BS ISO 529:2017

BSI Standards Publication

Short machine taps and hand taps

bsi.

National foreword

This British Standard is the UK implementation of ISO 529:2017. It supersedes BS 949-1:1992 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools tips and inserts for cutting applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Short machine taps and hand taps

Tarauds courts à machine et à main

Reference number
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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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/

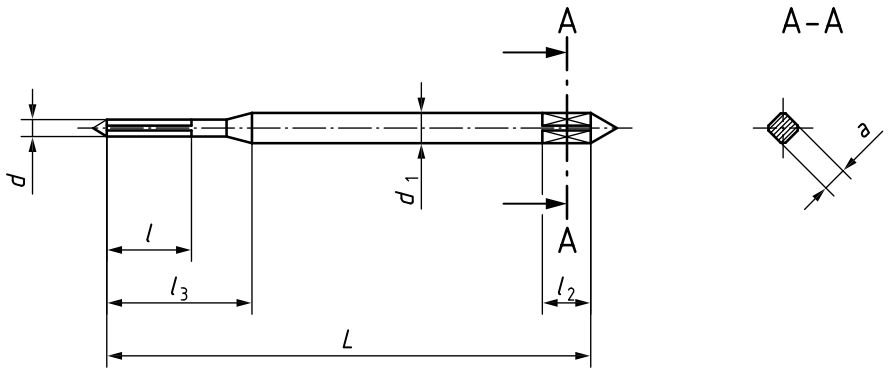
— ISO Online browsing platform: available at http://www.iso.org/obp

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	5,5	38,5	10	2	4
M1,1	M1,1 × 0,2	1,1								
M1,2	M1,2 × 0,2	1,2								
M1,4	M1,4 × 0,2	1,4	0,3			7	40	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						

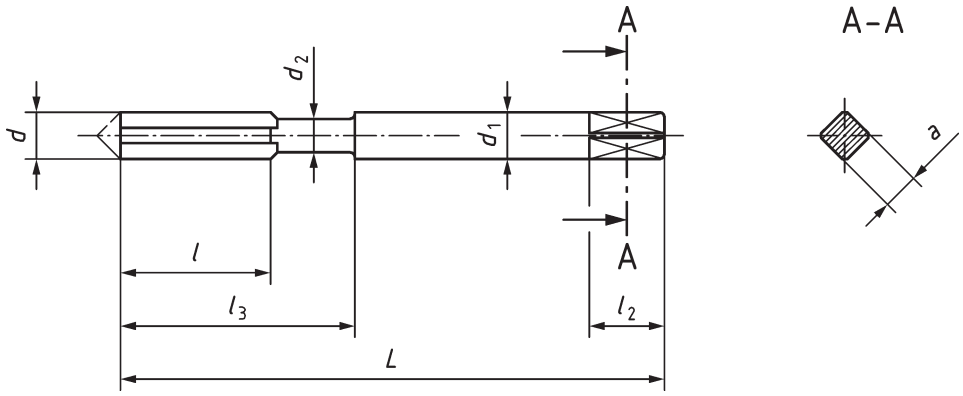
[a] Manufacturers, if they wish, may increase the thread length to $l + \frac{l_3 - l}{2}$.

[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	13	50	2,5	20	2,8	
M4	M4 × 0,5	4	0,7	0,5	4		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							

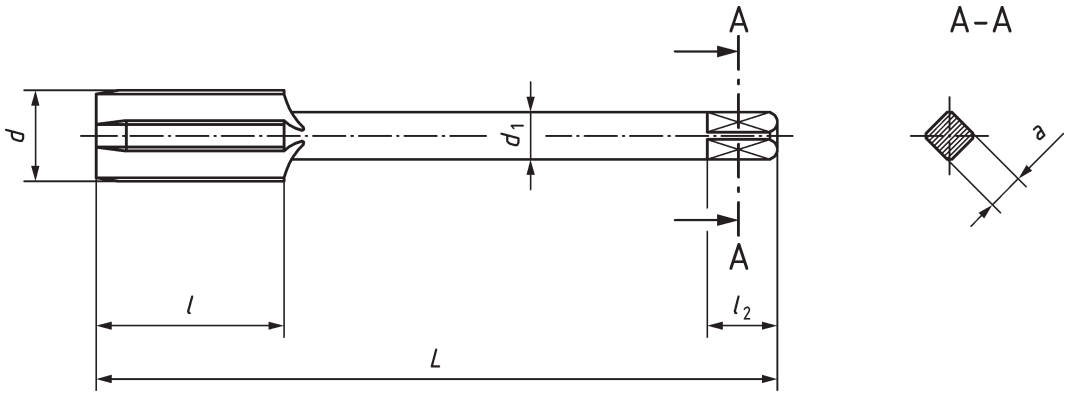
[a] The recess of full diameter shank taps with recess is optional at the manufacturer's discretion. If the recess is not required, such taps shall have a thread length equal to $l + \frac{l_3 - l}{2}$.

[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	13	50	2	
M4	M4 × 0,5	4	0,7	0,5	3,15		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		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		8	24	80	6,3	9
	M10 × 1,25			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					

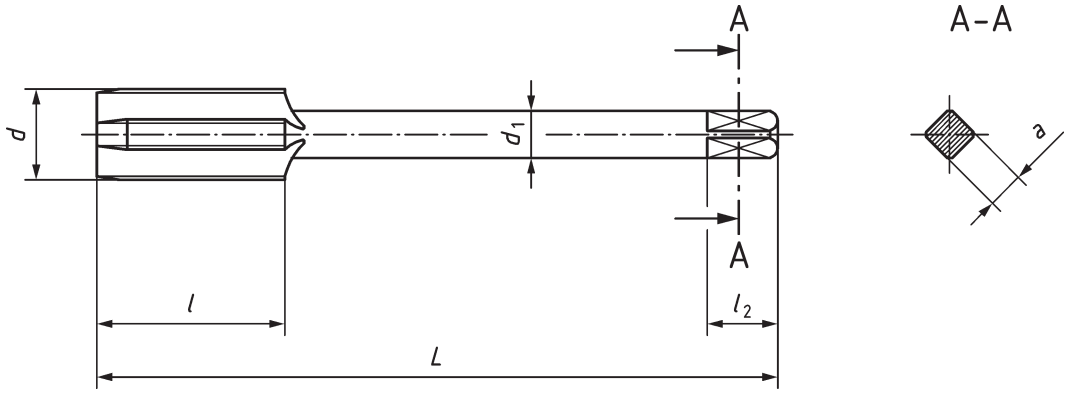
[a] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[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



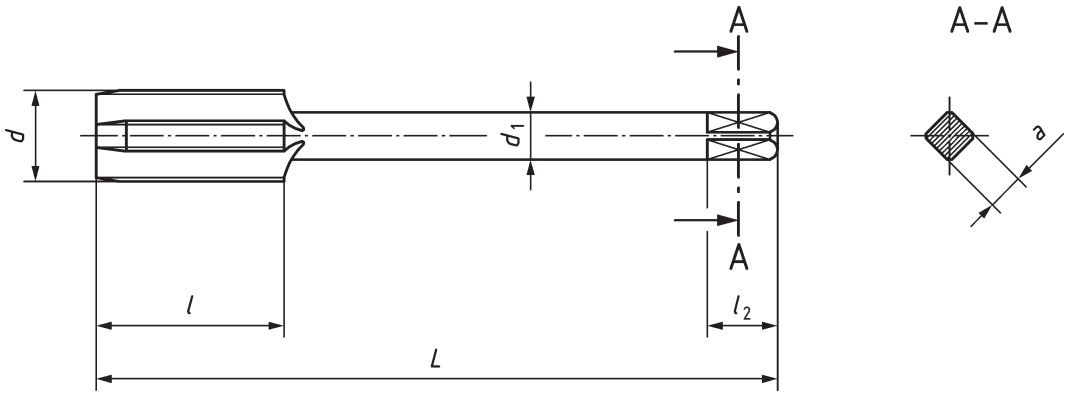
Designation	d nom.	Pitch	d_1 h9[a]	l max	L h16	Square	
						a h11[b]	l_2 ±1,6
M27	27	3	20	45	135	16	20
M30	30	3,5		48	138		
M33	33		22,4	51	151	18	22
M36	36	4	25	57	162	20	24
M39	39		28	60	170	22,4	26
M42	42	4,5					
M45	45		31,5	67	187	25	28
M48	48	5					
M52	52		35,5	70	200	28	31
M56	56	5,5					
M60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

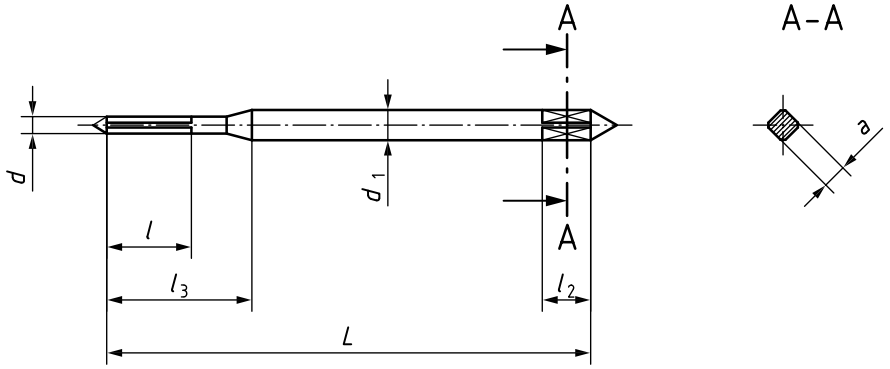
[b] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position to the shank.

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			Pitch ≈						Square	
UNC	UNF	d nom.	UNC	UNF	d_1 h9[b]	l[a] max.	L h16	l_3	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						

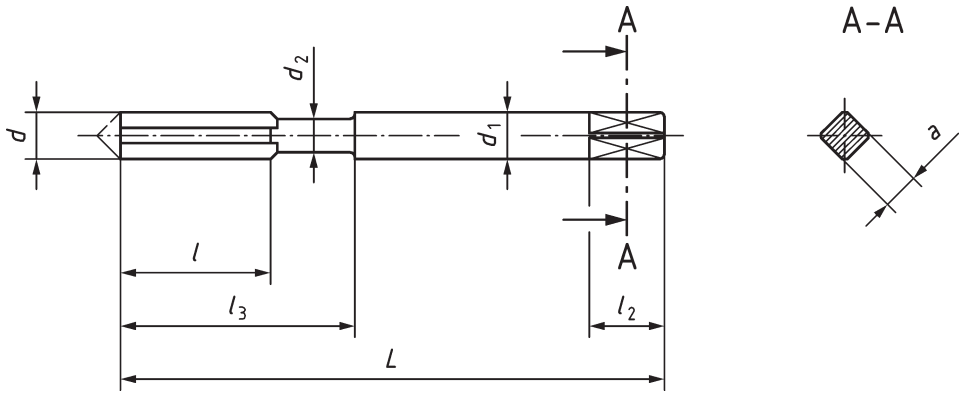
[a] Manufacturers, if they wish, may increase the thread length to $l + \frac{l_3 - l}{2}$.

[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.

5.1.2 Full-diameter shank taps with recess

Dimensions in millimetres



Designation			Pitch ≈							Square	
UNC	UNF	d nom.	UNC	UNF	d_1 h9[b]	l[a] max.	L h16	d_2[b] min.	l_3	a h11[c]	l_2 ±0,8
No.4–40-UNC	No.4–48-UNF	2,845	0,635	0,529	3,15	11	48	2,12	18	2,5	5
No.5–40-UNC	No.5–44-UNF	3,175		0,577				2,36			
No.6–32-UNC	No.6–40-UNF	3,505	0,794	0,635	3,55	13	50	2,5	20	2,8	
No.8–32-UNC	No.8–36-UNF	4,166		0,706	4,5		53	3,15	21	3,55	6
No.10–24-UNC	No.10–32-UNF	4,826	1,058	0,794	5	16	58	3,55	25	4	7
No.12–24-UNC	No.12–28-UNF	5,486		0,907	5,6	17	62	4,25	26	4,5	
1/4–20-UNC	1/4–28-UNF	6,35	1,27		6,3	19	66	4,5	30	5	8
5/16–18-UNC	5/16–24-UNF	7,938	1,411	1,058	8	22	72	6	35	6,3	9
3/8–16-UNC	3/8–24-UNF	9,525	1,588		10	24	80	7,5	39	8	11

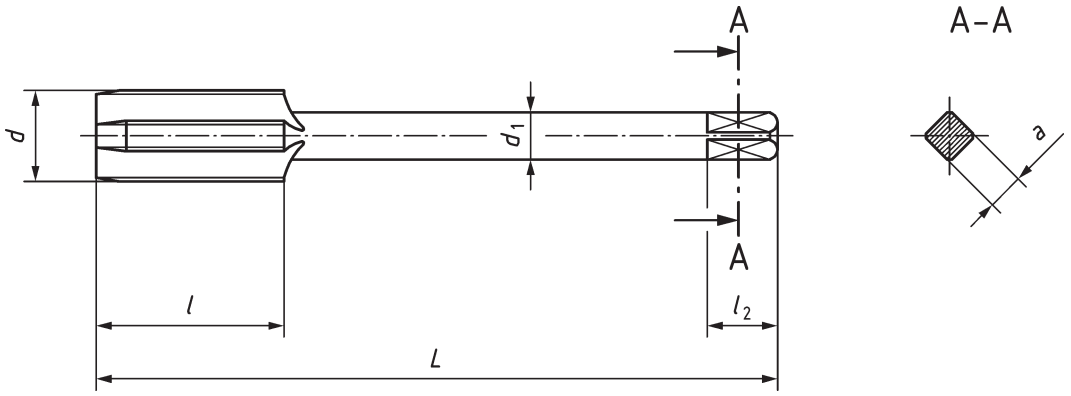
[a] The recess of full-diameter shank taps with recess is optional at the manufacturer's discretion. If the recess is not required, such taps shall have a thread length equal to $l + \frac{l_3 - l}{2}$.

[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.

5.1.3 Relieved-shank taps

Dimensions in millimetres



Designation			Pitch ≈					Square	
UNC	UNF	d nom.	UNC	UNF	d_1 h9[a]	l max.	L h16	a h11[b]	l_2 ±0,8
No.5–40-UNC	No.5–44-UNF	3,175	0,635	0,577	2,24	11	48	1,8	4
No.6–32-UNC	No.6–40-UNF	3,505	0,794	0,635	2,5	13	50	2	
No.8–32-UNC	No.8–36-UNF	4,166		0,706	3,15		53	2,5	5
No.10–24-UNC	No.10–32-UNF	4,826	1,058	0,794	3,55	16	58	2,8	
No.12–24-UNC	No.12–28-UNF	5,486		0,907	4	17	62	3,15	6
1/4–20-UNC	1/4–28-UNF	6,35	1,27		4,5	19	66	3,55	
5/16–18-UNC	5/16–24-UNF	7,938	1,411	1,058	6,3	22	72	5	8
3/8–16-UNC	3/8–24-UNF	9,525	1,588		7,1	24	80	5,6	
7/16–14-UNC	7/16–20-UNF	11,112	1,814	1,27	8	25	85	6,3	9
1/2–13-UNC	1/2–20-UNF	12,7	1,954		9	29	89	7,1	10
9/16–12-UNC	9/16–18-UNF	14,288	2,117	1,411	11,2	30	95	9	12
5/8–11-UNC	5/8–18-UNF	15,875	2,309		12,5	32	102	10	13
3/4–10-UNC	3/4–16-UNF	19,05	2,54	1,588	14	37	112	11,2	14
7/8–9-UNC	7/8–14-UNF	22,225	2,822	1,814	16	38	118	12,5	16
1–8-UNC	1–12-UNF	25,4	3,175	2,117	18	45	130	14	18

NOTE Some shank diameters are not in accordance with Table A.1 in Annex A.

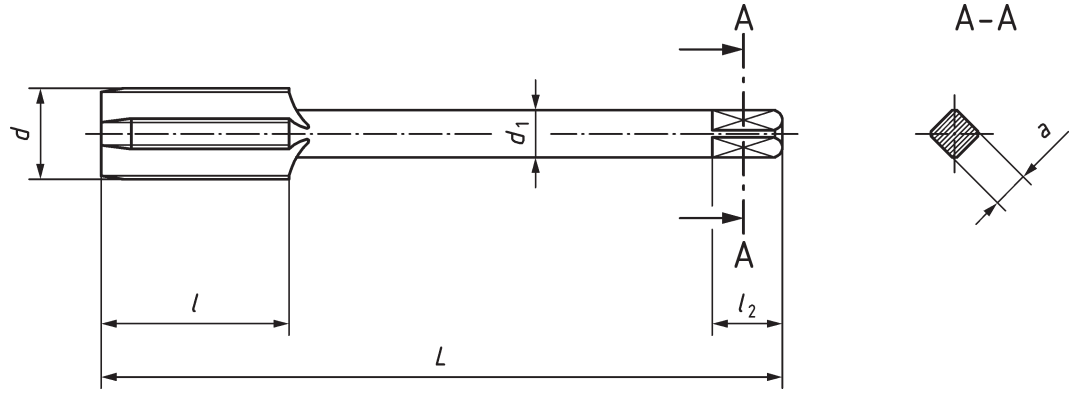
[a] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[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.

5.2 “Unified” series threads above 25,4 mm

5.2.1 Relieved-shank taps for “Unified coarse” series threads

Dimensions in millimetres



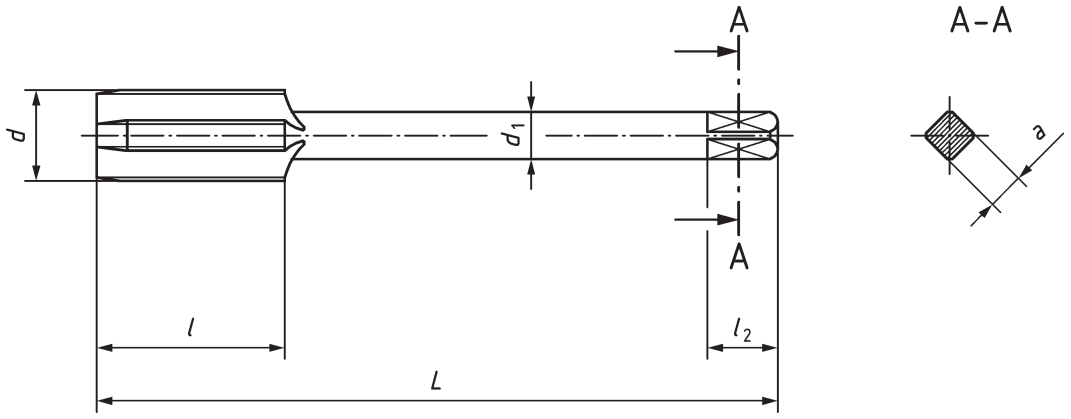
Designation	d nom	Pitch ≈	d_1 h9[a]	l max.	L h16	Square a h11[b]	Square l_2 ±1,6
1 1/8–7-UNC	28,575	3,629	20	48	138	16	20
1 1/4–7-UNC	31,75		22,4	51	151	18	22
1 3/8–6-UNC	34,925	4,233	25	57	162	20	24
1 1/2–6-UNC	38,1		28	60	170	22,4	26
1 3/4–5-UNC	44,45	5,08	31,5	67	187	25	28
2–4 1/2-UNC	50,8	5,644	35,5	70	200	28	31
2 1/4–4 1/2-UNC	57,15		40	76	221	31,5	34
2 1/2–4-UNC	63,5	6,35		79	224		
2 3/4–4-UNC	69,85		45		234	35,5	38
3–4-UNC	76,2		50	83	258	40	42
3 1/4–4-UNC	82,55			86	261		
3 1/2–4-UNC	88,9						
3 3/4–4-UNC	95,25		56	89	279	45	46
4–4-UNC	101,6						

[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 including errors of form of the square and of its position to the shank.

5.2.2 Relieved-shank taps for "Unified fine" series threads

Dimensions in millimetres



Designation	d nom.	Pitch ≈	d_1 h9[a]	l max.	L h16	Square a h11[b]	Square l_2 ±1,6
1 1/8–12-UNF	28,575	2,117	20	37	127	16	20
1 1/4–12-UNF	31,75		22,4		137	18	22
1 3/8–12-UNF	34,925		25	39	144	20	24
1 1/2–12-UNF	38,1		28		149	22,4	26

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

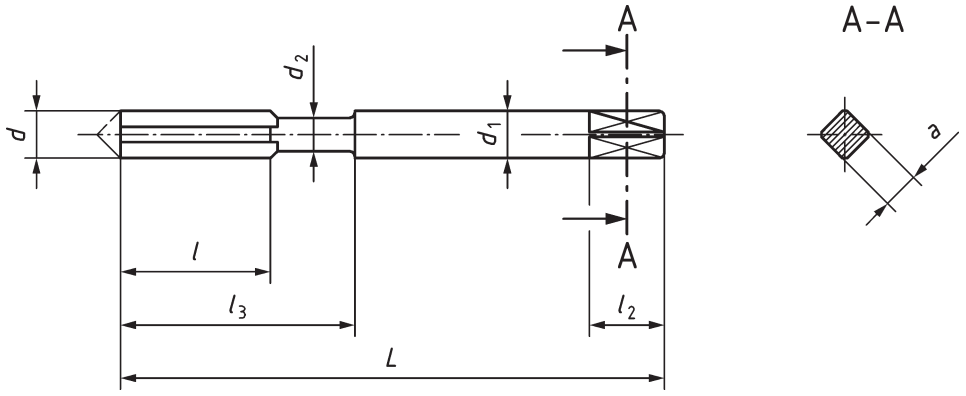
[b] In accordance with ISO 237, the tolerance is enlarged to h12 when including errors of form of the square and of its position to the shank.

6 Non-recommended inch threads

6.1 "British Standard Whitworth" (BSW) and "British Standard Fine" (BSF) threads

6.1.1 Full-diameter shank taps with recess

Dimensions in millimetres



Designation			Pitch ≈							Square	
BSW	BSF	d nom.	BSW	BSF	d_1 h9[b]	l[a] max.	L h16	d_2[a] min.	l_3	a h11[c]	l_2 ±0,8
1/8–40-BSW	—	3,175	0,635	—	3,15	11	48	2,36	18	2,5	5
3/16–24-BSW	3/16–32-BSF	4,762	1,058	0,794	5	16	58	3,55	25	4	7
—	7/32–28-BSF	5,556	—	0,907	5,6	17	62	4,25	26	4,5	
1/4–20-BSW	1/4–26-BSF	6,35	1,27	0,977	6,3	19	66	4,5	30	5	8
—	9/32–26-BSF	7,144	—		7,1			5,6		5,6	
5/16–18-BSW	5/16–22-BSF	7,938	1,411	1,154	8	22	72	6	35	6,3	9
3/8–16-BSW	3/8–20-BSF	9,525	1,588	1,27	10	24	80	7,5	39	8	11

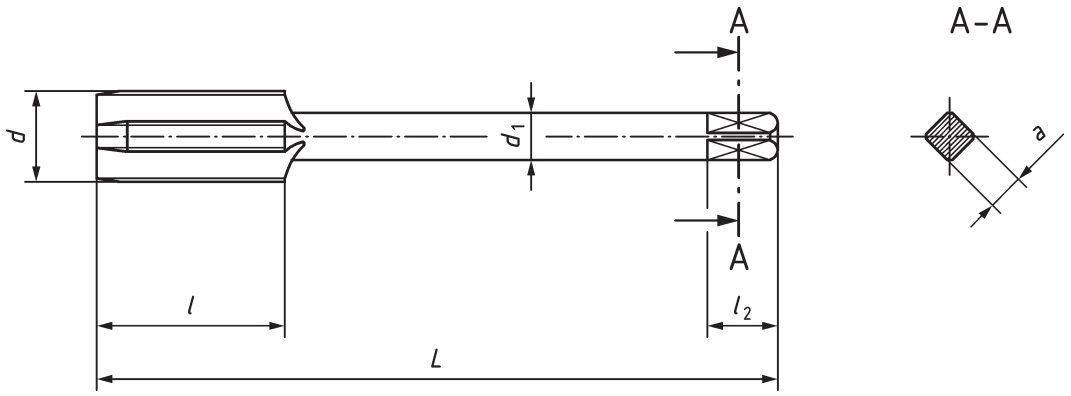
[a] The recess of full-diameter shank taps with recess is optional at the manufacturer's discretion. If the recess is not required, such taps shall have a thread length equal to $l + \frac{l_3 - l}{2}$.

[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.

6.1.2 Relieved-shank taps

Dimensions in millimetres



Designation		d nom.	Pitch ≈		d_1 h9[a]	l max.	L h16	Square a h11[b]	Square l_2 nom.	Square l_2 tol.
BSW	**BSF**		**BSW**	**BSF**						
1/8–40-BSW	—	3,175	0,635	—	2,24	11	48	1,8	4	±0,8
3/16–24-BSW	3/16–32-BSF	4,762	1,058	0,794	3,55	16	58	2,8	5	
—	7/32–28-BSF	5,556	—	0,907	4	17	62	3,15	6	
1/4–20-BSW	1/4–26-BSF	6,35	1,27	0,977	4,5	19	66	3,55		
—	9/32–26-BSF	7,144	—		5,6			4,5	7	
5/16–18-BSW	5/16–22-BSF	7,938	1,411	1,154	6,3	22	72	5	8	
3/8–16-BSW	3/8–20-BSF	9,525	1,588	1,27	7,1	24	80	5,6		
7/16–14-BSW	7/16–18-BSF	11,112	1,814	1,411	8	25	85	6,3	9	
1/2–12-BSW	1/2–16-BSF	12,7	2,117	1,588	9	29	89	7,1	10	
9/16–12-BSW	9/16–16-BSF	14,288			11,2	30	95	9	12	
5/8–11-BSW	5/8–14-BSF	15,875	2,309	1,814	12,5	32	102	10	13	
11/16–11-BSW	11/16–14-BSF	17,462			14	37	112	11,2	14	
3/4–10-BSW	3/4–12-BSF	19,05	2,54	2,117						
7/8–9-BSW	7/8–11-BSF	22,225	2,822	2,309	16	38	118	12,5	16	
1–8-BSW	1–10-BSF	25,4	3,175	2,54	18	45	130	14	18	

NOTE Some shank diameters are not in accordance with Table A.1 in Annex A.

[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		
								a	l_2	
BSW	**BSF**		**BSW**	**BSF**				h11[b]	nom.	tol.
1 1/8–7-BSW	1 1/8–9-BSF	28,575	3,629	2,822	20	48	138	16	20	±1,6
1 1/4–7-BSW	1 1/4–9-BSF	31,75			22,4	51	151	18	22	
—	1 3/8–8-BSF	34,925	—	3,175	25	57	162	20	24	
1 1/2–6-BSW	1 1/2–8-BSF	38,1	4,233		28	60	170	22,4	26	
—	1 5/8–8-BSF	41,275	—							
1 3/4–5-BSW	1 3/4–7-BSF	44,45	5,08	3,629	31,5	67	187	25	28	
2–4 1/2-BSW	2–7-BSF	50,8	5,644		35,5	70	200	28	31	
2 1/4–4-BSW	2 1/4–6-BSF	57,15	6,35	4,233	40	76	221	31,5	34	
2 1/2–4-BSW	2 1/2–6-BSF	63,5				79	224			
2 3/4–3 1/2-BSW	2 3/4–6-BSF	69,85	7,257		45		234	35,5	38	
3–3 1/2-BSW	3–5-BSF	76,2		5,08	50	83	258	40	42	
3 1/4–3 1/4-BSW	3 1/4–5-BSF	82,55	7,815			86	261			
3 1/2–3 1/4-BSW	3 1/2–4 1/2-BSF	88,9		5,644						
3 3/4–3-BSW	3 3/4–4 1/2-BSF	95,25	8,467		56	89	279	45	46	
4–3-BSW	4–4 1/2-BSF	101,6								

NOTE Some shank diameters are not in accordance with Table A.1 in Annex A.

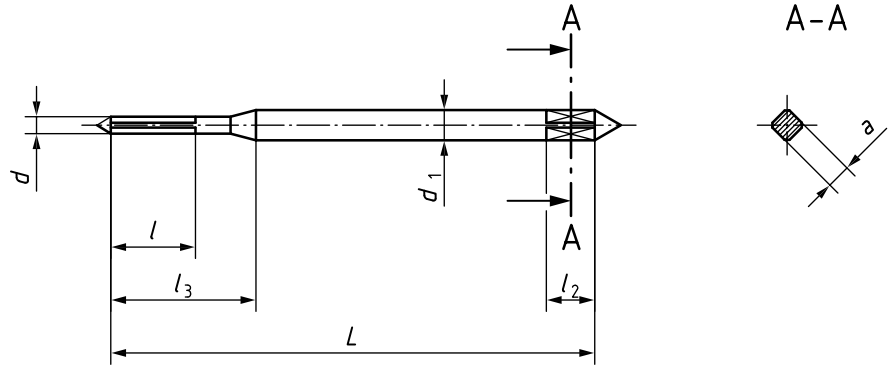
[a] In accordance with ISO 237, tolerance h9 applies to precision shanks. For non-precision shanks, the tolerance is h11.

[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.

6.2 “British Association” (BA) threads

6.2.1 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 a h11[c]	Square l_2 ±0,8
BA No. 14	1	0,23	2,5	5,5	38,5	10	2	4
BA No. 13	1,2	0,25						
BA No. 12	1,3	0,28		7	40	11,5		
BA No. 11	1,5	0,31		8	41	13		
BA No. 10	1,7	0,35						
BA No. 9	1,9	0,39				13,5		
BA No. 8	2,2	0,43	2,8	9,5	44,5	15,5	2,24	5
BA No. 7	2,5	0,48						
BA No. 6	2,8	0,53						

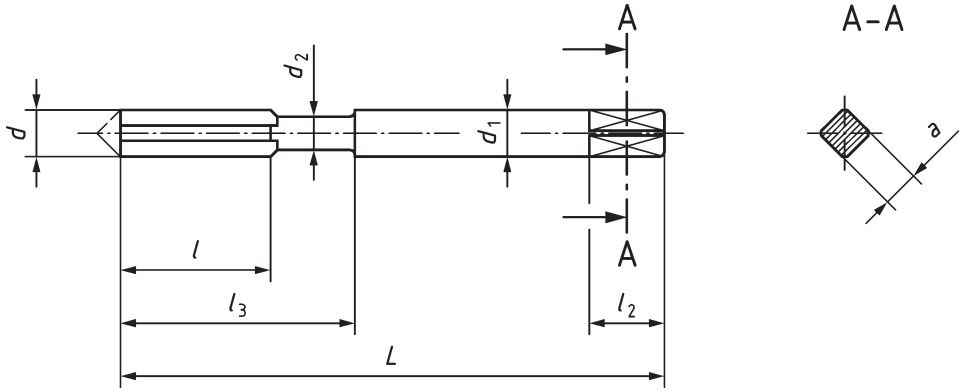
[a] Manufacturers if they wish may increase the thread length to $l + \frac{l_3 - l}{2}$.

[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.

6.2.2 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] min.	l_3	Square a h11[c]	Square l_2 ±0,8
BA No. 5	3,2	0,59	3,15	11	48	2,12	18	2,5	5
BA No. 4	3,6	0,66	3,55	13	50	2,5	20	2,8	
BA No. 3	4,1	0,73	4,5		53	3,15	21	3,55	6
BA No. 2	4,7	0,81	5	16	58	3,55	25	4	7
BA No. 1	5,3	0,9	5,6	17	62	4,25	26	4,5	
BA No. 0	6	1	6,3	19	66	4,5	30	5	8

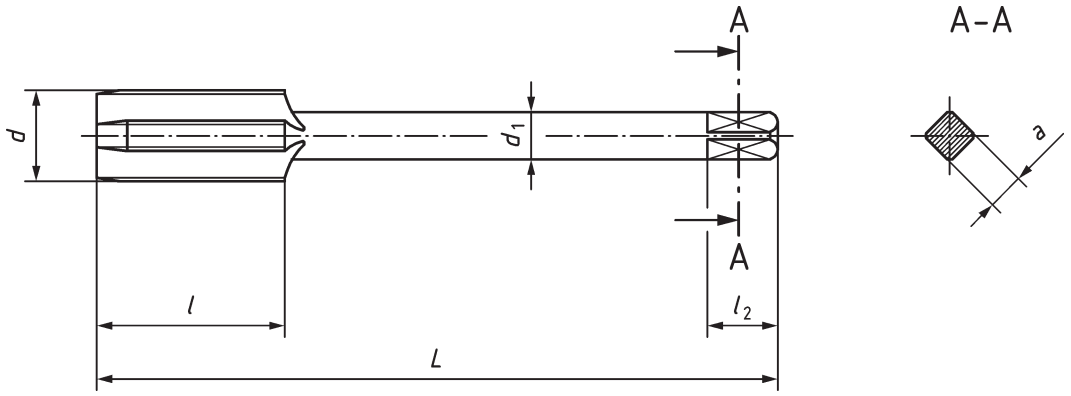
[a] The recess of full-diameter shank taps with recess is optional at the manufacturer's discretion. If the recess is not required, such taps shall have a thread length equal to $l + \frac{l_3 - l}{2}$.

[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.

6.2.3 Relieved-shank taps

Dimensions in millimetres



Designation	d nom.	Pitch	d_1 h9[b]	l max.	L h16	Square a h11[b]	Square l_2 ±0,8
BA No. 5	3,2	0,59	2,24	11	48	1,8	4
BA No. 4	3,6	0,66	2,5	13	50	2	
BA No. 3	4,1	0,73	3,15		53	2,5	5
BA No. 2	4,7	0,81	3,55	16	58	2,8	
BA No. 1	5,3	0,9	4	17	62	3,15	6
BA No. 0	6	1	4,5	19	66	3,55	

NOTE Some shank diameters are not in accordance with Table A.1 in Annex A.

[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.

Annex A
(normative)

Shank diameter, overall length and thread length as a function of range of diameters and pitches

Table A.1

Diameter ranges d mm		**Metric pitches, in millimetres**			0,2	0,23 0,25	0,28 0,35	0,39 0,4	0,43 0,45	0,48 0,53
		Number of threads per inch			—	—	80 72	64	56	48
		Inch pitches converted to millimetres (approximately)			—	—	0,318 0,353	0,397	0,454	0,529
		Shank diameter d_1, mm								
from (excluding)	to (including)	**Full-diameter shank tap with plain connecting portion**	**Full-diameter shank tap with recess**	**Relieved-shank tap**						
0,9	1,25	2,5	—	—	38,5 ; 5,5					
1,25	1,4				40 ; 7					
1,4	1,8				41 ; 8					
1,8	2									
2	2,8	2,8				44,5 ; 9,5				
2,8	3,2	—	3,15	2,24		48 ; 11				
3,2	3,6		3,55	2,5			50 ; 13			
3,6	4		4	3,15			53 ; 13			
4	4,5		4,5	3,55						
4,5	5		5	4			58; 16			
5	5,6		5,6	4			62 ; 17			
5,6	6,35		6,3	4,5						
6,35	7,2		7,1	5,6						
7,2	8		8	6,3						
8	9		9	7,1						
9	10		10	8						
10	10,6		—	8						
10,6	11,8			8						
11,8	13,2			9						
13,2	15			11,2						
15	17			12,5						
17	19			14						
19	21,2									
21,2	23,6			16						
23,6	26,5			18						
26,5	28			20						
28	30									
30	33,5			22,4						
33,5	37,5			25						
37,5	42,5			28						
42,5	45	—	—	31,5						
45	50									
50	56			35,5						
56	63			40						
63	67									
67	75			45						
75	80			50						
80	90									
90	101,6			56						

Table A.1 *(continued)*

0,59 0,66	0,7 0,81	0,9 1	1,25	—	—	1,5	1,75	2	2,5	3	3,5	4 4,5	5	5,5	6
44 40	36 32	28 24	22	20 19	18	16	14	13 12	11 10	9 8	7	6	5	4,5	4 3
0,577 0,635	0,706 0,794	0,907 1,058	1,154	1,27 1,337	1,411	1,588	1,814	1,954 2,117	2,309 2,54	2,822 3,175	3,629	4,233	5,08	5,644	6,35 8,467
Overall length; maximum thread length mm															
					66; 19										
					72; 22										
					80; 24										
					84; 24										
						85; 25									
						89; 29									
						95; 30									
						102; 32									
						112; 37									
						118; 38									
						130; 45									
						127; 37			135; 45						
									138; 48						
						137; 37			151; 51						
						144; 39			162; 57						
						149; 39			170; 60						
						165; 45				187; 67					
						175; 45				200; 70					
						221, 76									
						224; 79									
						234; 79									
							258; 83								
							261; 86								
							279; 89								

Annex B
(informative)

Shank diameters and size of driving squares (Extract from ISO 237)

Table B.1

Alternative form (for small diameters)
Dimensions in millimetres

Shank diameter	**Square**	
d_1 h9	a h11	l_2
2,24	1,8	4
2,5	2	
2,8	2,24	5
3,15	2,5	
3,55	2,8	
4	3,15	6
4,5	3,55	
5	4	7
5,6	4,5	
6,3	5	8
7,1	5,6	
8	6,3	9
9	7,1	10
10	8	11
11,2	9	12

Shank diameter	**Square**	
d_1 h9	a h11	l_2
12,5	10	13
14	11,2	14
16	12,5	16
18	14	18
20	16	20
22,4	18	22
25	20	24
28	22,4	26
31,5	25	28
35,5	28	31
40	31,5	34
45	35,5	38
50	40	42
56	45	46

Annex C
(informative)

Relationship between designations in this document and ISO 13399 series

For the relationship between the designations in this document and preferred symbols according to ISO 13399 series, see Table C.1.

Table C.1 — Relationship between designations in this document and ISO 13399 series

Symbol in this document	Reference in this document	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	Reference in the ISO 13399 series
Designation	5.1.1 5.1.2 5.1.3 5.2.1 5.2.2 6.1.1 6.1.2 6.2.1 6.2.2 6.2.3	thread diameter, inch fraction	TDFR	726E3EACB6BE4
d	4.1.1 4.1.2 4.1.3 4.2.1 4.2.2	thread diameter	TD	71E02C5C2EED3
d_1	4.1.1 4.1.2 4.1.3 4.2.1 4.2.2 5.1.1 5.1.2 5.1.3 5.2.1 5.2.2 6.1.1 6.1.2 6.2.1 6.2.2 6.2.3	connection diameter machine side	DCONMS	71EBDBF5060E6

Table C.1 *(continued)*

Symbol in this document	Reference in this document	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	Reference in the ISO 13399 series
d_1 h9	4.1.1 4.1.2 4.1.3 4.2.1 4.2.2 5.1.1 5.1.2 5.1.3 5.2.1 5.2.2 6.1.1 6.1.2 6.2.1 6.2.2 6.2.3	tolerance class connection diameter machine side	TCDCONMS	72719B2BD8041
d_2	4.1.2 5.1.2 6.1.1 6.2.2	neck diameter	DN	71EAC48EC5DE0
l	4.1.1 4.1.2 4.1.3 4.2.1 4.2.2 5.1.1 5.1.2 5.1.3 5.2.1 5.2.2 6.1.1 6.1.2 6.2.1 6.2.2 6.2.3	thread cutting part length	THL	71E02C65BB9DA

Table C.1 *(continued)*

Symbol in this document	Reference in this document	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	Reference in the ISO 13399 series
l_3	4.1.2 5.1.2 6.1.1 6.2.2	usable length	LU	71EBB33490FDA
L	4.1.1 4.1.2 4.1.3 4.2.1 4.2.2 5.1.1 5.1.2 5.1.3 5.2.1 5.2.2 6.1.1 6.1.2 6.2.1 6.2.2 6.2.3	overall length	OAL	71D078EB7C086
Pitch	4.1.1 4.1.2 4.1.3 4.2.1 4.2.2 5.1.1 5.1.2 5.1.3 5.2.1 5.2.2 6.1.1 6.1.2 6.2.1 6.2.2 6.2.3	thread pitch	TP	71CEAEC08D4B0

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[1] ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

[2] 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*

[3] ISO 8830, *High-speed steel machine taps with ground threads — Technical specifications*

[4] ISO 13399 (all parts), *Cutting tool data representation and exchange*

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