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ISO 529

Third edition
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Short machine taps and hand taps

Tarauds courts à machine et à main

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with defined cutting edges, cutting items*.

This third edition cancels and replaces the second edition (ISO 529:1993), of which it constitutes a minor revision with the following changes:

— added Annex C giving the relationship between the symbols of this document and the symbols according to the ISO 13399 series.

Short machine taps and hand taps

1 Scope

This document specifies the general dimensions of short machine taps and hand taps. These dimensions, established as functions of the thread diameter and pitch, are the following:

— length of thread (maximum);

— overall length;

— shank diameter and dimensions of driving square;

— dimensions of the connecting portion between the shank and threaded part.

This document is applicable to taps intended for cutting the following threads:

a) ISO metric threads:

  — coarse pitch;

  — fine pitch;

b) ISO inch threads:

  — “Unified Coarse” series (UNC) and “Unified Fine” series (UNF);

c) Inch threads, non-recommended:

  — “British Standard Whitworth” (BSW) and “British Standard Fine” (BSF);

  — “British Association” (BA).

NOTE 1 The overall length, thread length and diameters of shank for taps whose thread diameter and pitch are not listed in tables are given in Table A.1.

NOTE 2 Annex B gives an abstract from ISO 237 for shank diameters and size of driving squares, for information.

NOTE 3 Technical specifications for taps covered by this document (including marking) are given in ISO 8830.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

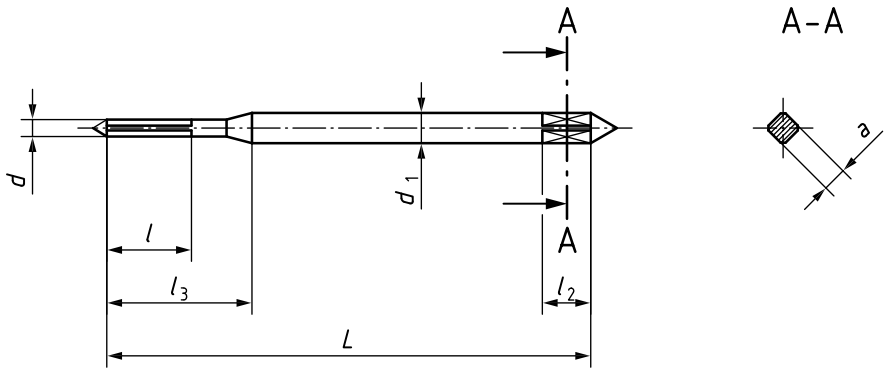
— ISO Online browsing platform: available at http://www.iso.org/obp

4 ISO metric threads

4.1 Threads up to M25

4.1.1 Full-diameter shank taps with plain connecting portion

Dimensions in millimetres



Designation		d nom.	Pitch		d_1 h9[b]	l[a] max.	L h16	l_3	Square	
Coarse pitch	Fine pitch		Coarse	Fine					a h11[c]	l_2 ±0,8
M1	M1 × 0,2	1	0,25	0,2	2,5	7	40	12	2	4
M1,1	M1,1 × 0,2	1,1						10		
M1,2	M1,2 × 0,2	1,2								
M1,4	M1,4 × 0,2	1,4	0,3					12		
M1,6	M1,6 × 0,2	1,6	0,35			8	41	13		
M1,8	M1,8 × 0,2	1,8								
M2	M2 × 0,25	2	0,4	0,25				13,5		
M2,2	M2,2 × 0,25	2,2	0,45		2,8	9,5	44,5	15,5	2,24	5
M2,5	M2,5 × 0,35	2,5		0,35						

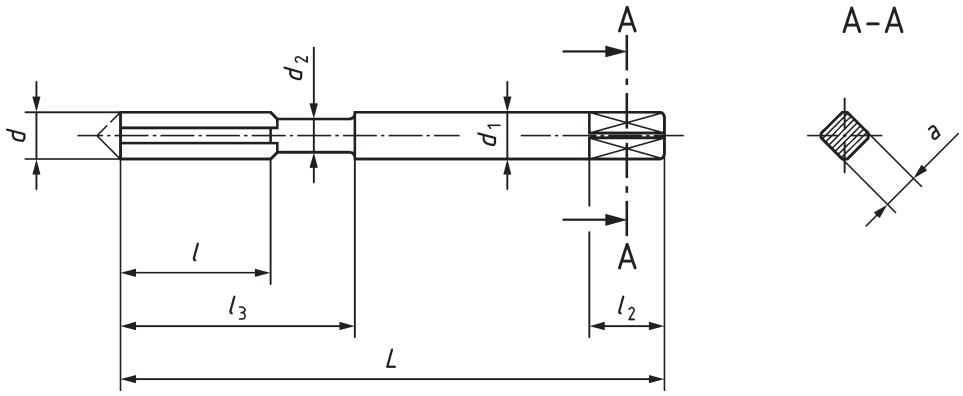
[a] Manufacturers, if they wish, may increase the thread length to $l + \frac{l_3 - l}{2}$.

[b] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[c] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position in relation to the shank.

4.1.2 Full-diameter shank taps with recess

Dimensions in millimetres



Designation		d nom.	Pitch		d_1 h9[b]	l[a] max.	L h16	d_2[a]	l_3	Square	
Coarse pitch	Fine pitch		Coarse	Fine						a h11[c]	l_2 ±0,8
M3	M3 × 0,35	3	0,5	0,35	3,15	11	48	2,12	18	2,5	5
M3,5	M3,5 × 0,3,5	3,5	0,6		3,55		50	2,5	20	2,8	
M4	M4 × 0,5	4	0,7	0,5	4	13	53	2,8	21	3,15	6
M4,5	M4,5 × 0,5	4,5	0,75		4,5			3,15		3,55	
M5	M5 × 0,5	5	0,8		5	16	58	3,55	25	4	7
—	M5,5 × 0,5	5,5	—		5,6	17	62	4	26	4,5	7
M6	M6 × 0,75	6	1	0,75	6,3	19	66	4,5	30	5	8
M7	M7 × 0,75	7			7,1			5,3		5,6	
M8	M8 × 1	8	1,25	1	8	22	72	6	35	6,3	9
M9	M9 × 1	9			9			7,1	36	7,1	10
M10	M10 × 1	10	1,5		10	24	80	7,5	39	8	11
	M10 × 1,25			1,25							

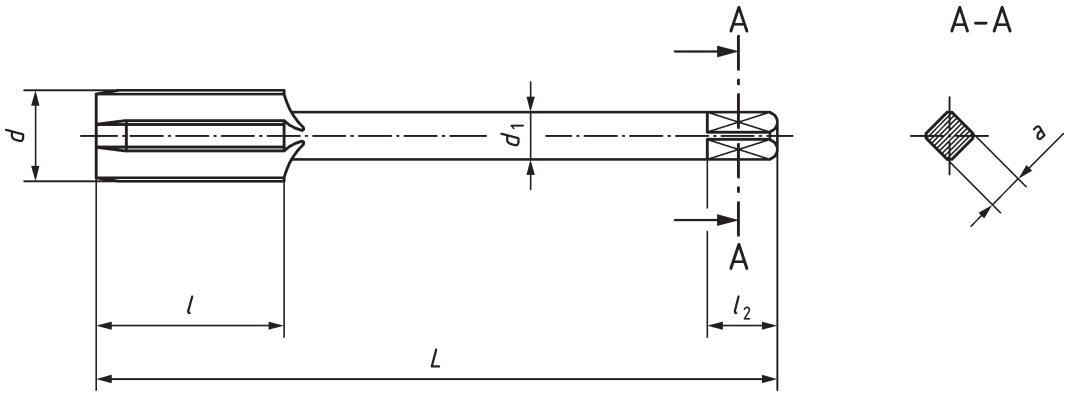
[a] The recess of full diameter shank taps with recess is optional at the manufacturer's discretion. If the recess is not required, such taps shall have a thread length equal to $l + \frac{l_3 - l}{2}$.

[b] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[c] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position in relation to the shank.

4.1.3 Relieved-shank taps

Dimensions in millimetres



Designation		d nom.	Pitch		d_1 h9[a]	l max.	L h16	Square	
Coarse pitch	Fine pitch		Coarse	Fine				a h11[b]	l_2 ±0,8
M3	M3 × 0,35	3	0,5	0,35	2,24	11	48	1,8	4
M3,5	M3,5 × 0,3,5	3,5	0,6		2,5		50	2	
M4	M4 × 0,5	4	0,7		3,15	13	53	2,5	5
M4,5	M4,5 × 0,5	4,5	0,75		3,55			2,8	
M5	M5 × 0,5	5	0,8	0,5	4	16	58	3,15	6
—	M5,5 × 0,5	5,5	—			17	62		
M6	M6 × 0,75	6	1	0,75	4,5	19	66	3,55	
M7	M7 × 0,75	7			5,6			4,5	7
M8	M8 × 1	8	1,25	1	6,3	22	72	5	8
M9	M9 × 1	9			7,1			5,6	
M10	M10 × 1	10	1,5	1,25	8	24	80	6,3	9
	M10 × 1,25								
M11	—	11		—		25	85		
M12	M12 × 1,25	12	1,75	1,25	9	29	89	7,1	10
	M12 × 1,5			1,5					
M14	M14 × 1,25	14	2	1,25	11,2	30	95	9	12
	M14 × 1,5			1,5					
—	M15 × 1,5	15							
M16	M16 × 1,5	16			12,5	32	102	10	13
—	M17 × 1,5	17	—						
M18	M18 × 1,5	18	2,5		14	37	112	11,2	14
	M18 × 2			2					
M20	M20 × 1,5	20		1,5					
	M20 × 2			2					
M22	M22 × 1,5	22		1,5	16	38	118	12,5	16
	M22 × 2			2					

[a] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[b] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position in relation to the shank.

Designation		d nom.	Pitch		d_1 h9[a]	l max.	L h16	Square	
Coarse pitch	Fine pitch		Coarse	Fine				a h11[b]	l_2 ±0,8
M24	M24 × 1,5	24	3	1,5	18	45	130	14	18
	M24 × 2			2					
—	M25 × 1,5	25	—	1,5					
	M25 × 2			2					

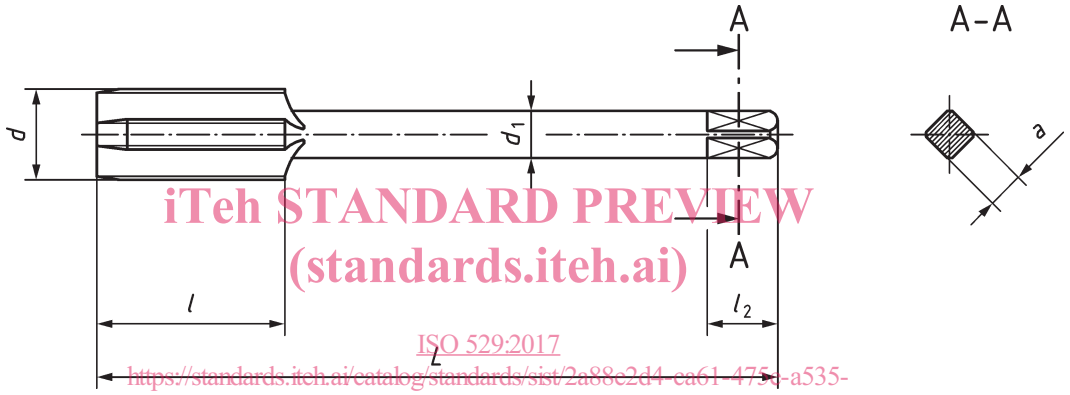
a In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

b In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position in relation to the shank.

4.2 Threads above M25

4.2.1 Relieved-shank taps for coarse pitch metric thread

Dimensions in millimetres



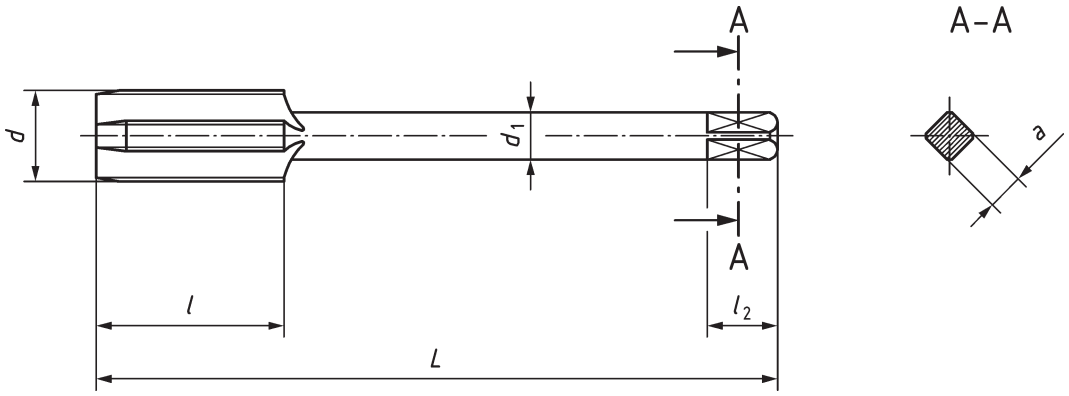
Designation	d nom.	Pitch	d_1 h9[a]	l max	L h16	Square	
						a h11[b]	l_2 ±1,6
M27	27	3	20	45	135	16	20
M30	30	3,5		48	138		
M33	33		22,4	51	151	18	22
M36	36	4	25	57	162	20	24
M39	39		28	60	170	22,4	26
M42	42	4,5					
M45	45		31,5	67	187	25	28
M48	48	5					
M52	52		35,5	70	200	28	31
M56	56	5,5					
M60	60		40	76	221	31,5	34
M64	64	6		79	224		
M68	68		45		234	35,5	38

a In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

b In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position to the shank.

4.2.2 Relieved-shank taps for fine pitch metric thread

Dimensions in millimetres



Designation	d nom.	Pitch	d_1 h9[a]	l max.	L h16	Square a h11[b]	Square l_2 ±1,6
M27 × 1,5	27	1,5	20	37	127	16	20
M27 × 2		2					
M28 × 1,5	28	1,5					
M28 × 2		2					
M30 × 1,5	30	1,5					
M30 × 2		2					
M30 × 3		3		48	138		
M32 × 1,5	32	1,5	22,4	37	137	18	22
M32 × 2		2					
M33 × 1,5	33	1,5					
M33 × 2		2					
M33 × 3		3		51	151		
M35 × 1,5	35	1,5	25	39	144	20	24
M36 × 1,5	36						
M36 × 2		2					
M36 × 3		3		57	162		
M39 × 1,5	39	1,5	28	39	149	22,4	26
M39 × 2		2					
M39 × 3		3		60	170		
M40 × 1,5	40	1,5		39	149		
M40 × 2		2					
M40 × 3		3		60	170		
M42 × 1,5	42	1,5		39	149		
M42 × 2		2					
M42 × 3		3		60	170		
M42 × 4		4					

[a] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[b] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position to the shank.

Designation	d nom.	Pitch	d_1 h9[a]	l max.	L h16	Square a h11[b]	Square l_2 ±1,6
M45 × 1,5	45	1,5	31,5	45	165	25	28
M45 × 2		2					
M45 × 3		3		67	187		
M45 × 4		4					
M48 × 1,5	48	1,5		45	165		
M48 × 2		2					
M48 × 3		3		67	187		
M48 × 4		4					
M50 × 1,5	50	1,5		45	165		
M50 × 2		2					
M50 × 3		3		67	187		
M52 × 1,5	52	1,5	35,5	45	175	28	31
M52 × 2		2					
M52 × 3		3		70	200		
M52 × 4		4					
M55 × 1,5	55	1,5		45	175		
M55 × 2		2					
M55 × 3		3		70	200		
M55 × 4		4					
M56 × 1,5	56	1,5		45	175		
M56 × 2		2					
M56 × 3		3		70	200		
M56 × 4		4					
M70 × 6	70	6	45	79	234	35,5	38
M72 × 6	72						
M75 × 6	75						
M76 × 6	76		50	83	258	40	42
M80 × 6	80						
M85 × 6	85			86	261		
M90 × 6	90						
M95 × 6	95		56	89	279	45	46
M100 × 6	100						

[a] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

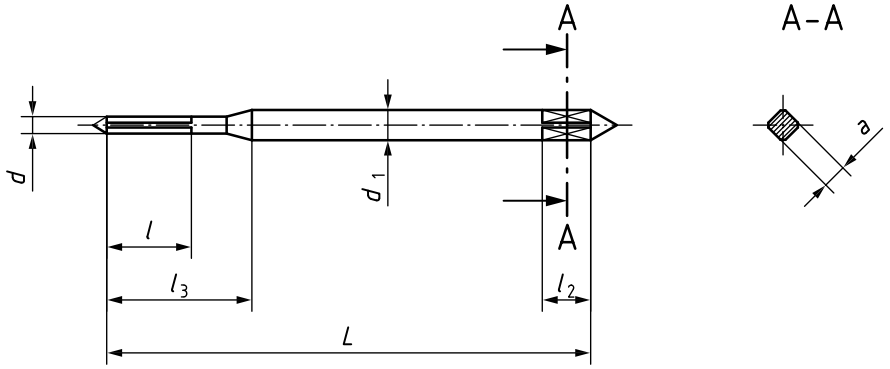
[b] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position to the shank.

5 ISO inch threads, “Unified coarse” (UNC) and “Unified fine” (UNF) series

5.1 “Unified” series threads up to 25,4 mm

5.1.1 Full-diameter shank taps with plain connecting portion

Dimensions in millimetres



Designation		d	Pitch		d_1	l_a	L	l_3	Square	
UNC	UNF	nom.	UNC	UNF	h9[b]	max.	h16		a h11[c]	l_2 ±0,8
—	No.0–80-UNF	1,524	—	0,318	2,5	8	41	13	2	4
No.1–64-UNC	No.1–72-UNF	1,854	0,397	0,353				13,5		
No.2–56-UNC	No.2–64-UNF	2,184	0,454	0,397	2,8	9,5	44,5	15,5	2,24	5
No.3–48-UNC	No.3–56-UNF	2,515	0,529	0,454						

[a] Manufacturers, if they wish, may increase the thread length to $l + \frac{l_3 - l}{2}$.

[b] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[c] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position in relation to the shank.