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# INTERNATIONAL STANDARD



# 2283

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Long shank machine taps with nominal diameters from 3 to 24 mm and 1/8 to 1 in

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Descriptors : tools, taps, dimensions.

## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2283 was drawn up by Technical Committee ISO/TC 29, *Small tools*.

It was approved in August 1971 by the Member Bodies of the following countries:

|                     |                |                       |
|---------------------|----------------|-----------------------|
| Belgium             | Israel         | South Africa, Rep. of |
| Czechoslovakia      | Italy          | Spain                 |
| Egypt, Arab Rep. of | Japan          | Switzerland           |
| France              | Korea, Rep. of | Thailand              |
| Hungary             | Netherlands    | Turkey                |
| India               | Poland         | U.S.A.                |
| Ireland             | Romania        | U.S.S.R.              |

The Member Bodies of the following countries expressed disapproval of the document on technical grounds:

Australia  
Austria  
Sweden  
United Kingdom

# Long shank machine taps with nominal diameters from 3 to 24 mm and 1/8 to 1 in

## 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the general dimensions of long shank machine taps.

It covers taps with nominal diameters from 3 to 24 mm and 1/8 to 1 in and applies essentially to relieved shank taps.

The dimensions of these taps are in accordance with those given in ISO/R 529.

Shank lengths ( $L - l$ ) are increased by 50 % with respect to those given in ISO/R 529; total lengths therefore vary accordingly.

This International Standard applies, as does ISO/R 529, to the following thread types :

### ISO metric threads

- coarse pitches (See Table 1)
- fine pitches (See Table 2)

### ISO inch threads

- Unified Coarse (UNC) (See Table 3)
- Unified Fine (UNF) (See Table 4)

Taps for non-recommended threads are given in an Appendix and apply to the following thread types :

- British Standard Whitworth (BSW) (See Table 5)
- British Standard Fine (BSF) (See Table 5)
- British Association (BA) (See Table 6)

For tolerances and for marking, refer to ISO/R 529.

Where taps with diameters larger than those covered by this International Standard are required, the threaded length shall be that given for the corresponding nominal diameter in ISO/R 529 and the length of shank ( $L - l$ ) shall be increased by 50 %.

## 2 REFERENCE

ISO/R 529, *Short machine taps and hand taps*.

3 TAPS FOR ISO METRIC THREADS

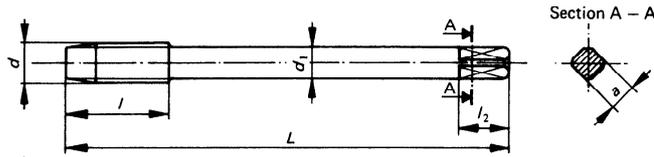


TABLE 1 – Coarse pitches

Dimensions in millimetres

| Designation | d nominal | Pitch | d <sub>1</sub> h9 | l    | L    | Square |                |
|-------------|-----------|-------|-------------------|------|------|--------|----------------|
|             |           |       |                   |      |      | a h11  | l <sub>2</sub> |
| M 3         | 3         | 0.5   | 2.24              | 11   | 66   | 1.80   | 4              |
| M 3.5       | 3.5       | 0.6   | 2.50              | 13   | 68   | 2.00   |                |
| M 4         | 4         | 0.7   | 3.15              |      | 73   | 73     | 2.50           |
| M 4.5       | 4.5       | 0.75  | 3.55              | 2.80 |      |        |                |
| M 5         | 5         | 0.8   | 4.00              | 16   | 79   | 3.15   | 6              |
| M 6         | 6         |       | 4.50              | 19   | 89   | 3.55   |                |
| M 7         | 7         | 1.25  | 5.60              | 22   | 97   | 4.50   | 7              |
| M 8         | 8         |       | 6.30              |      |      | 5.00   |                |
| M 9         | 9         | 1.5   | 7.10              | 24   | 108  | 5.60   | 8              |
| M 10        | 10        |       | 8.00              |      |      | 6.30   |                |
| M 11        | 11        | 1.75  | 8.00              | 25   | 115  | 7.10   | 10             |
| M 12        | 12        |       |                   | 119  | 9.00 |        |                |
| M 14        | 14        | 2     | 11.20             | 30   | 127  | 9.00   | 12             |
| M 16        | 16        |       | 12.50             | 32   | 137  | 10.00  | 13             |
| M 18        | 18        | 2.5   | 14.00             | 37   | 149  | 11.20  | 14             |
| M 20        | 20        |       |                   |      |      |        |                |
| M 22        | 22        | 3     | 18.00             | 45   | 172  | 14.00  | 18             |
| M 24        | 24        |       |                   |      |      |        |                |

TABLE 2 – Fine pitches

Dimensions in millimetres

| Designation  | d nominal | Pitch | d <sub>1</sub> h9 | l    | L    | Square |                |
|--------------|-----------|-------|-------------------|------|------|--------|----------------|
|              |           |       |                   |      |      | a h11  | l <sub>2</sub> |
| M 3 X 0.35   | 3         | 0.35  | 2.24              | 11   | 66   | 1.80   | 4              |
| M 3.5 X 0.35 | 3.5       | 0.35  | 2.50              | 13   | 68   | 2.00   |                |
| M 4 X 0.5    | 4         |       | 0.5               |      | 3.15 | 73     | 73             |
| M 4.5 X 0.5  | 4.5       | 3.55  |                   | 2.80 |      |        |                |
| M 5 X 0.5    | 5         | 0.5   | 4.00              | 16   | 79   | 3.15   | 6              |
| M 5.5 X 0.5  | 5.5       |       |                   | 17   | 84   |        |                |
| M 6 X 0.75   | 6         | 0.75  | 4.50              | 19   | 89   | 3.55   | 7              |
| M 7 X 0.75   | 7         |       |                   |      |      | 5.60   |                |
| M 8 X 1      | 8         | 1     | 6.30              | 97   | 97   | 5.00   | 8              |
| M 9 X 1      | 9         |       |                   |      |      | 7.10   |                |
| M 10 X 1     | 10        | 1.25  | 8.00              | 20   | 108  | 6.30   | 9              |
| M 10 X 1.25  | 10        |       |                   |      |      |        |                |
| M 12 X 1.25  | 12        | 1.25  | 9.00              | 24   | 119  | 7.10   | 10             |
| M 12 X 1.5   | 12        | 1.5   | 11.20             | 29   | 127  | 9.00   | 12             |
| M 14 X 1.25  | 14        | 1.25  |                   | 25   |      |        |                |
| M 14 X 1.5   | 14        | 1.5   | 30                | 127  | 9.00 | 12     |                |
| M 15 X 1.5   | 15        | 1.5   |                   |      |      |        |                |
| M 16 X 1.5   | 16        | 1.5   | 12.50             | 32   | 137  | 10.00  | 13             |
| M 17 X 1.5   | 17        | 1.5   |                   |      |      |        |                |
| M 18 X 1.5   | 18        | 1.5   | 14.00             | 29   | 149  | 11.20  | 14             |
| M 18 X 2     |           | 2     |                   | 37   |      |        |                |
| M 20 X 1.5   | 20        | 1.5   | 16.00             | 29   | 158  | 12.50  | 16             |
| M 20 X 2     |           | 2     |                   | 37   |      |        |                |
| M 22 X 1.5   | 22        | 1.5   | 16.00             | 33   | 158  | 12.50  | 16             |
| M 22 X 2     |           | 2     |                   | 38   |      |        |                |
| M 24 X 1.5   | 24        | 1.5   | 18.00             | 35   | 172  | 14.00  | 18             |
| M 24 X 2     |           | 2     |                   |      |      |        |                |

NOTE – For taps M3 to M10, a recess, optional at the wish of the manufacturer, having the dimension equal to d<sub>2</sub> of ISO/R 529, may be provided.

4 TAPS FOR ISO INCH THREADS

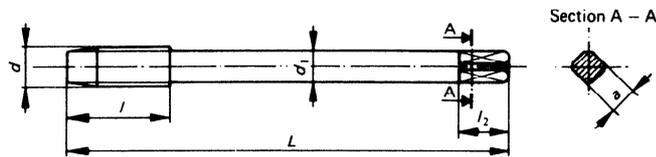


TABLE 3 – Unified Coarse (UNC)

Dimensions in millimetres

| Designation            | d nominal | Approximate pitch | d <sub>1</sub> h9 | l  | L   | Square |                |
|------------------------|-----------|-------------------|-------------------|----|-----|--------|----------------|
|                        |           |                   |                   |    |     | a h11  | l <sub>2</sub> |
| No. 5-40-UNC           | 3.175     | 0.635             | 2.24              | 11 | 66  | 1.80   | 4              |
| No. 6-32-UNC           | 3.505     | 0.794             | 2.50              | 13 | 68  | 2.00   |                |
| No. 8-32-UNC           | 4.166     |                   | 3.15              |    | 73  | 2.50   | 5              |
| No. 10-24-UNC          | 4.826     | 1.058             | 3.55              | 16 | 79  | 2.80   |                |
| No. 12-24-UNC          | 5.486     |                   | 4.00              | 17 | 84  |        |                |
| $\frac{1}{4}$ -20-UNC  | 6.350     | 1.270             | 4.50              | 19 | 89  | 3.55   | 8              |
| $\frac{5}{16}$ -18-UNC | 7.938     | 1.411             | 6.30              | 22 | 97  | 5.00   |                |
| $\frac{3}{8}$ -16-UNC  | 9.525     | 1.588             | 7.10              | 24 | 108 | 5.60   | 8              |
| $\frac{7}{16}$ -14-UNC | 11.112    | 1.814             | 8.00              | 25 | 115 | 6.30   | 9              |
| $\frac{1}{2}$ -13-UNC  | 12.700    | 1.954             | 9.00              | 29 | 119 | 7.10   | 10             |
| $\frac{9}{16}$ -12-UNC | 14.288    | 2.117             | 11.20             | 30 | 127 | 9.00   | 12             |
| $\frac{5}{8}$ -11-UNC  | 15.875    | 2.309             | 12.50             | 32 | 137 | 10.00  | 13             |
| $\frac{3}{4}$ -10-UNC  | 19.050    | 2.540             | 14.00             | 37 | 149 | 11.20  | 14             |
| $\frac{7}{8}$ -9-UNC   | 22.225    | 2.822             | 16.00             | 38 | 158 | 12.50  | 16             |
| 1 -8-UNC               | 25.400    | 3.175             | 18.00             | 45 | 172 | 14.00  | 18             |

TABLE 4 – Unified Fine (UNF)

Dimensions in millimetres

| Designation            | d nominal | Approximate pitch | d <sub>1</sub> h9 | l  | L     | Square |                |
|------------------------|-----------|-------------------|-------------------|----|-------|--------|----------------|
|                        |           |                   |                   |    |       | a h11  | l <sub>2</sub> |
| No. 5-44-UNF           | 3.175     | 0.577             | 2.24              | 11 | 66    | 1.80   | 4              |
| No. 6-40-UNF           | 3.505     | 0.635             | 2.50              | 13 | 68    | 2.00   |                |
| No. 8-36-UNF           | 4.166     | 0.706             | 3.15              |    | 73    | 2.50   | 5              |
| No. 10-32-UNF          | 4.826     | 0.794             | 3.55              | 16 | 79    | 2.80   | 5              |
| No. 12-28-UNF          | 5.486     | 0.907             | 4.00              | 17 | 84    |        |                |
| $\frac{1}{4}$ -28-UNF  | 6.350     |                   | 4.50              | 19 | 89    | 3.55   |                |
| $\frac{5}{16}$ -24-UNF | 7.938     | 1.058             | 6.30              | 22 | 115   | 6.30   | 9              |
| $\frac{3}{8}$ -24-UNF  | 9.525     |                   | 7.10              | 20 | 108   | 5.60   | 8              |
| $\frac{7}{16}$ -20-UNF | 11.112    | 1.270             | 8.00              | 22 | 115   | 6.30   | 9              |
| $\frac{1}{2}$ -20-UNF  | 12.700    | 1.411             | 9.00              | 24 | 119   | 7.10   | 10             |
| $\frac{9}{16}$ -18-UNF | 14.288    |                   | 11.20             | 25 | 127   | 9.00   | 12             |
| $\frac{5}{8}$ -18-UNF  | 15.875    | 12.50             | 137               |    | 10.00 | 13     |                |
| $\frac{3}{4}$ -16-UNF  | 19.050    | 1.588             | 14.00             | 29 | 149   | 11.20  | 14             |
| $\frac{7}{8}$ -14-UNF  | 22.225    | 1.814             | 16.00             | 33 | 158   | 12.50  | 16             |
| 1 -12-UNF              | 25.400    | 2.117             | 18.00             | 35 | 172   | 14.00  | 18             |

APPENDIX

NON-RECOMMENDED THREADS

TABLE 5 – British Standard Whitworth (BSW) and British Standard Fine (BSF)

Dimensions in millimetres

| Designation             |                         | <i>d</i><br>nominal | Approximate |       | <i>d</i> <sub>1</sub><br>h9 | <i>l</i> | <i>L</i> | Square          |                       |
|-------------------------|-------------------------|---------------------|-------------|-------|-----------------------------|----------|----------|-----------------|-----------------------|
| BSW                     | BSF                     |                     | BSW         | BSF   |                             |          |          | <i>a</i><br>h11 | <i>l</i> <sub>2</sub> |
| $\frac{1}{8}$ -40-BSW   | —                       | 3.175               | 0.635       | —     | 2.24                        | 11       | 66       | 1.80            | 4                     |
| $\frac{3}{16}$ -24-BSW  | $\frac{3}{16}$ -32-BSF  | 4.762               | 1.058       | 0.794 | 3.55                        | 16       | 79       | 2.80            | 5                     |
| —                       | $\frac{7}{32}$ -28-BSF  | 5.556               | —           | 0.907 | 4.00                        | 17       | 84       |                 | 6                     |
| $\frac{1}{4}$ -20-BSW   | $\frac{1}{4}$ -26-BSF   | 6.350               | 1.270       | 0.977 | 4.50                        | 19       | 89       | 3.55            | 6                     |
| —                       | $\frac{9}{32}$ -26-BSF  | 7.144               | —           |       | 5.60                        |          | 4.50     | 7               |                       |
| $\frac{5}{16}$ -18-BSW  | $\frac{5}{16}$ -22-BSF  | 7.938               | 1.411       | 1.154 | 6.30                        | 22       | 97       | 5.00            | 8                     |
| $\frac{3}{8}$ -16-BSW   | $\frac{3}{8}$ -20-BSF   | 9.525               | 1.588       | 1.270 | 7.10                        | 24       | 108      | 5.60            | 8                     |
| $\frac{7}{16}$ -14-BSW  | $\frac{7}{16}$ -18-BSF  | 11.112              | 1.814       | 1.411 | 8.00                        | 25       | 115      |                 |                       |
| $\frac{1}{2}$ -12-BSW   | $\frac{1}{2}$ -16-BSF   | 12.700              | 2.117       | 1.588 | 9.00                        | 29       | 119      | 7.10            | 10                    |
| $\frac{9}{16}$ -12-BSW  | $\frac{9}{16}$ -16-BSF  | 14.288              |             |       | 11.20                       | 30       | 127      | 9.00            | 12                    |
| $\frac{5}{8}$ -11-BSW   | $\frac{5}{8}$ -14-BSF   | 15.875              | 2.309       | 1.814 | 12.50                       | 32       | 137      | 10.00           | 13                    |
| $\frac{11}{16}$ -11-BSW | $\frac{11}{16}$ -14-BSF | 17.462              |             |       | 14.00                       | 37       | 149      | 11.20           | 14                    |
| $\frac{3}{4}$ -10-BSW   | $\frac{3}{4}$ -12-BSF   | 19.050              | 2.540       | 2.117 | 16.00                       | 38       | 158      | 12.50           | 16                    |
| $\frac{7}{8}$ -9-BSW    | $\frac{7}{8}$ -11-BSF   | 22.225              | 2.822       | 2.309 |                             |          |          |                 |                       |
| 1 -8-BSW                | 1 -10-BSF               | 25.400              | 3.175       | 2.540 | 18.00                       | 45       | 172      | 14.00           | 18                    |

TABLE 6 – British Association (BA)

Dimensions in millimetres

| Designation | <i>d</i><br>nominal | Pitch | <i>d</i> <sub>1</sub><br>h9 | <i>l</i> | <i>L</i> | Square          |                       |
|-------------|---------------------|-------|-----------------------------|----------|----------|-----------------|-----------------------|
|             |                     |       |                             |          |          | <i>a</i><br>h11 | <i>l</i> <sub>2</sub> |
| BA No. 5    | 3.2                 | 0.59  | 2.24                        | 11       | 66       | 1.80            | 4                     |
| BA No. 4    | 3.6                 | 0.66  | 2.50                        | 13       | 68       | 2.00            |                       |
| BA No. 3    | 4.1                 | 0.73  | 3.15                        |          | 73       | 2.50            | 5                     |
| BA No. 2    | 4.7                 | 0.81  | 3.55                        | 16       | 79       | 2.80            | 5                     |
| BA No. 1    | 5.3                 | 0.90  | 4.00                        | 17       | 84       |                 |                       |
| BA No. 0    | 6                   | 1     | 4.50                        | 19       | 89       | 3.55            |                       |