, combined drill countersinks and a broad range of other centering type cutting tools. Since YMAWA's founding in 1923, we have been putting a continuous effort into quality improvements and technical progress as a general cutting tool manufacturer for over 90 years.

## YMW TAPS USA

The sole agent of  
YMAWA/YMW USA products



YMW TAPS USA provides all the customers in the US with the following services.

### Customer support



YMW TAPS USA is equipped with the Microtap TTT system that produces operational testing and is available to support our customers needs. Should you have any tapping problems or difficulties, please call 855-969-8721.

### Inventory Operation



With high levels of inventory, we can meet your urgent delivery requests.

| YMW TAPS U.S.A.                                                                 |                       |             |      | TAPPING GUIDE |                  |       |       |       |        |        |        |         |         |         |       | 855-YMW-USA1                                                                          |       |  |  |
|---------------------------------------------------------------------------------|-----------------------|-------------|------|---------------|------------------|-------|-------|-------|--------|--------|--------|---------|---------|---------|-------|---------------------------------------------------------------------------------------|-------|--|--|
| BASED ON 65-75% THREAD HEIGHT, LENGTH OF THREAD 2 X DIAMETER, THROUGH HOLE.     |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| Material                                                                        | Condition             | Hardness    |      | Speed         | Z-PRO TAP SERIES |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
|                                                                                 |                       | BHN         | HRC  |               | SFPM             | SP OX | PO OX | HT OX | SP TiN | PO TiN | HT TiN | SP TiCN | PO TiCN | HT TiCN | SP BR | PO BR                                                                                 | HT BR |  |  |
| Low Carbon Steel, Wrought                                                       |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 1005-1029, 1513-1522                                                            | Normalized or         | < 175       | < 9  | 40-65         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
|                                                                                 | Cold Drawn            | < 276       | < 30 | 30-50         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| Medium Carbon Steel, Wrought                                                    |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 1030-1055, 1525-1522                                                            | Normalized            | < 250       | < 25 | 20-40         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| High Carbon Steel, Wrought                                                      |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 1060-1069, 1070-1078, 1089-1086, 1095                                           | Annealed              | < 275       | <30  | 20-40         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| Low Carbon Alloy Steel, Wrought                                                 |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 4023, 4320, 5120, 8115, 8622                                                    | Normalized            | < 250       | < 25 | 20-35         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| Medium Carbon Alloy Steel, Wrought                                              |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 4032, 4130, 5135, 8630                                                          | Normalized            | < 250       | < 25 | 15-25         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| Tool Steels, Wrought                                                            |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| H10, H11, H12, H13, H14, H19, H21, H26                                          | Annealed              | <250        | <25  | 15-25         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| D2, D3, D4, D5, D7, A7                                                          | Annealed              | <150        |      | 20-35         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| P2, P4, P5, P6                                                                  | Annealed              | <250        | <25  | 10-15         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| P20, P21                                                                        | Annealed              | <200        | <16  | 15-25         | ●                | ●     | ●     | ●     | ●      |        |        |         |         |         |       |                                                                                       |       |  |  |
| Ferritic Stainless Steel, Wrought                                               |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 405, 409, 430, 434, 436, 442, 446, 502                                          | Annealed              | < 185       | <12  | 15-30         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| Austenitic Stainless Steel, Wrought                                             |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 201, 202, 301, 302, 303, 304,                                                   | Annealed              | < 185       | <12  | 18-25         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| 305, 308, 309, 310, 314, 316,                                                   | Cold Drawn            | < 275       | < 30 | 12-20         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| 317, 321, 330, 347, 384, 385                                                    |                       |             |      |               | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| Martensitic Stainless                                                           |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| Steel Wrought                                                                   |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 403, 410, 420, 422                                                              | Annealed              | < 175       | < 9  | 15-30         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| 501, 502                                                                        | Annealed              | < 225       | < 21 | 15-25         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| 414, 431                                                                        | Annealed              | < 275       | < 30 | 15-25         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| 440A, 440B, 440C                                                                | Annealed              | < 275       | < 30 | 10-20         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| Precipitation Hardening                                                         |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| Stainless Steel Wrought                                                         |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 15-5PH, 16-6PH, 17-4PH                                                          | Annealed              | < 200       | < 16 | 12-25         | ●                | ●     | ●     |       |        |        |        | ●       | ●       |         |       |                                                                                       |       |  |  |
| Aluminum Alloys, Wrought                                                        |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 2011-2025, 5050                                                                 | Cold Drawn            | < 80        | -    | 95-125        |                  |       |       |       |        |        |        |         |         |         | ○     | ○                                                                                     | ○     |  |  |
| 6061, 7075                                                                      | Treated               | < 150       | -    | 75-100        |                  |       |       |       |        |        |        |         |         |         | ○     | ○                                                                                     | ○     |  |  |
| Aluminum Die Cast                                                               | As Cast               | < 100       | -    | 100-150       |                  |       |       |       | ●      | ●      |        |         |         |         | ○     | ○                                                                                     | ○     |  |  |
| Brass, Cast                                                                     |                       | -           | -    | 40-60         | ●                | ●     | ●     |       | ●      | ●      |        |         |         |         |       |                                                                                       |       |  |  |
| Bronze, Cast                                                                    |                       | -           | -    | 30-50         | ●                | ●     | ●     |       | ●      | ●      |        |         |         |         |       |                                                                                       |       |  |  |
| Copper, Wrought                                                                 | Annealed              | <100Rs      | -    | 30-90         |                  |       |       |       |        |        |        |         |         |         | ○     | ○                                                                                     | ○     |  |  |
| Magnesium Alloys, Wrought                                                       | Treated & Aged        | < 125       | -    | 60-90         |                  |       |       |       |        |        |        |         |         |         | ○     | ○                                                                                     | ○     |  |  |
| Plastics, Therosetting & Thermoplastic                                          |                       | UP TO 125Rm |      | 30 to 50      |                  |       |       |       |        |        |        |         |         |         | ○     | ○                                                                                     | ○     |  |  |
| Cast Iron, Gray                                                                 |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| Ferritic                                                                        | Annealed              | 120 to 150  |      | 40-70         |                  |       | ●     |       |        |        | ●      |         |         |         |       |                                                                                       |       |  |  |
| Pearlitic-Ferritic                                                              | As Cast               | 160 to 200  |      | 30-50         |                  |       | ●     |       |        |        | ●      |         |         |         |       |                                                                                       |       |  |  |
| Pearlitic                                                                       | As Cast               | 190 to 220  |      | 20-40         |                  |       | ●     |       |        |        | ●      |         |         |         |       |                                                                                       |       |  |  |
| Pearlitic + Free Carbides                                                       | As Cast               | 220 to 260  |      |               |                  |       | ●     |       |        |        | ●      |         |         |         |       |                                                                                       |       |  |  |
| Cast Iron, Ductile                                                              |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| Ferritic                                                                        | Annealed              | 140 to 190  |      | 30-50         | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| Ferritic-Pearlitic                                                              | As Cast               | 190 to 225  |      | 15-35         | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| Pearlitic-Martensitic                                                           | Normalized & Tempered | 240 to 300  |      | 15-20         | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| Martensitic                                                                     | Quenched              | 270 to 300  |      | 15            | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
|                                                                                 | & Tempered            |             |      |               | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| Cast Iron, Malleable                                                            |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| Ferritic 32510, 35018                                                           | Malleablized          | 110 to 160  |      | 30-50         | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| Pearlitic 40010, 45008                                                          | Malleablized          | 160 to 200  |      | 20-40         | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| 43010, 48005, 45006, 50005                                                      | & Heat Treated        | 200 to 240  |      | 15-25         | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| Martensitic 53004, 60003, 60004                                                 | Malleablized          | 200 to 255  |      | 14-25         | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
|                                                                                 | & Heat Treated        |             |      |               | ●                | ●     | ●     |       | ●      | ●      | ●      |         |         |         |       |                                                                                       |       |  |  |
| FIRST CHOICE ●      ALTERNATE TiN ●      ALTERNATE TiCN ●      BRIGHT SURFACE ○ |                       |             |      |               |                  |       |       |       |        |        |        |         |         |         |       |                                                                                       |       |  |  |
| 855-YMW-USA1                                                                    |                       |             |      | TAPPING GUIDE |                  |       |       |       |        |        |        |         |         |         |       |  |       |  |  |

# Z-PRO

YMW U.S.A.

## SUGGESTED SFM TO RPM CONVERSION CHART BY SIZE

| Tap<br>Sizes | Surface Feet per Minute |     |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |
|--------------|-------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
|              | 5'                      | 10' | 15'  | 20'  | 25'  | 30'  | 40'  | 50'  | 60'  | 70'  | 80'  | 90'  | 100' | 110'  | 120'  | 130'  | 140'  | 150'  |
|              | Revolutions per Minute  |     |      |      |      |      |      |      |      |      |      |      |      |       |       |       |       |       |
| 0            | 318                     | 637 | 955  | 1273 | 1592 | 1910 | 2546 | 3183 | 3820 | 4456 | 5093 | 5729 | 6366 | 7003  | 7639  | 8276  | 8913  | 9549  |
| 1            | 273                     | 546 | 819  | 1046 | 1308 | 1570 | 2093 | 2617 | 3140 | 3663 | 4186 | 4710 | 5233 | 5756  | 6279  | 6805  | 7326  | 7849  |
| 2            | 212                     | 424 | 637  | 888  | 1110 | 1333 | 1777 | 2221 | 2665 | 3109 | 3554 | 3999 | 4442 | 4886  | 5330  | 5774  | 6218  | 6662  |
| 3            | 191                     | 382 | 573  | 772  | 964  | 1157 | 1543 | 1929 | 2315 | 2701 | 3086 | 3472 | 3858 | 4244  | 4629  | 5015  | 5401  | 5787  |
| 4            | 174                     | 347 | 521  | 682  | 853  | 1023 | 1364 | 1705 | 2046 | 2387 | 2728 | 3069 | 3411 | 3751  | 4092  | 4434  | 4775  | 5116  |
| 5            | 147                     | 294 | 441  | 611  | 764  | 917  | 1222 | 1528 | 1833 | 2139 | 2445 | 2750 | 3056 | 3361  | 3667  | 3973  | 4278  | 4584  |
| 6            | 136                     | 273 | 409  | 553  | 691  | 829  | 1106 | 1382 | 1659 | 1935 | 2212 | 2488 | 2766 | 3042  | 3318  | 3595  | 3871  | 4148  |
| 8            | 119                     | 239 | 358  | 466  | 583  | 699  | 932  | 1165 | 1398 | 1631 | 1864 | 2097 | 2330 | 2563  | 2796  | 3029  | 3262  | 3495  |
| 10           | 101                     | 201 | 302  | 402  | 502  | 603  | 804  | 1005 | 1205 | 1406 | 1607 | 1808 | 2009 | 2210  | 2411  | 2612  | 2813  | 3014  |
| 12           | 87                      | 174 | 260  | 354  | 442  | 531  | 707  | 884  | 1061 | 1238 | 1415 | 1592 | 1769 | 1945  | 2122  | 2300  | 2476  | 2653  |
| 1/4          | 76                      | 153 | 229  | 306  | 382  | 458  | 611  | 764  | 917  | 1070 | 1222 | 1375 | 1528 | 1681  | 1833  | 1986  | 2139  | 2292  |
| 5/16         | 62                      | 123 | 185  | 245  | 306  | 367  | 489  | 611  | 733  | 856  | 978  | 1100 | 1222 | 1345  | 1467  | 1589  | 1711  | 1833  |
| 3/8          | 50                      | 101 | 151  | 204  | 255  | 305  | 407  | 509  | 611  | 713  | 815  | 917  | 1019 | 1120  | 1222  | 1324  | 1426  | 1528  |
| 7/16         | 43                      | 87  | 130  | 175  | 219  | 262  | 349  | 437  | 524  | 611  | 698  | 786  | 873  | 960   | 1048  | 1135  | 1222  | 1310  |
| 1/2          | 38                      | 76  | 115  | 153  | 191  | 229  | 305  | 382  | 458  | 535  | 611  | 688  | 764  | 840   | 917   | 993   | 1070  | 1146  |
| 9/16         | 34                      | 68  | 102  | 137  | 172  | 206  | 274  | 342  | 410  | 478  | 547  | 616  | 683  | 752   | 820   | 888   | 952   | 1020  |
| 5/8          | 32                      | 64  | 96   | 122  | 153  | 183  | 244  | 306  | 367  | 428  | 489  | 550  | 611  | 672   | 733   | 794   | 856   | 917   |
| 11/16        | 28                      | 55  | 83   | 111  | 138  | 167  | 222  | 278  | 333  | 389  | 444  | 500  | 556  | 611   | 667   | 722   | 778   | 833   |
| 3/4          | 25                      | 51  | 76   | 102  | 128  | 153  | 203  | 255  | 305  | 357  | 407  | 458  | 509  | 560   | 611   | 662   | 713   | 764   |
| 7/8          | 22                      | 43  | 65   | 87   | 109  | 131  | 175  | 218  | 262  | 306  | 350  | 392  | 437  | 480   | 524   | 568   | 611   | 655   |
| 1            | 19                      | 38  | 57   | 76   | 96   | 115  | 153  | 191  | 230  | 268  | 305  | 344  | 382  | 420   | 458   | 497   | 535   | 573   |
| 1-1/8        | 17                      | 34  | 51   | 68   | 84   | 102  | 136  | 170  | 204  | 238  | 272  | 306  | 340  | 373   | 407   | 441   | 475   | 509   |
| 1-1/4        | 15                      | 31  | 46   | 61   | 76   | 92   | 122  | 153  | 183  | 214  | 244  | 275  | 305  | 336   | 367   | 397   | 428   | 458   |
| 1-3/8        | 14                      | 28  | 42   | 56   | 69   | 83   | 111  | 139  | 167  | 194  | 222  | 250  | 278  | 306   | 333   | 361   | 389   | 417   |
| 1-1/2        | 13                      | 25  | 38   | 51   | 63   | 76   | 102  | 127  | 153  | 178  | 204  | 229  | 255  | 280   | 305   | 331   | 356   | 382   |
| 1-5/8        | 12                      | 23  | 35   | 47   | 59   | 71   | 94   | 118  | 141  | 165  | 188  | 212  | 235  | 259   | 282   | 306   | 329   | 353   |
| 1-3/4        | 11                      | 22  | 33   | 44   | 55   | 65   | 87   | 109  | 131  | 153  | 175  | 196  | 218  | 240   | 262   | 284   | 306   | 327   |
| 1-7/8        | 10                      | 20  | 30   | 41   | 51   | 61   | 81   | 102  | 122  | 143  | 163  | 183  | 204  | 224   | 244   | 265   | 285   | 306   |
| 2            | 9                       | 19  | 29   | 38   | 48   | 57   | 76   | 96   | 115  | 134  | 153  | 172  | 191  | 210   | 229   | 248   | 267   | 287   |
| M1           | 490                     | 979 | 1469 | 1959 | 2449 | 2938 | 3918 | 4897 | 5877 | 6856 | 7836 | 8815 | 9795 | 10774 | 11754 | 12733 | 13713 | 14692 |
| M2           | 242                     | 484 | 725  | 967  | 1209 | 1451 | 1934 | 2418 | 2901 | 3385 | 3868 | 4352 | 4835 | 5319  | 5803  | 6286  | 6770  | 7253  |
| M3           | 162                     | 324 | 486  | 647  | 829  | 971  | 1295 | 1619 | 1942 | 2266 | 2590 | 2914 | 3237 | 3561  | 3885  | 4208  | 4532  | 4856  |
| M3.5         | 138                     | 277 | 415  | 557  | 692  | 830  | 1107 | 1384 | 1661 | 1938 | 2214 | 2491 | 2768 | 3045  | 3322  | 3599  | 3875  | 4152  |
| M4           | 122                     | 243 | 365  | 487  | 608  | 730  | 973  | 1217 | 1460 | 1698 | 1946 | 2190 | 2433 | 2676  | 2920  | 3163  | 3406  | 3650  |
| M5           | 97                      | 194 | 291  | 388  | 485  | 582  | 776  | 970  | 1163 | 1357 | 1551 | 1745 | 1939 | 2133  | 2327  | 2521  | 2715  | 2909  |
| M6           | 81                      | 162 | 243  | 324  | 405  | 486  | 647  | 809  | 971  | 1133 | 1295 | 1457 | 1619 | 1781  | 1942  | 2104  | 2266  | 2428  |
| M7           | 69                      | 138 | 208  | 277  | 346  | 415  | 554  | 692  | 830  | 969  | 1107 | 1246 | 1384 | 1522  | 1661  | 1799  | 1938  | 2076  |
| M8           | 61                      | 121 | 182  | 243  | 303  | 364  | 485  | 606  | 728  | 849  | 970  | 1091 | 1213 | 1334  | 1455  | 1577  | 1698  | 1819  |
| M10          | 48                      | 97  | 145  | 194  | 242  | 291  | 388  | 485  | 582  | 679  | 776  | 873  | 970  | 1067  | 1163  | 1260  | 1357  | 1454  |
| M12          | 40                      | 81  | 121  | 162  | 202  | 243  | 324  | 405  | 486  | 567  | 647  | 728  | 809  | 890   | 971   | 1052  | 1133  | 1214  |
| M14          | 35                      | 69  | 104  | 139  | 173  | 208  | 277  | 347  | 416  | 485  | 555  | 624  | 693  | 763   | 832   | 901   | 971   | 1040  |
| M16          | 30                      | 61  | 91   | 121  | 152  | 182  | 243  | 303  | 364  | 424  | 485  | 546  | 606  | 667   | 728   | 788   | 849   | 910   |
| M18          | 27                      | 54  | 81   | 108  | 135  | 162  | 216  | 269  | 323  | 377  | 431  | 485  | 539  | 593   | 647   | 700   | 754   | 808   |
| M20          | 24                      | 49  | 73   | 97   | 121  | 146  | 194  | 243  | 291  | 340  | 388  | 437  | 485  | 534   | 582   | 631   | 680   | 728   |
| M22          | 22                      | 44  | 66   | 88   | 110  | 132  | 176  | 221  | 265  | 309  | 353  | 397  | 441  | 485   | 529   | 573   | 618   | 662   |
| M24          | 20                      | 40  | 61   | 81   | 101  | 121  | 162  | 202  | 243  | 283  | 323  | 364  | 404  | 445   | 485   | 526   | 566   | 606   |
| M27          | 18                      | 36  | 54   | 72   | 90   | 108  | 144  | 180  | 216  | 252  | 287  | 323  | 359  | 395   | 431   | 467   | 503   | 539   |
| M30          | 16                      | 32  | 49   | 65   | 81   | 97   | 129  | 162  | 194  | 226  | 259  | 291  | 323  | 356   | 388   | 420   | 453   | 485   |

# TAP INDEX

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# Z-PRO

YMW U.S.A.

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels and plastics.

Economical High Performance Taps  
For Unified Threads

PO

Spiral Pointed taps are recommended for tapping through holes.



\*Z-PRO PO have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TiCN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series PO

Machine Screw Sizes  
Fractional Sizes

| Nominal Size | NC | NF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            | Dimensions     |                              |                |
|--------------|----|----|---------------|------------------------------------|------------|------------|------------|------------|----------------|------------------------------|----------------|
|              |    |    |               | H1                                 | H2         | H3         | H4         | H5         | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 0            | 80 | —  | 2             | PSUN0B1NEB                         | PSUN0B2NEB | —          | —          | —          | .236           | —                            | 1.772          |
| 1            | 64 | —  | 2             | PSUN1D1NEB                         | PSUN1D2NEB | —          | —          | —          | .275           | —                            | 1.772          |
| 1            | —  | 72 | 2             | PSUN1C1NEB                         | PSUN1C2NEB | —          | —          | —          | .275           | —                            | 1.772          |
| 2            | 56 | —  | 2             | PSUN2E1NEB                         | PSUN2E2NEB | —          | —          | —          | .314           | —                            | 1.772          |
| 2            | —  | 64 | 2             | PSUN2D1NEB                         | PSUN2D2NEB | —          | —          | —          | .314           | —                            | 2.205          |
| 3            | 48 | —  | 2             | PSUN3F1NEB                         | PSUN3F2NEB | —          | —          | —          | .314           | .669                         | 2.205          |
| 3            | —  | 56 | 2             | PSUN3E1NEB                         | PSUN3E2NEB | —          | —          | —          | .354           | .669                         | 2.205          |
| 4            | 40 | —  | 2             | —                                  | PSUN4H2NEB | PSUN4H3NEB | —          | —          | .354           | .709                         | 2.205          |
| 4            | —  | 48 | 2             | PSUN4F1NEB                         | PSUN4F2NEB | —          | —          | —          | .354           | .709                         | 2.205          |
| 5            | 40 | —  | 2             | —                                  | PSUN5H2NEB | PSUN5H3NEB | —          | —          | .433           | .768                         | 2.205          |
| 5            | —  | 44 | 2             | —                                  | PSUN5G2NEB | PSUN5G3NEB | —          | —          | .433           | .768                         | 2.205          |
| 6            | 32 | —  | 2             | —                                  | PSUN6J2NEB | PSUN6J3NEB | —          | —          | .433           | .768                         | 2.205          |
| 6            | —  | 40 | 2             | —                                  | PSUN6H2NEB | PSUN6H3NEB | —          | —          | .433           | .768                         | 2.205          |
| 8            | 32 | —  | 2             | —                                  | PSUN8J2NEB | PSUN8J3NEB | —          | —          | .512           | .827                         | 2.480          |
| 8            | —  | 36 | 2             | —                                  | PSUN8I2NEB | PSUN8I3NEB | —          | —          | .512           | .827                         | 2.480          |
| 10           | 24 | —  | 2             | —                                  | PSUNAM2NEB | PSUNAM3NEB | —          | —          | .551           | .984                         | 2.756          |
| 10           | —  | 32 | 2             | —                                  | PSUNAJ2NEB | PSUNAJ3NEB | —          | —          | .551           | .984                         | 2.756          |
| 12           | 24 | —  | 2             | —                                  | PSUNCM2NEB | PSUNCM3NEB | —          | —          | .591           | .984                         | 3.150          |
| 12           | —  | 28 | 2             | —                                  | PSUNCK2NEB | PSUNCK3NEB | —          | —          | .591           | .984                         | 3.150          |
| 1/4          | 20 | —  | 3             | —                                  | —          | PSU04N3NEB | PSU04N4NEB | —          | .591           | 1.181                        | 3.150          |
| 1/4          | —  | 28 | 3             | —                                  | PSU04K2NEB | PSU04K3NEB | —          | —          | .591           | 1.181                        | 3.150          |
| 5/16         | 18 | —  | 3             | —                                  | —          | PSU05O3NEB | PSU05O4NEB | —          | .748           | 1.378                        | 3.543          |
| 5/16         | —  | 24 | 3             | —                                  | —          | PSU05M3NEB | PSU05M4NEB | —          | .748           | 1.378                        | 3.543          |
| 3/8          | 16 | —  | 3             | —                                  | —          | PSU06P3NEB | —          | PSU06P5NEB | .906           | 1.535                        | 3.937          |
| 3/8          | —  | 24 | 3             | —                                  | —          | PSU06M3NEB | PSU06M4NEB | —          | .906           | 1.535                        | 3.937          |
| 7/16         | 14 | —  | 3             | —                                  | —          | —          | PSU07Q4NEB | PSU07Q5NEB | .906           | —                            | 3.937          |
| 7/16         | —  | 20 | 3             | —                                  | —          | PSU07N3NEB | PSU07N4NEB | —          | .906           | —                            | 3.937          |
| 1/2          | 13 | —  | 3             | —                                  | —          | —          | PSU08R4NEB | PSU08R5NEB | 1.024          | —                            | 4.331          |
| 1/2          | —  | 20 | 3             | —                                  | —          | PSU08N3NEB | PSU08N4NEB | —          | 1.024          | —                            | 4.331          |
| 9/16         | 12 | —  | 3             | —                                  | —          | —          | PSU09S4NEB | PSU09S5NEB | 1.024          | —                            | 4.331          |
| 9/16         | —  | 18 | 3             | —                                  | —          | —          | PSU09O4NEB | PSU09O5NEB | 1.024          | —                            | 4.331          |

CONTINUED ON NEXT PAGE

Think threads with  
**YAMAWA**

## Economical High Performance Taps

For Unified Threads

# PO



\*Z-PRO PO have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels and plastics.

Spiral Pointed taps are recommended for tapping through holes.

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series PO

Machine Screw Sizes  
Fractional Sizes

| Nominal Size | NC UNC | NF UNF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            | Dimensions                        |             |                |
|--------------|--------|--------|---------------|------------------------------------|------------|------------|------------|------------|-----------------------------------|-------------|----------------|
|              |        |        |               | H4                                 | H5         | H6         | H7         | H8         | Length of Thread (=Thread + Neck) | Neck Length | Length Overall |
| 5/8          | 11     | —      | 3             | PSU10U4NEB                         | —          | PSU10U6NEB | —          | —          | 1.024                             | —           | 4.331          |
| 5/8          | —      | 18     | 3             | PSU10O4NEB                         | PSU10O5NEB | —          | —          | —          | 1.024                             | —           | 4.331          |
| 3/4          | 10     | —      | 3             | —                                  | PSU12V5NEB | PSU12V6NEB | —          | —          | 1.299                             | —           | 4.921          |
| 3/4          | —      | 16     | 3             | PSU12P4NEB                         | PSU12P5NEB | —          | —          | —          | 1.299                             | —           | 4.921          |
| 7/8          | 9      | —      | 3             | —                                  | PSU14W5NEB | PSU14W6NEB | —          | —          | 1.299                             | —           | 5.512          |
| 7/8          | —      | 14     | 3             | PSU14Q4NEB                         | —          | PSU14Q6NEB | —          | —          | 1.299                             | —           | 5.512          |
| 1            | 8      | —      | 3             | —                                  | PSU16X5NEB | —          | PSU16X7NEB | —          | 1.457                             | —           | 6.299          |
| 1            | —      | 12     | 3             | —                                  | PSU16S5NEB | PSU16S6NEB | —          | —          | 1.457                             | —           | 6.299          |
| 1 1/8        | 7      | —      | 4             | —                                  | —          | PSU18Y6NEB | PSU16Y7NEB | —          | 1.732                             | —           | 7.087          |
| 1 1/8        | —      | 12     | 4             | —                                  | PSU18S5NEB | PSU18S6NEB | —          | —          | 1.732                             | —           | 7.087          |
| 1 1/4        | 7      | —      | 4             | —                                  | —          | PSU20Y6NEB | —          | PSU20Y8NEB | 1.929                             | —           | 7.087          |
| 1 1/4        | —      | 12     | 4             | —                                  | PS020S5NEB | PS020S6NEB | —          | —          | 1.929                             | —           | 7.087          |
| 1 3/8        | 6      | —      | 4             | —                                  | —          | PSU22Z6NEB | —          | PSU22Z8NEB | 2.165                             | —           | 7.874          |
| 1 3/8        | —      | 12     | 4             | —                                  | PSU22S5NEB | PSU22S6NEB | —          | —          | 2.165                             | —           | 7.874          |
| 1 1/2        | 6      | —      | 4             | —                                  | —          | PSU24Z6NEB | —          | PSU24Z8NEB | 2.323                             | —           | 7.874          |
| 1 1/2        | —      | 12     | 4             | —                                  | PSU24S5NEB | —          | PSU24S7NEB | —          | 2.323                             | —           | 7.874          |



# Z-PRO

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Spiral Pointed taps are recommended for tapping through holes.

## Economical High Performance Taps For Unified Threads

### PO-OX



Z-PRO PO-OX have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

#### Z-PRO Series PO

#### Machine Screw Sizes Fractional Sizes

| Nominal Size | NC UNC | NF UNF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            |  | Dimensions     |                              |                |
|--------------|--------|--------|---------------|------------------------------------|------------|------------|------------|------------|--|----------------|------------------------------|----------------|
|              |        |        |               | H2                                 | H3         | H4         | H5         | H6         |  | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 2            | 56     | —      | 2             | PSUN2E2NEX                         | —          | —          | —          | —          |  | .314           | —                            | 1.772          |
| 4            | 40     | —      | 2             | —                                  | PSUN4H3NEX | —          | —          | —          |  | .354           | .709                         | 2.205          |
| 5            | 40     | —      | 2             | —                                  | PSUN5H3NEX | —          | —          | —          |  | .433           | .768                         | 2.205          |
| 6            | 32     | —      | 3             | —                                  | PSUN6J3NEX | —          | —          | —          |  | .433           | .768                         | 2.205          |
| 6            | —      | 40     | 3             | —                                  | PSUN6H3NEX | —          | —          | —          |  | .433           | .768                         | 2.205          |
| 8            | 32     | —      | 3             | —                                  | PSUN8J3NEX | —          | —          | —          |  | .512           | .827                         | 2.480          |
| 10           | 24     | —      | 3             | —                                  | PSUNAM3NEX | —          | —          | —          |  | .551           | .984                         | 2.756          |
| 10           | —      | 32     | 3             | —                                  | PSUNAJ3NEX | —          | —          | —          |  | .551           | .984                         | 2.756          |
| 12           | 24     | —      | 3             | —                                  | PSUNCM3NEX | —          | —          | —          |  | .591           | .984                         | 3.150          |
| 1/4          | 20     | —      | 3             | —                                  | —          | PSU04N4NEX | —          | —          |  | .591           | 1.181                        | 3.150          |
| 1/4          | —      | 28     | 3             | —                                  | PSU04K3NEX | —          | —          | —          |  | .591           | 1.181                        | 3.150          |
| 5/16         | 18     | —      | 3             | —                                  | —          | PSU05O4NEX | —          | —          |  | .748           | 1.378                        | 3.543          |
| 5/16         | —      | 24     | 3             | —                                  | —          | PSU05M4NEX | —          | —          |  | .748           | 1.378                        | 3.543          |
| 3/8          | 16     | —      | 3             | —                                  | —          | —          | PSU06P5NEX | —          |  | .906           | 1.535                        | 3.937          |
| 3/8          | —      | 24     | 3             | —                                  | —          | PSU06M4NEX | —          | —          |  | .906           | 1.535                        | 3.937          |
| 7/16         | 14     | —      | 3             | —                                  | —          | —          | PSU07Q5NEX | —          |  | .906           | —                            | 3.937          |
| 7/16         | —      | 20     | 3             | —                                  | —          | PSU07N4NEX | —          | —          |  | .906           | —                            | 3.937          |
| 1/2          | 13     | —      | 3             | —                                  | —          | —          | PSU08R5NEX | —          |  | 1.024          | —                            | 4.331          |
| 1/2          | —      | 20     | 3             | —                                  | —          | PSU08N4NEX | —          | —          |  | 1.024          | —                            | 4.331          |
| 5/8          | 11     | —      | 3             | —                                  | —          | —          | —          | PSU10U6NEX |  | 1.024          | —                            | 4.331          |
| 5/8          | —      | 18     | 3             | —                                  | —          | —          | PSU10O5NEX | —          |  | 1.024          | —                            | 4.331          |
| 3/4          | 10     | —      | 3             | —                                  | —          | —          | —          | PSU12V6NEX |  | 1.299          | —                            | 4.921          |

## Economical High Performance Taps

For Metric threads

PO



\*Z-PRO PO have a Bright Surface Treatment

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Spiral Pointed taps are recommended for tapping through holes.

## \*AVAILABLE IN TIN AND TICN COATING ON REQUEST

Custom Blend High Vanadium HSS

Plug Style (3 to 5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series PO

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |    | Dimensions     |                              |                |
|--------------|---------------|------------------------------------|------------|------------|------------|----|----------------|------------------------------|----------------|
|              |               | D3                                 | D4         | D5         | D6         | D7 | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | PS2.0E3NEB                         | —          | —          | —          | —  | .314           | .382                         | 1.772          |
| M2.2 x 0.45  | 3             | PS2.2F3NEB                         | —          | —          | —          | —  | .314           | .382                         | 1.772          |
| M2.5 x 0.45  | 3             | PS2.5F3NEB                         | —          | —          | —          | —  | .354           | .693                         | 2.205          |
| M2.6 x 0.45  | 3             | PS2.6F3NEB                         | —          | —          | —          | —  | .354           | .693                         | 2.205          |
| M3 x 0.5     | 3             | PS3.0G3NEB                         | —          | —          | —          | —  | .433           | .768                         | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | PS3.5H4NEB | —          | —          | —  | .433           | .787                         | 2.205          |
| M4 x 0.7     | 4             | —                                  | PS4.0I4NEB | —          | —          | —  | .512           | .827                         | 2.48           |
| M5 x 0.8     | 4             | —                                  | PS5.0K4NEB | —          | —          | —  | .591           | .984                         | 3.15           |
| M6 x 1       | 4             | —                                  | —          | PS6.0M5NEB | —          | —  | .591           | 1.181                        | 3.15           |
| M7 x 0.75    | 4             | —                                  | PS7.0J4NEB | —          | —          | —  | .748           | 1.315                        | 3.543          |
| M7 x 0.5     | 4             | —                                  | PS7.0G4NEB | —          | —          | —  | .394           | 1.315                        | 3.543          |
| M7 x 1       | 4             | —                                  | —          | PS7.0M5NEB | —          | —  | .748           | 1.315                        | 3.543          |
| M8 x 0.75    | 4             | —                                  | PS8.0J4NEB | —          | —          | —  | .748           | 1.382                        | 3.543          |
| M8 x 0.5     | 4             | —                                  | PS8.0G4NEB | —          | —          | —  | .394           | 1.382                        | 3.543          |
| M8 x 1       | 4             | —                                  | —          | PS8.0M5NEB | —          | —  | .748           | 1.382                        | 3.543          |
| M8 x 1.25    | 4             | —                                  | —          | PS8.0N5NEB | —          | —  | .748           | 1.382                        | 3.543          |
| M9 x 1       | 4             | —                                  | —          | PS9.0M5NEB | —          | —  | .748           | 1.382                        | 3.543          |
| M9 x 1.25    | 4             | —                                  | —          | PS9.0N5NEB | —          | —  | .748           | 1.382                        | 3.543          |
| M10 X 0.75   | 4             | —                                  | PS010J4NEB | —          | —          | —  | .512           | 1.929                        | 3.937          |
| M10 x 1      | 4             | —                                  | —          | PS010M5NEB | —          | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.25   | 4             | —                                  | —          | PS010N5NEB | —          | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.5    | 4             | —                                  | —          | —          | PS010O6NEB | —  | .906           | 1.929                        | 3.937          |
| M11 x 1.5    | 4             | —                                  | —          | —          | PS011O6NEB | —  | .906           | 1.929                        | 3.937          |
| M12 x 1      | 4             | —                                  | —          | PS012M5NEB | —          | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.25   | 4             | —                                  | —          | —          | PS012N6NEB | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.5    | 4             | —                                  | —          | —          | PS012O6NEB | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.75   | 4             | —                                  | —          | —          | PS012P6NEB | —  | 1.024          | 2.126                        | 4.331          |

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# Z-PRO

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels and plastics.

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## Economical High Performance Taps For Metric Threads

PO



\*Z-PRO PO have a Bright Surface Treatment

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Plug Style (3 to 5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |    | Metric Sizes                      |             |                |
|--------------|---------------|------------------------------------|------------|------------|------------|----|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9 | Length of Thread (=Thread + Neck) | Neck Length | Length Overall |
| M14 x 1      | 4             | PS014M5NEB                         | —          | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 1.25   | 4             | —                                  | PS014N6NEB | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 1.5    | 4             | —                                  | PS014O6NEB | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 2      | 4             | —                                  | —          | PS014Q7NEB | —          | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 1      | 4             | PS016M5NEB                         | —          | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 1.5    | 4             | —                                  | PS016O6NEB | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 2      | 4             | —                                  | —          | PS016Q7NEB | —          | —  | 1.024                             | 2.126       | 4.331          |
| M18 x 1      | 4             | PS018M5NEB                         | —          | —          | —          | —  | .945                              | 2.402       | 4.921          |
| M18 x 1.5    | 4             | —                                  | PS018O6NEB | —          | —          | —  | .945                              | 2.402       | 4.921          |
| M18 x 2      | 4             | —                                  | —          | PS018Q7NEB | —          | —  | 1.299                             | 2.402       | 4.921          |
| M18 x 2.5    | 4             | —                                  | —          | PS018R7NEB | —          | —  | 1.299                             | 2.402       | 4.921          |
| M20 x 1      | 4             | PS020M5NEB                         | —          | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M20 x 1.5    | 4             | —                                  | PS020O6NEB | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M20 x 2      | 4             | —                                  | —          | PS020Q7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M20 x 2.5    | 4             | —                                  | —          | PS020R7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M22 x 1      | 4             | PS022M5NEB                         | —          | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M22 x 1.5    | 4             | —                                  | PS022O6NEB | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M22 x 2      | 4             | —                                  | —          | PS022Q7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M22 x 2.5    | 4             | —                                  | —          | PS022R7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M24 x 1      | 4             | PS024M5NEB                         | —          | —          | —          | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 1.5    | 4             | —                                  | PS024O6NEB | —          | —          | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 2      | 4             | —                                  | —          | PS024Q7NEB | —          | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 3      | 4             | —                                  | —          | —          | PS024S8NEB | —  | 1.457                             | 3.071       | 6.299          |
| M25 x 1.5    | 4             | —                                  | PS025O6NEB | —          | —          | —  | 1.063                             | 3.071       | 6.299          |
| M26 x 1.5    | 4             | —                                  | PS026O6NEB | —          | —          | —  | 1.063                             | 3.465       | 7.087          |
| M27 x 1      | 4             | PS027M5NEB                         | —          | —          | —          | —  | 1.063                             | 3.465       | 7.087          |

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## Economic High Performance Taps

For Metric Threads

PO



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\*AVAILABLE IN TIN AND TICN COATING ON REQUEST

Custom Blend High Vanadium HSS

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Plug Style (3 to 5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

## Z-PRO Series PO

## Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | Length of Thread (-Thread + Neck) | Neck Length | Length Overall |
| M2.7 x 1.5   | 4             | —                                  | PS027O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M2.7 x 2     | 4             | —                                  | —          | PS027Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M2.7 x 3     | 4             | —                                  | —          | —          | PS027S8NEB | —          | 1.732                             | 3.465       | 7.087          |
| M2.8 x 1     | 4             | PS028M5NEB                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M2.8 x 1.5   | 4             | —                                  | PS028O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M2.8 x 2     | 4             | —                                  | —          | PS028Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M3.0 x 1     | 4             | PS030M5NEB                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M3.0 x 1.5   | 4             | —                                  | PS030O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M3.0 x 2     | 4             | —                                  | —          | PS030Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M3.0 x 3.5   | 4             | —                                  | —          | —          | —          | PS030T9NEB | 1.732                             | 3.465       | 7.087          |
| M3.2 x 1     | 4             | PS032M5NEB                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M3.2 x 1.5   | 4             | —                                  | PS032O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M3.2 x 2     | 4             | —                                  | —          | PS032Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M3.2 x 3     | 4             | PS033M5NEB                         | —          | —          | —          | —          | 1.142                             | 3.465       | 7.087          |
| M3.3 x 1     | 4             | —                                  | PS033O6NEB | —          | —          | —          | 1.142                             | 3.465       | 7.087          |
| M3.3 x 1.5   | 4             | —                                  | —          | PS033Q7NEB | —          | —          | 1.142                             | 3.465       | 7.087          |
| M3.3 x 2     | 4             | —                                  | —          | —          | —          | PS033T9NEB | 1.181                             | 3.465       | 7.087          |
| M3.3 x 3.5   | 4             | —                                  | —          | —          | —          | —          | 1.142                             | 3.858       | 7.784          |
| M3.6 x 1     | 4             | PS036M5NEB                         | —          | —          | —          | —          | 1.142                             | 3.858       | 7.784          |
| M3.6 x 1.5   | 4             | —                                  | PS036O6NEB | —          | —          | —          | 1.142                             | 3.858       | 7.784          |
| M3.6 x 2     | 4             | —                                  | —          | PS036Q7NEB | —          | —          | 1.142                             | 3.858       | 7.784          |
| M3.6 x 3     | 4             | —                                  | —          | —          | PS036S8NEB | —          | 2.047                             | 3.858       | 7.784          |
| M3.6 x 4     | 4             | —                                  | —          | —          | —          | PS036U9NEB | 2.047                             | 3.858       | 7.784          |
| M3.9 x 1     | 4             | PS039M5NEB                         | —          | —          | —          | —          | 1.142                             | 3.858       | 7.784          |
| M3.9 x 1.5   | 4             | —                                  | PS039O6NEB | —          | —          | —          | 1.142                             | 3.858       | 7.784          |
| M3.9 x 2     | 4             | —                                  | —          | PS039Q7NEB | —          | —          | 1.142                             | 3.858       | 7.784          |
| M3.9 x 3     | 4             | —                                  | —          | —          | PS039S8NEB | —          | 2.047                             | 3.858       | 7.784          |

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# Z-PRO

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## Economical High Performance Taps For Metric Threads PO



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Plug Style (3 to 5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series PO

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            |            |            | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|------------|------------|------------------|------------------------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | D10        | D11        | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M39 x 4      | 4             | —                                  | —          | —          | —          | PS039U9NEB | —          | —          | 2.047            | 3.858                        | 7.874          |
| M42 x 1      | 4             | PS042M5NEB                         | —          | —          | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M42 x 1.5    | 4             | —                                  | PS042O6NEB | —          | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M42 x 2      | 4             | —                                  | —          | PS042Q7NEB | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M42 x 4.5    | 4             | —                                  | —          | —          | —          | —          | PS042VONEB | —          | 2.323            | 3.858                        | 7.874          |
| M45 x 1      | 4             | PS045M5NEB                         | —          | —          | —          | —          | —          | —          | 1.22             | 4.252                        | 8.661          |
| M45 x 1.5    | 4             | —                                  | PS045O6NEB | —          | —          | —          | —          | —          | 1.22             | 4.252                        | 8.661          |
| M45 x 2      | 4             | —                                  | —          | PS045Q7NEB | —          | —          | —          | —          | 1.22             | 4.252                        | 8.661          |
| M45 x 3      | 4             | —                                  | —          | —          | PS045S8NEB | —          | —          | —          | 2.323            | 4.252                        | 8.661          |
| M45 x 4.5    | 4             | —                                  | —          | —          | —          | —          | PS045VONEB | —          | 2.323            | 4.252                        | 8.661          |
| M48 x 1      | 4             | —                                  | PS048M6NEB | —          | —          | —          | —          | —          | 1.22             | 4.803                        | 9.843          |
| M48 x 1.5    | 4             | —                                  | —          | PS048O7NEB | —          | —          | —          | —          | 1.22             | 4.803                        | 9.843          |
| M48 x 2      | 4             | —                                  | —          | PS048Q7NEB | —          | —          | —          | —          | 1.22             | 4.803                        | 9.843          |
| M48 x 3      | 4             | —                                  | —          | —          | —          | PS048S9NEB | —          | —          | 2.559            | 4.803                        | 9.843          |
| M48 x 5      | 4             | —                                  | —          | —          | —          | —          | —          | PS048W-NEB | 2.559            | 4.803                        | 9.843          |

## Economical High Performance Taps

For Metric Threads

## PO-OX



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Plug Style (3 to 5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series PO

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |    | Dimensions     |                               |                |
|--------------|---------------|------------------------------------|------------|------------|------------|----|----------------|-------------------------------|----------------|
|              |               | D3                                 | D4         | D5         | D6         | D7 | Length of Neck | Neck Length (= Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | PS2.0E3NEX                         | —          | —          | —          | —  | .314           | .382                          | 1.772          |
| M2.2 x 0.45  | 3             | PS2.2F3NEX                         | —          | —          | —          | —  | .314           | .382                          | 1.772          |
| M2.5 x 0.45  | 3             | PS2.5F3NEX                         | —          | —          | —          | —  | .354           | .693                          | 2.205          |
| M2.6 x 0.45  | 3             | PS2.6F3NEX                         | —          | —          | —          | —  | .354           | .693                          | 2.205          |
| M3 x 0.5     | 3             | PS3.0G3NEX                         | —          | —          | —          | —  | .433           | .768                          | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | PS3.5H4NEX | —          | —          | —  | .433           | .787                          | 2.205          |
| M4 x 0.7     | 4             | —                                  | PS4.0I4NEX | —          | —          | —  | .512           | .827                          | 2.48           |
| M5 x 0.8     | 4             | —                                  | PS5.0K4NEX | —          | —          | —  | .591           | .984                          | 3.15           |
| M6 x 1       | 4             | —                                  | —          | PS6.0M5NEX | —          | —  | .591           | 1.181                         | 3.15           |
| M7 x 0.75    | 4             | —                                  | PS7.0J4NEX | —          | —          | —  | .748           | 1.315                         | 3.543          |
| M7 x 0.5     | 4             | —                                  | PS7.0G4NEX | —          | —          | —  | .394           | 1.315                         | 3.543          |
| M7 x 1       | 4             | —                                  | —          | PS7.0M5NEX | —          | —  | .748           | 1.315                         | 3.543          |
| M8 x 0.75    | 4             | —                                  | PS8.0J4NEX | —          | —          | —  | .748           | 1.382                         | 3.543          |
| M8 x 0.5     | 4             | —                                  | PS8.0G4NEX | —          | —          | —  | .394           | 1.382                         | 3.543          |
| M8 x 1       | 4             | —                                  | —          | PS8.0M5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M8 x 1.25    | 4             | —                                  | —          | PS8.0N5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M9 x 1       | 4             | —                                  | —          | PS9.0M5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M9 x 1.25    | 4             | —                                  | —          | PS9.0N5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M10 x 0.75   | 4             | —                                  | PS010J4NEX | —          | —          | —  | .512           | 1.929                         | 3.937          |
| M10 x 1      | 4             | —                                  | —          | PS010M5NEX | —          | —  | .906           | 1.929                         | 3.937          |
| M10 x 1.25   | 4             | —                                  | —          | PS010N5NEX | —          | —  | .906           | 1.929                         | 3.937          |
| M10 x 1.5    | 4             | —                                  | —          | —          | PS010O6NEX | —  | .906           | 1.929                         | 3.937          |
| M11 x 1.5    | 4             | —                                  | —          | —          | PS011O6NEX | —  | .906           | 1.929                         | 3.937          |
| M12 x 1      | 4             | —                                  | —          | PS012M5NEX | —          | —  | 1.024          | 2.126                         | 4.331          |
| M12 x 1.25   | 4             | —                                  | —          | —          | PS012N6NEX | —  | 1.024          | 2.126                         | 4.331          |
| M12 x 1.5    | 4             | —                                  | —          | —          | PS012O6NEX | —  | 1.024          | 2.126                         | 4.331          |
| M12 x 1.75   | 4             | —                                  | —          | —          | PS012P6NEX | —  | 1.024          | 2.126                         | 4.331          |

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# Z-PRO

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For Metric Threads

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DIN lengths with ANSI shank dimensions.

### Z-PRO Series PO

### Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |             |            |    | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|------------|-------------|------------|----|------------------|------------------------------|----------------|
|              |               | D5                                 | D6         | D7          | D8         | D9 | Length of Thread | Neck Length (-Thread + Neck) | Length Overall |
| M14 x 1      | 4             | PS014M5NEX                         | —          | —           | —          | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.25   | 4             | —                                  | PS014N6NEX | —           | —          | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.5    | 4             | —                                  | PS014O6NEX | —           | —          | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 2      | 4             | —                                  | —          | PS014Q7NEX  | —          | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1      | 4             | PS016M5NEX                         | —          | —           | —          | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1.5    | 4             | —                                  | PS016O6NEX | —           | —          | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 2      | 4             | —                                  | —          | PS016Q7NEX  | —          | —  | 1.024            | 2.126                        | 4.331          |
| M18 x 1      | 4             | PS018M5NEX                         | —          | —           | —          | —  | .945             | 2.402                        | 4.921          |
| M18 x 1.5    | 4             | —                                  | PS018O6NEX | —           | —          | —  | .945             | 2.402                        | 4.921          |
| M18 x 2      | 4             | —                                  | —          | TS018Q7NEB5 | —          | —  | 1.299            | 2.402                        | 4.921          |
| M18 x 2.5    | 4             | —                                  | —          | TS018R7NEB5 | —          | —  | 1.299            | 2.402                        | 4.921          |
| M20 x 1      | 4             | PS020M5NEX                         | —          | —           | —          | —  | .945             | 2.717                        | 5.512          |
| M20 x 1.5    | 4             | —                                  | PS020O6NEX | —           | —          | —  | .945             | 2.717                        | 5.512          |
| M20 x 2      | 4             | —                                  | —          | PS020Q7NEX  | —          | —  | 1.299            | 2.717                        | 5.512          |
| M20 x 2.5    | 4             | —                                  | —          | PS020R7NEX  | —          | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 1      | 4             | PS022M5NEX                         | —          | —           | —          | —  | .945             | 2.717                        | 5.512          |
| M22 x 1.5    | 4             | —                                  | PS022O6NEX | —           | —          | —  | .945             | 2.717                        | 5.512          |
| M22 x 2      | 4             | —                                  | —          | PS022Q7NEX  | —          | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 2.5    | 4             | —                                  | —          | PS022R7NEX  | —          | —  | 1.299            | 2.717                        | 5.512          |
| M24 x 1      | 4             | PS024M5NEX                         | —          | —           | —          | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 1.5    | 4             | —                                  | PS024O6NEX | —           | —          | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 2      | 4             | —                                  | —          | PS024Q7NEX  | —          | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 3      | 4             | —                                  | —          | —           | PS024S8NEX | —  | 1.457            | 3.071                        | 6.299          |
| M25 x 1.5    | 4             | —                                  | PS025O6NEX | —           | —          | —  | 1.063            | 3.071                        | 6.299          |
| M26 x 1.5    | 4             | —                                  | PS026O6NEX | —           | —          | —  | 1.063            | 3.465                        | 7.087          |
| M27 x 1      | 4             | PS027M5NEX                         | —          | —           | —          | —  | 1.063            | 3.465                        | 7.087          |

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## Economical High Performance Taps

For Metric threads

PO-OX



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DIN lengths with ANSI shank dimensions.

Z-PRO Series PO

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|------------------|------------------------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M2 7x 1.5    | 4             | —                                  | PS027O6NEX | —          | —          | —          | 1.063            | 3.465                        | 7.087          |
| M27 x 2      | 4             | —                                  | —          | PS027Q7NEX | —          | —          | 1.063            | 3.465                        | 7.087          |
| M27 x 3      | 4             | —                                  | —          | —          | PS027S8NEX | —          | 1.732            | 3.465                        | 7.087          |
| M28 x 1      | 4             | PS028M5NEX                         | —          | —          | —          | —          | 1.063            | 3.465                        | 7.087          |
| M28 x 1.5    | 4             | —                                  | PS028O6NEX | —          | —          | —          | 1.063            | 3.465                        | 7.087          |
| M28 x 2      | 4             | —                                  | —          | PS028Q7NEX | —          | —          | 1.063            | 3.465                        | 7.087          |
| M30 x 1      | 4             | PS030M5NEX                         | —          | —          | —          | —          | 1.063            | 3.465                        | 7.087          |
| M30 x 1.5    | 4             | —                                  | PS030O6NEX | —          | —          | —          | 1.063            | 3.465                        | 7.087          |
| M30 x 2      | 4             | —                                  | —          | PS030Q7NEX | —          | —          | 1.063            | 3.465                        | 7.087          |
| M30 x 3.5    | 4             | —                                  | —          | —          | —          | PS030T9NEX | 1.732            | 3.465                        | 7.087          |
| M32 x 1      | 4             | PS032M5NEX                         | —          | —          | —          | —          | 1.063            | 3.465                        | 7.087          |
| M32 x 1.5    | 4             | —                                  | PS032O6NEX | —          | —          | —          | 1.063            | 3.465                        | 7.087          |
| M32 x 2      | 4             | —                                  | —          | PS032Q7NEX | —          | —          | 1.063            | 3.465                        | 7.087          |
| M33 x 1      | 4             | PS033M5NEX                         | —          | —          | —          | —          | 1.142            | 3.465                        | 7.087          |
| M33 x 1.5    | 4             | —                                  | PS033O6NEX | —          | —          | —          | 1.142            | 3.465                        | 7.087          |
| M33 x 2      | 4             | —                                  | —          | PS033Q7NEX | —          | —          | 1.142            | 3.465                        | 7.087          |
| M33 x 3.5    | 4             | —                                  | —          | —          | —          | PS033T9NEX | 1.181            | 3.465                        | 7.087          |
| M36 x 1      | 4             | PS036M5NEX                         | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M36 x 1.5    | 4             | —                                  | PS036O6NEX | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M36 x 2      | 4             | —                                  | —          | PS036Q7NEX | —          | —          | 1.142            | 3.858                        | 7.874          |
| M36 x 3      | 4             | —                                  | —          | —          | PS036S8NEX | —          | 2.047            | 3.858                        | 7.874          |
| M36 x 4      | 4             | —                                  | —          | —          | —          | PS036U9NEX | 2.047            | 3.858                        | 7.874          |
| M39 x 1      | 4             | PS039M5NEX                         | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M39 x 1.5    | 4             | —                                  | PS039O6NEX | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M39 x 2      | 4             | —                                  | —          | PS039Q7NEX | —          | —          | 1.142            | 3.858                        | 7.874          |
| M39 x 3      | 4             | —                                  | —          | —          | PS039S8NEX | —          | 2.047            | 3.858                        | 7.874          |

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# Z-PRO

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for the materials that produce stringy chips, such as steels, stainless steels and plastics.

Spiral Pointed taps are recommended for tapping trough holes.

Economical High Performance Taps  
For Metric Threads

PO-OX



Z-PRO PO have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

Plug Style (3 to 5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

## Z-PRO Series PO

## Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            |            |            | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|------------|------------|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | D10        | D11        | Length of Thread (-Thread + Neck) | Neck Length | Length Overall |
| M39 x 4      | 4             | —                                  | —          | —          | —          | PS039U9NEX | —          | —          | 2.047                             | 3.858       | 7.874          |
| M42 x 1      | 4             | PS042M5NEX                         | —          | —          | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M42 x 1.5    | 4             | —                                  | PS042O6NEX | —          | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M42 x 2      | 4             | —                                  | —          | PS042Q7NEX | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M42 x 4.5    | 4             | —                                  | —          | —          | —          | —          | PS042VONEX | —          | 2.323                             | 3.858       | 7.874          |
| M45 x 1      | 4             | PS045M5NEX                         | —          | —          | —          | —          | —          | —          | 1.22                              | 4.252       | 8.661          |
| M45 x 1.5    | 4             | —                                  | PS045O6NEX | —          | —          | —          | —          | —          | 1.22                              | 4.252       | 8.661          |
| M45 x 2      | 4             | —                                  | —          | PS045Q7NEX | —          | —          | —          | —          | 1.22                              | 4.252       | 8.661          |
| M45 x 3      | 4             | —                                  | —          | —          | PS045S8NEX | —          | —          | —          | 2.323                             | 4.252       | 8.661          |
| M45 x 4.5    | 4             | —                                  | —          | —          | —          | —          | PS045VONEX | —          | 2.323                             | 4.252       | 8.661          |
| M48 x 1      | 4             | —                                  | PS048M6NEX | —          | —          | —          | —          | —          | 1.22                              | 4.803       | 9.843          |
| M48 x 1.5    | 4             | —                                  | —          | PS048O7NEX | —          | —          | —          | —          | 1.22                              | 4.803       | 9.843          |
| M48 x 2      | 4             | —                                  | —          | PS048Q7NEX | —          | —          | —          | —          | 1.22                              | 4.803       | 9.843          |
| M48 x 3      | 4             | —                                  | —          | —          | —          | PS048S9NEX | —          | —          | 2.559                             | 4.803       | 9.843          |
| M48 x 5      | 4             | —                                  | —          | —          | —          | —          | —          | PS048W-NEX | 2.559                             | 4.803       | 9.843          |

## Economical High Performance Taps

For Unified Threads

### SP



\*Z-PRO SP have a Bright Surface Finish

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels, and plastics.

Spiral Fluted Bottoming taps are recommended for tapping blind holes where the chips are pulled out of the hole towards the tap shank instead of pushing them to the bottom of the hole.

### \*AVAILABLE IN TIN AND TICN COATING ON REQUEST

Custom Blend High Vanadium HSS

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

#### Z-PRO Series SP

Machine Screw Sizes  
Fractional Sizes

| Nominal Size | NC UNC | NF UNF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            | Dimensions     |                              |                |
|--------------|--------|--------|---------------|------------------------------------|------------|------------|------------|----------------|------------------------------|----------------|
|              |        |        |               | H1                                 | H2         | H3         | H4         | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 2            | 56     | —      | 2             | SSUN2E1NEB                         | SSUN2E2NEB | —          | —          | .314           | —                            | 1.772          |
| 2            | —      | 64     | 2             | SSUN2D1NEB                         | SSUN2D2NEB | —          | —          | .314           | —                            | 1.772          |
| 3            | 48     | —      | 2             | SSUN3F1NEB                         | SSUN3F2NEB | —          | —          | .354           | .669                         | 2.205          |
| 3            | —      | 56     | 2             | SSUN3E1NEB                         | SSUN3E2NEB | —          | —          | .354           | .669                         | 2.205          |
| 4            | 40     | —      | 2             | SSUN4H1NEB                         | SSUN4H2NEB | —          | —          | .354           | .709                         | 2.205          |
| 4            | —      | 48     | 2             | SSUN4F1NEB                         | SSUN4F2NEB | —          | —          | .354           | .709                         | 2.205          |
| 5            | 40     | —      | 2             | SSUN5H1NEB                         | SSUN5H2NEB | —          | —          | .433           | .768                         | 2.205          |
| 5            | —      | 44     | 2             | SSUN5G1NEB                         | SSUN5G2NEB | —          | —          | .433           | .768                         | 2.205          |
| 6            | 32     | —      | 3             | SSUN6J1NEB                         | SSUN6J2NEB | —          | —          | .433           | .768                         | 2.205          |
| 6            | —      | 40     | 3             | —                                  | SSUN6H2NEB | SSUN6H3NEB | —          | .433           | .768                         | 2.205          |
| 8            | 32     | —      | 3             | —                                  | SSUN8J2NEB | SSUN8J3NEB | —          | .512           | .827                         | 2.480          |
| 8            | —      | 36     | 3             | —                                  | SSUN8I2NEB | SSUN8I3NEB | —          | .512           | .827                         | 2.480          |
| 10           | 24     | —      | 3             | —                                  | SSUNAM2NEB | SSUNAM3NEB | —          | .551           | .984                         | 2.756          |
| 10           | —      | 32     | 3             | —                                  | SSUNAJ2NEB | SSUNAJ3NEB | —          | .551           | .984                         | 2.756          |
| 12           | 24     | —      | 3             | —                                  | SSUNCM2NEB | SSUNCM3NEB | —          | .591           | .984                         | 3.150          |
| 12           | —      | 28     | 3             | —                                  | SSUNCK2NEB | SSUNCK3NEB | —          | .591           | .984                         | 3.150          |
| 1/4          | 20     | —      | 3             | —                                  | SSU04N2NEB | SSU04N3NEB | —          | .591           | 1.181                        | 3.150          |
| 1/4          | —      | 28     | 3             | —                                  | SSU04K2NEB | SSU04K3NEB | —          | .591           | 1.181                        | 3.150          |
| 5/16         | 18     | —      | 3             | —                                  | SSU05O2NEB | SSU05O3NEB | —          | .748           | 1.378                        | 3.543          |
| 5/16         | —      | 24     | 3             | —                                  | SSU05M2NEB | SSU05M3NEB | —          | .748           | 1.378                        | 3.543          |
| 3/8          | 16     | —      | 3             | —                                  | —          | SSU06P3NEB | SSU06P4NEB | .906           | 1.535                        | 3.937          |
| 3/8          | —      | 24     | 3             | —                                  | SSU06M2NEB | SSU06M3NEB | —          | .906           | 1.535                        | 3.937          |
| 7/16         | 14     | —      | 3             | —                                  | —          | SSU07Q3NEB | SSU07Q4NEB | .906           | —                            | 3.937          |
| 7/16         | —      | 20     | 3             | —                                  | SSU07N2NEB | SSU07N3NEB | —          | .906           | —                            | 3.937          |
| 1/2          | 13     | —      | 3             | —                                  | —          | SSU08R3NEB | SSU08R4NEB | 1.024          | —                            | 4.331          |
| 1/2          | —      | 20     | 3             | —                                  | SSU08N2NEB | SSU08N3NEB | —          | 1.024          | —                            | 4.331          |
| 9/16         | 12     | —      | 3             | —                                  | —          | SSU09S3NEB | SSU09S4NEB | 1.024          | —                            | 4.331          |
| 9/16         | —      | 18     | 3             | —                                  | —          | SSU09O3NEB | SSU09O4NEB | 1.024          | —                            | 4.331          |

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# Z-PRO

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The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels and plastics.

Spiral Pointed taps are recommended for tapping through holes.

## Economical High Performance Taps For Unified Threads SP



\*Z-PRO SP have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series SP

Machine Screw Sizes  
Fractional Sizes

| Nominal<br>Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            | Dimensions          |                                  |                   |
|-----------------|-----------|-----------|------------------|------------------------------------|------------|------------|------------|---------------------|----------------------------------|-------------------|
|                 |           |           |                  | H3                                 | H4         | H5         | H6         | Length<br>of Thread | Neck Length<br>(= Thread + Neck) | Length<br>Overall |
| 5/8             | 11        | —         | 3                | SSU10U3NEB                         | SSU10U4NEB | —          | —          | 1.024               | —                                | 4.331             |
| 5/8             | —         | 18        | 3                | SSU10O3NEB                         | SSU10O4NEB | —          | —          | 1.024               | —                                | 4.331             |
| 3/4             | 10        | —         | 4                | SSU12V3NEB                         | —          | SSU12V5NEB | —          | 1.299               | —                                | 4.921             |
| 3/4             | —         | 16        | 4                | SSU12P3NEB                         | SSU12P4NEB | —          | —          | 1.299               | —                                | 4.921             |
| 7/8             | 9         | —         | 4                | —                                  | SSU14W4NEB | SSU14W5NEB | —          | 1.299               | —                                | 5.512             |
| 7/8             | —         | 14        | 4                | SSU14Q3NEB                         | SSU14Q4NEB | —          | —          | 1.299               | —                                | 5.512             |
| 1               | 8         | —         | 4                | —                                  | SSU16X4NEB | SSU16X5NEB | —          | 1.457               | —                                | 6.299             |
| 1               | —         | 12        | 4                | SSU16S3NEB                         | —          | SSU16S5NEB | —          | 1.457               | —                                | 6.299             |
| 1 1/8           | 7         | —         | 4                | —                                  | SSU18Y4NEB | —          | SSU16Y6NEB | 1.732               | —                                | 7.087             |
| 1 1/8           | —         | 12        | 4                | —                                  | SSU18S4NEB | SSU18S5NEB | —          | 1.732               | —                                | 7.087             |
| 1 1/4           | 7         | —         | 4                | —                                  | SSU20Y4NEB | —          | SSU20Y6NEB | 1.929               | —                                | 7.087             |
| 1 1/4           | —         | 12        | 4                | —                                  | SS020S4NEB | SS020S5NEB | —          | 1.929               | —                                | 7.087             |
| 1 3/8           | 6         | —         | 4                | —                                  | —          | SSU22Z5NEB | SSU22Z6NEB | 2.165               | —                                | 7.874             |
| 1 3/8           | —         | 12        | 4                | —                                  | SSU22S4NEB | SSU22S5NEB | —          | 2.165               | —                                | 7.874             |
| 1 1/2           | 6         | —         | 4                | —                                  | —          | SSU24Z5NEB | SSU24Z6NEB | 2.323               | —                                | 7.874             |
| 1 1/2           | —         | 12        | 4                | —                                  | SSU24S4NEB | SSU24S5NEB | —          | 2.323               | —                                | 7.874             |

## Economical High Performance Taps

For Unified Threads

### SP-OX



Z-PRO SP-OX have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

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Spiral Fluted Bottoming taps are recommended for tapping blind holes where the chips are pulled out of the hole towards the tap shank instead of pushing them to the bottom of the hole.

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series SP

Machine Screw Sizes  
Fractional Sizes

| Nominal Size | NC UNC | NF UNF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            | Dimensions     |                              |                |
|--------------|--------|--------|---------------|------------------------------------|------------|------------|------------|----------------|------------------------------|----------------|
|              |        |        |               | H2                                 | H3         | H4         | H5         | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 2            | 56     | —      | 2             | SSUN2E2NEX                         | —          | —          | —          | .314           | —                            | 1.772          |
| 4            | 40     | —      | 2             | SSUN4H2NEX                         | —          | —          | —          | .354           | .709                         | 2.205          |
| 5            | 40     | —      | 2             | SSUN5H2NEX                         | —          | —          | —          | .433           | .768                         | 2.205          |
| 6            | 32     | —      | 3             | SSUN6J2NEX                         | —          | —          | —          | .433           | .768                         | 2.205          |
| 6            | —      | 40     | 3             | SSUN6H2NEX                         | —          | —          | —          | .433           | .768                         | 2.205          |
| 8            | 32     | —      | 3             | —                                  | SSUN8J3NEX | —          | —          | .512           | .827                         | 2.480          |
| 10           | 24     | —      | 3             | —                                  | SSUNAM3NEX | —          | —          | .551           | .984                         | 2.756          |
| 10           | —      | 32     | 3             | —                                  | SSUNAJ3NEX | —          | —          | .551           | .984                         | 2.756          |
| 12           | 24     | —      | 3             | —                                  | SSUNCM3NEX | —          | —          | .591           | .984                         | 3.150          |
| 1/4          | 20     | —      | 3             | —                                  | SSU04N3NEX | —          | —          | .591           | 1.181                        | 3.150          |
| 1/4          | —      | 28     | 3             | —                                  | SSU04K3NEX | —          | —          | .591           | 1.181                        | 3.150          |
| 5/16         | 18     | —      | 3             | —                                  | SSU05O3NEX | —          | —          | .748           | 1.378                        | 3.543          |
| 5/16         | —      | 24     | 3             | —                                  | SSU05M3NEX | —          | —          | .748           | 1.378                        | 3.543          |
| 3/8          | 16     | —      | 3             | —                                  | —          | SSU06P4NEX | —          | .906           | 1.535                        | 3.937          |
| 3/8          | —      | 24     | 3             | —                                  | SSU06M3NEX | —          | —          | .906           | 1.535                        | 3.937          |
| 7/16         | 14     | —      | 3             | —                                  | —          | SSU07Q4NEX | —          | .906           | —                            | 3.937          |
| 7/16         | —      | 20     | 3             | —                                  | SSU07N3NEX | —          | —          | .906           | —                            | 3.937          |
| 1/2          | 13     | —      | 3             | —                                  | —          | SSU08R4NEX | —          | 1.024          | —                            | 4.331          |
| 1/2          | —      | 20     | 3             | —                                  | SSU08N3NEX | —          | —          | 1.024          | —                            | 4.331          |
| 5/8          | 11     | —      | 3             | —                                  | —          | SSU10U4NEX | —          | 1.024          | —                            | 4.331          |
| 3/4          | 10     | —      | 3             | —                                  | —          | —          | SSU12V5NEX | 1.299          | —                            | 4.921          |



# Z-PRO

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## Economical High Performance Taps For Metric Threads

### SP



\*Z-PRO SP have a Bright Surface Treatment

**\*AVAILABLE IN TIN AND TiCN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series SP

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |           |    | Dimensions     |                                 |                |
|--------------|---------------|------------------------------------|------------|------------|-----------|----|----------------|---------------------------------|----------------|
|              |               | D3                                 | D4         | D5         | D6        | D7 | Length of Neck | Neck Length<br>(+Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | SS2.0E3NEB                         | —          | —          | —         | —  | .314           | .382                            | 1.772          |
| M2.2 x 0.45  | 3             | SS2.2F3NEB                         | —          | —          | —         | —  | .314           | .382                            | 1.772          |
| M2.5 x 0.45  | 3             | SS2.5F3NEB                         | —          | —          | —         | —  | .354           | .693                            | 2.205          |
| M2.6 x 0.45  | 3             | SS2.6F3NEB                         | —          | —          | —         | —  | .354           | .693                            | 2.205          |
| M3 x 0.5     | 3             | SS3.0G3NEB                         | —          | —          | —         | —  | .433           | .768                            | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | SS3.5H4NEB | —          | —         | —  | .433           | .787                            | 2.205          |
| M4 x 0.7     | 4             | —                                  | SS4.0I4NEB | —          | —         | —  | .512           | .827                            | 2.48           |
| M5 x 0.8     | 4             | —                                  | SS5.0K4NEB | —          | —         | —  | .591           | .984                            | 3.15           |
| M6 x 1       | 4             | —                                  | —          | SS6.0M5NEB | —         | —  | .591           | 1.181                           | 3.15           |
| M7 x 0.75    | 4             | —                                  | SS7.0J4NEB | —          | —         | —  | .748           | 1.315                           | 3.543          |
| M7 x 0.5     | 4             | —                                  | SS7.0G4NEB | —          | —         | —  | .394           | 1.315                           | 3.543          |
| M7 x 1       | 4             | —                                  | —          | SS7.0M5NEB | —         | —  | .748           | 1.315                           | 3.543          |
| M8 x 0.75    | 4             | —                                  | SS8.0J4NEB | —          | —         | —  | .748           | 1.382                           | 3.543          |
| M8 x 0.5     | 4             | —                                  | SS8.0G4NEB | —          | —         | —  | .394           | 1.382                           | 3.543          |
| M8 x 1       | 4             | —                                  | —          | SS8.0M5NEB | —         | —  | .748           | 1.382                           | 3.543          |
| M8 x 1.25    | 4             | —                                  | —          | SS8.0N5NEB | —         | —  | .748           | 1.382                           | 3.543          |
| M9 x 1       | 4             | —                                  | —          | SS9.0M5NEB | —         | —  | .748           | 1.382                           | 3.543          |
| M9 x 1.25    | 4             | —                                  | —          | SS9.0N5NEB | —         | —  | .748           | 1.382                           | 3.543          |
| M10 x 0.75   | 4             | —                                  | SS10J4NEB  | —          | —         | —  | .512           | 1.929                           | 3.937          |
| M10 x 1      | 4             | —                                  | —          | SS10M5NEB  | —         | —  | .906           | 1.929                           | 3.937          |
| M10 x 1.25   | 4             | —                                  | —          | SS10N5NEB  | —         | —  | .906           | 1.929                           | 3.937          |
| M10 x 1.5    | 4             | —                                  | —          | —          | SS10O6NEB | —  | .906           | 1.929                           | 3.937          |
| M11 x 1.5    | 4             | —                                  | —          | —          | SS11O6NEB | —  | .906           | 1.929                           | 3.937          |
| M12 x 1      | 4             | —                                  | —          | SS12M5NEB  | —         | —  | 1.024          | 2.126                           | 4.331          |
| M12 x 1.25   | 4             | —                                  | —          | —          | SS12N6NEB | —  | 1.024          | 2.126                           | 4.331          |
| M12 x 1.5    | 4             | —                                  | —          | —          | SS12O6NEB | —  | 1.024          | 2.126                           | 4.331          |
| M12 x 1.75   | 4             | —                                  | —          | —          | SS12P6NEB | —  | 1.024          | 2.126                           | 4.331          |

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## Economical High Performance Taps

For Metric Threads

SP



\*Z-PRO SP have a Bright Surface Treatment

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels, and plastics.

Spiral Fluted Bottoming taps are recommended for tapping blind holes where the chips are pulled out of the hole towards the tap shank instead of pushing them to the bottom of the hole.

## \*AVAILABLE IN TIN AND TICN COATING ON REQUEST

Custom Blend High Vanadium HSS

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank Dimensions.

Z-PRO Series SP

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |    | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|------------|------------|------------|----|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9 | Length of Thread (-Thread + Neck) | Neck Length | Length Overall |
| M14 x 1      | 4             | SS014M5NEB                         | —          | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 1.25   | 4             | —                                  | SS014N6NEB | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 1.5    | 4             | —                                  | SS014O6NEB | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 2      | 4             | —                                  | —          | SS014Q7NEB | —          | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 1      | 4             | SS016M5NEB                         | —          | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 1.5    | 4             | —                                  | SS016O6NEB | —          | —          | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 2      | 4             | —                                  | —          | SS016Q7NEB | —          | —  | 1.024                             | 2.126       | 4.331          |
| M18 x 1      | 4             | SS018M5NEB                         | —          | —          | —          | —  | .945                              | 2.402       | 4.921          |
| M18 x 1.5    | 4             | —                                  | SS018O6NEB | —          | —          | —  | .945                              | 2.402       | 4.921          |
| M18 x 2      | 4             | —                                  | —          | SS018Q7NEB | —          | —  | 1.299                             | 2.402       | 4.921          |
| M18 x 2.5    | 4             | —                                  | —          | SS018R7NEB | —          | —  | 1.299                             | 2.402       | 4.921          |
| M20 x 1      | 4             | SS020M5NEB                         | —          | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M20 x 1.5    | 4             | —                                  | SS020O6NEB | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M20 x 2      | 4             | —                                  | —          | SS020Q7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M20 x 2.5    | 4             | —                                  | —          | SS020R7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M22 x 1      | 4             | SS022M5NEB                         | —          | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M22 x 1.5    | 4             | —                                  | SS022O6NEB | —          | —          | —  | .945                              | 2.717       | 5.512          |
| M22 x 2      | 4             | —                                  | —          | SS022Q7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M22 x 2.5    | 4             | —                                  | —          | SS022R7NEB | —          | —  | 1.299                             | 2.717       | 5.512          |
| M24 x 1      | 4             | SS024M5NEB                         | —          | —          | —          | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 1.5    | 4             | —                                  | SS024O6NEB | —          | —          | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 2      | 4             | —                                  | —          | SS024Q7NEB | —          | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 3      | 4             | —                                  | —          | —          | SS024S8NEB | —  | 1.457                             | 3.071       | 6.299          |
| M25 x 1.5    | 4             | —                                  | SS025O6NEB | —          | —          | —  | 1.063                             | 3.071       | 6.299          |
| M26 x 1.5    | 4             | —                                  | SS026O6NEB | —          | —          | —  | 1.063                             | 3.465       | 7.087          |
| M27 x 1      | 4             | SS027M5NEB                         | —          | —          | —          | —  | 1.063                             | 3.465       | 7.087          |

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# Z-PRO

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels and plastics.

## Economical High Performance Taps For Metric Threads SP

Spiral Fluted Bottoming taps are recommended for tapping blind holes where the chips are pulled out of the hole towards the tap shank instead of pushing them to the bottom of the hole.



\*Z-PRO SP have a Bright Surface Treatment

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank Dimensions.

Z-PRO Series SP

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | Length of Thread (+Thread + Neck) | Neck Length | Length Overall |
| M2 7x1.5     | 4             | —                                  | SS027O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M27 x 2      | 4             | —                                  | —          | SS027Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M27 x 3      | 4             | —                                  | —          | —          | SS027S8NEB | —          | 1.732                             | 3.465       | 7.087          |
| M28 x 1      | 4             | SS028M5NEB                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M28 x 1.5    | 4             | —                                  | SS028O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M28 x 2      | 4             | —                                  | —          | SS028Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 1      | 4             | SS030M5NEB                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 1.5    | 4             | —                                  | SS030O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 2      | 4             | —                                  | —          | SS030Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 3.5    | 4             | —                                  | —          | —          | —          | SS030T9NEB | 1.732                             | 3.465       | 7.087          |
| M32 x 1      | 4             | SS032M5NEB                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M32 x 1.5    | 4             | —                                  | SS032O6NEB | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M32 x 2      | 4             | —                                  | —          | SS032Q7NEB | —          | —          | 1.063                             | 3.465       | 7.087          |
| M33 x 1      | 4             | SS033M5NEB                         | —          | —          | —          | —          | 1.142                             | 3.465       | 7.087          |
| M33 x 1.5    | 4             | —                                  | SS033O6NEB | —          | —          | —          | 1.142                             | 3.465       | 7.087          |
| M33 x 2      | 4             | —                                  | —          | SS033Q7NEB | —          | —          | 1.142                             | 3.465       | 7.087          |
| M33 x 3.5    | 4             | —                                  | —          | —          | —          | SS033T9NEB | 1.181                             | 3.465       | 7.087          |
| M36 x 1      | 4             | SS036M5NEB                         | —          | —          | —          | —          | 1.142                             | 3.858       | 7.784          |
| M36 x 1.5    | 4             | —                                  | SS036O6NEB | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M36 x 2      | 4             | —                                  | —          | SS036Q7NEB | —          | —          | 1.142                             | 3.858       | 7.874          |
| M36 x 3      | 4             | —                                  | —          | —          | SS036S8NEB | —          | 2.047                             | 3.858       | 7.874          |
| M36 x 4      | 4             | —                                  | —          | —          | —          | SS036U9NEB | 2.047                             | 3.858       | 7.874          |
| M39 x 1      | 4             | SS039M5NEB                         | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M39 x 1.5    | 4             | —                                  | SS039O6NEB | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M39 x 2      | 4             | —                                  | —          | SS039Q7NEB | —          | —          | 1.142                             | 3.858       | 7.874          |
| M39 x 3      | 4             | —                                  | —          | —          | SS039S8NEB | —          | 2.047                             | 3.858       | 7.874          |

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## Economical High Performance Taps

For Metric Threads

### SP



\*Z-PRO SP have a Bright Surface Treatment

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

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Spiral Fluted Bottoming taps are recommended for tapping blind holes where the chips are pulled out of the hole towards the tap shank instead of pushing them to the bottom of the hole.

Bottoming Style (2.5 threads chamfered)

DIN lengths with ANSI shank Dimensions.

Z-PRO Series SP

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            |            |            | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|------------|------------|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | D10        | D11        | Length of Thread (-Thread + Neck) | Neck Length | Length Overall |
| M39 x 4      | 4             | —                                  | —          | —          | —          | SS039U9NEB | —          | —          | 2.047                             | 3.858       | 7.874          |
| M42 x 1      | 4             | SS042M5NEB                         | —          | —          | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M42 x 1.5    | 4             | —                                  | SS042O6NEB | —          | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M42 x 2      | 4             | —                                  | —          | SS042Q7NEB | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M42 x 4.5    | 4             | —                                  | —          | —          | —          | —          | SS042VONEB | —          | 2.323                             | 3.858       | 7.874          |
| M45 x 1      | 4             | SS045M5NEB                         | —          | —          | —          | —          | —          | —          | 1.22                              | 4.252       | 8.661          |
| M45 x 1.5    | 4             | —                                  | SS045O6NEB | —          | —          | —          | —          | —          | 1.22                              | 4.252       | 8.661          |
| M45 x 2      | 4             | —                                  | —          | SS045Q7NEB | —          | —          | —          | —          | 1.22                              | 4.252       | 8.661          |
| M45 x 3      | 4             | —                                  | —          | —          | SS045S8NEB | —          | —          | —          | 2.323                             | 4.252       | 8.661          |
| M45 x 4.5    | 4             | —                                  | —          | —          | —          | —          | SS045VONEB | —          | 2.323                             | 4.252       | 8.661          |
| M48 x 1      | 4             | —                                  | SS048M6NEB | —          | —          | —          | —          | —          | 1.22                              | 4.803       | 9.843          |
| M48 x 1.5    | 4             | —                                  | —          | SS048O7NEB | —          | —          | —          | —          | 1.22                              | 4.803       | 9.843          |
| M48 x 2      | 4             | —                                  | —          | SS048Q7NEB | —          | —          | —          | —          | 1.22                              | 4.803       | 9.843          |
| M48 x 3      | 4             | —                                  | —          | —          | —          | SS048S9NEB | —          | —          | 2.559                             | 4.803       | 9.843          |
| M48 x 5      | 4             | —                                  | —          | —          | —          | —          | —          | SS048W-NEB | 2.559                             | 4.803       | 9.843          |



# Z-PRO

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Z-PRO SP have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

### Z-PRO Series SP

### Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |    | Dimensions     |                               |                |
|--------------|---------------|------------------------------------|------------|------------|------------|----|----------------|-------------------------------|----------------|
|              |               | D3                                 | D4         | D5         | D6         | D7 | Length of Neck | Neck Length (+ Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | SS2.0E3NEX                         | —          | —          | —          | —  | .314           | .382                          | 1.772          |
| M2.2 x 0.45  | 3             | SS2.2F3NEX                         | —          | —          | —          | —  | .314           | .382                          | 1.772          |
| M2.5 x 0.45  | 3             | SS2.5F3NEX                         | —          | —          | —          | —  | .354           | .693                          | 2.205          |
| M2.6 x 0.45  | 3             | SS2.6F3NEX                         | —          | —          | —          | —  | .354           | .693                          | 2.205          |
| M3 x 0.5     | 3             | SS3.0G3NEX                         | —          | —          | —          | —  | .433           | .768                          | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | SS3.5H4NEX | —          | —          | —  | .433           | .787                          | 2.205          |
| M4 x 0.7     | 4             | —                                  | SS4.0I4NEX | —          | —          | —  | .512           | .827                          | 2.48           |
| M5 x 0.8     | 4             | —                                  | SS5.0K4NEX | —          | —          | —  | .591           | .984                          | 3.15           |
| M6 x 1       | 4             | —                                  | —          | SS6.0M5NEX | —          | —  | .591           | 1.181                         | 3.15           |
| M7 x 0.75    | 4             | —                                  | SS7.0J4NEX | —          | —          | —  | .748           | 1.315                         | 3.543          |
| M7 x 0.5     | 4             | —                                  | SS7.0G4NEX | —          | —          | —  | .394           | 1.315                         | 3.543          |
| M7 x 1       | 4             | —                                  | —          | SS7.0M5NEX | —          | —  | .748           | 1.315                         | 3.543          |
| M8 x 0.75    | 4             | —                                  | SS8.0J4NEX | —          | —          | —  | .748           | 1.382                         | 3.543          |
| M8 x 0.5     | 4             | —                                  | SS8.0G4NEX | —          | —          | —  | .394           | 1.382                         | 3.543          |
| M8 x 1       | 4             | —                                  | —          | SS8.0M5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M8 x 1.25    | 4             | —                                  | —          | SS8.0N5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M9 x 1       | 4             | —                                  | —          | SS9.0M5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M9 x 1.25    | 4             | —                                  | —          | SS9.0N5NEX | —          | —  | .748           | 1.382                         | 3.543          |
| M10 X 0.75   | 4             | —                                  | SS010J4NEX | —          | —          | —  | .512           | 1.929                         | 3.937          |
| M10 x 1      | 4             | —                                  | —          | SS010M5NEX | —          | —  | .906           | 1.929                         | 3.937          |
| M10 x 1.25   | 4             | —                                  | —          | SS010N5NEX | —          | —  | .906           | 1.929                         | 3.937          |
| M10 x 1.5    | 4             | —                                  | —          | —          | SS010O6NEX | —  | .906           | 1.929                         | 3.937          |
| M11 x 1.5    | 4             | —                                  | —          | —          | SS011O6NEX | —  | .906           | 1.929                         | 3.937          |
| M12 x 1      | 4             | —                                  | —          | SS012M5NEX | —          | —  | 1.024          | 2.126                         | 4.331          |
| M12 x 1.25   | 4             | —                                  | —          | —          | SS012N6NEX | —  | 1.024          | 2.126                         | 4.331          |
| M12 x 1.5    | 4             | —                                  | —          | —          | SS012O6NEX | —  | 1.024          | 2.126                         | 4.331          |
| M12 x 1.75   | 4             | —                                  | —          | —          | SS012P6NEX | —  | 1.024          | 2.126                         | 4.331          |

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## Economical High Performance Taps

For Metric Threads

SP-OX



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Custom Blend High Vanadium HSS

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Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series SP

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |    | Dimensions       |                                  |                |
|--------------|---------------|------------------------------------|------------|------------|------------|----|------------------|----------------------------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9 | Length of Thread | Neck Length<br>(= Thread + Neck) | Length Overall |
| M14 x 1      | 4             | SS014M5NEX                         | —          | —          | —          | —  | 1.024            | 2.126                            | 4.331          |
| M14 x 1.25   | 4             | —                                  | SS014N6NEX | —          | —          | —  | 1.024            | 2.126                            | 4.331          |
| M14 x 1.5    | 4             | —                                  | SS014O6NEX | —          | —          | —  | 1.024            | 2.126                            | 4.331          |
| M14 x 2      | 4             | —                                  | —          | SS014Q7NEX | —          | —  | 1.024            | 2.126                            | 4.331          |
| M16 x 1      | 4             | SS016M5NEX                         | —          | —          | —          | —  | 1.024            | 2.126                            | 4.331          |
| M16 x 1.5    | 4             | —                                  | SS016O6NEX | —          | —          | —  | 1.024            | 2.126                            | 4.331          |
| M16 x 2      | 4             | —                                  | —          | SS016Q7NEX | —          | —  | 1.024            | 2.126                            | 4.331          |
| M18 x 1      | 4             | SS018M5NEX                         | —          | —          | —          | —  | .945             | 2.402                            | 4.921          |
| M18 x 1.5    | 4             | —                                  | SS018O6NEX | —          | —          | —  | .945             | 2.402                            | 4.921          |
| M18 x 2      | 4             | —                                  | —          | SS018Q7NEX | —          | —  | 1.299            | 2.402                            | 4.921          |
| M18 x 2.5    | 4             | —                                  | —          | SS018R7NEX | —          | —  | 1.299            | 2.402                            | 4.921          |
| M20 x 1      | 4             | SS020M5NEX                         | —          | —          | —          | —  | .945             | 2.717                            | 5.512          |
| M20 x 1.5    | 4             | —                                  | SS020O6NEX | —          | —          | —  | .945             | 2.717                            | 5.512          |
| M20 x 2      | 4             | —                                  | —          | SS020Q7NEX | —          | —  | 1.299            | 2.717                            | 5.512          |
| M20 x 2.5    | 4             | —                                  | —          | SS020R7NEX | —          | —  | 1.299            | 2.717                            | 5.512          |
| M22 x 1      | 4             | SS022M5NEX                         | —          | —          | —          | —  | .945             | 2.717                            | 5.512          |
| M22 x 1.5    | 4             | —                                  | SS022O6NEX | —          | —          | —  | .945             | 2.717                            | 5.512          |
| M22 x 2      | 4             | —                                  | —          | SS022Q7NEX | —          | —  | 1.299            | 2.717                            | 5.512          |
| M22 x 2.5    | 4             | —                                  | —          | SS022R7NEX | —          | —  | 1.299            | 2.717                            | 5.512          |
| M24 x 1      | 4             | SS024M5NEX                         | —          | —          | —          | —  | 1.063            | 3.071                            | 6.299          |
| M24 x 1.5    | 4             | —                                  | SS024O6NEX | —          | —          | —  | 1.063            | 3.071                            | 6.299          |
| M24 x 2      | 4             | —                                  | —          | SS024Q7NEX | —          | —  | 1.063            | 3.071                            | 6.299          |
| M24 x 3      | 4             | —                                  | —          | —          | SS024S8NEX | —  | 1.457            | 3.071                            | 6.299          |
| M25 x 1.5    | 4             | —                                  | SS025O6NEX | —          | —          | —  | 1.063            | 3.071                            | 6.299          |
| M26 x 1.5    | 4             | —                                  | SS026O6NEX | —          | —          | —  | 1.063            | 3.465                            | 7.087          |
| M27 x 1      | 4             | SS027M5NEX                         | —          | —          | —          | —  | 1.063            | 3.465                            | 7.087          |

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For Metric Threads

**SP-OX**

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Custom Blend High Vanadium HSS

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series SP

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | Length of Thread (+Thread + Neck) | Neck Length | Length Overall |
| M2 7x 1.5    | 4             | —                                  | SS027O6NEX | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M27 x 2      | 4             | —                                  | —          | SS027Q7NEX | —          | —          | 1.063                             | 3.465       | 7.087          |
| M27 x 3      | 4             | —                                  | —          | —          | SS027S8NEX | —          | 1.732                             | 3.465       | 7.087          |
| M28 x 1      | 4             | SS028M5NEX                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M28 x 1.5    | 4             | —                                  | SS028O6NEX | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M28 x 2      | 4             | —                                  | —          | SS028Q7NEX | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 1      | 4             | SS030M5NEX                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 1.5    | 4             | —                                  | SS030O6NEX | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 2      | 4             | —                                  | —          | SS030Q7NEX | —          | —          | 1.063                             | 3.465       | 7.087          |
| M30 x 3.5    | 4             | —                                  | —          | —          | —          | SS030T9NEX | 1.732                             | 3.465       | 7.087          |
| M32 x 1      | 4             | SS032M5NEX                         | —          | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M32 x 1.5    | 4             | —                                  | SS032O6NEX | —          | —          | —          | 1.063                             | 3.465       | 7.087          |
| M32 x 2      | 4             | —                                  | —          | SS032Q7NEX | —          | —          | 1.063                             | 3.465       | 7.087          |
| M33 x 1      | 4             | SS033M5NEX                         | —          | —          | —          | —          | 1.142                             | 3.465       | 7.087          |
| M33 x 1.5    | 4             | —                                  | SS033O6NEX | —          | —          | —          | 1.142                             | 3.465       | 7.087          |
| M33 x 2      | 4             | —                                  | —          | SS033Q7NEX | —          | —          | 1.142                             | 3.465       | 7.087          |
| M33 x 3.5    | 4             | —                                  | —          | —          | —          | SS033T9NEX | 1.181                             | 3.465       | 7.087          |
| M36 x 1      | 4             | SS036M5NEX                         | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M36 x 1.5    | 4             | —                                  | SS036O6NEX | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M36 x 2      | 4             | —                                  | —          | SS036Q7NEX | —          | —          | 1.142                             | 3.858       | 7.874          |
| M36 x 3      | 4             | —                                  | —          | —          | SS036S8NEX | —          | 2.047                             | 3.858       | 7.874          |
| M36 x 4      | 4             | —                                  | —          | —          | —          | SS036U9NEX | 2.047                             | 3.858       | 7.874          |
| M39 x 1      | 4             | SS039M5NEX                         | —          | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M39 x 1.5    | 4             | —                                  | SS039O6NEX | —          | —          | —          | 1.142                             | 3.858       | 7.874          |
| M39 x 2      | 4             | —                                  | —          | SS039Q7NEX | —          | —          | 1.142                             | 3.858       | 7.874          |
| M39 x 3      | 4             | —                                  | —          | —          | SS039S8NEX | —          | 2.047                             | 3.858       | 7.874          |

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## Economical High Performance Taps

For Metric Threads

### SP-OX



Z-PRO SP have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

The Z-PRO Series is designed for carbon steels, alloyed steels, irons, brass and free machining materials, including stainless steel that require the most economical tool life. They are ideal for materials that produce stringy chips, such as steels, stainless steels and plastics.

Spiral Fluted Bottoming taps are recommended for tapping blind holes where the chips are pulled out of the hole towards the tap shank instead of pushing them to the bottom of the hole.

Bottoming Style (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

#### Z-PRO Series SP

#### Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            |            |            |            | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|------------|------------|------------|------------|------------|------------|------------------|------------------------------|----------------|
|              |               | D5                                 | D6         | D7         | D8         | D9         | D10        | D11        | Length of Thread | Neck Length (-Thread + Neck) | Length Overall |
| M39 x 4      | 4             | —                                  | —          | —          | —          | SS039U9NEX | —          | —          | 2.047            | 3.858                        | 7.874          |
| M42 x 1      | 4             | SS042M5NEX                         | —          | —          | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M42 x 1.5    | 4             | —                                  | SS042O6NEX | —          | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M42 x 2      | 4             | —                                  | —          | SS042Q7NEX | —          | —          | —          | —          | 1.142            | 3.858                        | 7.874          |
| M42 x 4.5    | 4             | —                                  | —          | —          | —          | —          | SS042VONEX | —          | 2.323            | 3.858                        | 7.874          |
| M45 x 1      | 4             | SS045M5NEX                         | —          | —          | —          | —          | —          | —          | 1.22             | 4.252                        | 8.661          |
| M45 x 1.5    | 4             | —                                  | SS045O6NEX | —          | —          | —          | —          | —          | 1.22             | 4.252                        | 8.661          |
| M45 x 2      | 4             | —                                  | —          | SS045Q7NEX | —          | —          | —          | —          | 1.22             | 4.252                        | 8.661          |
| M45 x 3      | 4             | —                                  | —          | —          | SS045S8NEX | —          | —          | —          | 2.323            | 4.252                        | 8.661          |
| M45 x 4.5    | 4             | —                                  | —          | —          | —          | —          | SS045VONEX | —          | 2.323            | 4.252                        | 8.661          |
| M48 x 1      | 4             | —                                  | SS048M6NEX | —          | —          | —          | —          | —          | 1.22             | 4.803                        | 9.843          |
| M48 x 1.5    | 4             | —                                  | —          | SS048O7NEX | —          | —          | —          | —          | 1.22             | 4.803                        | 9.843          |
| M48 x 2      | 4             | —                                  | —          | SS048Q7NEX | —          | —          | —          | —          | 1.22             | 4.803                        | 9.843          |
| M48 x 3      | 4             | —                                  | —          | —          | —          | SS048S9NEX | —          | —          | 2.559            | 4.803                        | 9.843          |
| M48 x 5      | 4             | —                                  | —          | —          | —          | —          | —          | SS048W-NEX | 2.559            | 4.803                        | 9.843          |



# Z-PRO

YMW U.S.A.

For Tapping Steels, Irons, Brass and Plastics

Z-PRO HT are manufactured from YMW's own high speed steel for maximum toughness and wear life.

Z-PRO HT are the most popular style of general purpose taps for tapping under power or by hand.

Economical High Performance Taps

Hand Taps

For Unified Threads

Z-PRO HT



\*Z-PRO HT have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

Z-PRO Series HT

Machine Screw Sizes  
Fractional Sizes

| Nominal Size | NC UNF | NF UNF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions     |                              |                |
|--------------|--------|--------|---------------|------------------------------------|-------------|-------------|-------------|-------------|----------------|------------------------------|----------------|
|              |        |        |               | H1                                 | H2          | H3          | H4          | H5          | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 0            | 80     | —      | 2             | TSUN0B1NEB5                        | TSUN0B2NEB5 | —           | —           | —           | .236           | —                            | 1.772          |
| 1            | 64     | —      | 2             | TSUN1D1NEB5                        | TSUN1D2NEB5 | —           | —           | —           | .275           | —                            | 1.772          |
| 1            | —      | 72     | 2             | TSUN1C1NEB5                        | TSUN1C2NEB5 | —           | —           | —           | .275           | —                            | 1.772          |
| 2            | 56     | —      | 3             | TSUN2E1NEB5                        | TSUN2E2NEB5 | —           | —           | —           | .314           | —                            | 1.772          |
| 2            | —      | 64     | 3             | TSUN2D1NEB5                        | TSUN2D2NEB5 | —           | —           | —           | .314           | —                            | 1.772          |
| 3            | 48     | —      | 3             | TSUN3F1NEB5                        | TSUN3F2NEB5 | —           | —           | —           | .354           | .669                         | 2.205          |
| 3            | —      | 56     | 3             | TSUN3E1NEB5                        | TSUN3E2NEB5 | —           | —           | —           | .354           | .669                         | 2.205          |
| 4            | 40     | —      | 3             | —                                  | TSUN4H2NEB5 | TSUN4H3NEB4 | —           | —           | .354           | .709                         | 2.205          |
| 4            | —      | 48     | 3             | TSUN4F1NEB5                        | TSUN4F2NEB5 | —           | —           | —           | .354           | .709                         | 2.205          |
| 5            | 40     | —      | 3             | —                                  | TSUN5H2NEB5 | TSUN5H3NEB4 | —           | —           | .433           | .768                         | 2.205          |
| 5            | —      | 44     | 3             | —                                  | TSUN5G2NEB5 | TSUN5G3NEB5 | —           | —           | .433           | .768                         | 2.205          |
| 6            | 32     | —      | 3             | —                                  | TSUN6J2NEB5 | TSUN6J3NEB4 | —           | —           | .433           | .787                         | 2.205          |
| 6            | —      | 40     | 3             | —                                  | TSUN6H2NEB5 | TSUN6H3NEB4 | —           | —           | .433           | .787                         | 2.205          |
| 8            | 32     | —      | 4             | —                                  | TSUN8J2NEB5 | TSUN8J3NEB4 | —           | —           | .512           | .827                         | 2.480          |
| 8            | —      | 36     | 4             | —                                  | TSUN8I2NEB5 | TSUN8I3NEB5 | —           | —           | .512           | .827                         | 2.480          |
| 10           | 24     | —      | 4             | —                                  | TSUNAM2NEB5 | TSUNAM3NEB4 | —           | —           | .551           | .984                         | 2.756          |
| 10           | —      | 32     | 4             | —                                  | TSUNAJ2NEB5 | TSUNAJ3NEB4 | —           | —           | .551           | .984                         | 2.756          |
| 12           | 24     | —      | 4             | —                                  | TSUNCM2NEB5 | TSUNCM3NEB4 | —           | —           | .591           | .984                         | 3.150          |
| 12           | —      | 28     | 4             | —                                  | TSUNCK2NEB5 | TSUNCK3NEB5 | —           | —           | .591           | .984                         | 3.150          |
| 1/4          | 20     | —      | 4             | —                                  | —           | TSU04N3NEB5 | TSU04N4NEB4 | —           | .591           | 1.181                        | 3.150          |
| 1/4          | —      | 28     | 4             | —                                  | TSU04K2NEB5 | TSU04K3NEB4 | —           | —           | .591           | 1.181                        | 3.150          |
| 5/16         | 18     | —      | 4             | —                                  | —           | TSU05O3NEB5 | TSU05O4NEB4 | —           | .748           | 1.378                        | 3.543          |
| 5/16         | —      | 24     | 4             | —                                  | —           | TSU05M3NEB5 | TSU05M4NEB4 | —           | .748           | 1.378                        | 3.543          |
| 3/8          | 16     | —      | 4             | —                                  | —           | TSU06P3NEB5 | —           | TSU06P5NEB4 | .906           | 1.535                        | 3.937          |
| 3/8          | —      | 24     | 4             | —                                  | —           | TSU06M3NEB5 | TSU06M4NEB4 | —           | .906           | 1.535                        | 3.937          |
| 7/16         | 14     | —      | 4             | —                                  | —           | —           | TSU07Q4NEB5 | TSU07Q5NEB4 | .906           | —                            | 3.937          |
| 7/16         | —      | 20     | 4             | —                                  | —           | TSU07N3NEB5 | TSU07N4NEB4 | —           | .906           | —                            | 3.937          |
| 1/2          | 13     | —      | 4             | —                                  | —           | —           | TSU08R4NEB5 | TSU08R5NEB4 | 1.024          | —                            | 4.331          |
| 1/2          | —      | 20     | 4             | —                                  | —           | TSU08N3NEB5 | TSU08N4NEB4 | —           | 1.024          | —                            | 4.331          |
| 9/16         | 12     | —      | 4             | —                                  | —           | —           | TSU09S4NEB5 | TSU09S5NEB4 | 1.024          | —                            | 4.331          |
| 9/16         | —      | 18     | 4             | —                                  | —           | —           | TSU09O4NEB5 | TSU09O5NEB4 | 1.024          | —                            | 4.331          |

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Think threads with  
**YAMAWA**

## Economical High Performance Hand Taps

For Unified Threads

## Z-PRO HT



\*Z-PRO HT have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

For Tapping Steels, Irons, Brass

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Z-PRO HT are the most popular style of general purpose taps for tapping under power or by hand.

Plug Style (5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series HT

Machine Screw Sizes

Fractional Sizes

| Nominal Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions       |                                 |                |
|--------------|-----------|-----------|------------------|------------------------------------|-------------|-------------|-------------|-------------|------------------|---------------------------------|----------------|
|              |           |           |                  | H4                                 | H5          | H6          | H7          | H8          | Length of Thread | Neck Length<br>(=Thread + Neck) | Length Overall |
| 5/8          | 11        | —         | 4                | TSU10U4NEB5                        | —           | TSU10U6NEB4 | —           | —           | 1.024            | —                               | 4.331          |
| 5/8          | —         | 18        | 4                | TSU10O4NEB5                        | TSU10O5NEB4 | —           | —           | —           | 1.024            | —                               | 4.331          |
| 3/4          | 10        | —         | 4                | —                                  | TSU12V5NEB5 | TSU12V6NEB4 | —           | —           | 1.299            | —                               | 4.921          |
| 3/4          | —         | 16        | 4                | TSU12P4NEB5                        | TSU12P5NEB4 | —           | —           | —           | 1.299            | —                               | 4.921          |
| 7/8          | 9         | —         | 4                | —                                  | TSU14W5NEB5 | TSU14W6NEB4 | —           | —           | 1.299            | —                               | 5.512          |
| 7/8          | —         | 14        | 4                | TSU14Q4NEB5                        | —           | TSU14Q6NEB5 | —           | —           | 1.299            | —                               | 5.512          |
| 1            | 8         | —         | 4                | —                                  | TSU16X5NEB5 | —           | TSU16X7NEB4 | —           | 1.457            | —                               | 6.299          |
| 1            | —         | 12        | 4                | —                                  | TSU16S5NEB5 | TSU16S6NEB5 | —           | —           | 1.457            | —                               | 6.299          |
| 1 1/8        | 7         | —         | 4                | —                                  | —           | TSU18Y6NEB5 | TSU16Y7NEB5 | —           | 1.732            | —                               | 7.087          |
| 1 1/8        | —         | 12        | 4                | —                                  | TSU18S5NEB5 | TSU18S6NEB5 | —           | —           | 1.732            | —                               | 7.087          |
| 1 1/4        | 7         | —         | 4                | —                                  | —           | TSU20Y6NEB5 | —           | TSU20Y8NEB5 | 1.929            | —                               | 7.087          |
| 1 1/4        | —         | 12        | 4                | —                                  | TS020S5NEB5 | TS020S6NEB5 | —           | —           | 1.929            | —                               | 7.087          |
| 1 3/8        | 6         | —         | 4                | —                                  | —           | TSU22Z6NEB4 | —           | TSU22Z8NEB5 | 2.165            | —                               | 7.874          |
| 1 3/8        | —         | 12        | 4                | —                                  | TSU22S5NEB5 | TSU22S6NEB5 | —           | —           | 2.165            | —                               | 7.874          |
| 1 1/2        | 6         | —         | 4                | —                                  | —           | TSU24Z6NEB4 | —           | TSU24Z8NEB4 | 2.323            | —                               | 7.874          |
| 1 1/2        | —         | 12        | 4                | —                                  | TSU24S5NEB4 | —           | TSU24S7NEB4 | —           | 2.323            | —                               | 7.874          |



# Z-PRO

For Tapping Steels, Irons, Brass and Plastics

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Economical High Performance Taps

For Unified Threads

## Z-PRO HT-OX



Z-PRO HT-OX have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

### Z-PRO Series HT

Machine Screw Sizes  
Fractional Sizes

| Nominal Size | NC UNC | NF UNF | No. of Flutes | Pitch Diameter Limit/ EDP Numbers |             |             |             |             | Dimensions     |                              |                |
|--------------|--------|--------|---------------|-----------------------------------|-------------|-------------|-------------|-------------|----------------|------------------------------|----------------|
|              |        |        |               | H2                                | H3          | H4          | H5          | H6          | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 2            | 56     | —      | 2             | TSUN2E2NEX5                       | —           | —           | —           | —           | .314           | —                            | 1.772          |
| 4            | 40     | —      | 2             | —                                 | TSUN4H3NEX5 | —           | —           | —           | .354           | .709                         | 2.205          |
| 5            | 40     | —      | 2             | —                                 | TSUN5H3NEX5 | —           | —           | —           | .433           | .768                         | 2.205          |
| 6            | 32     | —      | 3             | —                                 | TSUN6J3NEX5 | —           | —           | —           | .433           | .787                         | 2.205          |
| 6            | —      | 40     | 3             | —                                 | TSUN6H3NEX5 | —           | —           | —           | .433           | .787                         | 2.205          |
| 8            | 32     | —      | 3             | —                                 | TSUN8J3NEX5 | —           | —           | —           | .512           | .827                         | 2.480          |
| 10           | 24     | —      | 3             | —                                 | TSUNAM3NEX5 | —           | —           | —           | .551           | .984                         | 2.756          |
| 10           | —      | 32     | 3             | —                                 | TSUNAJ3NEX5 | —           | —           | —           | .551           | .984                         | 2.756          |
| 12           | 24     | —      | 3             | —                                 | TSUNCM3NEX5 | —           | —           | —           | .591           | .984                         | 3.150          |
| 1/4          | 20     | —      | 3             | —                                 | —           | TSU04N4NEX5 | —           | —           | .591           | 1.181                        | 3.150          |
| 1/4          | —      | 28     | 3             | —                                 | TSU04K3NEX5 | —           | —           | —           | .591           | 1.181                        | 3.150          |
| 5/16         | 18     | —      | 3             | —                                 | —           | TSU05O4NEX5 | —           | —           | .748           | 1.378                        | 3.543          |
| 5/16         | —      | 24     | 3             | —                                 | —           | TSU05M4NEX5 | —           | —           | .748           | 1.378                        | 3.543          |
| 3/8          | 16     | —      | 3             | —                                 | —           | —           | TSU06P5NEX5 | —           | .906           | 1.535                        | 3.937          |
| 3/8          | —      | 24     | 3             | —                                 | —           | TSU06M4NEX5 | —           | —           | .906           | 1.535                        | 3.937          |
| 7/16         | 14     | —      | 3             | —                                 | —           | —           | TSU07Q5NEX5 | —           | .906           | —                            | 3.937          |
| 7/16         | —      | 20     | 3             | —                                 | —           | TSU07N4NEX5 | —           | —           | .906           | —                            | 3.937          |
| 1/2          | 13     | —      | 3             | —                                 | —           | —           | TSU08R5NEX5 | —           | 1.024          | —                            | 4.331          |
| 1/2          | —      | 20     | 3             | —                                 | —           | TSU08N4NEX5 | —           | —           | 1.024          | —                            | 4.331          |
| 9/16         | 12     | —      | 4             | —                                 | —           | —           | TSU09S5NEX5 | —           | 1.024          | —                            | 4.331          |
| 9/16         | —      | 18     | 4             | —                                 | —           | —           | TSU09O5NEX5 | —           | 1.024          | —                            | 4.331          |
| 5/8          | 11     | —      | 3             | —                                 | —           | —           | —           | TSU10U6NEX5 | 1.024          | —                            | 4.331          |
| 5/8          | —      | 18     | 4             | —                                 | —           | —           | TSU10O5NEX5 | —           | 1.024          | —                            | 4.331          |
| 3/4          | 10     | —      | 4             | —                                 | —           | —           | —           | TSU12V6NEX5 | 1.299          | —                            | 4.921          |
| 3/4          | —      | 16     | 4             | —                                 | —           | —           | TSU12P5NEX5 | —           | 1.299          | —                            | 4.921          |
| 7/8          | 9      | —      | 4             | —                                 | —           | —           | —           | TSU14W6NEX5 | 1.299          | —                            | 5.512          |
| 1            | 8      | —      | 4             | —                                 | —           | —           | —           | TSU16X7NEX5 | 1.457          | —                            | 6.299          |

## Economical High Performance Hand Taps

For Metric Threads

### Z-PRO HT



\*Z-PRO HT have a Bright Surface Treatment

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

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Plug Style (5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |            |    | Dimensions     |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|------------|----|----------------|------------------------------|----------------|
|              |               | D3                                 | D4          | D5          | D6         | D7 | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | TS2.0E3NEB5                        | —           | —           | —          | —  | .314           | .382                         | 1.772          |
| M2.2 x 0.45  | 3             | TS2.2F3NEB5                        | —           | —           | —          | —  | .314           | .382                         | 1.772          |
| M2.5 x 0.45  | 3             | TS2.5F3NEB5                        | —           | —           | —          | —  | .354           | .693                         | 2.205          |
| M2.6 x 0.45  | 3             | TS2.6F3NEB5                        | —           | —           | —          | —  | .354           | .693                         | 2.205          |
| M3 x 0.5     | 3             | TS3.0G3NEB5                        | —           | —           | —          | —  | .433           | .768                         | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | TS3.5H4NEB5 | —           | —          | —  | .433           | .787                         | 2.205          |
| M4 x 0.7     | 4             | —                                  | TS4.0I4NEB5 | —           | —          | —  | .512           | .827                         | 2.48           |
| M5 x 0.8     | 4             | —                                  | TS5.0K4NEB5 | —           | —          | —  | .591           | .984                         | 3.15           |
| M6 x 1       | 4             | —                                  | —           | TS6.0M5NEB5 | —          | —  | .591           | 1.181                        | 3.15           |
| M7 x 0.75    | 4             | —                                  | TS7.0J4NEB5 | —           | —          | —  | .748           | 1.315                        | 3.543          |
| M7 x 0.5     | 4             | —                                  | TS7.0G4NEB5 | —           | —          | —  | .394           | 1.315                        | 3.543          |
| M7 x 1       | 4             | —                                  | —           | TS7.0M5NEB5 | —          | —  | .748           | 1.315                        | 3.543          |
| M8 x 0.75    | 4             | —                                  | TS8.0J4NEB5 | —           | —          | —  | .748           | 1.382                        | 3.543          |
| M8 x 0.5     | 4             | —                                  | TS8.0G4NEB5 | —           | —          | —  | .394           | 1.382                        | 3.543          |
| M8 x 1       | 4             | —                                  | —           | TS8.0M5NEB5 | —          | —  | .748           | 1.382                        | 3.543          |
| M8 x 1.25    | 4             | —                                  | —           | TS8.0N5NEB5 | —          | —  | .748           | 1.382                        | 3.543          |
| M9 x 1       | 4             | —                                  | —           | TS9.0M5NEB5 | —          | —  | .748           | 1.382                        | 3.543          |
| M9 x 1.25    | 4             | —                                  | —           | TS9.0N5NEB5 | —          | —  | .748           | 1.382                        | 3.543          |
| M10 x 0.75   | 4             | —                                  | TS10J4NEB5  | —           | —          | —  | .512           | 1.929                        | 3.937          |
| M10 x 1      | 4             | —                                  | —           | TS10M5NEB5  | —          | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.25   | 4             | —                                  | —           | TS10N5NEB5  | —          | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.5    | 4             | —                                  | —           | —           | TS10O6NEB5 | —  | .906           | 1.929                        | 3.937          |
| M11 x 1.5    | 4             | —                                  | —           | —           | TS11O6NEB5 | —  | .906           | 1.929                        | 3.937          |
| M12 x 1      | 4             | —                                  | —           | TS12M5NEB5  | —          | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.25   | 4             | —                                  | —           | —           | TS12N6NEB5 | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.5    | 4             | —                                  | —           | —           | TS12O6NEB5 | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.75   | 4             | —                                  | —           | —           | TS12P6NEB5 | —  | 1.024          | 2.126                        | 4.331          |

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# Z-PRO

YMW U.S.A.

For Tapping Steels, Irons, Brass and Plastics

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Economical High Performance Hand Taps  
For Metric Threads

Z-PRO HT



\*Z-PRO HT have a Bright Surface Treatment

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |    | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|----|------------------|------------------------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9 | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M14 x 1      | 4             | TS014M5NEB5                        | —           | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.25   | 4             | —                                  | TS014N6NEB5 | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.5    | 4             | —                                  | TS014O6NEB5 | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 2      | 4             | —                                  | —           | TS014Q7NEB5 | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1      | 4             | TS016M5NEB5                        | —           | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1.5    | 4             | —                                  | TS016O6NEB5 | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 2      | 4             | —                                  | —           | TS016Q7NEB5 | —           | —  | 1.024            | 2.126                        | 4.331          |
| M18 x 1      | 4             | TS018M5NEB5                        | —           | —           | —           | —  | .945             | 2.402                        | 4.921          |
| M18 x 1.5    | 4             | —                                  | TS018O6NEB5 | —           | —           | —  | .945             | 2.402                        | 4.921          |
| M18 x 2      | 4             | —                                  | —           | TS018Q7NEB5 | —           | —  | 1.299            | 2.402                        | 4.921          |
| M18 x 2.5    | 4             | —                                  | —           | TS018R7NEB5 | —           | —  | 1.299            | 2.402                        | 4.921          |
| M20 x 1      | 4             | TS020M5NEB5                        | —           | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M20 x 1.5    | 4             | —                                  | TS020O6NEB5 | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M20 x 2      | 4             | —                                  | —           | TS020Q7NEB5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M20 x 2.5    | 4             | —                                  | —           | TS020R7NEB5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 1      | 4             | TS022M5NEB5                        | —           | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M22 x 1.5    | 4             | —                                  | TS022O6NEB5 | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M22 x 2      | 4             | —                                  | —           | TS022Q7NEB5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 2.5    | 4             | —                                  | —           | TS022R7NEB5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M24 x 1      | 4             | TS024M5NEB5                        | —           | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 1.5    | 4             | —                                  | TS024O6NEB5 | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 2      | 4             | —                                  | —           | TS024Q7NEB5 | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 3      | 4             | —                                  | —           | —           | TS024S8NEB5 | —  | 1.457            | 3.071                        | 6.299          |
| M25 x 1.5    | 4             | —                                  | TS025O6NEB5 | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M26 x 1.5    | 4             | —                                  | TS026O6NEB5 | —           | —           | —  | 1.063            | 3.465                        | 7.087          |
| M27 x 1      | 4             | TS027M5NEB5                        | —           | —           | —           | —  | 1.063            | 3.465                        | 7.087          |

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## Economical High Performance Hand Taps

For Metric Threads

## Z-PRO HT



\*Z-PRO HT have a Bright Surface Treatment

### \*AVAILABLE IN TIN AND TICN COATING ON REQUEST

Custom Blend High Vanadium HSS

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Plug Style (5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|-------------|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9          | Length of Thread (=Thread + Neck) | Neck Length | Length Overall |
| M2 7x 1.5    | 4             | —                                  | TS027O6NEB5 | —           | —           | —           | 1.063                             | 3.465       | 7.087          |
| M27 x 2      | 4             | —                                  | —           | TS027Q7NEB5 | —           | —           | 1.063                             | 3.465       | 7.087          |
| M27 x 3      | 4             | —                                  | —           | —           | TS027S8NEB5 | —           | 1.732                             | 3.465       | 7.087          |
| M28 x 1      | 4             | TS028M5NEB5                        | —           | —           | —           | —           | 1.063                             | 3.465       | 7.087          |
| M28 x 1.5    | 4             | —                                  | TS028O6NEB5 | —           | —           | —           | 1.063                             | 3.465       | 7.087          |
| M28 x 2      | 4             | —                                  | —           | TS028Q7NEB5 | —           | —           | 1.063                             | 3.465       | 7.087          |
| M30 x 1      | 4             | TS030M5NEB5                        | —           | —           | —           | —           | 1.063                             | 3.465       | 7.087          |
| M30 x 1.5    | 4             | —                                  | TS030O6NEB5 | —           | —           | —           | 1.063                             | 3.465       | 7.087          |
| M30 x 2      | 4             | —                                  | —           | TS030Q7NEB5 | —           | —           | 1.063                             | 3.465       | 7.087          |
| M30 x 3.5    | 4             | —                                  | —           | —           | —           | TS030T9NEB5 | 1.732                             | 3.465       | 7.087          |
| M32 x 1      | 4             | TS032M5NEB5                        | —           | —           | —           | —           | 1.063                             | 3.465       | 7.087          |
| M32 x 1.5    | 4             | —                                  | TS032O6NEB5 | —           | —           | —           | 1.063                             | 3.465       | 7.087          |
| M32 x 2      | 4             | —                                  | —           | TS032Q7NEB5 | —           | —           | 1.063                             | 3.465       | 7.087          |
| M33 x 1      | 4             | TS033M5NEB5                        | —           | —           | —           | —           | 1.142                             | 3.465       | 7.087          |
| M33 x 1.5    | 4             | —                                  | TS033O6NEB5 | —           | —           | —           | 1.142                             | 3.465       | 7.087          |
| M33 x 2      | 4             | —                                  | —           | TS033Q7NEB5 | —           | —           | 1.142                             | 3.465       | 7.087          |
| M33 x 3.5    | 4             | —                                  | —           | —           | —           | TS033T9NEB5 | 1.181                             | 3.465       | 7.087          |
| M36 x 1      | 4             | TS036M5NEB5                        | —           | —           | —           | —           | 1.142                             | 3.858       | 7.784          |
| M36 x 1.5    | 4             | —                                  | TS036O6NEB5 | —           | —           | —           | 1.142                             | 3.858       | 7.874          |
| M36 x 2      | 4             | —                                  | —           | TS036Q7NEB5 | —           | —           | 1.142                             | 3.858       | 7.874          |
| M36 x 3      | 4             | —                                  | —           | —           | TS036S8NEB5 | —           | 2.047                             | 3.858       | 7.874          |
| M36 x 4      | 4             | —                                  | —           | —           | —           | TS036U9NEB5 | 2.047                             | 3.858       | 7.874          |
| M39 x 1      | 4             | TS039M5NEB5                        | —           | —           | —           | —           | 1.142                             | 3.858       | 7.874          |
| M39 x 1.5    | 4             | —                                  | TS039O6NEB5 | —           | —           | —           | 1.142                             | 3.858       | 7.874          |
| M39 x 2      | 4             | —                                  | —           | TS039Q7NEB5 | —           | —           | 1.142                             | 3.858       | 7.874          |
| M39 x 3      | 4             | —                                  | —           | —           | TS039S8NEB5 | —           | 2.047                             | 3.858       | 7.874          |

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For Metric Threads

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**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             |             |             | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------|------------------------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9          | D10         | D11         | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M39 x 4      | 4             | —                                  | —           | —           | —           | TS039U9NEB5 | —           | —           | 2.047            | 3.858                        | 7.874          |
| M42 x 1      | 4             | TS042M5NEB5                        | —           | —           | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 1.5    | 4             | —                                  | TS042O6NEB5 | —           | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 2      | 4             | —                                  | —           | TS042Q7NEB5 | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS042VONEB5 | —           | 2.323            | 3.858                        | 7.874          |
| M45 x 1      | 4             | TS045M5NEB5                        | —           | —           | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 1.5    | 4             | —                                  | TS045O6NEB5 | —           | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 2      | 4             | —                                  | —           | TS045Q7NEB5 | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 3      | 4             | —                                  | —           | —           | TS045S8NEB5 | —           | —           | —           | 2.323            | 4.252                        | 8.661          |
| M45 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS045VONEB5 | —           | 2.323            | 4.252                        | 8.661          |
| M48 x 1      | 4             | —                                  | TS048M6NEB5 | —           | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 1.5    | 4             | —                                  | —           | TS048O7NEB5 | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 2      | 4             | —                                  | —           | TS048Q7NEB5 | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 3      | 4             | —                                  | —           | —           | —           | TS048S9NEB5 | —           | —           | 2.559            | 4.803                        | 9.843          |
| M48 x 5      | 4             | —                                  | —           | —           | —           | —           | —           | TS048W-NEB5 | 2.559            | 4.803                        | 9.843          |

## Economical High Performance Hand Taps

For Metric Threads

## Z-PRO HT-OX



Z-PRO HT have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

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Plug Style (5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |    | Dimensions     |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|----|----------------|------------------------------|----------------|
|              |               | D3                                 | D4          | D5          | D6          | D7 | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | TS2.0E3NEX5                        | —           | —           | —           | —  | .314           | .382                         | 1.772          |
| M2.2 x 0.45  | 3             | TS2.2F3NEX5                        | —           | —           | —           | —  | .314           | .382                         | 1.772          |
| M2.5 x 0.45  | 3             | TS2.5F3NEX5                        | —           | —           | —           | —  | .354           | .693                         | 2.205          |
| M2.6 x 0.45  | 3             | TS2.6F3NEX5                        | —           | —           | —           | —  | .354           | .693                         | 2.205          |
| M3 x 0.5     | 3             | TS3.0G3NEX5                        | —           | —           | —           | —  | .433           | .768                         | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | TS3.5H4NEX5 | —           | —           | —  | .433           | .787                         | 2.205          |
| M4 x 0.7     | 4             | —                                  | TS4.0I4NEX5 | —           | —           | —  | .512           | .827                         | 2.48           |
| M5 x 0.8     | 4             | —                                  | TS5.0K4NEX5 | —           | —           | —  | .591           | .984                         | 3.15           |
| M6 x 1       | 4             | —                                  | —           | TS6.0M5NEX5 | —           | —  | .591           | 1.181                        | 3.15           |
| M7 x 0.75    | 4             | —                                  | TS7.0J4NEX5 | —           | —           | —  | .748           | 1.315                        | 3.543          |
| M7 x 0.5     | 4             | —                                  | TS7.0G4NEX5 | —           | —           | —  | .394           | 1.315                        | 3.543          |
| M7 x 1       | 4             | —                                  | —           | TS7.0M5NEX5 | —           | —  | .748           | 1.315                        | 3.543          |
| M8 x 0.75    | 4             | —                                  | TS8.0J4NEX5 | —           | —           | —  | .394           | 1.382                        | 3.543          |
| M8 x 0.5     | 4             | —                                  | TS8.0G4NEX5 | —           | —           | —  | .394           | 1.382                        | 3.543          |
| M8 x 1       | 4             | —                                  | —           | TS8.0M5NEX5 | —           | —  | .748           | 1.382                        | 3.543          |
| M8 x 1.25    | 4             | —                                  | —           | TS8.0N5NEX5 | —           | —  | .748           | 1.382                        | 3.543          |
| M9 x 1       | 4             | —                                  | —           | TS9.0M5NEX5 | —           | —  | .748           | 1.382                        | 3.543          |
| M9 x 1.25    | 4             | —                                  | —           | TS9.0N5NEX5 | —           | —  | .748           | 1.382                        | 3.543          |
| M10 X 0.75   | 4             | —                                  | TS010J4NEX5 | —           | —           | —  | .512           | 1.929                        | 3.937          |
| M10 x 1      | 4             | —                                  | —           | TS010M5NEX5 | —           | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.25   | 4             | —                                  | —           | TS010N5NEX5 | —           | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.5    | 4             | —                                  | —           | —           | TS010O6NEX5 | —  | .906           | 1.929                        | 3.937          |
| M11 x 1.5    | 4             | —                                  | —           | —           | TS011O6NEX5 | —  | .906           | 1.929                        | 3.937          |
| M12 x 1      | 4             | —                                  | —           | TS012M5NEX5 | —           | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.25   | 4             | —                                  | —           | —           | TS012N6NEX5 | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.5    | 4             | —                                  | —           | —           | TS012O6NEX5 | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.75   | 4             | —                                  | —           | —           | TS012P6NEX5 | —  | 1.024          | 2.126                        | 4.331          |

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Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |    | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|----|------------------|------------------------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9 | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M14 x 1      | 4             | TS014M5NEX5                        | —           | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.25   | 4             | —                                  | TS014N6NEX5 | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.5    | 4             | —                                  | TS014O6NEX5 | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 2      | 4             | —                                  | —           | TS014Q7NEX5 | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1      | 4             | TS016M5NEX5                        | —           | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1.5    | 4             | —                                  | TS016O6NEX5 | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 2      | 4             | —                                  | —           | TS016Q7NEX5 | —           | —  | 1.024            | 2.126                        | 4.331          |
| M18 x 1      | 4             | TS018M5NEX5                        | —           | —           | —           | —  | .945             | 2.402                        | 4.921          |
| M18 x 1.5    | 4             | —                                  | TS018O6NEX5 | —           | —           | —  | .945             | 2.402                        | 4.921          |
| M18 x 2      | 4             | —                                  | —           | TS018Q7NEX5 | —           | —  | 1.299            | 2.402                        | 4.921          |
| M18 x 2.5    | 4             | —                                  | —           | TS018R7NEX5 | —           | —  | 1.299            | 2.402                        | 4.921          |
| M20 x 1      | 4             | TS020M5NEX5                        | —           | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M20 x 1.5    | 4             | —                                  | TS020O6NEX5 | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M20 x 2      | 4             | —                                  | —           | TS020Q7NEX5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M20 x 2.5    | 4             | —                                  | —           | TS020R7NEX5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 1      | 4             | TS022M5NEX5                        | —           | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M22 x 1.5    | 4             | —                                  | TS022O6NEX5 | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M22 x 2      | 4             | —                                  | —           | TS022Q7NEX5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 2.5    | 4             | —                                  | —           | TS022R7NEX5 | —           | —  | 1.299            | 2.717                        | 5.512          |
| M24 x 1      | 4             | TS024M5NEX5                        | —           | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 1.5    | 4             | —                                  | TS024O6NEX5 | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 2      | 4             | —                                  | —           | TS024Q7NEX5 | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 3      | 4             | —                                  | —           | —           | TS024S8NEX5 | —  | 1.457            | 3.071                        | 6.299          |
| M25 x 1.5    | 4             | —                                  | TS025O6NEX5 | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M26 x 1.5    | 4             | —                                  | TS026O6NEX5 | —           | —           | —  | 1.063            | 3.465                        | 7.087          |
| M27 x 1      | 4             | TS027M5NEX5                        | —           | —           | —           | —  | 1.063            | 3.465                        | 7.087          |

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For Tapping Steels, Irons, Brass and Plastics

## Economical High Performance Hand Taps

For Metric Threads

## Z-PRO HT-OX



Z-PRO HT have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

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Z-PRO HT are the most popular style of general purpose taps for tapping under power or by hand.

Plug Style (5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions                         |             |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|-------------|------------------------------------|-------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9          | Length of Thread (+ Thread + Neck) | Neck Length | Length Overall |
| M2 x 1.5     | 4             | —                                  | TS027O6NEX5 | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M27 x 2      | 4             | —                                  | —           | TS027Q7NEX5 | —           | —           | 1.063                              | 3.465       | 7.087          |
| M27 x 3      | 4             | —                                  | —           | —           | TS027S8NEX5 | —           | 1.732                              | 3.465       | 7.087          |
| M28 x 1      | 4             | TS028M5NEX5                        | —           | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M28 x 1.5    | 4             | —                                  | TS028O6NEX5 | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M28 x 2      | 4             | —                                  | —           | TS028Q7NEX5 | —           | —           | 1.063                              | 3.465       | 7.087          |
| M30 x 1      | 4             | TS030M5NEX5                        | —           | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M30 x 1.5    | 4             | —                                  | TS030O6NEX5 | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M30 x 2      | 4             | —                                  | —           | TS030Q7NEX5 | —           | —           | 1.063                              | 3.465       | 7.087          |
| M30 x 3.5    | 4             | —                                  | —           | —           | —           | TS030T9NEX5 | 1.732                              | 3.465       | 7.087          |
| M32 x 1      | 4             | TS032M5NEX5                        | —           | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M32 x 1.5    | 4             | —                                  | TS032O6NEX5 | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M32 x 2      | 4             | —                                  | —           | TS032Q7NEX5 | —           | —           | 1.063                              | 3.465       | 7.087          |
| M33 x 1      | 4             | TS033M5NEX5                        | —           | —           | —           | —           | 1.142                              | 3.465       | 7.087          |
| M33 x 1.5    | 4             | —                                  | TS033O6NEX5 | —           | —           | —           | 1.142                              | 3.465       | 7.087          |
| M33 x 2      | 4             | —                                  | —           | TS033Q7NEX5 | —           | —           | 1.142                              | 3.465       | 7.087          |
| M33 x 3.5    | 4             | —                                  | —           | —           | —           | TS033T9NEX5 | 1.181                              | 3.465       | 7.087          |
| M36 x 1      | 4             | TS036M5NEX5                        | —           | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M36 x 1.5    | 4             | —                                  | TS036O6NEX5 | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M36 x 2      | 4             | —                                  | —           | TS036Q7NEX5 | —           | —           | 1.142                              | 3.858       | 7.874          |
| M36 x 3      | 4             | —                                  | —           | —           | TS036S8NEX5 | —           | 2.047                              | 3.858       | 7.874          |
| M36 x 4      | 4             | —                                  | —           | —           | —           | TS036U9NEX5 | 2.047                              | 3.858       | 7.874          |
| M39 x 1      | 4             | TS039M5NEX5                        | —           | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M39 x 1.5    | 4             | —                                  | TS039O6NEX5 | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M39 x 2      | 4             | —                                  | —           | TS039Q7NEX5 | —           | —           | 1.142                              | 3.858       | 7.874          |
| M39 x 3      | 4             | —                                  | —           | —           | TS039S8NEX5 | —           | 2.047                              | 3.858       | 7.874          |

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# Z-PRO

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**Economical High Performance Hand Taps**

For Metric Threads

**Z-PRO HT-OX**



Z-PRO HT have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             |             |             | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------|------------------------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9          | D10         | D11         | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M39 x 4      | 4             | —                                  | —           | —           | —           | TS039U9NEX5 | —           | —           | 2.047            | 3.858                        | 7.874          |
| M42 x 1      | 4             | TS042M5NEX5                        | —           | —           | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 1.5    | 4             | —                                  | TS042O6NEX5 | —           | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 2      | 4             | —                                  | —           | TS042Q7NEX5 | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS042VONEX5 | —           | 2.323            | 3.858                        | 7.874          |
| M45 x 1      | 4             | TS045M5NEX5                        | —           | —           | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 1.5    | 4             | —                                  | TS045O6NEX5 | —           | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 2      | 4             | —                                  | —           | TS045Q7NEX5 | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 3      | 4             | —                                  | —           | —           | TS045S8NEX5 | —           | —           | —           | 2.323            | 4.252                        | 8.661          |
| M45 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS045VONEX5 | —           | 2.323            | 4.252                        | 8.661          |
| M48 x 1      | 4             | —                                  | TS048M6NEX5 | —           | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 1.5    | 4             | —                                  | —           | TS048O7NEX5 | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 2      | 4             | —                                  | —           | TS048Q7NEX5 | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 3      | 4             | —                                  | —           | —           | —           | TS048S9NEX5 | —           | —           | 2.559            | 4.803                        | 9.843          |
| M48 x 5      | 4             | —                                  | —           | —           | —           | —           | —           | TS048W-NEX5 | 2.559            | 4.803                        | 9.843          |



## Economical High Performance Taps

For Unified Threads

## Z-PRO HT



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Bottoming Style (1.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

### Z-PRO Series HT

Machine Screw Sizes  
Fractional Sizes

| Nominal Size | NC UNC | NF UNF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions     |                              |                |
|--------------|--------|--------|---------------|------------------------------------|-------------|-------------|-------------|-------------|----------------|------------------------------|----------------|
|              |        |        |               | H1                                 | H2          | H3          | H4          | H5          | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 0            | 80     | —      | 2             | TSUN0B1NEBA                        | TSUN0B2NEBA | —           | —           | —           | .236           | —                            | 1.772          |
| 1            | 64     | —      | 2             | TSUN1D1NEBA                        | TSUN1D2NEBA | —           | —           | —           | .275           | —                            | 1.772          |
| 1            | —      | 72     | 2             | TSUN1C1NEBA                        | TSUN1C2NEBA | —           | —           | —           | .275           | —                            | 1.772          |
| 2            | 56     | —      | 3             | TSUN2E1NEBA                        | TSUN2E2NEBA | —           | —           | —           | .314           | —                            | 1.772          |
| 2            | —      | 64     | 3             | TSUN2D1NEBA                        | TSUN2D2NEBA | —           | —           | —           | .314           | —                            | 1.772          |
| 3            | 48     | —      | 3             | TSUN3F1NEBA                        | TSUN3F2NEBA | —           | —           | —           | .354           | .669                         | 2.205          |
| 3            | —      | 56     | 3             | TSUN3E1NEBA                        | TSUN3E2NEBA | —           | —           | —           | .354           | .669                         | 2.205          |
| 4            | 40     | —      | 3             | —                                  | TSUN4H2NEBA | TSUN4H3NEBA | —           | —           | .354           | .709                         | 2.205          |
| 4            | —      | 48     | 3             | TSUN4F1NEBA                        | TSUN4F2NEBA | —           | —           | —           | .354           | .709                         | 2.205          |
| 5            | 40     | —      | 3             | —                                  | TSUN5H2NEBA | TSUN5H3NEBA | —           | —           | .433           | .768                         | 2.205          |
| 5            | —      | 44     | 3             | —                                  | TSUN5G2NEBA | TSUN5G3NEBA | —           | —           | .433           | .768                         | 2.205          |
| 6            | 32     | —      | 3             | —                                  | TSUN6J2NEBA | TSUN6J3NEBA | —           | —           | .433           | .787                         | 2.205          |
| 6            | —      | 40     | 3             | —                                  | TSUN6H2NEBA | TSUN6H3NEBA | —           | —           | .433           | .787                         | 2.205          |
| 8            | 32     | —      | 4             | —                                  | TSUN8J2NEBA | TSUN8J3NEBA | —           | —           | .512           | .827                         | 2.480          |
| 8            | —      | 36     | 4             | —                                  | TSUN8I2NEBA | TSUN8I3NEBA | —           | —           | .512           | .827                         | 2.480          |
| 10           | 24     | —      | 4             | —                                  | TSUNAM2NEBA | TSUNAM3NEBA | —           | —           | .551           | .984                         | 2.756          |
| 10           | —      | 32     | 4             | —                                  | TSUNAJ2NEBA | TSUNAJ3NEBA | —           | —           | .551           | .984                         | 2.756          |
| 12           | 24     | —      | 4             | —                                  | TSUNCM2NEBA | TSUNCM3NEBA | —           | —           | .591           | .984                         | 3.150          |
| 12           | —      | 28     | 4             | —                                  | TSUNCK2NEBA | TSUNCK3NEBA | —           | —           | .591           | .984                         | 3.150          |
| 1/4          | 20     | —      | 4             | —                                  | —           | TSU04N3NEBA | TSU04N4NEBA | —           | .591           | 1.181                        | 3.150          |
| 1/4          | —      | 28     | 4             | —                                  | TSU04K2NEBA | TSU04K3NEBA | —           | —           | .591           | 1.181                        | 3.150          |
| 5/16         | 18     | —      | 4             | —                                  | —           | TSU05O3NEBA | TSU05O4NEBA | —           | .748           | 1.378                        | 3.543          |
| 5/16         | —      | 24     | 4             | —                                  | —           | TSU05M3NEBA | TSU05M4NEBA | —           | .748           | 1.378                        | 3.543          |
| 3/8          | 16     | —      | 4             | —                                  | —           | TSU06P3NEBA | —           | TSU06P5NEBA | .906           | 1.535                        | 3.937          |
| 3/8          | —      | 24     | 4             | —                                  | —           | TSU06M3NEBA | TSU06M4NEBA | —           | .906           | 1.535                        | 3.937          |
| 7/16         | 14     | —      | 4             | —                                  | —           | —           | TSU07Q4NEBA | TSU07Q5NEBA | .906           | —                            | 3.937          |
| 7/16         | —      | 20     | 4             | —                                  | —           | TSU07N3NEBA | TSU07N4NEBA | —           | .906           | —                            | 3.937          |
| 1/2          | 13     | —      | 4             | —                                  | —           | —           | TSU08R4NEBA | TSU08R5NEBA | 1.024          | —                            | 4.331          |
| 1/2          | —      | 20     | 4             | —                                  | —           | TSU08N3NEBA | TSU08N4NEBA | —           | 1.024          | —                            | 4.331          |
| 9/16         | 12     | —      | 4             | —                                  | —           | —           | TSU09S4NEBA | TSU09S5NEBA | 1.024          | —                            | 4.331          |
| 9/16         | —      | 18     | 4             | —                                  | —           | —           | TSU09O4NEBA | TSU09O5NEBA | 1.024          | —                            | 4.331          |



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Bottoming Style (1.5 threads chamfered)

DIN lengths with ANSI shank dimensions.

Z-PRO Series HT

Machine Screw Sizes  
 Fractional Sizes

| Nominal Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions          |                                 |                   |
|--------------|-----------|-----------|------------------|------------------------------------|-------------|-------------|-------------|-------------|---------------------|---------------------------------|-------------------|
|              |           |           |                  | H4                                 | H5          | H6          | H7          | H8          | Length<br>of Thread | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| 5/8          | 11        | —         | 4                | TSU10U4NEBA                        | —           | TSU10U6NEBA | —           | —           | 1.024               | —                               | 4.331             |
| 5/8          | —         | 18        | 4                | TSU10O4NEBA                        | TSU10O5NEBA | —           | —           | —           | 1.024               | —                               | 4.331             |
| 3/4          | 10        | —         | 4                | —                                  | TSU12V5NEBA | TSU12V6NEBA | —           | —           | 1.299               | —                               | 4.921             |
| 3/4          | —         | 16        | 4                | TSU12P4NEBA                        | TSU12P5NEBA | —           | —           | —           | 1.299               | —                               | 4.921             |
| 7/8          | 9         | —         | 4                | —                                  | TSU14W5NEBA | TSU14W6NEBA | —           | —           | 1.299               | —                               | 5.512             |
| 7/8          | —         | 14        | 4                | TSU14Q4NEBA                        | —           | TSU14Q6NEBA | —           | —           | 1.299               | —                               | 5.512             |
| 1            | 8         | —         | 4                | —                                  | TSU16X5NEBA | —           | TSU16X7NEBA | —           | 1.457               | —                               | 6.299             |
| 1            | —         | 12        | 4                | —                                  | TSU16S5NEBA | TSU16S6NEBA | —           | —           | 1.457               | —                               | 6.299             |
| 1 1/8        | 7         | —         | 4                | —                                  | —           | TSU18Y6NEBA | TSU16Y7NEBA | —           | 1.732               | —                               | 7.087             |
| 1 1/8        | —         | 12        | 4                | —                                  | TSU18S5NEBA | TSU18S6NEBA | —           | —           | 1.732               | —                               | 7.087             |
| 1 1/4        | 7         | —         | 4                | —                                  | —           | TSU20Y6NEBA | —           | TSU20Y8NEBA | 1.929               | —                               | 7.087             |
| 1 1/4        | —         | 12        | 4                | —                                  | TSU20S5NEBA | TSU20S6NEBA | —           | —           | 1.929               | —                               | 7.087             |
| 1 3/8        | 6         | —         | 4                | —                                  | —           | TSU22Z6NEBA | —           | TSU22Z8NEB5 | 2.165               | —                               | 7.874             |
| 1 3/8        | —         | 12        | 4                | —                                  | TSU22S5NEBA | TSU22S6NEBA | —           | —           | 2.165               | —                               | 7.874             |
| 1 1/2        | 6         | —         | 4                | —                                  | —           | TSU24Z6NEBA | —           | TSU24Z8NEBA | 2.323               | —                               | 7.874             |
| 1 1/2        | —         | 12        | 4                | —                                  | TSU24S5NEBA | —           | TSU24S7NEBA | —           | 2.323               | —                               | 7.874             |

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Custom Blend High Vanadium HSS

Bottoming Style (1.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

## Z-PRO Series HT

Machine Screw Sizes  
Fractional Sizes

| Nominal<br>Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions        |                                 |                   |
|-----------------|-----------|-----------|------------------|------------------------------------|-------------|-------------|-------------|-------------|-------------------|---------------------------------|-------------------|
|                 |           |           |                  | H2                                 | H3          | H4          | H5          | H6          | Length<br>of Neck | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| 2               | 56        | —         | 2                | TSUN2E2NEXA                        | —           | —           | —           | —           | .314              | —                               | 1.772             |
| 4               | 40        | —         | 2                | —                                  | TSUN4H3NEXA | —           | —           | —           | .354              | .709                            | 2.205             |
| 5               | 40        | —         | 2                | —                                  | TSUN5H3NEXA | —           | —           | —           | .433              | .768                            | 2.205             |
| 6               | 32        | —         | 3                | —                                  | TSUN6J3NEXA | —           | —           | —           | .433              | .787                            | 2.205             |
| 6               | —         | 40        | 3                | —                                  | TSUN6H3NEXA | —           | —           | —           | .433              | .787                            | 2.205             |
| 8               | 32        | —         | 3                | —                                  | TSUN8J3NEXA | —           | —           | —           | .512              | .827                            | 2.480             |
| 10              | 24        | —         | 3                | —                                  | TSUNAM3NEXA | —           | —           | —           | .551              | .984                            | 2.756             |
| 10              | —         | 32        | 3                | —                                  | TSUNAJ3NEXA | —           | —           | —           | .551              | .984                            | 2.756             |
| 12              | 24        | —         | 3                | —                                  | TSUNCM3NEXA | —           | —           | —           | .591              | .984                            | 3.150             |
| 1/4             | 20        | —         | 3                | —                                  | —           | TSU04N4NEXA | —           | —           | .591              | 1.181                           | 3.150             |
| 1/4             | —         | 28        | 3                | —                                  | TSU04K3NEXA | —           | —           | —           | .591              | 1.181                           | 3.150             |
| 5/16            | 18        | —         | 3                | —                                  | —           | TSU05O4NEXA | —           | —           | .748              | 1.378                           | 3.543             |
| 5/16            | —         | 24        | 3                | —                                  | —           | TSU05M4NEXA | —           | —           | .748              | 1.378                           | 3.543             |
| 3/8             | 16        | —         | 3                | —                                  | —           | TSU06P4NEXA | —           | —           | .906              | 1.535                           | 3.937             |
| 3/8             | —         | 24        | 3                | —                                  | —           | TSU06M4NEXA | —           | —           | .906              | 1.535                           | 3.937             |
| 7/16            | 14        | —         | 3                | —                                  | —           | TSU07Q4NEXA | —           | —           | .906              | —                               | 3.937             |
| 7/16            | —         | 20        | 3                | —                                  | —           | TSU07N4NEXA | —           | —           | .906              | —                               | 3.937             |
| 1/2             | 13        | —         | 3                | —                                  | —           | —           | TSU08R5NEXA | —           | 1.024             | —                               | 4.331             |
| 1/2             | —         | 20        | 3                | —                                  | —           | TSU08N4NEXA | —           | —           | 1.024             | —                               | 4.331             |
| 9/16            | 12        | —         | 4                | —                                  | —           | —           | TSU09S5NEXA | —           | 1.024             | —                               | 4.331             |
| 9/16            | —         | 18        | 4                | —                                  | —           | —           | TSU09O5NEXA | —           | 1.024             | —                               | 4.331             |
| 5/8             | 11        | —         | 3                | —                                  | —           | —           | —           | TSU10U6NEXA | 1.024             | —                               | 4.331             |
| 5/8             | —         | 18        | 4                | —                                  | —           | —           | TSU10O5NEXA | —           | 1.024             | —                               | 4.331             |
| 3/4             | 10        | —         | 4                | —                                  | —           | —           | —           | TSU12V6NEXA | 1.299             | —                               | 4.921             |
| 3/4             | —         | 16        | 4                | —                                  | —           | —           | TSU12P5NEXA | —           | 1.299             | —                               | 4.921             |
| 7/8             | 9         | —         | 4                | —                                  | —           | —           | —           | TSU14W6NEXA | 1.299             | —                               | 5.512             |
| 1               | 8         | —         | 4                | —                                  | —           | —           | —           | TSU16X7NEXA | 1.457             | —                               | 6.299             |



# Z-PRO

YMW U.S.A.

For Tapping Steels, Irons, Brass and Plastics

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Z-PRO HT are the most popular style of general purpose taps for tapping under power or by hand.

Economical High Performance

Hand Taps  
For Metric Threads

Z-PRO HT



\*Z-PRO PO have a Bright Surface Treatment

**\*AVAILABLE IN TIN AND TiCN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Bottoming Style (1.5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |    | Dimensions     |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|----|----------------|------------------------------|----------------|
|              |               | D3                                 | D4          | D5          | D6          | D7 | Length of Neck | Neck Length (-Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | TS2.0E3NEBA                        | —           | —           | —           | —  | .314           | .382                         | 1.772          |
| M2.2 x 0.45  | 3             | TS2.2F3NEBA                        | —           | —           | —           | —  | .314           | .382                         | 1.772          |
| M2.5 x 0.45  | 3             | TS2.5F3NEBA                        | —           | —           | —           | —  | .354           | .693                         | 2.205          |
| M2.6 x 0.45  | 3             | TS2.6F3NEBA                        | —           | —           | —           | —  | .354           | .693                         | 2.205          |
| M3 x 0.5     | 3             | TS3.0G3NEBA                        | —           | —           | —           | —  | .433           | .768                         | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | TS3.5H4NEBA | —           | —           | —  | .433           | .787                         | 2.205          |
| M4 x 0.7     | 4             | —                                  | TS4.0I4NEBA | —           | —           | —  | .512           | .827                         | 2.48           |
| M5 x 0.8     | 4             | —                                  | TS5.0K4NEBA | —           | —           | —  | .591           | .984                         | 3.15           |
| M6 x 1       | 4             | —                                  | —           | TS6.0M5NEBA | —           | —  | .591           | 1.181                        | 3.15           |
| M7 x 0.75    | 4             | —                                  | TS7.0J4NEBA | —           | —           | —  | .748           | 1.315                        | 3.543          |
| M7 x 0.5     | 4             | —                                  | TS7.0G4NEBA | —           | —           | —  | .394           | 1.315                        | 3.543          |
| M7 x 1       | 4             | —                                  | —           | TS7.0M5NEBA | —           | —  | .748           | 1.315                        | 3.543          |
| M8 x 0.75    | 4             | —                                  | TS8.0J4NEBA | —           | —           | —  | .394           | 1.382                        | 3.543          |
| M8 x 0.5     | 4             | —                                  | TS8.0G4NEBA | —           | —           | —  | .394           | 1.382                        | 3.543          |
| M8 x 1       | 4             | —                                  | —           | TS8.0M5NEBA | —           | —  | .748           | 1.382                        | 3.543          |
| M8 x 1.25    | 4             | —                                  | —           | TS8.0N5NEBA | —           | —  | .748           | 1.382                        | 3.543          |
| M9 x 1       | 4             | —                                  | —           | TS9.0M5NEBA | —           | —  | .748           | 1.382                        | 3.543          |
| M9 x 1.25    | 4             | —                                  | —           | TS9.0N5NEBA | —           | —  | .748           | 1.382                        | 3.543          |
| M10 X 0.75   | 4             | —                                  | TS010J4NEBA | —           | —           | —  | .512           | 1.929                        | 3.937          |
| M10 x 1      | 4             | —                                  | —           | TS010M5NEBA | —           | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.25   | 4             | —                                  | —           | TS010N5NEBA | —           | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.5    | 4             | —                                  | —           | —           | TS010O6NEBA | —  | .906           | 1.929                        | 3.937          |
| M11 x 1.5    | 4             | —                                  | —           | —           | TS011O6NEBA | —  | .906           | 1.929                        | 3.937          |
| M12 x 1      | 4             | —                                  | —           | TS012M5NEBA | —           | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.25   | 4             | —                                  | —           | —           | TS012N6NEBA | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.5    | 4             | —                                  | —           | —           | TS012O6NEBA | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.75   | 4             | —                                  | —           | —           | TS012P6NEBA | —  | 1.024          | 2.126                        | 4.331          |

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## Economical High Performance Hand Taps For Metric Threads Z-PRO HT



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### \*AVAILABLE IN TIN AND TiCN COATING ON REQUEST

Custom Blend High Vanadium HSS

Bottoming Style (1.5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |    | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|----|------------------|------------------------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9 | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M14 x 1      | 4             | TS014M5NEBA                        | —           | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.25   | 4             | —                                  | TS014N6NEBA | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 1.5    | 4             | —                                  | TS014O6NEBA | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M14 x 2      | 4             | —                                  | —           | TS014Q7NEBA | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1      | 4             | TS016M5NEBA                        | —           | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 1.5    | 4             | —                                  | TS016O6NEBA | —           | —           | —  | 1.024            | 2.126                        | 4.331          |
| M16 x 2      | 4             | —                                  | —           | TS016Q7NEBA | —           | —  | 1.024            | 2.126                        | 4.331          |
| M18 x 1      | 4             | TS018M5NEBA                        | —           | —           | —           | —  | .945             | 2.402                        | 4.921          |
| M18 x 1.5    | 4             | —                                  | TS018O6NEBA | —           | —           | —  | .945             | 2.402                        | 4.921          |
| M18 x 2      | 4             | —                                  | —           | TS018Q7NEBA | —           | —  | 1.299            | 2.402                        | 4.921          |
| M18 x 2.5    | 4             | —                                  | —           | TS018R7NEBA | —           | —  | 1.299            | 2.402                        | 4.921          |
| M20 x 1      | 4             | TS020M5NEBA                        | —           | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M20 x 1.5    | 4             | —                                  | TS020O6NEBA | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M20 x 2      | 4             | —                                  | —           | TS020Q7NEBA | —           | —  | 1.299            | 2.717                        | 5.512          |
| M20 x 2.5    | 4             | —                                  | —           | TS020R7NEBA | —           | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 1      | 4             | TS022M5NEBA                        | —           | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M22 x 1.5    | 4             | —                                  | TS022O6NEBA | —           | —           | —  | .945             | 2.717                        | 5.512          |
| M22 x 2      | 4             | —                                  | —           | TS022Q7NEBA | —           | —  | 1.299            | 2.717                        | 5.512          |
| M22 x 2.5    | 4             | —                                  | —           | TS022R7NEBA | —           | —  | 1.299            | 2.717                        | 5.512          |
| M24 x 1      | 4             | TS024M5NEBA                        | —           | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 1.5    | 4             | —                                  | TS024O6NEBA | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 2      | 4             | —                                  | —           | TS024Q7NEBA | —           | —  | 1.063            | 3.071                        | 6.299          |
| M24 x 3      | 4             | —                                  | —           | —           | TS024S8NEBA | —  | 1.457            | 3.071                        | 6.299          |
| M25 x 1.5    | 4             | —                                  | TS025O6NEBA | —           | —           | —  | 1.063            | 3.071                        | 6.299          |
| M26 x 1.5    | 4             | —                                  | TS026O6NEBA | —           | —           | —  | 1.063            | 3.465                        | 7.087          |
| M27 x 1      | 4             | TS027M5NEBA                        | —           | —           | —           | —  | 1.063            | 3.465                        | 7.087          |

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| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions                         |             |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|-------------|------------------------------------|-------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9          | Length of Thread (= Thread + Neck) | Neck Length | Length Overall |
| M2.7 x 1.5   | 4             | —                                  | TS027O6NEBA | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M2.7 x 2     | 4             | —                                  | —           | TS027Q7NEBA | —           | —           | 1.063                              | 3.465       | 7.087          |
| M2.7 x 3     | 4             | —                                  | —           | —           | TS027S8NEBA | —           | 1.732                              | 3.465       | 7.087          |
| M2.8 x 1     | 4             | TS028M5NEBA                        | —           | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M2.8 x 1.5   | 4             | —                                  | TS028O6NEBA | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M2.8 x 2     | 4             | —                                  | —           | TS028Q7NEBA | —           | —           | 1.063                              | 3.465       | 7.087          |
| M3.0 x 1     | 4             | TS030M5NEBA                        | —           | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M3.0 x 1.5   | 4             | —                                  | TS030O6NEBA | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M3.0 x 2     | 4             | —                                  | —           | TS030Q7NEBA | —           | —           | 1.063                              | 3.465       | 7.087          |
| M3.0 x 3.5   | 4             | —                                  | —           | —           | —           | TS030T9NEBA | 1.732                              | 3.465       | 7.087          |
| M3.2 x 1     | 4             | TS032M5NEBA                        | —           | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M3.2 x 1.5   | 4             | —                                  | TS032O6NEBA | —           | —           | —           | 1.063                              | 3.465       | 7.087          |
| M3.2 x 2     | 4             | —                                  | —           | TS032Q7NEBA | —           | —           | 1.063                              | 3.465       | 7.087          |
| M3.3 x 1     | 4             | TS033M5NEBA                        | —           | —           | —           | —           | 1.142                              | 3.465       | 7.087          |
| M3.3 x 1.5   | 4             | —                                  | TS033O6NEBA | —           | —           | —           | 1.142                              | 3.465       | 7.087          |
| M3.3 x 2     | 4             | —                                  | —           | TS033Q7NEBA | —           | —           | 1.142                              | 3.465       | 7.087          |
| M3.3 x 3.5   | 4             | —                                  | —           | —           | —           | TS033T9NEBA | 1.181                              | 3.465       | 7.087          |
| M3.6 x 1     | 4             | TS036M5NEBA                        | —           | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M3.6 x 1.5   | 4             | —                                  | TS036O6NEBA | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M3.6 x 2     | 4             | —                                  | —           | TS036Q7NEBA | —           | —           | 1.142                              | 3.858       | 7.874          |
| M3.6 x 3     | 4             | —                                  | —           | —           | TS036S8NEBA | —           | 2.047                              | 3.858       | 7.874          |
| M3.6 x 4     | 4             | —                                  | —           | —           | —           | TS036U9NEBA | 2.047                              | 3.858       | 7.874          |
| M3.9 x 1     | 4             | TS039M5NEBA                        | —           | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M3.9 x 1.5   | 4             | —                                  | TS039O6NEBA | —           | —           | —           | 1.142                              | 3.858       | 7.874          |
| M3.9 x 2     | 4             | —                                  | —           | TS039Q7NEBA | —           | —           | 1.142                              | 3.858       | 7.874          |
| M3.9 x 3     | 4             | —                                  | —           | —           | TS039S8NEBA | —           | 2.047                              | 3.858       | 7.874          |

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Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             |             |             | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9          | D10         | D11         | Length of Thread (-Thread + Neck) | Neck Length | Length Overall |
| M39 x 4      | 4             | —                                  | —           | —           | —           | TS039U9NEBA | —           | —           | 2.047                             | 3.858       | 7.874          |
| M42 x 1      | 4             | TS042M5NEBA                        | —           | —           | —           | —           | —           | —           | 1.142                             | 3.858       | 7.874          |
| M42 x 1.5    | 4             | —                                  | TS042O6NEBA | —           | —           | —           | —           | —           | 1.142                             | 3.858       | 7.874          |
| M42 x 2      | 4             | —                                  | —           | TS042Q7NEBA | —           | —           | —           | —           | 1.142                             | 3.858       | 7.874          |
| M42 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS042VONEBA | —           | 2.323                             | 3.858       | 7.874          |
| M45 x 1      | 4             | TS045M5NEBA                        | —           | —           | —           | —           | —           | —           | 1.22                              | 4.252       | 8.661          |
| M45 x 1.5    | 4             | —                                  | TS045O6NEBA | —           | —           | —           | —           | —           | 1.22                              | 4.252       | 8.661          |
| M45 x 2      | 4             | —                                  | —           | TS045Q7NEBA | —           | —           | —           | —           | 1.22                              | 4.252       | 8.661          |
| M45 x 3      | 4             | —                                  | —           | —           | TS045S8NEBA | —           | —           | —           | 2.323                             | 4.252       | 8.661          |
| M45 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS045VONEBA | —           | 2.323                             | 4.252       | 8.661          |
| M48 x 1      | 4             | —                                  | TS048M6NEBA | —           | —           | —           | —           | —           | 1.22                              | 4.803       | 9.843          |
| M48 x 1.5    | 4             | —                                  | —           | TS048O7NEBA | —           | —           | —           | —           | 1.22                              | 4.803       | 9.843          |
| M48 x 2      | 4             | —                                  | —           | TS048Q7NEBA | —           | —           | —           | —           | 1.22                              | 4.803       | 9.843          |
| M48 x 3      | 4             | —                                  | —           | —           | —           | TS048S9NEBA | —           | —           | 2.559                             | 4.803       | 9.843          |
| M48 x 5      | 4             | —                                  | —           | —           | —           | —           | —           | TS048W-NEBA | 2.559                             | 4.803       | 9.843          |



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Bottoming Style (1.5 threads chamfered)  
DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |    | Dimensions     |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|----|----------------|------------------------------|----------------|
|              |               | D3                                 | D4          | D5          | D6          | D7 | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| M2 x 0.4     | 3             | TS2.0E3NEXA                        | —           | —           | —           | —  | .314           | .382                         | 1.772          |
| M2.2 x 0.45  | 3             | TS2.2F3NEXA                        | —           | —           | —           | —  | .314           | .382                         | 1.772          |
| M2.5 x 0.45  | 3             | TS2.5F3NEXA                        | —           | —           | —           | —  | .354           | .693                         | 2.205          |
| M2.6 x 0.45  | 3             | TS2.6F3NEXA                        | —           | —           | —           | —  | .354           | .693                         | 2.205          |
| M3 x 0.5     | 3             | TS3.0G3NEXA                        | —           | —           | —           | —  | .433           | .768                         | 2.205          |
| M3.5 x 0.6   | 3             | —                                  | TS3.5H4NEXA | —           | —           | —  | .433           | .787                         | 2.205          |
| M4 x 0.7     | 4             | —                                  | TS4.0I4NEXA | —           | —           | —  | .512           | .827                         | 2.48           |
| M5 x 0.8     | 4             | —                                  | TS5.0K4NEXA | —           | —           | —  | .591           | .984                         | 3.15           |
| M6 x 1       | 4             | —                                  | —           | TS6.0M5NEXA | —           | —  | .591           | 1.181                        | 3.15           |
| M7 x 0.75    | 4             | —                                  | TS7.0J4NEXA | —           | —           | —  | .748           | 1.315                        | 3.543          |
| M7 x 0.5     | 4             | —                                  | TS7.0G4NEXA | —           | —           | —  | .394           | 1.315                        | 3.543          |
| M7 x 1       | 4             | —                                  | —           | TS7.0M5NEXA | —           | —  | .748           | 1.315                        | 3.543          |
| M8 x 0.75    | 4             | —                                  | TS8.0J4NEXA | —           | —           | —  | .394           | 1.382                        | 3.543          |
| M8 x 0.5     | 4             | —                                  | TS8.0G4NEXA | —           | —           | —  | .394           | 1.382                        | 3.543          |
| M8 x 1       | 4             | —                                  | —           | TS8.0M5NEXA | —           | —  | .748           | 1.382                        | 3.543          |
| M8 x 1.25    | 4             | —                                  | —           | TS8.0N5NEXA | —           | —  | .748           | 1.382                        | 3.543          |
| M9 x 1       | 4             | —                                  | —           | TS9.0M5NEXA | —           | —  | .748           | 1.382                        | 3.543          |
| M9 x 1.25    | 4             | —                                  | —           | TS9.0N5NEXA | —           | —  | .748           | 1.382                        | 3.543          |
| M10 X 0.75   | 4             | —                                  | TS010J4NEXA | —           | —           | —  | .512           | 1.929                        | 3.937          |
| M10 x 1      | 4             | —                                  | —           | TS010M5NEXA | —           | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.25   | 4             | —                                  | —           | TS010N5NEXA | —           | —  | .906           | 1.929                        | 3.937          |
| M10 x 1.5    | 4             | —                                  | —           | —           | TS010O6NEXA | —  | .906           | 1.929                        | 3.937          |
| M11 x 1.5    | 4             | —                                  | —           | —           | TS011O6NEXA | —  | .906           | 1.929                        | 3.937          |
| M12 x 1      | 4             | —                                  | —           | TS012M5NEXA | —           | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.25   | 4             | —                                  | —           | —           | TS012N6NEXA | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.5    | 4             | —                                  | —           | —           | TS012O6NEXA | —  | 1.024          | 2.126                        | 4.331          |
| M12 x 1.75   | 4             | —                                  | —           | —           | TS012P6NEXA | —  | 1.024          | 2.126                        | 4.331          |

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| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |    | Dimensions                        |             |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|----|-----------------------------------|-------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9 | Length of Thread (=Thread + Neck) | Neck Length | Length Overall |
| M14 x 1      | 4             | TS014M5NEXA                        | —           | —           | —           | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 1.25   | 4             | —                                  | TS014N6NEXA | —           | —           | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 1.5    | 4             | —                                  | TS014O6NEXA | —           | —           | —  | 1.024                             | 2.126       | 4.331          |
| M14 x 2      | 4             | —                                  | —           | TS014Q7NEXA | —           | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 1      | 4             | TS016M5NEXA                        | —           | —           | —           | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 1.5    | 4             | —                                  | TS016O6NEXA | —           | —           | —  | 1.024                             | 2.126       | 4.331          |
| M16 x 2      | 4             | —                                  | —           | TS016Q7NEXA | —           | —  | 1.024                             | 2.126       | 4.331          |
| M18 x 1      | 4             | TS018M5NEXA                        | —           | —           | —           | —  | .945                              | 2.402       | 4.921          |
| M18 x 1.5    | 4             | —                                  | TS018O6NEXA | —           | —           | —  | .945                              | 2.402       | 4.921          |
| M18 x 2      | 4             | —                                  | —           | TS018Q7NEXA | —           | —  | 1.299                             | 2.402       | 4.921          |
| M18 x 2.5    | 4             | —                                  | —           | TS018R7NEXA | —           | —  | 1.299                             | 2.402       | 4.921          |
| M20 x 1      | 4             | TS020M5NEXA                        | —           | —           | —           | —  | .945                              | 2.717       | 5.512          |
| M20 x 1.5    | 4             | —                                  | TS020O6NEXA | —           | —           | —  | .945                              | 2.717       | 5.512          |
| M20 x 2      | 4             | —                                  | —           | TS020Q7NEXA | —           | —  | 1.299                             | 2.717       | 5.512          |
| M20 x 2.5    | 4             | —                                  | —           | TS020R7NEXA | —           | —  | 1.299                             | 2.717       | 5.512          |
| M22 x 1      | 4             | TS022M5NEXA                        | —           | —           | —           | —  | .945                              | 2.717       | 5.512          |
| M22 x 1.5    | 4             | —                                  | TS022O6NEXA | —           | —           | —  | .945                              | 2.717       | 5.512          |
| M22 x 2      | 4             | —                                  | —           | TS022Q7NEXA | —           | —  | 1.299                             | 2.717       | 5.512          |
| M22 x 2.5    | 4             | —                                  | —           | TS022R7NEXA | —           | —  | 1.299                             | 2.717       | 5.512          |
| M24 x 1      | 4             | TS024M5NEXA                        | —           | —           | —           | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 1.5    | 4             | —                                  | TS024O6NEXA | —           | —           | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 2      | 4             | —                                  | —           | TS024Q7NEXA | —           | —  | 1.063                             | 3.071       | 6.299          |
| M24 x 3      | 4             | —                                  | —           | —           | TS024S8NEXA | —  | 1.457                             | 3.071       | 6.299          |
| M25 x 1.5    | 4             | —                                  | TS025O6NEXA | —           | —           | —  | 1.063                             | 3.071       | 6.299          |
| M26 x 1.5    | 4             | —                                  | TS026O6NEXA | —           | —           | —  | 1.063                             | 3.465       | 7.087          |
| M27 x 1      | 4             | TS027M5NEXA                        | —           | —           | —           | —  | 1.063                             | 3.465       | 7.087          |

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# Z-PRO

For Tapping Steels, Irons, Brass and Plastics

Z-PRO HT are manufactured from YMW's own high speed for maximum toughness and wear life.

Z-PRO HT are the most popular style of general purpose taps for tapping under power or by hand.

**Economical High Performance  
Hand Taps**  
For Metric Threads

## Z-PRO HT-OX



Z-PRO HT have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

Bottoming Style (1.5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal<br>Size | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             | Dimensions          |                                 |                   |
|-----------------|------------------|------------------------------------|-------------|-------------|-------------|-------------|---------------------|---------------------------------|-------------------|
|                 |                  | D5                                 | D6          | D7          | D8          | D9          | Length<br>of Thread | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| M2 7x1.5        | 4                | —                                  | TS027O6NEXA | —           | —           | —           | 1.063               | 3.465                           | 7.087             |
| M27x2           | 4                | —                                  | —           | TS027Q7NEXA | —           | —           | 1.063               | 3.465                           | 7.087             |
| M27x3           | 4                | —                                  | —           | —           | TS027S8NEXA | —           | 1.732               | 3.465                           | 7.087             |
| M28x1           | 4                | TS028M5NEXA                        | —           | —           | —           | —           | 1.063               | 3.465                           | 7.087             |
| M28x1.5         | 4                | —                                  | TS028O6NEXA | —           | —           | —           | 1.063               | 3.465                           | 7.087             |
| M28x2           | 4                | —                                  | —           | TS028Q7NEXA | —           | —           | 1.063               | 3.465                           | 7.087             |
| M30x1           | 4                | TS030M5NEXA                        | —           | —           | —           | —           | 1.063               | 3.465                           | 7.087             |
| M30x1.5         | 4                | —                                  | TS030O6NEXA | —           | —           | —           | 1.063               | 3.465                           | 7.087             |
| M30x2           | 4                | —                                  | —           | TS030Q7NEXA | —           | —           | 1.063               | 3.465                           | 7.087             |
| M30x3.5         | 4                | —                                  | —           | —           | —           | TS030T9NEXA | 1.732               | 3.465                           | 7.087             |
| M32x1           | 4                | TS032M5NEXA                        | —           | —           | —           | —           | 1.063               | 3.465                           | 7.087             |
| M32x1.5         | 4                | —                                  | TS032O6NEXA | —           | —           | —           | 1.063               | 3.465                           | 7.087             |
| M32x2           | 4                | —                                  | —           | TS032Q7NEXA | —           | —           | 1.063               | 3.465                           | 7.087             |
| M33x1           | 4                | TS033M5NEXA                        | —           | —           | —           | —           | 1.142               | 3.465                           | 7.087             |
| M33x1.5         | 4                | —                                  | TS033O6NEXA | —           | —           | —           | 1.142               | 3.465                           | 7.087             |
| M33x2           | 4                | —                                  | —           | TS033Q7NEXA | —           | —           | 1.142               | 3.465                           | 7.087             |
| M33x3.5         | 4                | —                                  | —           | —           | —           | TS033T9NEXA | 1.181               | 3.465                           | 7.087             |
| M36x1           | 4                | TS036M5NEXA                        | —           | —           | —           | —           | 1.142               | 3.858                           | 7.874             |
| M36x1.5         | 4                | —                                  | TS036O6NEXA | —           | —           | —           | 1.142               | 3.858                           | 7.874             |
| M36x2           | 4                | —                                  | —           | TS036Q7NEXA | —           | —           | 1.142               | 3.858                           | 7.874             |
| M36x3           | 4                | —                                  | —           | —           | TS036S8NEXA | —           | 2.047               | 3.858                           | 7.874             |
| M36x4           | 4                | —                                  | —           | —           | —           | TS036U9NEXA | 2.047               | 3.858                           | 7.874             |
| M39x1           | 4                | TS039M5NEXA                        | —           | —           | —           | —           | 1.142               | 3.858                           | 7.874             |
| M39x1.5         | 4                | —                                  | TS039O6NEXA | —           | —           | —           | 1.142               | 3.858                           | 7.874             |
| M39x2           | 4                | —                                  | —           | TS039Q7NEXA | —           | —           | 1.142               | 3.858                           | 7.874             |
| M39x3           | 4                | —                                  | —           | —           | TS039S8NEXA | —           | 2.047               | 3.858                           | 7.874             |

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## Economical High Performance Hand Taps

For Metric Threads

## Z-PRO HT-OX



Z-PRO HT have an Oxide Surface Treatment

Custom Blend High Vanadium HSS

For Tapping Steels, Irons, Brass and Plastics

Z-PRO HT are manufactured from YMW own high speed for maximum toughness and wear life.

Z-PRO HT are the most popular style general purpose taps for tapping under power or by hand.

Bottoming Style (1.5 threads chamfered)

DIN lengths with ANSI dimensions.

Z-PRO Series HT

Metric Sizes

| Nominal Size | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             |             |             |             | Dimensions       |                              |                |
|--------------|---------------|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------------|------------------------------|----------------|
|              |               | D5                                 | D6          | D7          | D8          | D9          | D10         | D11         | Length of Thread | Neck Length (=Thread + Neck) | Length Overall |
| M39 x 4      | 4             | —                                  | —           | —           | —           | TS039U9NEXA | —           | —           | 2.047            | 3.858                        | 7.874          |
| M42 x 1      | 4             | TS042M5NEXA                        | —           | —           | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 1.5    | 4             | —                                  | TS042O6NEXA | —           | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 2      | 4             | —                                  | —           | TS042Q7NEXA | —           | —           | —           | —           | 1.142            | 3.858                        | 7.874          |
| M42 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS042VONEXA | —           | 2.323            | 3.858                        | 7.874          |
| M45 x 1      | 4             | TS045M5NEXA                        | —           | —           | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 1.5    | 4             | —                                  | TS045O6NEXA | —           | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 2      | 4             | —                                  | —           | TS045Q7NEXA | —           | —           | —           | —           | 1.22             | 4.252                        | 8.661          |
| M45 x 3      | 4             | —                                  | —           | —           | TS045S8NEXA | —           | —           | —           | 2.323            | 4.252                        | 8.661          |
| M45 x 4.5    | 4             | —                                  | —           | —           | —           | —           | TS045VONEXA | —           | 2.323            | 4.252                        | 8.661          |
| M48 x 1      | 4             | —                                  | TS048M6NEXA | —           | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 1.5    | 4             | —                                  | —           | TS048O7NEXA | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 2      | 4             | —                                  | —           | TS048Q7NEXA | —           | —           | —           | —           | 1.22             | 4.803                        | 9.843          |
| M48 x 3      | 4             | —                                  | —           | —           | —           | TS048S9NEXA | —           | —           | 2.559            | 4.803                        | 9.843          |
| M48 x 5      | 4             | —                                  | —           | —           | —           | —           | —           | TS048W-NEXA | 2.559            | 4.803                        | 9.843          |



# Z-PRO

The Z-PRO Series taps are designed for general purpose usage in small and large batch quantity jobs that require the most economical tool life. These taps are designed to thread steels and ferrous materials that produce stringy chips. They are also ideal for brass, plastics in through hole applications.

**Economical High Performance Taps**  
For Unified Threads

## STI-PO



\*Z-PRO STI-PO have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

### Z-PRO Series STI-PO

| Nominal Size | NC | NF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            | Dimensions     |                              |                |
|--------------|----|----|---------------|------------------------------------|------------|------------|------------|----------------|------------------------------|----------------|
|              |    |    |               | H1                                 | H2         | H3         | H4         | Length of Neck | Neck Length (=Thread + Neck) | Length Overall |
| 2            | —  | 56 | 2             | PUUN2E1NEB                         | PUUN2E2NEB | —          | —          | .354           | .709                         | 2.205          |
| 4            | 40 | —  | 2             | PUUN4H2NEB                         | PUUN4H2NEB | —          | —          | .512           | .827                         | 2.480          |
| 6            | 32 | —  | 2             | PUUN6J1NEB                         | PUUN6J2NEB | —          | —          | .551           | .945                         | 2.756          |
| 8            | 32 | —  | 2             | PUUN8J1NEB                         | PUUN8J2NEB | —          | —          | .591           | .984                         | 3.150          |
| 10           | 24 | —  | 3             | —                                  | PUUNAM2NEB | PUUNAM3NEB | —          | .591           | 1.181                        | 3.150          |
| 10           | —  | 32 | 3             | —                                  | PUUNAJ2NEB | PUUNAJ3NEB | —          | .591           | 1.181                        | 3.150          |
| 1/4          | 20 | —  | 3             | —                                  | PUU04N2NEB | PUU04N3NEB | —          | .748           | 1.378                        | 3.543          |
| 1/4          | —  | 28 | 3             | —                                  | PUU04K2NEB | PUU04K3NEB | —          | .748           | 1.378                        | 3.543          |
| 5/16         | 18 | —  | 3             | —                                  | PUU05O2NEB | PUU05O3NEB | —          | .906           | 1.535                        | 3.937          |
| 5/16         | —  | 24 | 3             | —                                  | PUU05M2NEB | PUU05M3NEB | —          | .906           | 1.535                        | 3.937          |
| 3/8          | 16 | —  | 3             | —                                  | —          | PUU06P3NEB | PUU06P4NEB | 1.024          | —                            | 4.331          |
| 3/8          | —  | 24 | 3             | —                                  | PUU06M2NEB | PUU06M3NEB | —          | .906           | —                            | 3.937          |
| 7/16         | 14 | —  | 3             | —                                  | —          | PUU07Q3NEB | PUU07Q4NEB | 1.024          | —                            | 4.331          |
| 7/16         | —  | 20 | 3             | —                                  | —          | PUU07N3NEB | PUU07N4NEB | 1.024          | —                            | 4.331          |
| 1/2          | 13 | —  | 3             | —                                  | —          | PUU08R3NEB | PUU08R4NEB | 1.024          | —                            | 4.331          |
| 1/2          | —  | 20 | 3             | —                                  | —          | PUU08N3NEB | PUU08N4NEB | 1.024          | —                            | 4.331          |

## Economical High Performance Taps

For Unified Threads

### STI-SP



\*Z-PRO STI-SP have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

The Z-PRO Series taps are designed for general purpose usage in small and large batch quantity jobs that require the most economical tool life. These taps are designed to thread steels and ferrous materials that produce stringy chips. They are also ideal for brass, plastics in blind hole applications.

Bottoming Style (2 threads chamfered)  
DIN lengths with ANSI shank dimensions.

#### Z-PRO Series STI-SP

| Nominal<br>Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |            |            |    | Dimensions        |                                 |                   |
|-----------------|-----------|-----------|------------------|------------------------------------|------------|------------|----|-------------------|---------------------------------|-------------------|
|                 |           |           |                  | H1                                 | H2         | H3         | H4 | Length<br>of Neck | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| 2               | —         | 56        | 2                | SUUN2E1NEB                         | SUUN2E2NEB | —          | —  | .354              | .709                            | 2.205             |
| 4               | 40        | —         | 2                | SUUN4H2NEB                         | SUUN4H2NEB | —          | —  | .512              | .827                            | 2.248             |
| 6               | 32        | —         | 2                | SUUN6J1NEB                         | SUUN6J2NEB | —          | —  | .551              | .945                            | 2.756             |
| 8               | 32        | —         | 2                | SUUN8J1NEB                         | SUUN8J2NEB | —          | —  | .591              | .984                            | 3.150             |
| 10              | 24        | —         | 3                | —                                  | SUUNAM2NEB | SUUNAM3NEB | —  | .591              | 1.181                           | 3.150             |
| 10              | —         | 32        | 3                | —                                  | SUUNAJ2NEB | SUUNAJ3NEB | —  | .591              | 1.181                           | 3.150             |
| 1/4             | 20        | —         | 3                | —                                  | SUU04N2NEB | SUU04N3NEB | —  | .748              | 1.378                           | 3.543             |
| 1/4             | —         | 28        | 3                | —                                  | SUU04K2NEB | SUU04K3NEB | —  | .748              | 1.378                           | 3.543             |
| 5/16            | 18        | —         | 3                | —                                  | SUU05O2NEB | SUU05O3NEB | —  | .906              | 1.535                           | 3.937             |
| 5/16            | —         | 24        | 3                | —                                  | SUU05M2NEB | SUU05M3NEB | —  | .906              | 1.535                           | 3.937             |
| 3/8             | 16        | —         | 3                | —                                  | SUU06P3NEB | SUU06P3NEB | —  | 1.024             | —                               | 4.331             |
| 3/8             | —         | 24        | 3                | —                                  | SUU06M2NEB | SUU06M3NEB | —  | .906              | —                               | 3.937             |
| 7/16            | 14        | —         | 3                | —                                  | SUU07Q3NEB | SUU07Q4NEB | —  | 1.024             | —                               | 4.331             |
| 7/16            | —         | 20        | 3                | —                                  | SUU07N3NEB | SUU07N3NEB | —  | 1.024             | —                               | 4.331             |
| 1/2             | 13        | —         | 3                | —                                  | SUU08R3NEB | SUU08R3NEB | —  | 1.024             | —                               | 4.331             |
| 1/2             | —         | 20        | 3                | —                                  | SUU08N3NEB | SUU08N3NEB | —  | 1.024             | —                               | 4.331             |



# Z-PRO

YMW U.S.A.

The Z-PRO Series taps are designed for general purpose usage in small and large batch quantity jobs that require the most economical tool life. These taps are designed to thread steels and ferrous materials that produce stringy chips. They are also ideal for brass, plastics in through hole applications.

Economical High Performance Taps  
For Unified Threads

STI-PO-OX



\*Z-PRO STI-PO-OX have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

## Z-PRO Series STI-PO

| Nominal<br>Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |            |            |            | Dimensions        |                                 |                   |
|-----------------|-----------|-----------|------------------|------------------------------------|------------|------------|------------|-------------------|---------------------------------|-------------------|
|                 |           |           |                  | H1                                 | H2         | H3         | H4         | Length<br>of Neck | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| 2               | —         | 56        | 2                | —                                  | PUUN2E2NEX | —          | —          | .354              | .709                            | 2.205             |
| 4               | 40        | —         | 2                | —                                  | PUUN4H2NEX | —          | —          | .512              | .827                            | 2.480             |
| 6               | 32        | —         | 2                | —                                  | PUUN6J2NEX | —          | —          | .551              | .945                            | 2.756             |
| 8               | 32        | —         | 2                | —                                  | PUUN8J2NEX | —          | —          | .591              | .984                            | 3.150             |
| 10              | 24        | —         | 3                | —                                  | —          | PUUNAM3NEX | —          | .591              | 1.181                           | 3.150             |
| 10              | —         | 32        | 3                | —                                  | PUUNAJ2NEX | PUUNAJ3NEX | —          | .591              | 1.181                           | 3.150             |
| 1/4             | 20        | —         | 3                | —                                  | —          | PUU04N3NEX | —          | .748              | 1.378                           | 3.543             |
| 1/4             | —         | 28        | 3                | —                                  | —          | PUU04K3NEX | —          | .748              | 1.378                           | 3.543             |
| 5/16            | 18        | —         | 3                | —                                  | —          | PUU05O3NEX | —          | .906              | 1.535                           | 3.937             |
| 5/16            | —         | 24        | 3                | —                                  | —          | PUU05M3NEX | —          | .906              | 1.535                           | 3.937             |
| 3/8             | 16        | —         | 3                | —                                  | —          | —          | PUU06P4NEX | 1.024             | —                               | 4.331             |
| 3/8             | —         | 24        | 3                | —                                  | —          | PUU06M3NEX | —          | .906              | —                               | 3.937             |
| 7/16            | 14        | —         | 3                | —                                  | —          | —          | PUU07Q4NEX | 1.024             | —                               | 4.331             |
| 7/16            | —         | 20        | 3                | —                                  | —          | —          | PUU07N4NEX | 1.024             | —                               | 4.331             |
| 1/2             | 13        | —         | 3                | —                                  | —          | —          | PUU08R4NEX | 1.024             | —                               | 4.331             |
| 1/2             | —         | 20        | 3                | —                                  | —          | —          | PUU08N4NEX | 1.024             | —                               | 4.331             |



## Economical High Performance Taps

For Unified Threads

### STI-SP-OX



\*Z-PRO STI-SP-OX have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

The Z-PRO Series taps are designed for general purpose usage in small and large batch quantity jobs that require the most economical tool life. These taps are designed to thread steels and ferrous materials that produce stringy chips. They are also ideal for brass, plastics in blind hole applications.

Bottoming Style (2 threads chamfered)  
DIN lengths with ANSI shank dimensions.

#### Z-PRO Series STI-SP

| Nominal<br>Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |            |            |    | Dimensions        |                                 |                   |
|-----------------|-----------|-----------|------------------|------------------------------------|------------|------------|----|-------------------|---------------------------------|-------------------|
|                 |           |           |                  | H1                                 | H2         | H3         | H4 | Length<br>of Neck | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| 2               | —         | 56        | 2                | —                                  | SUUN2E2NEX | —          | —  | .354              | .709                            | 2.205             |
| 4               | 40        | —         | 2                | —                                  | SUUN4H2NEX | —          | —  | .512              | .827                            | 2.248             |
| 6               | 32        | —         | 2                | —                                  | SUUN6J2NEX | —          | —  | .551              | .945                            | 2.756             |
| 8               | 32        | —         | 2                | —                                  | SUUN8J2NEX | —          | —  | .591              | .984                            | 3.150             |
| 10              | 24        | —         | 3                | —                                  | —          | SUUNAM3NEX | —  | .591              | 1.181                           | 3.150             |
| 10              | —         | 32        | 3                | —                                  | —          | SUUNAJ3NEX | —  | .591              | 1.181                           | 3.150             |
| 1/4             | 20        | —         | 3                | —                                  | —          | SUU04N3NEX | —  | .748              | 1.378                           | 3.543             |
| 1/4             | —         | 28        | 3                | —                                  | —          | SUU04K3NEX | —  | .748              | 1.378                           | 3.543             |
| 5/16            | 18        | —         | 3                | —                                  | —          | SUU05O3NEX | —  | .906              | 1.535                           | 3.937             |
| 5/16            | —         | 24        | 3                | —                                  | —          | SUU05M3NEX | —  | .906              | 1.535                           | 3.937             |
| 3/8             | 16        | —         | 3                | —                                  | —          | SUU06P3NEX | —  | 1.024             | —                               | 4.331             |
| 3/8             | —         | 24        | 3                | —                                  | —          | SUU06M3NEX | —  | .906              | —                               | 3.937             |
| 7/16            | 14        | —         | 3                | —                                  | —          | SUU07Q3NEX | —  | 1.024             | —                               | 4.331             |
| 7/16            | —         | 20        | 3                | —                                  | —          | SUU07N3NEX | —  | 1.024             | —                               | 4.331             |
| 1/2             | 13        | —         | 3                | —                                  | —          | SUU08R3NEX | —  | 1.024             | —                               | 4.331             |
| 1/2             | —         | 20        | 3                | —                                  | —          | SUU08N3NEX | —  | 1.024             | —                               | 4.331             |



# Z-PRO

The Z-PRO STI HAND taps are designed for general purpose usage in small and large batch quantity jobs that require the most economical tool life. These taps are designed to thread steels and ferrous materials that produce stringy chips. They are also ideal for brass and plastics.

Z-PRO STI-HT taps are recommended for tapping through holes or blind bottoming holes where the hole depth is great enough to allow chip accumulation at bottom of the hole.

## Economical High Performance Taps

For Unified Threads

## STI-HT



\*Z-PRO STI-HT have a Bright Surface Finish

**\*AVAILABLE IN TIN AND TICN COATING ON REQUEST**

Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

### Z-PRO Series STI-HT

| Nominal NC<br>Size | UNC | NF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             | Dimensions        |                                 |                   |
|--------------------|-----|----|------------------|------------------------------------|-------------|-------------|-------------|-------------------|---------------------------------|-------------------|
|                    |     |    |                  | H1                                 | H2          | H3          | H4          | Length<br>of Neck | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| 2                  | —   | 56 | 3                | TUUN2E1NEB5                        | TUUN2E2NEB4 | —           | —           | .354              | .709                            | 2.205             |
| 4                  | 40  | —  | 3                | TUUN4H1NEB5                        | TUUN4H2NEB4 | —           | —           | .512              | .827                            | 2.480             |
| 6                  | 32  | —  | 3                | TUUN6J1NEB5                        | TUUN6J2NEB4 | —           | —           | .551              | .945                            | 2.756             |
| 8                  | 32  | —  | 3                | TUUN8J1NEB5                        | TUUN8J2NEB4 | —           | —           | .591              | .984                            | 3.150             |
| 10                 | 24  | —  | 3                | —                                  | TUUNAM2NEB5 | TUUNAM3NEB4 | —           | .591              | 1.181                           | 3.150             |
| 10                 | —   | 32 | 3                | —                                  | TUUNAJ2NEB5 | TUUNAJ3NEB4 | —           | .591              | 1.181                           | 3.150             |
| 1/4                | 20  | —  | 3                | —                                  | TUU04N2NEB5 | TUU04N3NEB4 | —           | .748              | 1.378                           | 3.543             |
| 1/4                | —   | 28 | 3                | —                                  | TUU04K2NEB5 | TUU04K3NEB4 | —           | .748              | 1.378                           | 3.543             |
| 5/16               | 18  | —  | 4                | —                                  | TUU05O2NEB5 | TUU05O3NEB4 | —           | .906              | 1.535                           | 3.937             |
| 5/16               | —   | 24 | 4                | —                                  | TUU05M2NEB5 | TUU05M3NEB4 | —           | .906              | 1.535                           | 3.937             |
| 3/8                | 16  | —  | 4                | —                                  | —           | TUU06P4NEB5 | TUU06P4NEB4 | 1.024             | —                               | 4.331             |
| 3/8                | —   | 24 | 4                | —                                  | TUU06M2NEB5 | TUU06M3NEB4 | —           | .906              | —                               | 3.937             |
| 7/16               | 14  | —  | 4                | —                                  | —           | TUU07Q3NEB5 | TUU07Q4NEB4 | 1.024             | —                               | 4.331             |
| 7/16               | —   | 20 | 4                | —                                  | —           | TUU07N3NEB5 | TUU07N4NEB4 | 1.024             | —                               | 4.331             |
| 1/2                | 13  | —  | 4                | —                                  | —           | TUU08R3NEB5 | TUU08R4NEB4 | 1.024             | —                               | 4.331             |
| 1/2                | —   | 20 | 4                | —                                  | —           | TUU08N3NEB5 | TUU08N4NEB4 | 1.024             | —                               | 4.331             |

CONTINUED ON NEXT PAGE

## Economical High Performance Taps

For Unified Threads

## STI-HT



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Custom Blend High Vanadium HSS

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Bottoming Style (1.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

## Z-PRO Series STI-HT

| Nominal Size | NC UNC | NF UNF | No. of Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             | Dimensions     |                               |                |
|--------------|--------|--------|---------------|------------------------------------|-------------|-------------|-------------|----------------|-------------------------------|----------------|
|              |        |        |               | H1                                 | H2          | H3          | H4          | Length of Neck | Neck Length (= Thread + Neck) | Length Overall |
| 2            | —      | 56     | 3             | TUUN2E1NEBA                        | TUUN2E2NEBA | —           | —           | .354           | .709                          | 2.205          |
| 4            | 40     | —      | 3             | TUUN4H1NEBA                        | TUUN4H2NEBA | —           | —           | .512           | .827                          | 2.248          |
| 6            | 32     | —      | 3             | TUUN6J1NEBA                        | TUUN6J2NEBA | —           | —           | .551           | .945                          | 2.756          |
| 8            | 32     | —      | 3             | TUUN8J1NEBA                        | TUUN8J2NEBA | —           | —           | .591           | .984                          | 3.150          |
| 10           | 24     | —      | 3             | —                                  | TUUNAM2NEBA | TUUNAM3NEBA | —           | .591           | 1.181                         | 3.150          |
| 10           | —      | 32     | 3             | —                                  | TUUNAJ2NEBA | TUUNAJ3NEBA | —           | .591           | 1.181                         | 3.150          |
| 1/4          | 20     | —      | 3             | —                                  | TUU04N2NEBA | TUU04N3NEBA | —           | .748           | 1.378                         | 3.543          |
| 1/4          | —      | 28     | 3             | —                                  | TUU04K2NEBA | TUU04K3NEBA | —           | .748           | 1.378                         | 3.543          |
| 5/16         | 18     | —      | 4             | —                                  | TUU05O2NEBA | TUU05O3NEBA | —           | .906           | 1.535                         | 3.937          |
| 5/16         | —      | 24     | 4             | —                                  | TUU05M2NEBA | TUU05M3NEBA | —           | .906           | 1.535                         | 3.937          |
| 3/8          | 16     | —      | 4             | —                                  | —           | TUU06P3NEBA | TUU06P4NEBA | 1.024          | —                             | 4.331          |
| 3/8          | —      | 24     | 4             | —                                  | TUU06M2NEBA | TUU06M3NEBA | —           | .906           | —                             | 3.937          |
| 7/16         | 14     | —      | 4             | —                                  | —           | TUU07Q3NEBA | TUU07Q4NEBA | 1.024          | —                             | 4.331          |
| 7/16         | —      | 20     | 4             | —                                  | —           | TUU07N3NEBA | TUU07N4NEBA | 1.024          | —                             | 4.331          |
| 1/2          | 13     | —      | 4             | —                                  | —           | TUU08R3NEBA | TUU08R4NEBA | 1.024          | —                             | 4.331          |
| 1/2          | —      | 20     | 4             | —                                  | —           | TUU08N3NEBA | TUU08N4NEBA | 1.024          | —                             | 4.331          |



# Z-PRO

The Z-PRO STI HAND taps are designed for general purpose usage in small and large batch quantity jobs that require the most economical tool life. These taps are designed to thread steels and ferrous materials that produce stringy chips. They are also ideal for brass and plastics.

Z-PRO STI-HT taps are recommended for tapping through holes or blind bottoming holes where the hole depth is great enough to allow chip accumulation at bottom of the hole.

## Economical High Performance Taps

For Unified Threads

## STI-HT-OX



\*Z-PRO STI-HT-OX have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

Plug Style (5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

### Z-PRO Series STI-HT

| Nominal<br>Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             | Dimensions        |                                 |                   |
|-----------------|-----------|-----------|------------------|------------------------------------|-------------|-------------|-------------|-------------------|---------------------------------|-------------------|
|                 |           |           |                  | H1                                 | H2          | H3          | H4          | Length<br>of Neck | Neck Length<br>(=Thread + Neck) | Length<br>Overall |
| 2               | —         | 56        | 3                | —                                  | TUUN2E2NEX5 | —           | —           | .354              | .709                            | 2.205             |
| 4               | 40        | —         | 3                | —                                  | TUUN4H2NEX5 | —           | —           | .512              | .827                            | 2.480             |
| 6               | 32        | —         | 3                | —                                  | TUUN6J2NEX5 | —           | —           | .551              | .945                            | 2.756             |
| 8               | 32        | —         | 3                | —                                  | TUUN8J2NEX5 | —           | —           | .591              | .984                            | 3.150             |
| 10              | 24        | —         | 3                | —                                  | —           | TUUNAM3NEX5 | —           | .591              | 1.181                           | 3.150             |
| 10              | —         | 32        | 3                | —                                  | —           | TUUNAJ3NEX5 | —           | .591              | 1.181                           | 3.150             |
| 1/4             | 20        | —         | 3                | —                                  | —           | TUU04N3NEX5 | —           | .748              | 1.378                           | 3.543             |
| 1/4             | —         | 28        | 3                | —                                  | —           | TUU04K3NEX5 | —           | .748              | 1.378                           | 3.543             |
| 5/16            | 18        | —         | 4                | —                                  | —           | TUU05O3NEX5 | —           | .906              | 1.535                           | 3.937             |
| 5/16            | —         | 24        | 4                | —                                  | —           | TUU05M3NEX5 | —           | .906              | 1.535                           | 3.937             |
| 3/8             | 16        | —         | 4                | —                                  | —           | —           | TUU06P4NEX5 | 1.024             | —                               | 4.331             |
| 3/8             | —         | 24        | 4                | —                                  | —           | TUU06M3NEX5 | —           | .906              | —                               | 3.937             |
| 7/16            | 14        | —         | 4                | —                                  | —           | —           | TUU07Q4NEX5 | 1.024             | —                               | 4.331             |
| 7/16            | —         | 20        | 4                | —                                  | —           | —           | TUU07N4NEX5 | 1.024             | —                               | 4.331             |
| 1/2             | 13        | —         | 4                | —                                  | —           | —           | TUU08R4NEX5 | 1.024             | —                               | 4.331             |
| 1/2             | —         | 20        | 4                | —                                  | —           | —           | TUU08N4NEX5 | 1.024             | —                               | 4.331             |

## Economical High Performance Taps

For Unified Threads

## STI-HT-OX



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Custom Blend High Vanadium HSS

The Z-PRO STI HAND taps are designed for general purpose usage in small and large batch quantity jobs that require the most economical tool life. These taps are designed to thread steels and ferrous materials that produce stringy chips. They are also ideal for brass, plastics in through hole application.

Bottoming Style (1.5 threads chamfered)  
DIN lengths with ANSI shank dimensions.

## Z-PRO Series STI-HT

| Nominal<br>Size | NC<br>UNC | NF<br>UNF | No. of<br>Flutes | Pitch Diameter Limit / EDP Numbers |             |             |             | Dimensions        |                                  |                   |
|-----------------|-----------|-----------|------------------|------------------------------------|-------------|-------------|-------------|-------------------|----------------------------------|-------------------|
|                 |           |           |                  | H1                                 | H2          | H3          | H4          | Length<br>of Neck | Neck Length<br>(= Thread + Neck) | Length<br>Overall |
| 2               | —         | 56        | 3                | —                                  | TUUN2E2NEXA | —           | —           | .354              | .709                             | 2.205             |
| 4               | 40        | —         | 3                | —                                  | TUUN4H2NEXA | —           | —           | .512              | .827                             | 2.248             |
| 6               | 32        | —         | 3                | —                                  | TUUN6J2NEXA | —           | —           | .551              | .945                             | 2.756             |
| 8               | 32        | —         | 3                | —                                  | TUUN8J2NEXA | —           | —           | .591              | .984                             | 3.150             |
| 10              | 24        | —         | 3                | —                                  | —           | TUUNAM3NEXA | —           | .591              | 1.181                            | 3.150             |
| 10              | —         | 32        | 3                | —                                  | —           | TUUNAJ3NEXA | —           | .591              | 1.181                            | 3.150             |
| 1/4             | 20        | —         | 3                | —                                  | —           | TUU04N3NEXA | —           | .748              | 1.378                            | 3.543             |
| 1/4             | —         | 28        | 3                | —                                  | —           | TUU04K3NEXA | —           | .748              | 1.378                            | 3.543             |
| 5/16            | 18        | —         | 4                | —                                  | —           | TUU05O3NEXA | —           | .906              | 1.535                            | 3.937             |
| 5/16            | —         | 24        | 4                | —                                  | —           | TUU05M3NEXA | —           | .906              | 1.535                            | 3.937             |
| 3/8             | 16        | —         | 4                | —                                  | —           | —           | TUU06P4NEXA | 1.024             | —                                | 4.331             |
| 3/8             | —         | 24        | 4                | —                                  | —           | TUU06M3NEXA | —           | .906              | —                                | 3.937             |
| 7/16            | 14        | —         | 4                | —                                  | —           | —           | TUU07Q4NEXA | 1.024             | —                                | 4.331             |
| 7/16            | —         | 20        | 4                | —                                  | —           | —           | TUU07N4NEXA | 1.024             | —                                | 4.331             |
| 1/2             | 13        | —         | 4                | —                                  | —           | —           | TUU08R4NEXA | 1.024             | —                                | 4.331             |
| 1/2             | —         | 20        | 4                | —                                  | —           | —           | TUU08N4NEXA | 1.024             | —                                | 4.331             |

**SP**

For Vertical use

**LO-SP**

For Horizontal use

**SP/LO-SP**

Spiral Fluted Taps for Alloy Steels



## Feature of products

Spiral Fluted Taps for Alloy Steels

# SP/LO-SP 1"-8UNC~1 1/2-8UNC

SP for Vertical use

HSS

OX



LO-SP for Horizontal use

HSS

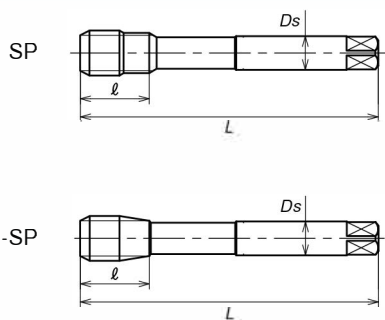
OX



### ■ Features

- Recommended for tapping alloy steels and high carbon steels
- Custom blended vanadium High Speed Steel with high wear resistance
- Ideal flute design for larger thread sizes produces smooth chip ejection and improved tool life
- DIN overall length/ANSI shank diameter creates smooth chip ejection and better application of coolant for more stable tapping
- Rear section of the thread part is specially ground off in order to improve the chip ejection and reduce friction resistance during tapping which lead to lower tapping torque, more accurate internal threads with better surface finish
- Recommendable tapping condition
  - Tapping speed : Up to 24SFM (~8m/min)
  - Coolant : Non soluble oil
  - Tapping length : Up to 2D

## Table of dimensions and sizes



| Size      | Class | Chamfer | L    | ℓ     | Ds    | Number of flutes | Code        |
|-----------|-------|---------|------|-------|-------|------------------|-------------|
| 1"-8UNC   | 2BX   | 2.5P    | 6.30 | 1.457 | 0.800 | 4                | SSU16XYEEXJ |
| 1 1/8-8UN | 2BX   | 2.5P    | 7.09 | 1.732 | 0.896 | 4                | SSU18XYEEXJ |
| 1 1/4-8UN | 2BX   | 2.5P    | 7.09 | 1.929 | 1.021 | 4                | SSU20XYEEXJ |
| 1 3/8-8UN | 2BX   | 2.5P    | 7.87 | 2.165 | 1.108 | 4                | SSU22XYEEXJ |
| 1 1/2-8UN | 2BX   | 2.5P    | 7.87 | 2.323 | 1.233 | 4                | SSU24XYEEXJ |

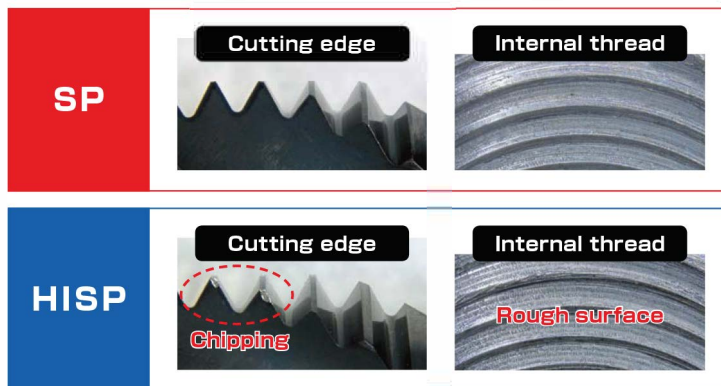
| Size      | Class | Chamfer | L    | ℓ     | Ds    | Number of flutes | Code         |
|-----------|-------|---------|------|-------|-------|------------------|--------------|
| 1"-8UNC   | 2BX   | 2.5P    | 6.30 | 1.457 | 0.800 | 4                | SSU16XYEEXHT |
| 1 1/8-8UN | 2BX   | 2.5P    | 7.09 | 1.732 | 0.896 | 4                | SSU18XYEEXHT |
| 1 1/4-8UN | 2BX   | 2.5P    | 7.09 | 1.929 | 1.021 | 4                | SSU20XYEEXHT |
| 1 3/8-8UN | 2BX   | 2.5P    | 7.87 | 2.165 | 1.108 | 4                | SSU22XYEEXHT |
| 1 1/2-8UN | 2BX   | 2.5P    | 7.87 | 2.323 | 1.233 | 4                | SSU24XYEEXHT |

## Tapping data

As a result of the taps' features shown above, the "SP" tap showed far better results for tapping into large diameter threads in alloy steel than a conventional "HISP" tap without causing damage to the cutting edge. The surface finish of internal thread produced by "SP" is excellent.

### Tapping condition

|                |                         |
|----------------|-------------------------|
| Tap size       | 1"-8UNC                 |
| Work material  | AISI 4140 (SCM440)      |
| Tapping speed  | 22.6 SFM (6.9 m/min)    |
| Hole shape     | Blind hole              |
| Hole diameter  | 0.878" (22.3 mm)        |
| Tapping length | 1.50" (38 mm)           |
| Machine        | Radial drilling machine |
| Coolant        | Non-soluble oil         |



### Warning

- ◆ Tools may shatter. Wear safety glass to avoid eye injury during tapping.
- ◆ Tools may be shatter. Use tools under the proper tapping condition.
- ◆ Never wear gloves during turning operations as the gloves may get caught with the tools.
- ◆ Wear safety shoes to avoid injury from falling tools.

- ◆ On attaching tools to the machine, fasten firmly to avoid chattering and runout. Fasten the workpieces firmly so there is no movement during operation. Never use worn tools or damaged tools with chipping.
- ◆ Take special care to avoid fire. High temperature during machining may cause fire.

Please note that specification may change without advance notice.

# YAMAWA Mfg. CO., Ltd.

Website : <http://www.yamawa.com>

Think threads with  
**YAMAWA**

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855-969-8721  
Fax 714-380-6324  
[www.ymw-tapsusa.com](http://www.ymw-tapsusa.com)





# Z-PRO

## SP Series Spiral Fluted Taps

For Unified Threads

### 8 Pitch Series SP-OX



\*SP-OX have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

Recommended for tapping alloy steels and high carbon steels. Ideal flute design for larger thread sizes produces smooth chip ejection and improved tool life. The rear section of the thread part is specially ground off in order to improve the chip ejection and reduce friction resistance during tapping which lead to lower tapping torque, more accurate internal threads with better surface finish.

Modified Bottoming (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions

SP Series

Machine Screw sizes  
Fractional sizes

| Nominal Size | Threads per Inch |        | No. of Flutes | EDP Numbers     | Dimensions       |                |
|--------------|------------------|--------|---------------|-----------------|------------------|----------------|
|              | NC UNC           | NF UNF |               | 2B CLASS OF FIT | Length of Thread | Length Overall |
| 1            | 8                | —      | 4             | SSU16XYEEXJ     | 1.457            | 6.30           |
| 1" 1/8       | 8                | —      | 4             | SSU18XYEEXJ     | 1.732            | 7.09           |
| 1" 1/4       | 8                | —      | 4             | SSU20XYEEXJ     | 1.929            | 7.09           |
| 1" 3/8       | 8                | —      | 4             | SSU22XYEEXJ     | 2.165            | 7.87           |
| 1" 1/2       | 8                | —      | 4             |                 |                  |                |

## LO-SP Spiral Fluted Taps

For Unified Threads

### 8 Pitch Series LO-SP-OX



\*LO-SP-OX have an Oxide Surface Treatment  
Custom Blend High Vanadium HSS

Bottoming (2.5 threads chamfered)  
DIN lengths with ANSI shank dimensions

LO-SP Series

Machine Screw sizes  
Fractional sizes

| Nominal Size | Threads per Inch |        | No. of Flutes | EDP Numbers     | Dimensions       |                |
|--------------|------------------|--------|---------------|-----------------|------------------|----------------|
|              | NC UNC           | NF UNF |               | 2B CLASS OF FIT | Length of Thread | Length Overall |
| 1            | 8                | —      | 4             | SSU16XYEEXHT    | 1.457            | 6.30           |
| 1" 1/8       | 8                | —      | 4             | SSU18XYEEXHT    | 1.732            | 7.09           |
| 1" 1/4       | 8                | —      | 4             | SSU20XYEEXHT    | 1.929            | 7.09           |
| 1" 3/8       | 8                | —      | 4             | SSU22XYEEXHT    | 2.165            | 7.87           |
| 1" 1/2       | 8                | —      | 4             | SSU24XYEEXHT    | 2.323            | 7.87           |

Diagram illustrating the geometry of a screw thread cross-section, showing the internal thread profile (top) and the external thread profile (bottom).

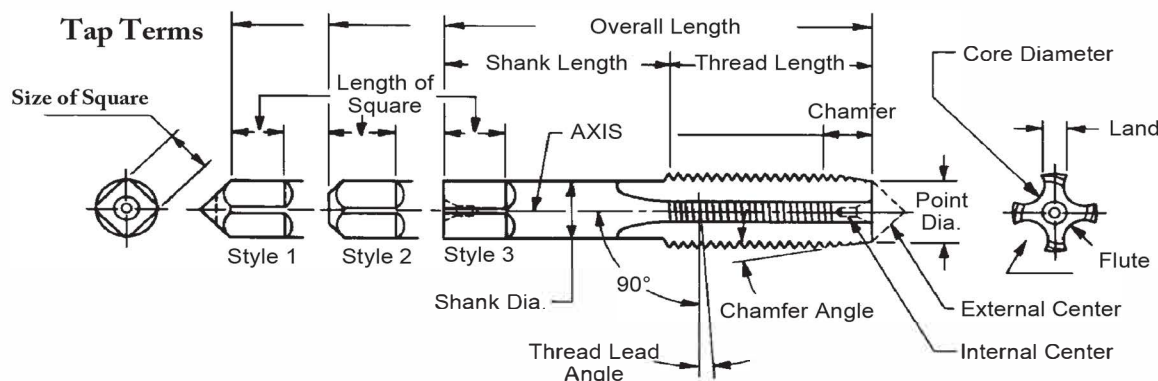
**Internal Thread Dimensions:**

- Internal Thread:** The upper profile.
- Major Diameter ( $D_{maj}$ ):** The outermost diameter of the internal thread.
- Pitch Diameter ( $D_p$ ):** The diameter at the pitch line.
- Minor Diameter ( $D_{min}$ ):** The innermost diameter of the internal thread.
- Thread Angle:**  $60^\circ$  (indicated for the internal thread).
- Flank Angle:**  $30^\circ$  (indicated for the internal thread).
- Pitch ( $P$ ):** The distance between corresponding points on adjacent threads.
- Lead Angle:**  $90^\circ$  (indicated for the internal thread).
- Internal Thread Profile:** The upper profile.
- Internal Thread Dimensions:**
  - $P/8$ : Addendum of the internal thread.
  - $H/8$ : Addendum of the internal thread.
  - $3H/8$ : Depth of the internal thread.
  - $5H/8$ : Depth of the internal thread.
  - $H/4$ : Depth of the internal thread.

**External Thread Dimensions:**

- External Thread:** The lower profile.
- Major Diameter ( $D_{maj}$ ):** The outermost diameter of the external thread.
- Pitch Diameter ( $D_p$ ):** The diameter at the pitch line.
- Minor Diameter ( $D_{min}$ ):** The innermost diameter of the external thread.
- Thread Angle:**  $60^\circ$  (indicated for the external thread).
- Flank Angle:**  $30^\circ$  (indicated for the external thread).
- Pitch ( $P$ ):** The distance between corresponding points on adjacent threads.
- Lead Angle:**  $90^\circ$  (indicated for the external thread).
- External Thread Profile:** The lower profile.
- External Thread Dimensions:**
  - $P/4$ : Addendum of the external thread.

**Axis of Screw Thread:** The central axis of the thread.



**ALLOWANCE.** An allowance is an intentional difference in correlated dimensions of mating parts. It is the minimum clearance (positive allowance) or maximum interference (negative allowance) between such parts.

**ANGLE OF THREAD.** The angle included between the flanks of the thread, measured in an axial plane.

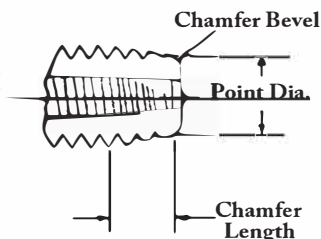
**AXIS.** The longitudinal central line through the screw or tap.

**BACK TAPER.** A slight axial relief on the thread of the tap which makes the pitch diameter of the thread near the shank somewhat smaller than that at the chamfered end. (See RELIEF)

**BASIC.** The theoretical or nominal standard size from which all variations are made. (See SIZE)

**CHAMFER.** The tapering of the end of the thread on a tap by cutting away and relieving the crest of the first few teeth to distribute the cutting action over several teeth. It also acts as a guide in starting the tap. When the tapering amounts to 7 to 10 threads, the tap is called a "taper" tap; 3 to 5 threads, a "plug" tap; and 1 to 2 threads chamfer, a "bottoming" tap.

## Chamfer Dimensions



**CORE DIAMETER.** The diameter of an imaginary cylinder tangent to the deepest part of the flute.

**CREST.** The top surface joining the two flanks of a thread. The crest of an external thread is at its major diameter, while the crest of an internal thread is at its minor diameter.

**CREST CLEARANCE.** The space between the crest of a thread and the root of its component.

**CUTTING EDGE.** The leading side of the land in the direction of rotation for cutting and which does the actual cutting.

**DEPTH OF THREAD.** The distance between the crest and the base of the thread, measured normal to the axis.

**DRYSEAL.** A pipe-threaded connection for both external and internal application designed for use where the assembled product must withstand high fluid or gas pressures without the use of a sealing compound, or where a sealer is functionally objectionable.

**FLANK.** The surface of the thread, sometimes referred to as side of thread, which connects the crest with the root.

**FLUTES.** The longitudinal channels formed in a tap to create cutting edges on the thread profile and to provide chip spaces and cutting-fluid passages.

**FLUTE LEAD.** The axial advance of a helical or spiral cutting edge in one turn around the tool axis.

**HEEL.** The face of the tap land trailing the cutting edge during forward rotation.

**HEIGHT OF THREAD.** The distance between the crest and the root of a thread measured normal to the axis.

**HELIX ANGLE—FLUTE.** Flutes of taps are sometimes cut helically instead of straight. This helix angle is the angle made by the flute with the axis of the tap. (Helical flutes are sometimes called spiral flutes.)

**HELIX ANGLE—THREAD.** The angle made by the helix of a thread at the pitch diameter with a plane perpendicular to the axis.

**HOOK.** The concave cutting face of a tap land between the crest and the root of thread.

**INTERRUPTED THREAD.** A tap having an odd number of lands, with every other tooth along the thread helix removed.

**LAND.** One of the threaded sections between the flutes on a tap.

**LEAD.** The distance a screw thread advances axially in one complete turn. On a single-lead screw or tap, the lead and the pitch are identical. On a double-lead screw or tap, the lead is twice the pitch, etc.

**LEAD ERROR.** The amount the actual lead of the screw thread differs from the specified lead.

**LEAD—DRUNKEN.** Irregular advance of the thread helix or lead. Usually called "drunken thread."

**LENGTH OF ENGAGEMENT.** The length of contact between two mating threaded parts measured axially.

**LIMITS.** The maximum and minimum sizes permissible for a specific dimension. (See ALLOWANCE AND TOLERANCE)

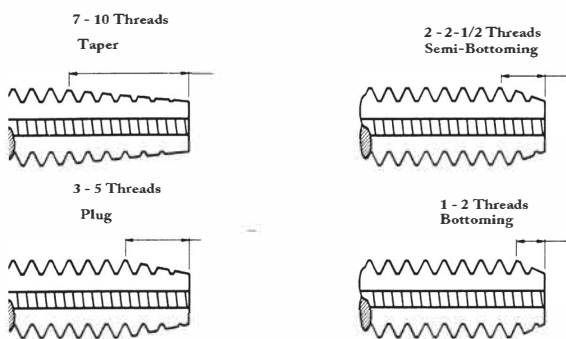
## TYPE OF TAPPED HOLES, TAP CHAMFERS AND TAP GEOMETRY

Tap taps have 7 to 10 threads chamfered and are designed for threading through holes.

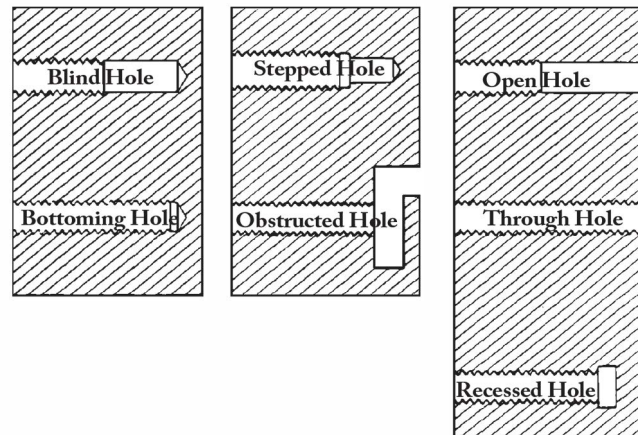
Plug taps have 3 to 5 threads chamfered and are most widely used in through holes and in blind holes that do not have to be threaded all the way to the bottom. Although most hand taps are available in taper, plug, and bottoming styles, some taps, such as pipe taps, are available only in the plug chamfer.

Semi-bottoming taps have 2 to 2-1/2 threads chamfered and are designed for both through and blind hole tapping.

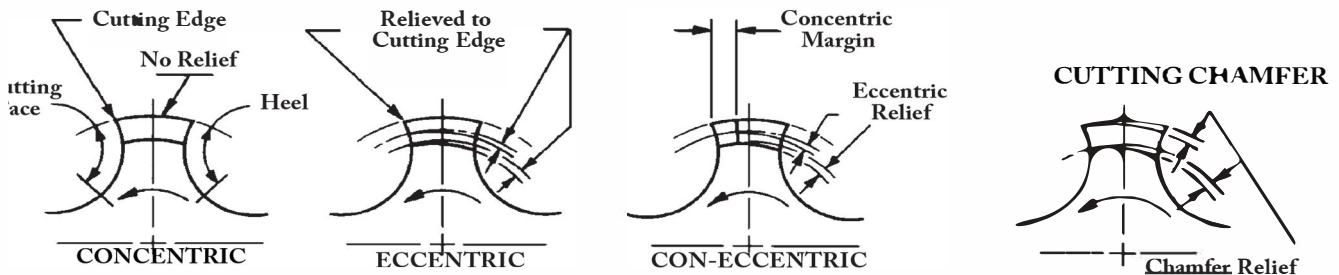
Bottoming taps have 1 to 2 threads chamfered, and are de-signed to thread blind holes close to the bottom.



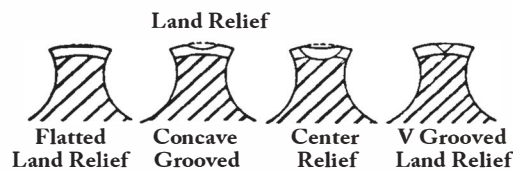
### Types of Tapped Holes



### Clearance Relief Styles



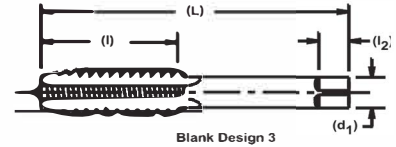
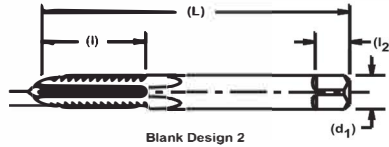
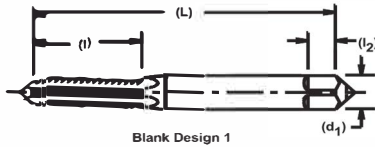
### ADDED RELIEF FOR DIFFICULT MATERIALS



# Z-PRO

YMW U.S.A.

Tap Dimensions Table 302 (\*USCTI)

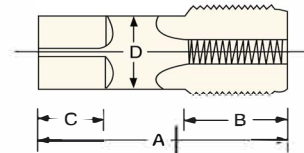


## General Tap Dimensions

| Nominal Diameter Range Inches<br>Over To (Incl) |       | Machine Screw Size No. | Nominal Fractional Diameter Inches | Nominal Metri Diameter Millimeters | Style Per Illustration Above | Overall Length L | Tap Dimensions — Inches |                  |                   |                  |
|-------------------------------------------------|-------|------------------------|------------------------------------|------------------------------------|------------------------------|------------------|-------------------------|------------------|-------------------|------------------|
|                                                 |       |                        |                                    |                                    |                              |                  | Thread Length l1        | Square Length l2 | Shank Diameter d1 | Size of Square a |
| .052                                            | .065  | 0 (.0600)              |                                    | M 1.6 (.0630)                      | 1                            | 1.63             | .31                     | .19              | .1410             | .110             |
| .065                                            | .078  | 1 (.0730)              |                                    | M1.8 (.0709)                       | 1                            | 1.69             | .38                     | .19              | .1410             | .110             |
| .078                                            | .091  | 2 (.0860)              |                                    | M2 (.0787), M2.2 (.0866)           | 1                            | 1.75             | .44                     | .19              | .1410             | .110             |
| .091                                            | .104  | 3 (.0990)              |                                    | M2.5 (.0984)                       | 1                            | 1.81             | .50                     | .19              | .1410             | .110             |
| .104                                            | .117  | 4 (.1120)              |                                    |                                    | 1                            | 1.88             | .56                     | .19              | .1410             | .110             |
| .117                                            | .130  | 5 (.1250)              |                                    | M3 (.1181)                         | 1                            | 1.94             | .63                     | .19              | .1410             | .110             |
| .130                                            | .145  | 6 (.1380)              |                                    | M3.5 (.1378)                       | 1                            | 2.00             | .69                     | .19              | .1410             | .110             |
| .145                                            | .171  | 8 (.1640)              |                                    | M4 (.1575)                         | 1                            | 2.13             | .75                     | .25              | .1680             | .131             |
| .171                                            | .197  | 10 (.1900)             |                                    | M4.5 (.1772), M5 (.1969)           | 1                            | 2.38             | .88                     | .25              | .1940             | .152             |
| .197                                            | .223  | 12 (.2160)             |                                    |                                    | 1                            | 2.38             | .94                     | .28              | .2200             | .165             |
| .223                                            | .260  |                        | 1/4 (.2500)                        | M6 (.2362)                         | 2                            | 2.50             | 1.00                    | .31              | .2550             | .191             |
| .260                                            | .323  |                        | 5/16 (.3125)                       | M7 (.2756), M8 (.3150)             | 2                            | 2.72             | 1.13                    | .38              | .3180             | .238             |
| .323                                            | .395  |                        | 3/8 (.3750)                        | M10 (.3937)                        | 2                            | 2.94             | 1.25                    | .44              | .3810             | .286             |
| .395                                            | .448  |                        | 7/16 (.4375)                       |                                    | 3                            | 3.16             | 1.44                    | .41              | .3230             | .242             |
| .448                                            | .510  |                        | 1/2 (.5000)                        | M12 (.4724)                        | 3                            | 3.38             | 1.66                    | .44              | .3670             | .275             |
| .510                                            | .573  |                        | 9/16 (.5625)                       | M14 (.5512)                        | 3                            | 3.59             | 1.66                    | .50              | .4290             | .322             |
| .573                                            | .635  |                        | 5/8 (.6250)                        | M16 (.6299)                        | 3                            | 3.81             | 1.81                    | .56              | .4800             | .360             |
| .635                                            | .709  |                        | 11/16 (.6875)                      | M18 (.7087)                        | 3                            | 4.03             | 1.81                    | .63              | .5420             | .406             |
| .709                                            | .760  |                        | 3/4 (.7500)                        |                                    | 3                            | 4.25             | 2.00                    | .69              | .5900             | .442             |
| .760                                            | .823  |                        | 13/16 (.8125)                      | M20 (.7874)                        | 3                            | 4.47             | 2.00                    | .69              | .6520             | .489             |
| .823                                            | .885  |                        | 7/8 (.8750)                        | M22 (.8661)                        | 3                            | 4.69             | 2.22                    | .75              | .6970             | .523             |
| .885                                            | .948  |                        | 15/16 (.9375)                      | M24 (.9449)                        | 3                            | 4.91             | 2.22                    | .75              | .7600             | .570             |
| .948                                            | 1.010 |                        | 1 (1.0000)                         | M25 (.9843)                        | 3                            | 5.13             | 2.50                    | .81              | .8000             | .600             |
| 1.010                                           | 1.073 |                        | 1-1/16 (1.0625)                    | M27 (1.0630)                       | 3                            | 5.13             | 2.50                    | .88              | .8960             | .672             |
| 1.073                                           | 1.135 |                        | 1-1/8 (1.1250)                     |                                    | 3                            | 5.44             | 2.56                    | .88              | .8960             | .672             |
| 1.135                                           | 1.198 |                        | 1-3/16 (1.1875)                    | M30 (1.1811)                       | 3                            | 5.44             | 2.56                    | 1.00             | 1.0210            | .766             |
| 1.198                                           | 1.260 |                        | 1-1/4 (1.2500)                     |                                    | 3                            | 5.75             | 2.56                    | 1.00             | 1.0210            | .766             |
| 1.260                                           | 1.323 |                        | 1-5/16 (1.3125)                    | M33 (1.2992)                       | 3                            | 5.75             | 2.56                    | 1.06             | 1.1080            | .831             |
| 1.323                                           | 1.385 |                        | 1-3/8 (1.3750)                     |                                    | 3                            | 6.06             | 3.00                    | 1.06             | 1.1080            | .831             |
| 1.385                                           | 1.448 |                        | 1-7/16 (1.4375)                    | M36 (1.4173)                       | 3                            | 6.06             | 3.00                    | 1.13             | 1.2330            | .925             |
| 1.448                                           | 1.510 |                        | 1-1/2 (1.5000)                     |                                    | 3                            | 6.38             | 3.00                    | 1.13             | 1.2330            | .925             |
| 1.510                                           | 1.635 |                        | 1-5/8 (1.6250)                     | M39 (1.5354)                       | 3                            | 6.69             | 3.19                    | 1.13             | 1.3050            | .979             |
| 1.635                                           | 1.760 |                        | 1-3/4 (1.7500)                     | M42 (1.6535)                       | 3                            | 7.00             | 3.19                    | 1.25             | 1.4300            | 1.072            |
| 1.760                                           | 1.885 |                        | 1-7/8 (1.8750)                     |                                    | 3                            | 7.31             | 3.56                    | 1.25             | 1.5190            | 1.139            |
| 1.885                                           | 2.010 |                        | 2 (2.0000)                         | M48 (1.8898)                       | 3                            | 7.63             | 3.56                    | 1.38             | 1.6440            | 1.233            |
| 2.010                                           | 2.135 |                        | 2 1/8 (2.1250)                     |                                    | 3                            | 8.00             | 3.56                    | 1.38             | 1.7690            | 1.327            |
| 2.135                                           | 2.260 |                        | 2 1/4 (2.2500)                     | M56 (2.2047)                       | 3                            | 8.25             | 3.56                    | 1.44             | 1.8940            | 1.420            |
| 2.260                                           | 2.385 |                        | 2 3/8 (2.3750)                     |                                    | 3                            | 8.50             | 4.00                    | 1.44             | 2.0190            | 1.514            |
| 2.385                                           | 2.510 |                        | 2 1/2 (2.5000)                     |                                    | 3                            | 8.75             | 4.00                    | 1.50             | 2.1000            | 1.575            |
| 2.510                                           | 2.635 |                        | 2 5/8 (2.6250)                     | M64 (2.5197)                       | 3                            | 8.75             | 4.00                    | 1.50             | 2.2250            | 1.669            |
| 2.635                                           | 2.760 |                        | 2 3/4 (2.7500)                     |                                    | 3                            | 9.25             | 4.00                    | 1.56             | 2.3500            | 1.762            |
| 2.760                                           | 2.885 |                        | 2 7/8 (2.8750)                     | M72 (2.8346)                       | 3                            | 9.25             | 4.00                    | 1.56             | 2.4750            | 1.856            |
| 2.885                                           | 3.010 |                        | 3 (3.0000)                         |                                    | 3                            | 9.75             | 4.56                    | 1.63             | 2.5430            | 1.907            |
| 3.010                                           | 3.135 |                        | 3 1/8 (3.1250)                     |                                    | 3                            | 9.75             | 4.56                    | 1.63             | 2.6680            | 2.001            |
| 3.135                                           | 3.260 |                        | 3 1/4 (3.2500)                     | M80 (3.1496)                       | 3                            | 10.00            | 4.56                    | 1.75             | 2.7930            | 2.095            |
| 3.260                                           | 3.385 |                        | 3 3/8 (3.3750)                     |                                    | 3                            | 10.00            | 4.56                    | 1.75             | 2.8830            | 2.162            |
| 3.385                                           | 3.510 |                        | 3 1/2 (3.5000)                     |                                    | 3                            | 10.25            | 4.94                    | 2.00             | 3.0080            | 2.256            |
| 3.510                                           | 3.635 |                        | 3 5/8 (3.6250)                     | M90 (3.5433)                       | 3                            | 10.25            | 4.94                    | 2.00             | 3.1330            | 2.350            |
| 3.635                                           | 3.760 |                        | 3 3/4 (3.7500)                     |                                    | 3                            | 10.50            | 5.31                    | 2.13             | 3.2170            | 2.413            |
| 3.760                                           | 3.885 |                        | 3 7/8 (3.8750)                     |                                    | 3                            | 10.50            | 5.31                    | 2.13             | 3.3420            | 2.506            |
| 3.885                                           | 4.010 |                        | 4 (4.0000)                         | M100 (3.9370)                      | 3                            | 10.75            | 5.31                    | 2.25             | 3.4670            | 2.600            |

\*United States Cutting Tool Institute (USCTI) governs tap dimensions for the United States

## Tap Dimensions



USCTI Table 302 Tap Tolerance

| Element               | Nominal Diameter Range – Inches |           | Direction     | Tolerance (Inches) |
|-----------------------|---------------------------------|-----------|---------------|--------------------|
|                       | Over                            | To (Inc.) |               |                    |
| Length Overall - A    | .0520                           | 1.0100    | Plus or Minus | .031               |
|                       | 1.0100                          | 4.0100    | Plus or Minus | .063               |
| Length of Thread - B  | .0520                           | .2230     | Plus or Minus | .047               |
|                       | .2230                           | .5100     | Plus or Minus | .063               |
|                       | .5100                           | 1.5100    | Plus or Minus | .094               |
|                       | 1.5100                          | 4.0100    | Plus or Minus | .125               |
| Length of square - C  | .0520                           | 1.0100    | Plus or Minus | .031               |
|                       | 1.0100                          | 4.0100    | Plus or Minus | .063               |
| Diameter of shank - D | .0520                           | .2230     | Minus         | .0015              |
|                       | .2230                           | .6350     | Minus         | .0015              |
|                       | .6350                           | 1.0100    | Minus         | .0020              |
|                       | 1.0100                          | 1.5100    | Minus         | .0020              |
|                       | 1.5100                          | 2.0100    | Minus         | .0030              |
|                       | 2.0100                          | 4.0100    | Minus         | .0030              |
| Size of square        | .0520                           | .5100     | Minus         | .004               |
|                       | .5100                           | 1.0100    | Minus         | .006               |
|                       | 1.0100                          | 2.0100    | Minus         | .008               |
|                       | 2.0100                          | 4.0100    | Minus         | .010               |

## Special Fine Pitch Taps — Short Series, Ground Thread USCTI TABLE 303

Unless otherwise specified, special taps 1.010" to 1.510" diameter inclusive having 14 or more threads per inch or 1.75 millimeter pitch and finer, and sizes over 1.510"

diameter with 10 or more threads per inch, or 2.5 millimeter pitch and finer, will be made to the general dimensions shown below:

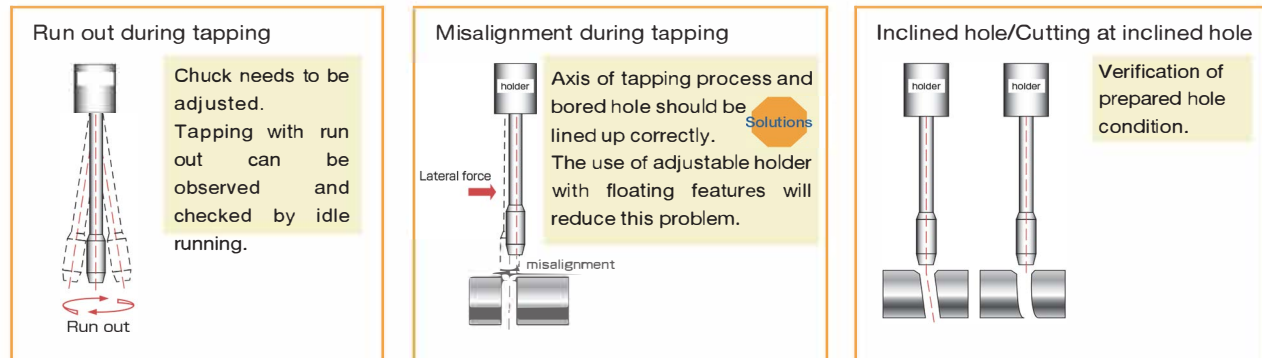
| Nominal Diameter Range Inches |       | Nominal Fractional Diameter Inches | Nominal Metric Diameter Millimeters | General Tap Dimensions - Inches |                 |                 |                  |                |
|-------------------------------|-------|------------------------------------|-------------------------------------|---------------------------------|-----------------|-----------------|------------------|----------------|
|                               |       |                                    |                                     | Overall Length A                | Thread Length B | Square Length C | Shank Diameter D | Size of Square |
| 1.010                         | 1.073 | 1-1/16                             | M27                                 | 4.00                            | 1.50            | .88             | .8960            | .672           |
| 1.073                         | 1.135 | 1- 1/8                             |                                     | 4.00                            | 1.50            | .88             | .8960            | .672           |
| 1.135                         | 1.198 | 1-3/16                             | M30                                 | 4.00                            | 1.50            | 1.00            | 1.0210           | .766           |
| 1.198                         | 1.260 | 1-1/4                              |                                     | 4.00                            | 1.50            | 1.00            | 1.0210           | .766           |
| 1.260                         | 1.323 | 1-5/16                             | M33                                 | 4.00                            | 1.50            | 1.00            | 1.1080           | .831           |
| 1.323                         | 1.385 | 1-3/8                              |                                     | 4.00                            | 1.50            | 1.00            | 1.1080           | .831           |
| 1.385                         | 1.448 | 1-7/16                             | M36                                 | 4.00                            | 1.50            | 1.00            | 1.2330           | .925           |
| 1.448                         | 1.510 | 1-1/2                              |                                     | 4.00                            | 1.50            | 1.00            | 1.2330           | .925           |
| 1.510                         | 1.635 | 1-5/8                              | M39                                 | 5.00                            | 2.00            | 1.13            | 1.3050           | .979           |
| 1.635                         | 1.760 | 1-3/4                              | M42                                 | 5.00                            | 2.00            | 1.25            | 1.4300           | 1.072          |
| 1.760                         | 1.885 | 1-7/8                              |                                     | 5.00                            | 2.00            | 1.25            | 1.5190           | 1.139          |
| 1.885                         | 2.010 | 2                                  | M48                                 | 5.00                            | 2.00            | 1.38            | 1.6440           | 1.233          |
| 2.010                         | 2.135 | 2-1/8                              |                                     | 5.25                            | 2.00            | 1.38            | 1.7690           | 1.327          |
| 2.135                         | 2.260 | 2-1/4                              | M56                                 | 5.25                            | 2.00            | 1.44            | 1.8940           | 1.420          |
| 2.260                         | 2.385 | 2-3/8                              |                                     | 5.25                            | 2.00            | 1.44            | 2.0190           | 1.514          |
| 2.385                         | 2.510 | 2-1/2                              |                                     | 5.25                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 2.510                         | 2.635 | 2-5/8                              | M64                                 | 5.50                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 2.635                         | 2.760 | 2-3/4                              |                                     | 5.50                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 2.760                         | 2.885 | 2-7/8                              | M72                                 | 5.50                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 2.885                         | 3.010 | 3                                  |                                     | 5.50                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 3.010                         | 3.135 | 3-1/8                              |                                     | 5.75                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 3.135                         | 3.260 | 3-1/4                              | M80                                 | 5.75                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 3.260                         | 3.385 | 3-3/8                              |                                     | 5.75                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 3.385                         | 3.510 | 3-1/2                              |                                     | 5.75                            | 2.00            | 1.50            | 2.1000           | 1.575          |
| 3.510                         | 3.635 | 3-5/8                              | M90                                 | 6.00                            | 2.00            | 1.75            | 2.1000           | 1.575          |
| 3.635                         | 3.760 | 3-3/8                              |                                     | 6.00                            | 2.00            | 1.75            | 2.1000           | 1.575          |
| 3.760                         | 3.885 | 3-7/8                              |                                     | 6.00                            | 2.00            | 1.75            | 2.1000           | 1.575          |
| 3.885                         | 4.010 | 4                                  | M100                                | 6.00                            | 2.00            | 1.75            | 2.1000           | 1.575          |

United States Cutting Tool Institute (USCTI) governs tap dimensions for the United States

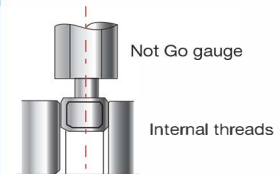
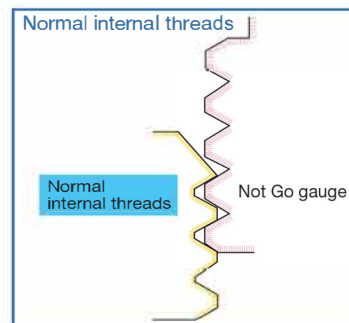
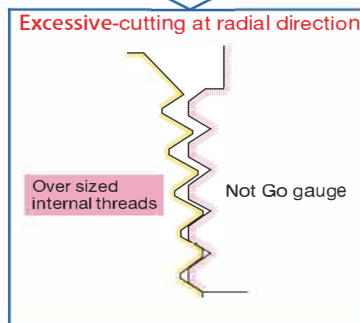
Think threads with  
**YAMAWA**

## COMMON REASONS FOR OVER SIZE-CUTTING OF AN INTERNAL THREAD AND ITS MECHANISM

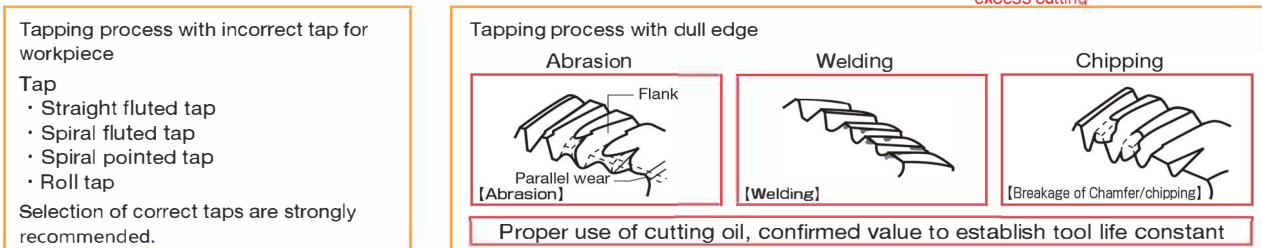
### 1. Run out, misalignment, inclined hole/cutting at inclined hole → Over-cutting at radial direction



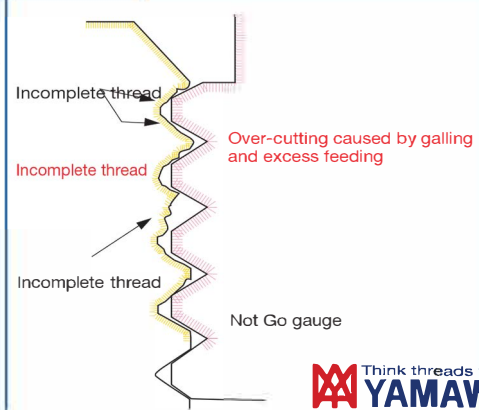
Over-cutting is caused by extra cutting of workpiece at rotational direction. This process is followed along bored hole, which small amount of over-cutting would be observed at bored hole bottom, and over-cutting would be observed at bored hole entrance.



### 2. Using a tap not suitable for the operation or a tap with a dull cutting edge may cause galling and over-cutting. → Over-cutting caused by galling and excess cutting



A torn thread is observed at the surface of internal thread. When this situation is continued, over-cutting of internal thread, deform threads, interrupted threads, and finally it leads to over-cutting of internal thread.

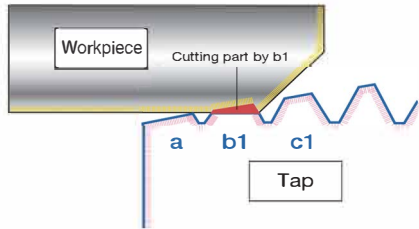


### 3. Tapping with improper feed condition

over-cutting at axial direction

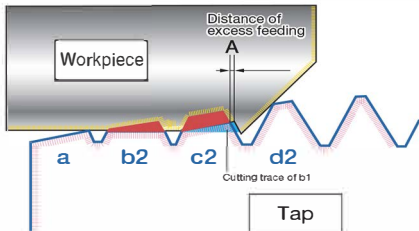
#### The mechanism producing an incorrect thread;

① At cutting edge b1, cutting chamfer



② Position after the tap rotates 1 turn.

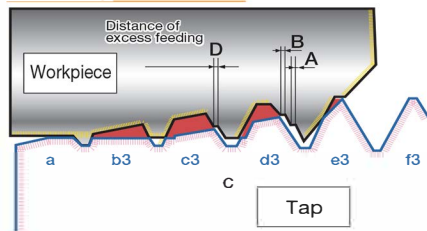
Cutting trace(b1) and thread phase of cutting face(c2) are misaligned creating the distance of excessive feeding A.



③ Position after the tap rotates 2 turns.

Cutting chamfer(c3) is misaligned until the distance of excess feeding B and cutting chamfer (d3) is misaligned until the distance of over feeding A+B.

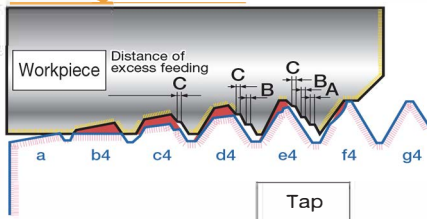
#### Cutting situation



④ Position of thread after 3 rotations of tap.

The thread continues to misalign until the distance of the thread lead is in error from excessive feeding C.

#### Cutting situation



Feed adjustment is strongly recommended.

\* (Use of fully synchronous feed system and fixing holder)

Cutting machine that do not have the functions listed, such as drilling machine.

\* The correct balance of main spindle adjustment is strongly recommended.

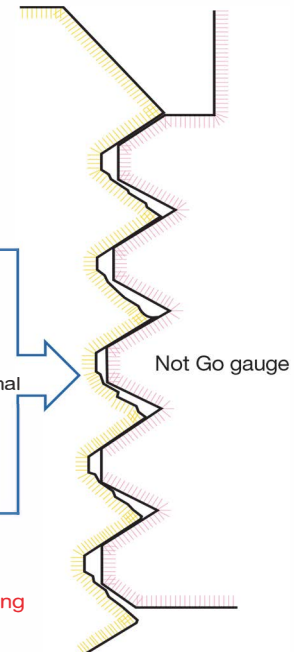
\* Use an axial/radial floating holder for its adjustment.

**Excessive-cutting of the thread by excessive feeding.** A clearance gap is created at the back flank of the thread. An additional amount of material is cut at the front flank, creating incomplete threads.



**over-cutting thread by too slow feeding;**

This mechanism creates the opposite of excessive feeding or over-cutting internal thread. A clearance gap is created at the front flank and extra material is cut at the back flank.



**Reasons for over-cutting during tapping process (overview)**

- ① The tap mounting condition in the holder.
- ② The condition of bored hole.
- ③ The cutting oil selection.
- ④ Incorrect adjustment of feed balance.
- ⑤ Selecting the correct tap from the tap selection section.

# Z-PRO

## Tap Drill Size Selection

YMW U.S.A.

### Recommended Percentage of Full Thread in Tapped Holes

To reduce tapping problems and improve tool life use the largest drill possible for the minor diameter. Select the percentage of thread height from the chart below to find the appropriate drill size for each size thread.

A minor diameter that provides a 55% to 65% thread is sufficient for good strength in most applications. In some cases it may be necessary to produce a thread with a higher percentage of thread height to meet minor diameter limits of the thread class specified or for added strength.

| Material                              |                                                                      | >2D to L Tapping | Average Commercial Work | Thin Sheet Stock or Stamping |
|---------------------------------------|----------------------------------------------------------------------|------------------|-------------------------|------------------------------|
| Free machining                        | Aluminum, Brass, Bronze, Cast Iron, Copper, Mild Steel, Tool Steel   | 60% - 70%        | 65% - 70%               | 75% - 85%                    |
| Harder materials or tougher machining | Cast Steel, Drop Forging, Monel Metal, Nickel Steel, Stainless Steel | 55% - 65%        | 60% - 70%               |                              |

| Tap Size | Threads Per Inch |     | Minor Diameter |         | Tap Drill Diameter |            |            |            |            |
|----------|------------------|-----|----------------|---------|--------------------|------------|------------|------------|------------|
|          | UNC              | UNF | Min. 2B        | Max. 2B | 80% Thread         | 75% Thread | 70% Thread | 65% Thread | 60% Thread |
| 0        | -                | 80  | 0.0465         | 0.0514  | 0.0470             | 0.0478     | 0.0486     | 0.0494     | 0.0503     |
| 1        | 64               | -   | 0.0561         | 0.0623  | 0.0568             | 0.0578     | 0.0588     | 0.0598     | 0.0608     |
|          | -                | 72  | 0.0580         | 0.0635  | 0.0586             | 0.0595     | 0.0604     | 0.0613     | 0.0622     |
| 2        | 56               | -   | 0.0667         | 0.0737  | 0.0674             | 0.0686     | 0.0698     | 0.0709     | 0.0721     |
|          | -                | 64  | 0.0691         | 0.0752  | 0.0698             | 0.0708     | 0.0718     | 0.0728     | 0.0738     |
| 3        | 48               | -   | 0.0764         | 0.0845  | 0.0774             | 0.0787     | 0.0801     | 0.0814     | 0.0828     |
|          | -                | 56  | 0.0797         | 0.0865  | 0.0804             | 0.0816     | 0.0828     | 0.0839     | 0.0851     |
| 4        | 40               | -   | 0.0849         | 0.0939  | 0.0860             | 0.0876     | 0.0893     | 0.0909     | 0.0925     |
|          | -                | 48  | 0.0894         | 0.0968  | 0.0904             | 0.0917     | 0.0931     | 0.0944     | 0.0958     |
| 5        | 40               | -   | 0.0979         | 0.1062  | 0.0990             | 0.1006     | 0.1023     | 0.1039     | 0.1055     |
|          | -                | 44  | 0.1004         | 0.1079  | 0.1014             | 0.1029     | 0.1043     | 0.1058     | 0.1073     |
| 6        | 32               | -   | 0.1040         | 0.1140  | 0.1055             | 0.1076     | 0.1096     | 0.1116     | 0.1136     |
|          | -                | 40  | 0.1110         | 0.1190  | 0.1120             | 0.1136     | 0.1153     | 0.1169     | 0.1185     |
| 8        | 32               | -   | 0.1300         | 0.1390  | 0.1315             | 0.1336     | 0.1356     | 0.1376     | 0.1396     |
|          | -                | 36  | 0.1340         | 0.1420  | 0.1351             | 0.1369     | 0.1387     | 0.1405     | 0.1424     |
| 10       | 24               | -   | 0.1450         | 0.1560  | 0.1467             | 0.1494     | 0.1521     | 0.1548     | 0.1575     |
|          | -                | 32  | 0.1560         | 0.1640  | 0.1575             | 0.1596     | 0.1616     | 0.1636     | 0.1656     |
| 12       | 24               | -   | 0.1710         | 0.1810  | 0.1727             | 0.1754     | 0.1781     | 0.1808     | 0.1835     |
|          | -                | 28  | 0.1770         | 0.1860  | 0.1789             | 0.1812     | 0.1835     | 0.1858     | 0.1882     |
| 1/4      | 20               | -   | 0.1960         | 0.2070  | 0.1980             | 0.2013     | 0.2045     | 0.2078     | 0.2110     |
|          | -                | 28  | 0.2110         | 0.2200  | 0.2129             | 0.2152     | 0.2175     | 0.2198     | 0.2222     |
| 5/16     | 18               | -   | 0.2520         | 0.2650  | 0.2548             | 0.2584     | 0.2620     | 0.2656     | 0.2692     |
|          | -                | 24  | 0.2670         | 0.2770  | 0.2692             | 0.2719     | 0.2746     | 0.2773     | 0.2800     |
| 3/8      | 16               | -   | 0.3070         | 0.3210  | 0.3101             | 0.3141     | 0.3182     | 0.3222     | 0.3263     |
|          | -                | 24  | 0.3300         | 0.3400  | 0.3317             | 0.3344     | 0.3371     | 0.3398     | 0.3425     |
| 7/16     | 14               | -   | 0.3600         | 0.3760  | 0.3633             | 0.3679     | 0.3726     | 0.3772     | 0.3818     |
|          | -                | 20  | 0.3830         | 0.3950  | 0.3855             | 0.3888     | 0.3920     | 0.3953     | 0.3985     |
| 1/2      | 13               | -   | 0.4170         | 0.4340  | 0.4201             | 0.4251     | 0.4301     | 0.4351     | 0.4400     |
|          | -                | 20  | 0.4460         | 0.4570  | 0.4480             | 0.4513     | 0.4545     | 0.4578     | 0.4610     |
| 9/16     | 12               | -   | 0.4720         | 0.4900  | 0.4759             | 0.4813     | 0.4867     | 0.4921     | 0.4976     |
|          | -                | 18  | 0.5020         | 0.5150  | 0.5048             | 0.5084     | 0.5120     | 0.5156     | 0.5192     |
| 5/8      | 11               | -   | 0.5270         | 0.5460  | 0.5305             | 0.5364     | 0.5423     | 0.5482     | 0.5541     |
|          | -                | 18  | 0.5650         | 0.5780  | 0.5673             | 0.5709     | 0.5745     | 0.5781     | 0.5817     |
| 3/4      | 10               | -   | 0.6420         | 0.6630  | 0.6461             | 0.6526     | 0.6591     | 0.6656     | 0.6721     |
|          | -                | 16  | 0.6820         | 0.6960  | 0.6851             | 0.6891     | 0.6932     | 0.6972     | 0.7013     |
| 7/8      | 9                | -   | 0.7550         | 0.7780  | 0.7595             | 0.7668     | 0.7740     | 0.7812     | 0.7884     |
|          | -                | 14  | 0.7980         | 0.8140  | 0.8008             | 0.8054     | 0.8101     | 0.8147     | 0.8193     |
| 1        | 8                | -   | 0.8650         | 0.8900  | 0.8701             | 0.8782     | 0.8863     | 0.8945     | 0.9026     |
|          | -                | 12  | 0.9100         | 0.9280  | 0.9134             | 0.9188     | 0.9242     | 0.9296     | 0.9351     |
| 1-1/8    | 7                | -   | 0.9700         | 0.9980  | 0.9765             | 0.9858     | 0.9951     | 1.0044     | 1.0137     |
|          | -                | 12  | 1.0350         | 1.0530  | 1.0384             | 1.0438     | 1.0492     | 1.0546     | 1.0601     |
| 1-1/4    | 7                | -   | 1.0950         | 1.1230  | 1.1015             | 1.1108     | 1.1201     | 1.1294     | 1.1387     |
|          | -                | 12  | 1.1600         | 1.1780  | 1.1634             | 1.1688     | 1.1742     | 1.1796     | 1.1851     |
| 1-3/8    | 6                | -   | 1.1950         | 1.2250  | 1.2018             | 1.2126     | 1.2235     | 1.2343     | 1.2451     |
|          | -                | 12  | 1.2850         | 1.3030  | 1.2884             | 1.2938     | 1.2992     | 1.3046     | 1.3101     |
| 1-1/2    | 6                | -   | 1.3200         | 1.3500  | 1.3268             | 1.3376     | 1.3485     | 1.3593     | 1.3701     |
|          | -                | 12  | 1.4100         | 1.4280  | 1.4134             | 1.4188     | 1.4242     | 1.4296     | 1.4351     |
| 1-3/4    | 5                | -   | 1.5330         | 1.5670  | 1.5422             | 1.5551     | 1.5681     | 1.5811     | 1.5941     |
| 2        | 4-1/2            | -   | 1.7590         | 1.7950  | 1.7691             | 1.7835     | 1.7979     | 1.8124     | 1.8268     |

#### TAP DRILL SIZE FORMULA

$$\text{Drill Size} = \frac{\text{Tap Major Dia} - 0.01299 \times \% \text{ of Full Thread}}{\# \text{ of Threads Per Inch}}$$

Example : To determine Drill Size for 3/4"—10 Tap, 70% Full Thread  
 Basic Major Diameter of Tap = .750"  
 $0.01299 \times 70 = 0.9093$   
 $0.9093 \div 10 = 0.09093$   
 Drill size = .750" - 0.09093 = .6591"

#### PERCENTAGE OF FULL THREAD FORMULA

$$\% \text{ of Full Thread} = \text{Threads Per Inch} \times \frac{\text{Major Dia} - \text{Drill}}{0.01299}$$

Example : To determine the % of Full Thread for 3/4"—10 Tap, using .6656" Drill.

$$\begin{aligned} \text{Threads Per Inch} &= 10.750 - .6656 = 0.0844 \\ 0.0844 \div 0.01299 &= 6.497 \\ \text{Percentage of Full Threads} &= 10 \times 6.497 = 65\% \end{aligned}$$

## Metric Tap Drill Sizes

### Suggested Percentage of Full Thread in Tapped Holes

| Material                            |                                                                      | >2D to L Tapping | Average Commercial Work | Thin Sheet Stock or Stamping |
|-------------------------------------|----------------------------------------------------------------------|------------------|-------------------------|------------------------------|
| Free Machining                      | Aluminum, Brass, Bronze, Cast Iron, Copper, Mild Steel, Tool Steel   | 60% - 70%        | 65% - 70%               | 75% - 85%                    |
| Harder Materials or Tough Machining | Cast Steel, Drop Forging, Monel Metal, Nickel Steel, Stainless Steel | 55% - 65%        | 60% - 70%               |                              |

To reduce tapping problems and improve tool life use the largest drill possible for the minor diameter. Select the percentage of thread height from the chart below to find the appropriate drill size for each size thread.

A minor diameter that provides sufficient for good strength in most applications. In some cases it may be necessary to produce a thread with a higher percentage of thread height to meet minor diameter limits of the thread class specified or for added strength.

| Tap Size | Pitch |      | Minor Diameter (mm) |         | Metric Tap Drill Dia |        |            |        |            |        |            |        |            |        |
|----------|-------|------|---------------------|---------|----------------------|--------|------------|--------|------------|--------|------------|--------|------------|--------|
|          | M     | MF   | Min. 6H             | Max. 6H | 80% Thread           |        | 75% Thread |        | 70% Thread |        | 65% Thread |        | 60% Thread |        |
|          |       |      |                     |         | (mm)                 | (in)   | (mm)       | (in)   | (mm)       | (in)   | (mm)       | (in)   | (mm)       | (in)   |
| M1.6     | 0.35  | -    | 1.221               | 1.321   | 1.24                 | 0.0488 | 1.26       | 0.0496 | 1.28       | 0.0504 | 1.30       | 0.0512 | 1.33       | 0.0524 |
| M1.7     | 0.35  | -    | 1.321               | 1.421   | 1.33                 | 0.0524 | 1.36       | 0.0535 | 1.38       | 0.0543 | 1.40       | 0.0551 | 1.42       | 0.0559 |
| M1.8     | 0.35  | -    | 1.422               | 1.519   | 1.44                 | 0.0567 | 1.46       | 0.0575 | 1.48       | 0.0583 | 1.50       | 0.0591 | 1.53       | 0.0602 |
| M2       | 0.4   | -    | 1.567               | 1.679   | 1.58                 | 0.0622 | 1.61       | 0.0634 | 1.64       | 0.0646 | 1.66       | 0.0654 | 1.69       | 0.0665 |
| M2.2     | 0.45  | -    | 1.715               | 1.836   | 1.73                 | 0.0681 | 1.76       | 0.0693 | 1.79       | 0.0705 | 1.82       | 0.0717 | 1.85       | 0.0728 |
| M2.5     | 0.45  | -    | 2.013               | 2.138   | 2.03                 | 0.0799 | 2.06       | 0.0811 | 2.09       | 0.0823 | 2.12       | 0.0835 | 2.15       | 0.0846 |
| M2.6     | 0.45  | -    | 2.113               | 2.238   | 2.13                 | 0.0839 | 2.16       | 0.0850 | 2.19       | 0.0862 | 2.22       | 0.0874 | 2.25       | 0.0886 |
| M3       | 0.5   | -    | 2.459               | 2.599   | 2.48                 | 0.0976 | 2.51       | 0.0988 | 2.55       | 0.1004 | 2.58       | 0.1016 | 2.61       | 0.1028 |
| M3.5     | 0.6   | 0.35 | 2.621               | 2.721   | 2.63                 | 0.1035 | 2.66       | 0.1047 | 2.68       | 0.1055 | 2.70       | 0.1063 | 2.72       | 0.1071 |
| M4       | 0.7   | -    | 2.850               | 3.010   | 2.88                 | 0.1134 | 2.92       | 0.1150 | 2.95       | 0.1161 | 2.99       | 0.1177 | 3.03       | 0.1193 |
| M4.5     | 0.75  | 0.5  | 3.242               | 3.422   | 3.27                 | 0.1287 | 3.32       | 0.1307 | 3.36       | 0.1323 | 3.41       | 0.1343 | 3.45       | 0.1358 |
| M5       | 0.8   | -    | 3.459               | 3.599   | 3.48                 | 0.1370 | 3.51       | 0.1382 | 3.54       | 0.1394 | 3.58       | 0.1409 | 3.61       | 0.1421 |
| M6       | 1     | 0.5  | 3.688               | 3.876   | 3.72                 | 0.1465 | 3.77       | 0.1484 | 3.82       | 0.1504 | 3.87       | 0.1524 | 3.92       | 0.1543 |
| M7       | 1.25  | -    | 4.134               | 4.334   | 4.17                 | 0.1642 | 4.22       | 0.1661 | 4.27       | 0.1681 | 4.32       | 0.1701 | 4.38       | 0.1724 |
| M8       | 1     | 0.75 | 4.458               | 4.600   | 4.48                 | 0.1764 | 4.51       | 0.1776 | 4.54       | 0.1787 | 4.58       | 0.1803 | 4.61       | 0.1815 |
| M10      | 1.5   | -    | 4.917               | 5.153   | 4.96                 | 0.1953 | 5.03       | 0.1980 | 5.09       | 0.2004 | 5.16       | 0.2031 | 5.22       | 0.2055 |
| M12      | 1.75  | -    | 5.187               | 5.377   | 5.22                 | 0.2055 | 5.27       | 0.2075 | 5.32       | 0.2094 | 5.37       | 0.2114 | 5.41       | 0.2130 |
| M14      | 2     | -    | 5.918               | 6.152   | 5.96                 | 0.2346 | 6.03       | 0.2374 | 6.09       | 0.2398 | 6.16       | 0.2425 | 6.22       | 0.2449 |
| M16      | 2.5   | -    | 6.647               | 6.912   | 6.70                 | 0.2638 | 6.78       | 0.2669 | 6.86       | 0.2701 | 6.94       | 0.2732 | 7.03       | 0.2768 |
| M18      | 3     | -    | 6.917               | 7.153   | 6.96                 | 0.2740 | 7.03       | 0.2768 | 7.09       | 0.2791 | 7.16       | 0.2819 | 7.22       | 0.2843 |
| M20      | 3.5   | -    | 7.187               | 7.377   | 7.22                 | 0.2843 | 7.27       | 0.2862 | 7.32       | 0.2882 | 7.37       | 0.2902 | 7.41       | 0.2917 |
| M22      | 4     | -    | 8.376               | 8.676   | 8.44                 | 0.3323 | 8.54       | 0.3362 | 8.64       | 0.3402 | 8.73       | 0.3437 | 8.83       | 0.3476 |
| M24      | 4.5   | -    | 8.647               | 8.912   | 8.70                 | 0.3425 | 8.78       | 0.3457 | 8.86       | 0.3488 | 8.94       | 0.3520 | 9.03       | 0.3555 |
| M27      | 5     | -    | 9.817               | 9.153   | 8.96                 | 0.3528 | 9.03       | 0.3555 | 9.09       | 0.3579 | 9.16       | 0.3606 | 9.22       | 0.3630 |
| M30      | 5.5   | -    | 9.168               | 9.378   | 9.22                 | 0.3630 | 9.27       | 0.3650 | 9.32       | 0.3669 | 9.37       | 0.3689 | 9.41       | 0.3705 |
| M33      | 6     | -    | 10.106              | 10.441  | 10.18                | 0.4008 | 10.30      | 0.4055 | 10.41      | 0.4098 | 10.52      | 0.4142 | 10.64      | 0.4189 |
| M36      | 6.5   | -    | 10.376              | 10.676  | 10.44                | 0.4110 | 10.54      | 0.4150 | 10.64      | 0.4189 | 10.73      | 0.4224 | 10.83      | 0.4264 |
| M39      | 7     | -    | 10.647              | 10.912  | 10.70                | 0.4213 | 10.78      | 0.4244 | 10.86      | 0.4276 | 10.94      | 0.4307 | 11.03      | 0.4343 |
| M42      | 8     | -    | 10.917              | 11.153  | 10.96                | 0.4315 | 11.03      | 0.4343 | 11.09      | 0.4366 | 11.16      | 0.4394 | 11.22      | 0.4417 |
| M45      | 9     | -    | 11.835              | 12.210  | 11.92                | 0.4693 | 12.05      | 0.4744 | 12.18      | 0.4795 | 12.31      | 0.4846 | 12.44      | 0.4898 |
| M48      | 10    | -    | 12.376              | 12.676  | 12.44                | 0.4898 | 12.54      | 0.4937 | 12.64      | 0.4976 | 12.73      | 0.5012 | 12.83      | 0.5051 |
| M50      | 10.5  | -    | 13.835              | 14.210  | 13.92                | 0.5480 | 14.05      | 0.5531 | 14.18      | 0.5583 | 14.31      | 0.5634 | 14.44      | 0.5685 |
| M55      | 12    | -    | 14.376              | 14.676  | 14.44                | 0.5685 | 14.54      | 0.5724 | 14.64      | 0.5764 | 14.73      | 0.5799 | 14.83      | 0.5839 |
| M60      | 14    | -    | 15.296              | 15.743  | 15.40                | 0.6063 | 15.56      | 0.6126 | 15.73      | 0.6193 | 15.89      | 0.6256 | 16.05      | 0.6319 |
| M65      | 15    | -    | 16.376              | 16.676  | 16.44                | 0.6472 | 16.54      | 0.6512 | 16.64      | 0.6551 | 16.73      | 0.6587 | 16.83      | 0.6626 |
| M70      | 16    | -    | 17.294              | 17.744  | 17.40                | 0.6850 | 17.56      | 0.6913 | 17.73      | 0.6980 | 17.89      | 0.7043 | 18.05      | 0.7106 |
| M75      | 18    | -    | 18.376              | 18.676  | 18.44                | 0.7260 | 18.54      | 0.7299 | 18.64      | 0.7339 | 18.73      | 0.7374 | 18.83      | 0.7413 |
| M80      | 20    | -    | 18.917              | 19.153  | 18.96                | 0.7465 | 19.03      | 0.7492 | 19.09      | 0.7516 | 19.16      | 0.7543 | 19.22      | 0.7567 |
| M85      | 22    | -    | 19.294              | 19.744  | 19.40                | 0.7638 | 19.56      | 0.7701 | 19.73      | 0.7768 | 19.89      | 0.7831 | 20.05      | 0.7894 |
| M90      | 24    | -    | 19.835              | 20.210  | 19.92                | 0.7843 | 20.05      | 0.7894 | 20.18      | 0.7945 | 20.31      | 0.7996 | 20.44      | 0.8047 |
| M95      | 25    | -    | 20.376              | 20.676  | 20.44                | 0.8047 | 20.54      | 0.8087 | 20.64      | 0.8126 | 20.73      | 0.8161 | 20.83      | 0.8201 |
| M100     | 26    | -    | 20.752              | 21.252  | 20.88                | 0.8220 | 21.08      | 0.8299 | 21.27      | 0.8374 | 21.47      | 0.8453 | 21.66      | 0.8528 |
| M105     | 28    | -    | 21.835              | 22.210  | 21.92                | 0.8630 | 22.05      | 0.8681 | 22.18      | 0.8732 | 22.31      | 0.8783 | 22.44      | 0.8835 |
| M110     | 30    | -    | 22.376              | 22.676  | 22.44                | 0.8835 | 22.54      | 0.8874 | 22.64      | 0.8913 | 22.73      | 0.8949 | 22.83      | 0.8988 |
| M115     | 32    | -    | 23.752              | 24.252  | 23.88                | 0.9402 | 24.08      | 0.9480 | 24.27      | 0.9555 | 24.47      | 0.9634 | 24.66      | 0.9709 |
| M120     | 35    | -    | 24.835              | 25.210  | 24.92                | 0.9811 | 25.05      | 0.9862 | 25.18      | 0.9913 | 25.31      | 0.9965 | 25.44      | 1.0016 |
| M125     | 36    | -    | 25.376              | 25.676  | 25.44                | 1.0016 | 25.54      | 1.0055 | 25.64      | 1.0094 | 25.73      | 1.0130 | 25.83      | 1.0169 |
| M130     | 38    | -    | 26.211              | 26.771  | 26.36                | 1.0378 | 26.59      | 1.0469 | 26.82      | 1.0559 | 27.04      | 1.0646 | 27.27      | 1.0736 |
| M135     | 40    | -    | 27.835              | 28.210  | 27.92                | 1.0992 | 28.05      | 1.1043 | 28.18      | 1.1094 | 28.31      | 1.1146 | 28.44      | 1.1197 |
| M140     | 42    | -    | 28.376              | 28.676  | 28.44                | 1.1197 | 28.54      | 1.1236 | 28.64      | 1.1276 | 28.73      | 1.1311 | 28.83      | 1.1350 |
| M145     | 45    | -    | 29.211              | 29.771  | 29.36                | 1.1559 | 29.59      | 1.1650 | 29.82      | 1.1740 | 30.04      | 1.1827 | 30.27      | 1.1917 |
| M150     | 48    | -    | 30.835              | 31.210  | 30.92                | 1.2173 | 31.05      | 1.2224 | 31.18      | 1.2276 | 31.31      | 1.2327 | 31.44      | 1.2378 |
| M155     | 50    | -    | 31.670              | 32.270  | 31.84                | 1.2535 | 32.10      | 1.2638 | 32.36      | 1.2740 | 32.62      | 1.2843 | 32.88      | 1.2945 |
| M160     | 52    | -    | 32.752              | 33.252  | 32.88                | 1.2945 | 33.08      | 1.3024 | 33.27      | 1.3098 | 33.47      | 1.3177 | 33.66      | 1.3252 |
| M165     | 54    | -    | 33.835              | 34.210  | 33.92                | 1.3354 | 34.05      | 1.3406 | 34.18      | 1.3457 | 34.31      | 1.3508 | 34.44      | 1.3559 |
| M170     | 56    | -    | 34.670              | 35.270  | 34.84                | 1.3717 | 35.10      | 1.3819 | 35.36      | 1.3921 | 35.62      | 1.4024 | 35.88      | 1.4126 |
| M175     | 60    | -    | 36.835              | 37.210  | 36.92                | 1.4535 | 37.05      | 1.4587 | 37.18      | 1.4638 | 37.31      | 1.4689 | 37.44      | 1.4740 |
| M180     | 63    | -    | 37.129              | 37.799  | 37.32                | 1.4693 | 37.62      | 1.4811 | 37.91      | 1.4925 | 38.20      | 1.5039 | 38.49      | 1.5154 |
| M185     | 65    | -    | 38.752              | 39.252  | 38.88                | 1.5307 | 39.08      | 1.5386 | 39.27      | 1.5461 | 39.47      | 1.5539 | 39.66      | 1.5614 |
| M190     | 68    | -    | 39.835              | 40.210  | 39.92                | 1.5717 | 40.05      | 1.5768 | 40.18      | 1.5819 | 40.31      | 1.5870 | 40.44      | 1.5921 |

#### TAP DRILL SIZE FORMULA

$$\text{Drill Size} = \text{Tap Major Dia} - \frac{\text{Pitch} \times \% \text{ of Full Thread}}{76.980}$$

Example: Determine Drill Size for M12 x 1.75 Tap, 70% Full Thread.

$$\text{Tap Major Diameter} = 12$$

$$1.75 \times 70 = 122.5, \quad 122.5 \div 76.980 = 1.59$$

$$\text{Drill Size} = 12 - 1.59 = 10.41\text{mm}$$

#### PERCENTAGE OF FULL THREAD FORMULA FOR MATRIC THREADS

$$\% \text{ of Full Thread} = (\text{Tap Major Dia} - \text{Drill Dia}) \times \frac{76.980}{\text{Pitch}}$$

Example: Determine the % of Full Thread for M12 x 1.75 Tap, using 10.41mm Drill.

$$\text{Pitch} = 1.75$$

$$12 - 10.41 = 1.59$$

$$76.980 \div 1.75 = 44$$

$$\text{Percentage of Full Thread} = 1.59 \times 44 = 70\%$$

## TAP RECOMMENDATIONS FOR CLASSES 2, 3, 2B & 3B

### UNIFIED AND AMERICAN NATIONAL SCREW THREADS

|       | THREADS PER INCH |           | RECOMMENDED TAP LIMITS AND FOR INTERNAL THREAD PITCH DIAMETER LIMITS |         |          |          |                    |         |         |          |          |
|-------|------------------|-----------|----------------------------------------------------------------------|---------|----------|----------|--------------------|---------|---------|----------|----------|
| SIZE  | NC<br>UNC        | NF<br>UNF | CLASS 2                                                              | CLASS 3 | CLASS 2B | CLASS 3B | MIN/ALL            | MAX     | MAX     | MAX      | MAX      |
|       |                  |           |                                                                      |         |          |          | CLASSES<br>(BASIC) | CLASS 2 | CLASS 3 | CLASS 2B | CLASS 3B |
| 0     |                  | 80        | G H1                                                                 | G H1    | G H2     | G H1     | .0519              | .0536   | .0532   | .0542    | .0536    |
| 1     | 64               |           | G H1                                                                 | G H1    | G H2     | G H1     | .0629              | .0648   | .0643   | .0655    | .0648    |
| 1     |                  | 72        | G H1                                                                 | G H1    | G H2     | G H1     | .0640              | .0658   | .0653   | .0665    | .0659    |
| 2     | 56               |           | G H1                                                                 | G H1    | G H2     | G H1     | .0744              | .0764   | .0759   | .0772    | .0765    |
| 2     |                  | 64        | G H1                                                                 | G H1    | G H2     | G H1     | .0759              | .0778   | .0773   | .0786    | .0779    |
| 3     | 48               |           | G H1                                                                 | G H1    | G H2     | G H1     | .0855              | .0877   | .0871   | .0885    | .0877    |
| 3     |                  | 56        | G H1                                                                 | G H1    | G H2     | G H1     | .0874              | .0894   | .0889   | .0902    | .0895    |
| 4     | 40               |           | G H2                                                                 | G H1    | G H2     | G H2     | .0958              | .0982   | .0975   | .0991    | .0982    |
| 4     |                  | 48        | G H1                                                                 | G H1    | G H2     | G H1     | .0985              | .1007   | .1001   | .1016    | .1008    |
| 5     | 40               |           | G H2                                                                 | G H1    | G H2     | G H2     | .1088              | .1112   | .1105   | .1121    | .1113    |
| 5     |                  | 44        | G H1                                                                 | G H1    | G H2     | G H1     | .1102              | .1125   | .1118   | .1134    | .1126    |
| 6     | 32               |           | G H2                                                                 | G H1    | G H3     | G H2     | .1177              | .1204   | .1196   | .1214    | .1204    |
| 6     |                  | 40        | G H2                                                                 | G H1    | G H2     | G H2     | .1218              | .1242   | .1235   | .1252    | .1243    |
| 8     | 32               |           | G H2                                                                 | G H1    | G H3     | G H2     | .1437              | .1464   | .1456   | .1475    | .1465    |
| 8     |                  | 36        | G H2                                                                 | G H1    | G H2     | G H2     | .1460              | .1485   | .1478   | .1496    | .1487    |
| 10    | 24               |           | G H3                                                                 | G H1    | G H3     | G H3     | .1629              | .1662   | .1653   | .1672    | .1661    |
| 10    |                  | 32        | G H2                                                                 | G H1    | G H3     | G H2     | .1697              | .1724   | .1716   | .1736    | .1726    |
| 12    | 24               |           | G H3                                                                 | G H1    | G H3     | G H3     | .1889              | .1922   | .1913   | .1933    | .1922    |
| 12    |                  | 28        | G H3                                                                 | G H1    | G H3     | G H3     | .1928              | .1959   | .1950   | .1970    | .1959    |
| 1/4   | 20               |           | G H3                                                                 | G H2    | G H5     | G H3     | .2175              | .2211   | .2201   | .2223    | .2211    |
| 1/4   |                  | 28        | G H3                                                                 | G H1    | G H4     | G H3     | .2268              | .2299   | .2290   | .2311    | .2300    |
| 5/16  | 18               |           | G H3                                                                 | G H2    | G H5     | G H3     | .2764              | .2805   | .2794   | .2817    | .2803    |
| 5/16  |                  | 24        | G H3                                                                 | G H1    | G H4     | G H3     | .2854              | .2887   | .2878   | .2902    | .2890    |
| 3/8   | 16               |           | G H3                                                                 | G H2    | G H5     | G H3     | .3344              | .3389   | .3376   | .3401    | .3387    |
| 3/8   |                  | 24        | G H3                                                                 | G H1    | G H4     | G H3     | .3479              | .3512   | .3503   | .3528    | .3516    |
| 7/16  | 14               |           | G H5                                                                 | G H3    | G H5     | G H3     | .3911              | .3960   | .3947   | .3972    | .3957    |
| 7/16  |                  | 20        | G H3                                                                 | G H1    | G H5     | G H3     | .4050              | .4086   | .4076   | .4104    | .4091    |
| 1/2   | 13               |           | G H5                                                                 | G H3    | G H5     | G H3     | .4500              | .4552   | .4537   | .4565    | .4548    |
| 1/2   |                  | 20        | G H3                                                                 | G H1    | G H5     | G H3     | .4675              | .4711   | .4701   | .4731    | .4717    |
| 9/16  | 12               |           | G H5                                                                 | G H3    | G H5     | G H3     | .5084              | .5140   | .5124   | .5152    | .5135    |
| 9/16  |                  | 18        | G H3                                                                 | G H2    | G H5     | G H3     | .5264              | .5305   | .5294   | .5323    | .5308    |
| 5/8   | 11               |           | G H5                                                                 | G H3    | G H5     | G H3     | .5660              | .5719   | .5702   | .5732    | .5714    |
| 5/8   |                  | 18        | G H3                                                                 | G H2    | G H5     | G H3     | .5889              | .5930   | .5919   | .5949    | .5934    |
| 3/4   | 10               |           | G H5                                                                 | G H3    | G H5     | G H5     | .6850              | .6914   | .6895   | .6927    | .6907    |
| 3/4   |                  | 16        | G H3                                                                 | G H2    | G H5     | G H3     | .7094              | .7139   | .7126   | .7159    | .7143    |
| 7/8   | 9                |           | G H6                                                                 | G H4    | G H6     | G H4     | .8028              | .8098   | .8077   | .8110    | .8089    |
| 7/8   |                  | 14        | G H4                                                                 | G H2    | G H6     | G H4     | .8286              | .8335   | .8322   | .8356    | .8339    |
| 1     | 8                |           | G H6                                                                 | G H4    | G H6     | G H4     | .9188              | .9264   | .9242   | .9276    | .9254    |
| 1     |                  | 12        | G H4                                                                 | G H2    | G H6     | G H4     | .9459              | .9515   | .9499   | .9535    | .9516    |
| 1     | 7                | 14 NS     | G H4                                                                 | G H2    | G H6     | G H4     | .9536              | .9585   | .9572   | .9609    | .9590    |
| 1-1/8 |                  |           | G H8                                                                 | G H4    | G H8     | G H4     | 1.0322             | 1.0407  | 1.0381  | 1.0416   | 1.0393   |
| 1-1/8 |                  | 12        | G H4                                                                 | G H4    | G H6     | G H4     | 1.0709             | 1.0765  | 1.0749  | 1.0787   | 1.0768   |
| 1-1/4 | 7                |           | G H8                                                                 | G H4    | G H8     | G H4     | 1.1572             | 1.1657  | 1.1631  | 1.1668   | 1.1644   |
| 1-1/4 |                  | 12        | G H4                                                                 | G H4    | G H6     | G H4     | 1.1959             | 1.2015  | 1.1999  | 1.2039   | 1.2019   |
| 1-3/8 | 6                |           | G H8                                                                 | G H4    | G H8     | G H4     | 1.2667             | 1.2768  | 1.2738  | 1.2771   | 1.2745   |
| 1-3/8 |                  | 12        | G H4                                                                 | G H4    | G H6     | G H4     | 1.3209             | 1.3265  | 1.3249  | 1.3291   | 1.3270   |
| 1-1/2 | 6                |           | G H8                                                                 | G H4    | G H8     | G H4     | 1.3917             | 1.4018  | 1.3988  | 1.4022   | 1.3996   |
| 1-1/2 |                  | 12        | G H4                                                                 | G H4    | G H6     | G H4     | 1.4459             | 1.4515  | 1.4499  | 1.4542   | 1.4522   |

above recommended taps normally produce the class of thread indicated in average materials when used with reasonable care  
tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.

\*\*Sizes through 1" diameter:  
H1 = Basic PD to Basic PD + 0.0005"  
H2 = Basic PD + 0.0005" to Basic PD + 0.0010"  
H3 = Basic PD + 0.0010" to Basic PD + 0.0015"  
H4 = Basic PD + 0.0015" to Basic PD + 0.0020"  
H5 = Basic PD + 0.0020" to Basic PD + 0.0025"  
H6 = Basic PD + 0.0025" to Basic PD + 0.0030"  
Sizes larger than 1" diameter through 1-1/2"  
H4 = Basic PD + 0.0010" to Basic PD + 0.0020"



# YMW TAPS USA

**Distributed By:**

**1507 E. McFadden Ave Santa Ana, CA 92705**

**Customer Service 855-YMW-USA1 855-969-8721**

**Ph: 714-782-0960 Fx: 714-380-6324**

**[ymwtapsusa.com](http://ymwtapsusa.com)**

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