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④ JIS B 4430 : 1998

Short machine taps and hand taps for metric threads

ICS 25.100.50

Descriptors : taps (threading), tapping (threads), hand tools, iso metric threads, cgs system

Reference number : JIS B 4430 : 1998 (E)

B 4430 : 1998

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS B 4430 : 1987** is replaced with **JIS B 4430 : 1998**.

In this revision, under the purpose of international conformity, this Standard adopts **ISO 529 : 1993**, *Short machine taps and hand taps*, **ISO 2857 : 1973**, *Ground thread taps for ISO metric threads of tolerances 4H to 8H and 4G to 6G coarse and fine pitches—Manufacturing tolerances on the threaded portion* and **ISO 8830 : 1991**, *High-speed steel machine taps with ground threads—Technical specifications* as the basis.

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Short machine taps and hand taps for metric threads

Introduction This Japanese Industrial Standard has been prepared based on the second edition of **ISO 529**, *Short machine taps and hand taps* published in 1993, the first edition of **ISO 2857**, *Ground thread taps for ISO metric threads of tolerances 4H to 8H and 4G to 6G coarse and fine pitches—Manufacturing tolerances on the threaded portion* published in 1973 and the first edition of **ISO 8830**, *High-speed steel machine taps with ground threads—Technical specifications* published in 1991, in such a manner that the text contains the corresponding parts to the International Standards without modifying the technical contents but complementarily provides with the items of definitions, appearance of quality, test methods, inspection, designation of products and marking on package which are not specified in the corresponding International Standards. Further, Annex to this Standard specifies the taps different from the corresponding International Standards in the shape, dimensions and the accuracy of thread.

1 Scope This Standard specifies hand taps, which are also called as short machine taps, for metric threads used for cutting metric coarse screw threads of nominal sizes M1 to M68 and metric fine screw threads of nominal sizes M1 × 0.2 to M100 × 6 (hereafter referred to as “taps”).

Remarks 1 Hand taps are those intended for general use of tappings, which are mainly used by machine but sometimes by hand.

2 For the taps not subjected to the text, Annex (normative) applies.

3 The International Standards corresponding to this Standard are listed as follows:

ISO 529 : 1993 *Short machine taps and hand taps*

ISO 2857 : 1973 *Ground thread taps for ISO metric threads of tolerances 4H to 8H and 4G to 6G coarse and fine pitches—Manufacturing tolerances on the threaded portion*

ISO 8830 : 1991 *High-speed steel machine taps with ground threads—Technical specifications*

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions (including the amendments) shall be applied.

JIS B 0021 *Geometrical product specifications (GPS)—Geometrical tolerancing—Tolerancing of form, orientation, location and run-out*

JIS B 0101 *Screw threads and fasteners—Vocabulary*

JIS B 0176 *Threading tools—Vocabulary*

JIS B 0215 *Tolerance system for metric screw threads*

JIS B 0271 *Three wires for screw thread measuring*

JIS B 0401-2 *ISO system of limits and fits—Part 2 : Tables of standard tolerance grades and limit deviations for holes and shafts*

JIS B 4002 *Rotating tools with parallel shanks—Diameters of shanks and sizes of driving squares*

JIS B 7153 *Measuring microscopes*

JIS B 7502 *Micrometer callipers*

JIS B 7503 *Dial gauges*

JIS B 7519 *Microindicators*

JIS B 7725 *Vickers hardness test—Verification of testing machines*

JIS B 7726 *Rockwell hardness test—Verification of testing machines*

JIS G 4051 *Carbon steels for machine structural use*

JIS G 4403 *High speed tool steels*

JIS G 4404 *Alloy tool steels*

JIS Z 2244 *Vickers hardness test—Test method*

JIS Z 2245 *Rockwell hardness test—Test method*

ISO 237 *Rotating tools with parallel shank—Diameters of shanks and sizes of driving squares*

3 Definitions For the main terms used in this Standard the definitions in **JIS B 0176** and **JIS B 0101** apply.

4 Classification and grade Taps shall be classified by the shape into three types of full-diameter shank taps, recessed taps and relieved-shank taps.

The taps shall be graded by the tolerance position of the thread pitch diameter into three classes of 1, 2 and 3, which are symbolized as given in Table 1.

Table 1 Symbol of grade

Grade	Class 1	Class 2	Class 3
Symbol	ISO 1	ISO 2	ISO 3
Grade of internal thread (informative)	4 H, 5 H	6 H 4 G, 5 G	7 H, 8 H 6 G

Remarks : The grade of internal threads relative to the grade of taps is shown for informative reference, and the internal thread made by the tap of each grade shall not necessarily meet that grade.

As the accuracies required for internal threads vary generally depending on the work material, condition of machining tool, tapping attachment, cutting speed, cutting oil and the like, it is essential to select the grade of the tap suitable to the respective conditions based on the grade of internal thread.

5 Shape and dimensions The shape and dimensions of taps shall be as given in Attached Tables 1 to 6.

6 Qualities

6.1 Appearance Taps, in appearance, shall be free from such defects as macro-streak-flow or crack as well as harmful burrs, flaws, rust or incomplete joining, and shall be well finished.

6.2 Hardness The hardness of taps, when tested by the method of 8.1, shall be as follows:

- a) The hardness of the threaded part of taps shall be as given in Table 2.
- b) The hardness of the shank and driving square of taps shall be at least 30HRC.

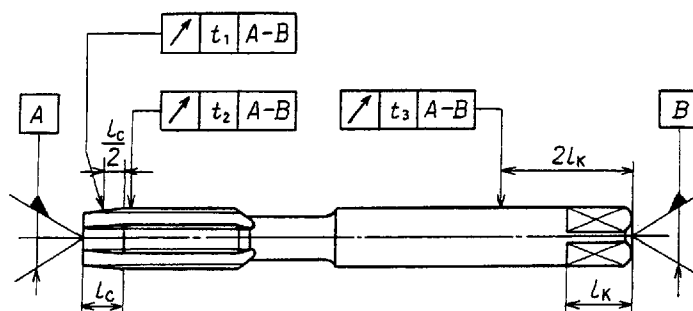
Table 2 Hardness of threaded part

Basic major diameter, D mm	Hardness min.
$D \leq 3$	61HRC or 750HV
$3 < D \leq 6$	62HRC or 780HV
$6 < D$	63HRC or 820HV

6.3 Accuracy of thread The accuracy of thread of taps, when tested according to 8.2 shall be as follows:

- a) For the tolerances on the major diameter, pitch diameter and minor diameter of threads of taps, Attached Table 7 applies to the taps for metric coarse threads and Attached Table 8, to the taps for metric fine threads.
- b) For the pitch tolerance on the thread of taps, Attached Table 9 applies.
- c) For the tolerance on the thread half angle of taps, Attached Table 10 applies.

6.4 Runouts Runout tolerances on the leading chamfer, threaded portion and shank of taps, when tested according to 8.3, shall be as given in Table 3.

Table 3 Runout tolerances

Remarks : Drawing indications are based on **JIS B 0021**.

Unit : mm

Basic major diameter D	Runout tolerance on chamfer t_1	Runout tolerance on threaded portion t_2	Runout tolerance on shank t_3
$D < 10$	0.018	0.018	0.030
$10 \leq D < 18$	0.022	0.018	0.030
$18 \leq D < 30$	0.026	0.022	0.040
$30 \leq D < 40$	0.030	0.022	0.040
$40 \leq D$	0.036	0.026	0.040

Remarks : Each measuring position of t_1 , t_2 and t_3 shall be as follows:

- t_1 : centre of chamfer length
- t_2 : the first complete thread behind the chamfer
- t_3 : twice the square length from end face of the shank driving square

7 Materials Materials of the threaded portion of taps shall be SKH51 of **JIS G 4403** or those at least equivalent thereto in the function.

8 Test methods

8.1 Hardness The hardness of taps shall be determined by the method specified in **JIS Z 2245** by using a Rockwell hardness testing machine of **JIS B 7726**. If it is impossible to measure by Rockwell testing machine, it may be determined by the method of **JIS Z 2244**, using a Vickers hardness testing machine specified in **JIS B 7725**.

Further, if it is difficult to determine by using any testing machine, relative measurement by file may also be permitted.

8.2 Accuracy of thread The accuracy of thread of taps shall be determined as given in Attached Table 11.

8.3 Runouts The runouts of taps shall be determined as given in Attached Table 11.

9 Inspection Taps shall be inspected on the shape and dimensions, appearance, hardness, accuracy of thread and runouts, and shall meet the respective requirements given in clauses 5 and 6.

10 Designation of products Taps shall be designated by the number or title of this Standard, classification⁽¹⁾, size designation, grade⁽²⁾, type of chamfer length and symbol of thread material⁽³⁾.

For the left-hand thread taps "left" shall be prefixed to the size designation.

Example 1 **JIS B 4430**, M8, ISO class 1, Plug tap, SKH51

Example 2 Hand tap for metric threads, Recessed, M8, ISO class 1, Bottoming tap, HSS

Example 3 Hand tap for metric threads, M10 × 1.25, ISO class 2, Taper tap, HSS-E

Example 4 **JIS B 4430**, Left M3, ISO class 2, Plug tap, HSS

Notes (1) In the classification, only for the tap with recess, "Recessed" shall be added.

(2) For the grade, as avoiding confusion with the classes of grade defined in Annex, "ISO" shall be prefixed to the classes 1, 2 and 3 in the immediate future.

(3) The material used may be designated as HSS for SKH51 or equivalent thereto, and as HSS-E for those consisting of at least 2.6 % vanadium or at least 4.5 % cobalt.

11 Markings

11.1 Marking on products Taps shall be marked horizontally with the following information in general on the shank with the driving square upward or lateral. For the tap up to and including 3.9 mm shank diameter, the information may be altered or omitted as appropriate.

Example

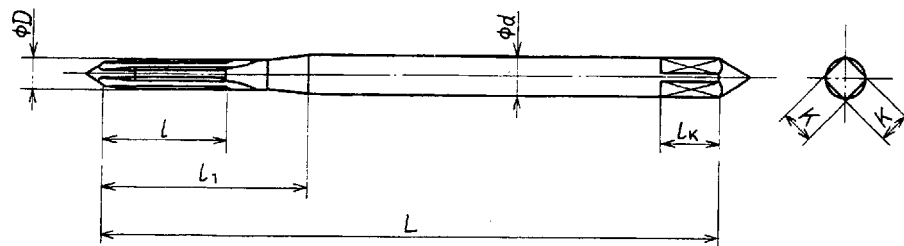
- a) Symbol of left-hand thread: L (No symbol marking for right-hand thread)
- b) Size designation: M8 (The pitch size may be followed for metric coarse threads)
- c) Symbol of thread material⁽⁴⁾: SKH51
- d) Manufacturer's name or abbreviation
- e) Symbol of grade: ISO 2

Note (4) For the material used, the marking may be as HSS for SKH51 or its equivalent, and as HSS-E for those consisting of at least 2.6 % vanadium or at least 4.5 % cobalt.

11.2 Marking on package The package of taps shall be marked with the product name⁽⁵⁾, type of chamfer length⁽⁶⁾ and the information as given in 11.1.

Notes (5) The product name refers to short machine tap or hand tap.

(6) This may be marked as A, D and E for taper tap, plug tap and bottoming tap respectively.

Attached Table 1 Shape and dimensions of full-diameter shank taps for metric coarse threads

Remarks : Shank centre point is not always necessary.

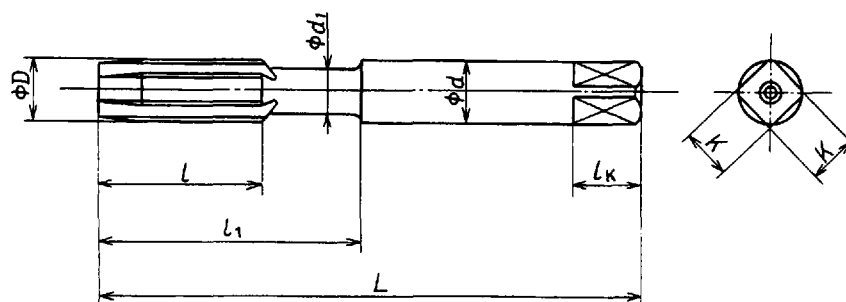
Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length $l^{(7)}$ max.	l_1	Shank diameter d		Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance h16			Basic size	Tolerance h9 ⁽⁸⁾	Basic size	Tolerance h11 ⁽⁹⁾	Basic size	Tolerance	
M 1	1	0.25	38.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	5.5	10	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	2 or 3
M1.1	1.1	0.25	38.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	5.5	10	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	2 or 3
M1.2	1.2	0.25	38.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	5.5	10	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	2 or 3
M1.4	1.4	0.3	40	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	7	12	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	2 or 3
M1.6	1.6	0.35	41	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	8	13	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	2 or 3
M1.8	1.8	0.35	41	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	8	13	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	2 or 3
M 2	2	0.4	41	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	8	13.5	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	2 or 3
M2.2	2.2	0.45	44.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	9.5	15.5	2.8	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2.24	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3
M2.5	2.5	0.45	44.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	9.5	15.5	2.8	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2.24	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3

Notes ⁽⁷⁾ The thread length may be increased to $l + \frac{l_1 - l}{2}$.⁽⁸⁾ Tolerance h9 applies to precision shanks, and tolerance h11, to non-precision shanks. This is identical to ISO 237.⁽⁹⁾ The tolerance is enlarged to h12 when including errors of form and position (deviation of the centre).Remarks 1 For tolerances on overall length, L , shank diameter, d , and square width, K , JIS B 0401-2 applies.

2 The chamfer length shall generally be 6 threads or more for taper taps, 3.5 to 5.5 threads for plug taps and up to 2 threads for bottoming taps.

3 Thread side centre point may be removed when requested by the purchaser.

Attached Table 2 Shape and dimensions of recessed taps for metric coarse threads

Remarks : Those up to and including M8 designations may have centre point.

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length $l^{(10)}$ max.	l_1	Shank diameter d		$d_1^{(10)}$ min.	Square width K		Square length l_k		Number of flutes Z (informative)
			Basic size	Tolerance h16			Basic size	Tolerance h9 ⁽⁸⁾		Basic size	Tolerance h11 ⁽⁹⁾	Basic size	Tolerance	
M 3	3	0.5	48	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	11	18	3.15	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.12	2.5	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3
M3.5	3.5	0.6	50	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	13	20	3.55	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.5	2.8	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3
M 4	4	0.7	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	21	4	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.8	3.15	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	± 0.8	3 or 4
M4.5	4.5	0.75	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	21	4.5	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.15	3.55	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	± 0.8	3 or 4
M 5	5	0.8	58	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	16	25	5	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.55	4	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	7	± 0.8	3 or 4
M 6	6	1	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	30	6.3	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	4.5	5	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	± 0.8	3 or 4
M 7	7	1	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	30	7.1	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	5.3	5.6	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	± 0.8	3 or 4
M 8	8	1.25	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	35	8	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	6	6.3	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	9	± 0.8	3 or 4
M 9	9	1.25	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	36	9	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.1	7.1	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	10	± 0.8	3 or 4
M10	10	1.5	80	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	24	39	10	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.5	8	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	11	± 0.8	3 or 4

Notes ⁽⁸⁾ Tolerance h9 applies to precision shanks, and tolerance h11, to non-precision shanks. This is identical to ISO 237.

⁽⁹⁾ The tolerance is enlarged to h12 when including errors of form and position (deviation of the centre).

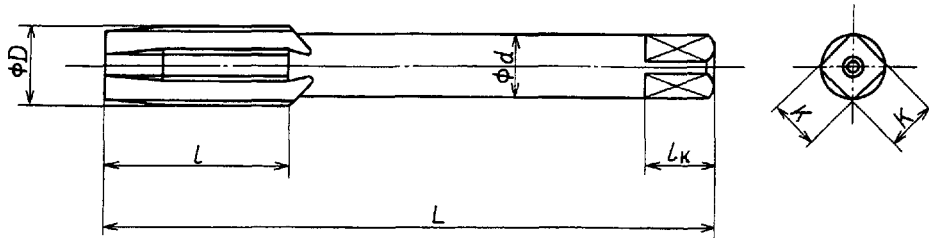
⁽¹⁰⁾ If the recess is not required the thread length shall be equal to $l + \frac{l_1 - l}{2}$.

Remarks 1 For the tolerances on overall length, L , shank diameter, d , and square width, K , JIS B 0401-2 applies.

2 The chamfer length shall generally be 6 threads or more for taper taps, 3.5 to 5.5 threads for plug taps and up to 2 threads for bottoming taps.

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Attached Table 3 Shape and dimensions of relieved-shank taps for metric coarse threads



Remarks : Those up to and including M8 designations may have centre point.

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length l max.	Shank diameter d		Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance h16		Basic size	Tolerance h9 ⁽⁸⁾	Basic size	Tolerance h11 ⁽⁹⁾	Basic size	Tolerance	
M 3	3	0.5	48	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	11	2.24	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	1.8	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	3
M3.5	3.5	0.6	50	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	13	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	± 0.8	3
M 4	4	0.7	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	3.15	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.5	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3 or 4
M4.5	4.5	0.75	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	3.55	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.8	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3 or 4
M 5	5	0.8	58	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	16	4	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.15	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	± 0.8	3 or 4
M 6	6	1	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	4.5	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.55	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	± 0.8	3 or 4
M 7	7	1	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	5.6	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	4.5	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	7	± 0.8	3 or 4
M 8	8	1.25	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	6.3	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	5	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	± 0.8	3 or 4
M 9	9	1.25	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	7.1	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	5.6	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	± 0.8	3 or 4
M10	10	1.5	80	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	24	8	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	6.3	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	9	± 0.8	3 or 4
M11	11	1.5	85	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	25	8	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	6.3	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	9	± 0.8	4
M12	12	1.75	89	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	29	9	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.1	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	10	± 0.8	4
M14	14	2	95	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	30	11.2	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	9	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	12	± 0.8	4
M16	16	2	102	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	32	12.5	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	10	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	13	± 0.8	4
M18	18	2.5	112	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	37	14	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	11.2	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	14	± 0.8	4
M20	20	2.5	112	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	37	14	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	11.2	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	14	± 0.8	4
M22	22	2.5	118	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	38	16	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	12.5	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	16	± 0.8	4
M24	24	3	130	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	18	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	14	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	18	± 0.8	4
M27	27	3	135	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	± 1.6	4

Attached Table 3 (concluded)

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length l max.	Shank diameter d		Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance h16		Basic size	Tolerance h9 ⁽⁸⁾	Basic size	Tolerance h11 ⁽⁹⁾	Basic size	Tolerance	
M30	30	3.5	138	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	48	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	± 1.6	4
M33	33	3.5	151	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	51	22.4	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	18	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	22	± 1.6	4
M36	36	4	162	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	57	25	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	20	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	24	± 1.6	4
M39	39	4	170	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	60	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4
M42	42	4.5	170	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	60	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M45	45	4.5	187	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	67	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M48	48	5	187	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	67	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M52	52	5	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M56	56	5.5	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M60	60	5.5	221	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	76	40	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	31.5	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	34	± 1.6	4 or 6
M64	64	6	224	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	79	40	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	31.5	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	34	± 1.6	4 or 6
M68	68	6	234	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	79	45	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	35.5	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	38	± 1.6	4 or 6

Notes ⁽⁸⁾ Tolerance h9 applies to precision shanks, and tolerance h11, to non-precision shanks. This is identical to ISO 237.

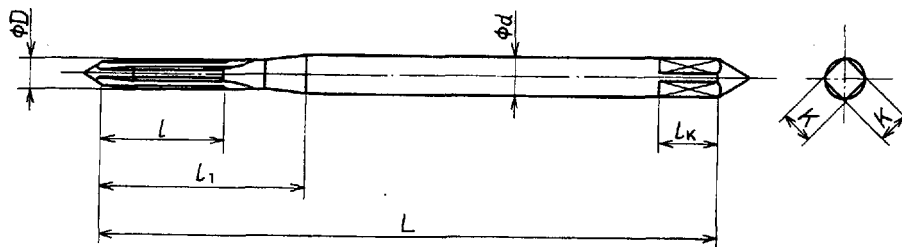
⁽⁹⁾ The tolerance is enlarged to h12 when including errors of form and position (deviation of the centre).

Remarks 1 For the tolerances on overall length, L , shank diameter, d , and square width, K , JIS B 0401-2 applies.

2 The chamfer length shall generally be 6 threads or more for taper taps, 3.5 to 5.5 threads for plug taps and up to 2 threads for bottoming taps.

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Attached Table 4 Shape and dimensions of full-diameter shank taps for metric fine threads



Remarks : Shank centre point is not always necessary.

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length $l^{(7)}$ max.	l_1	Shank diameter d		Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance h16			Basic size	Tolerance h9 ⁽⁸⁾	Basic size	Tolerance h11 ⁽⁹⁾	Basic size	Tolerance	
M1 × 0.2	1	0.2	38.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	5.5	10	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	2 or 3
M1.1 × 0.2	1.1	0.2	38.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	5.5	10	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	2 or 3
M1.2 × 0.2	1.2	0.2	38.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	5.5	10	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	2 or 3
M1.4 × 0.2	1.4	0.2	40	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	7	12	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	2 or 3
M1.6 × 0.2	1.6	0.2	41	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	8	13	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	2 or 3
M1.8 × 0.2	1.8	0.2	41	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	8	13	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	2 or 3
M2 × 0.25	2	0.25	41	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	8	13.5	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	2 or 3
M2.2 × 0.25	2.2	0.25	44.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	9.5	15.5	2.8	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2.24	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	±0.8	3
M2.5 × 0.35	2.5	0.35	44.5	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	9.5	15.5	2.8	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2.24	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	±0.8	3

Notes (7) The thread length may be increased to $l + \frac{l_1 - l}{2}$.

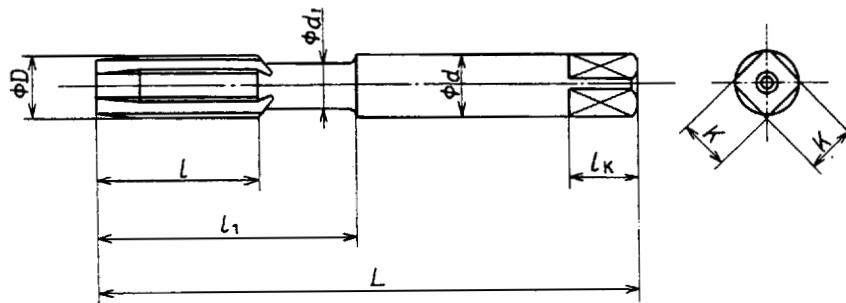
(8) Tolerance h9 applies to precision shanks, and tolerance h11, to non-precision shanks. This is identical to **ISO 237**.

(9) The tolerance is enlarged to h12 when including errors of form and position (deviation of the centre).

Remarks 1 For tolerances on overall length, L , shank diameter, d , and square width, K , **JIS B 0401-2** applies.

2 The chamfer length shall generally be 6 threads or more for taper taps, 3.5 to 5.5 threads for plug taps and up to 2 threads for bottoming taps.

3 Thread side centre point may be removed when requested by the purchaser.

Attached Table 5 Shape and dimensions of recessed taps for metric fine threads

Remarks : Those up to and including M8 designations may have centre point.

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length $l^{(10)}$ max.	l_1	Shank diameter d		$d_1^{(10)}$ min.	Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance h16			Basic size	Tolerance h9 ⁽⁸⁾		Basic size	Tolerance h11 ⁽⁹⁾	Basic size	Tolerance	
M 3 × 0.35	3	0.35	48	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	11	18	3.15	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.12	2.5	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3
M3.5 × 0.35	3.5	0.35	50	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	13	20	3.55	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.5	2.8	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	± 0.8	3
M 4 × 0.5	4	0.5	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	21	4	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.8	3.15	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	± 0.8	3 or 4
M4.5 × 0.5	4.5	0.5	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	21	4.5	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.15	3.55	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	± 0.8	3 or 4
M 5 × 0.5	5	0.5	58	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	16	25	5	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.55	4	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	7	± 0.8	3 or 4
M5.5 × 0.5	5.5	0.5	62	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	17	26	5.6	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	4	4.5	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	7	± 0.8	3 or 4
M 6 × 0.75	6	0.75	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	30	6.3	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	4.5	5	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	± 0.8	3 or 4
M 7 × 0.75	7	0.75	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	30	7.1	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	5.3	5.6	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	± 0.8	3 or 4
M 8 × 1	8	1	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	35	8	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	6	6.3	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	9	± 0.8	3 or 4
M 9 × 1	9	1	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	36	9	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.1	7.1	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	10	± 0.8	3 or 4
M10 × 1.25	10	1.25	80	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	24	39	10	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.5	8	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	11	± 0.8	3 or 4
M10 × 1	10	1	80	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	24	39	10	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.5	8	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	11	± 0.8	3 or 4

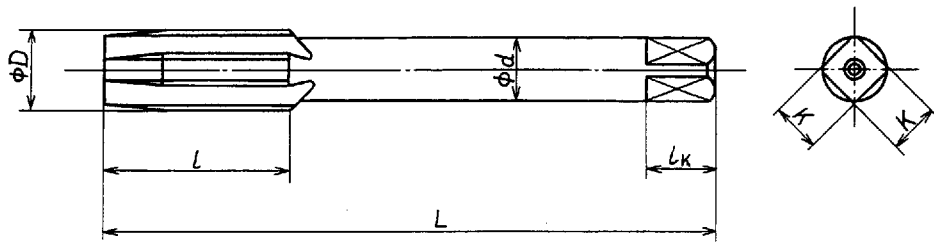
Notes ⁽⁸⁾ Tolerance h9 applies to precision shanks, and tolerance h11, to non-precision shanks. This is identical to **ISO 237**.

⁽⁹⁾ The tolerance is enlarged to h12 when including errors of form and position (deviation of the centre).

⁽¹⁰⁾ If the recess is not required the thread length shall be equal to $l + \frac{l_1 - l}{2}$.

Remarks 1 For the tolerances on overall length, L , shank diameter, d , and square width, K , **JIS B 0401-2** applies.

2 The chamfer length shall generally be 6 threads or more for taper taps, 3.5 to 5.5 threads for plug taps and up to 2 threads for bottoming taps.

Attached Table 6 Shape and dimensions of relieved-shank taps for metric fine threads

Remarks : Those up to and including M8 designations may have centre point.

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length l max.	Shank diameter d		Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance h16		Basic size	Tolerance h9(°)	Basic size	Tolerance h11(°)	Basic size	Tolerance	
M3 × 0.35	3	0.35	48	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	11	2.24	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	1.8	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	3
M3.5 × 0.35	3.5	0.35	50	$\begin{smallmatrix} 0 \\ -1.6 \end{smallmatrix}$	13	2.5	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	2	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	4	±0.8	3
M4 × 0.5	4	0.5	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	3.15	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.5	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	±0.8	3 or 4
M4.5 × 0.5	4.5	0.5	53	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	13	3.55	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	2.8	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	5	±0.8	3 or 4
M5 × 0.5	5	0.5	58	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	16	4	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.15	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	±0.8	3 or 4
M5.5 × 0.5	5.5	0.5	62	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	17	4	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.15	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	±0.8	3 or 4
M6 × 0.75	6	0.75	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	4.5	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	3.55	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	6	±0.8	3 or 4
M7 × 0.75	7	0.75	66	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	19	5.6	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	4.5	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	7	±0.8	3 or 4
M8 × 1	8	1	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	6.3	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	5	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	±0.8	3 or 4
M9 × 1	9	1	72	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	22	7.1	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	5.6	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	8	±0.8	3 or 4
M10 × 1.25	10	1.25	80	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	24	8	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	6.3	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	9	±0.8	3 or 4
M10 × 1	10	1	80	$\begin{smallmatrix} 0 \\ -1.9 \end{smallmatrix}$	24	8	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	6.3	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	9	±0.8	3 or 4
M12 × 1.5	12	1.5	89	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	29	9	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.1	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	10	±0.8	4
M12 × 1.25	12	1.25	89	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	29	9	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	7.1	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	10	±0.8	4
M14 × 1.5	14	1.5	95	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	30	11.2	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	9	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	12	±0.8	4
M14 × 1.25	14	1.25	95	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	30	11.2	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	9	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	12	±0.8	4
M15 × 1.5	15	1.5	95	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	30	11.2	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	9	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	12	±0.8	4
M16 × 1.5	16	1.5	102	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	32	12.5	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	10	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	13	±0.8	4
M17 × 1.5	17	1.5	102	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	32	12.5	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	10	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	13	±0.8	4

Attached Table 6 (continued)

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length l max.	Shank diameter d		Square width K		Square length l_k		Number of flutes Z (informative)
			Basic size	Tolerance h16		Basic size	Tolerance h9(°)	Basic size	Tolerance h11(°)	Basic size	Tolerance	
M18 × 2	18	2	112	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	37	14	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	11.2	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	14	±0.8	4
M18 × 1.5	18	1.5	112	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	37	14	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	11.2	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	14	±0.8	4
M20 × 2	20	2	112	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	37	14	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	11.2	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	14	±0.8	4
M20 × 1.5	20	1.5	112	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	37	14	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	11.2	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	14	±0.8	4
M22 × 2	22	2	118	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	38	16	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	12.5	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	16	±0.8	4
M22 × 1.5	22	1.5	118	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	38	16	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	12.5	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	16	±0.8	4
M24 × 2	24	2	130	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	18	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	14	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	18	±0.8	4
M24 × 1.5	24	1.5	130	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	18	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	14	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	18	±0.8	4
M25 × 2	25	2	130	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	18	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	14	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	18	±0.8	4
M25 × 1.5	25	1.5	130	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	18	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	14	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	18	±0.8	4
M27 × 2	27	2	127	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	±1.6	4
M27 × 1.5	27	1.5	127	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	±1.6	4
M28 × 2	28	2	127	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	±1.6	4
M28 × 1.5	28	1.5	127	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	±1.6	4
M30 × 3	30	3	138	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	48	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	±1.6	4
M30 × 2	30	2	127	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	±1.6	4
M30 × 1.5	30	1.5	127	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	20	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	16	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	20	±1.6	4
M32 × 2	32	2	137	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	22.4	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	18	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	22	±1.6	4
M32 × 1.5	32	1.5	137	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	22.4	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	18	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	22	±1.6	4
M33 × 3	33	3	151	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	51	22.4	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	18	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	22	±1.6	4
M33 × 2	33	2	137	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	22.4	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	18	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	22	±1.6	4
M33 × 1.5	33	1.5	137	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	37	22.4	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	18	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	22	±1.6	4
M35 × 1.5	35	1.5	144	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	25	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	20	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	24	±1.6	4
M36 × 3	36	3	162	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	57	25	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	20	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	24	±1.6	4

Attached Table 6 (continued)

Unit : mm

Designation	Basic major diameter D	Pitch P	Overall length L		Thread length l max.	Shank diameter d		Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance $h16$		Basic size	Tolerance $h9^{(8)}$	Basic size	Tolerance $h11^{(9)}$	Basic size	Tolerance	
M36 $\times$ 2	36	2	144	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	25	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	20	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	24	± 1.6	4
M36 $\times$ 1.5	36	1.5	144	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	25	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	20	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	24	± 1.6	4
M39 $\times$ 3	39	3	170	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	60	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4
M39 $\times$ 2	39	2	149	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4
M39 $\times$ 1.5	39	1.5	149	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4
M40 $\times$ 3	40	3	170	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	60	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M40 $\times$ 2	40	2	149	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M40 $\times$ 1.5	40	1.5	149	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M42 $\times$ 4	42	4	170	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	60	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M42 $\times$ 3	42	3	170	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	60	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M42 $\times$ 2	42	2	149	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	39	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M42 $\times$ 1.5	42	1.5	149	$\begin{smallmatrix} 0 \\ -2.2 \end{smallmatrix}$	39	28	$\begin{smallmatrix} 0 \\ -0.052 \end{smallmatrix}$	22.4	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	26	± 1.6	4 or 6
M45 $\times$ 4	45	4	187	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	67	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M45 $\times$ 3	45	3	187	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	67	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M45 $\times$ 2	45	2	165	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M45 $\times$ 1.5	45	1.5	165	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M48 $\times$ 4	48	4	187	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	67	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M48 $\times$ 3	48	3	187	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	67	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M48 $\times$ 2	48	2	165	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M48 $\times$ 1.5	48	1.5	165	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M50 $\times$ 3	50	3	187	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	67	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M50 $\times$ 2	50	2	165	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6
M50 $\times$ 1.5	50	1.5	165	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	31.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	25	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	28	± 1.6	4 or 6

Attached Table 6 (concluded)

Unit : mm

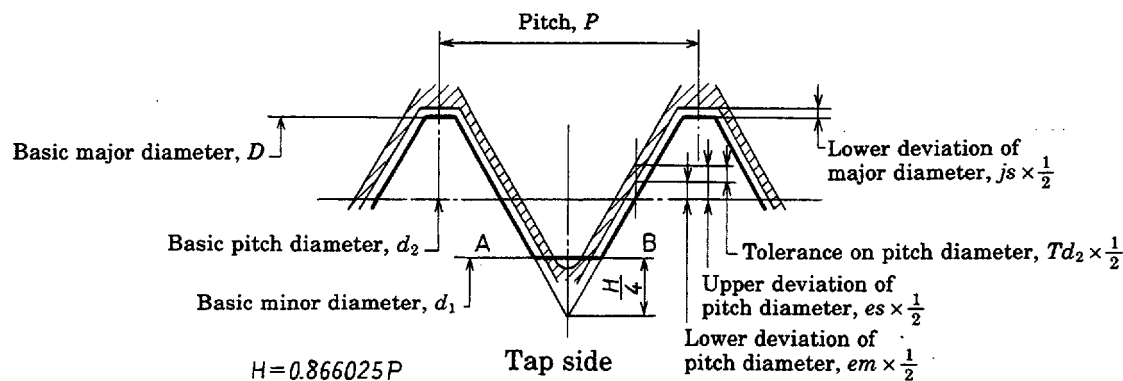
Designation	Basic major diameter D	Pitch P	Overall length L		Thread length l max.	Shank diameter d		Square width K		Square length l_K		Number of flutes Z (informative)
			Basic size	Tolerance $h16$		Basic size	Tolerance $h9^{(8)}$	Basic size	Tolerance $h11^{(9)}$	Basic size	Tolerance	
M52 $\times$ 4	52	4	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M52 $\times$ 3	52	3	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M52 $\times$ 2	52	2	175	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M52 $\times$ 1.5	52	1.5	175	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M55 $\times$ 4	55	4	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M55 $\times$ 3	55	3	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M55 $\times$ 2	55	2	175	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M55 $\times$ 1.5	55	1.5	175	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M56 $\times$ 4	56	4	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M56 $\times$ 3	56	3	200	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	70	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M56 $\times$ 2	56	2	175	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M56 $\times$ 1.5	56	1.5	175	$\begin{smallmatrix} 0 \\ -2.5 \end{smallmatrix}$	45	35.5	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	28	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	31	± 1.6	4 or 6
M70 $\times$ 6	70	6	234	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	79	45	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	35.5	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	38	± 1.6	4 or 6
M72 $\times$ 6	72	6	234	$\begin{smallmatrix} 0 \\ -2.9 \end{smallmatrix}$	79	45	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	35.5	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	38	± 1.6	4 or 6
M76 $\times$ 6	76	6	258	$\begin{smallmatrix} 0 \\ -3.2 \end{smallmatrix}$	83	50	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	40	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	42	± 1.6	4 or 6
M80 $\times$ 6	80	6	258	$\begin{smallmatrix} 0 \\ -3.2 \end{smallmatrix}$	83	50	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	40	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	42	± 1.6	6
M85 $\times$ 6	85	6	261	$\begin{smallmatrix} 0 \\ -3.2 \end{smallmatrix}$	86	50	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	40	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	42	± 1.6	6 or 8
M90 $\times$ 6	90	6	261	$\begin{smallmatrix} 0 \\ -3.2 \end{smallmatrix}$	86	50	$\begin{smallmatrix} 0 \\ -0.062 \end{smallmatrix}$	40	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	42	± 1.6	6 or 8
M95 $\times$ 6	95	6	279	$\begin{smallmatrix} 0 \\ -3.2 \end{smallmatrix}$	89	56	$\begin{smallmatrix} 0 \\ -0.074 \end{smallmatrix}$	45	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	46	± 1.6	6 or 8
M100 $\times$ 6	100	6	279	$\begin{smallmatrix} 0 \\ -3.2 \end{smallmatrix}$	89	56	$\begin{smallmatrix} 0 \\ -0.074 \end{smallmatrix}$	45	$\begin{smallmatrix} 0 \\ -0.160 \end{smallmatrix}$	46	± 1.6	6 or 8

Notes (8) Tolerance $h9$ applies to precision shanks, and tolerance $h11$, to non-precision shanks. This is identical to ISO 237.

(9) The tolerance is enlarged to $h12$ when including errors of form and position (deviation of the centre).

Remarks 1 For the tolerances on overall length, L , shank diameter, d , and square width, K , JIS B 0401-2 applies.

2 The chamfer length shall generally be 6 threads or more for taper taps, 3.5 to 5.5 threads for plug taps and up to 2 threads for bottoming taps.

Attached Table 7 Permissible deviations and tolerances on the major diameter, pitch diameter and minor diameter of taps for metric coarse threads

Remarks : In above drawing, thick continuous lines represent the basic profile and oblique line area is the tolerance zone of taps.

Unit : μm

Designation	Pitch <i>P</i> (mm)	Major diameter		Pitch diameter ⁽¹⁾											Minor diameter
		Basic size <i>D</i> (mm)	All classes		Basic size <i>d</i> ₂ (mm)	Class 1			Class 2			Class 3			Basic size <i>d</i> ₁ (mm)
			Upper deviation	Lower deviation <i>js</i> +		Upper deviation <i>es</i> +	Lower deviation <i>em</i> +	Tolerance <i>Td</i> ₂	Upper deviation <i>es</i> +	Lower deviation <i>em</i> +	Tolerance <i>Td</i> ₂	Upper deviation <i>es</i> +	Lower deviation <i>em</i> +	Tolerance <i>Td</i> ₂	
M 1	0.25	1.000	Not specified	22	0.838	17	6	11	—	—	—	—	—	—	0.729
M1.1	0.25	1.100		22	0.938	17	6	11	—	—	—	—	—	—	0.829
M1.2	0.25	1.200		22	1.038	17	6	11	—	—	—	—	—	—	0.929
M1.4	0.3	1.400		24	1.205	18	6	12	30	18	12	—	—	—	1.075
M1.6	0.35	1.600		27	1.373	20	7	13	34	20	14	—	—	—	1.221
M1.8	0.35	1.800		27	1.573	20	7	13	34	20	14	—	—	—	1.421
M 2	0.4	2.000		28	1.740	21	7	14	36	21	15	—	—	—	1.567
M2.2	0.45	2.200		30	1.908	23	8	15	38	23	15	—	—	—	1.713
M2.5	0.45	2.500		30	2.208	23	8	15	38	23	15	—	—	—	2.013
M 3	0.5	3.000		32	2.675	24	8	16	40	24	16	56	40	16	2.459
M3.5	0.6	3.500		36	3.110	27	9	18	45	27	18	63	45	18	2.850
M 4	0.7	4.000		38	3.545	29	10	19	48	29	19	67	48	19	3.242
M4.5	0.75	4.500		38	4.013	29	10	19	48	29	19	67	48	19	3.688
M 5	0.8	5.000		40	4.480	30	10	20	50	30	20	70	50	20	4.134
M 6	1	6.000		47	5.350	35	12	23	59	35	24	83	59	24	4.917
M 7	1	7.000		47	6.350	35	12	23	59	35	24	83	59	24	5.917
M 8	1.25	8.000		50	7.188	38	13	25	63	38	25	88	63	25	6.647
M 9	1.25	9.000		50	8.188	38	13	25	63	38	25	88	63	25	7.647
M10	1.5	10.000	56	9.026	42	14	28	70	42	28	98	70	28	8.376	
M11	1.5	11.000	56	10.026	42	14	28	70	42	28	98	70	28	9.376	
M12	1.75	12.000	64	10.863	48	16	32	80	48	32	112	80	32	10.106	
M14	2	14.000	68	12.701	51	17	34	85	51	34	119	85	34	11.835	
M16	2	16.000	68	14.701	51	17	34	85	51	34	119	85	34	13.835	
M18	2.5	18.000	72	16.376	54	18	36	90	54	36	126	90	36	16.294	

Not specified