ISO general purpose metric screw threads — Basic dimensions

Filetages métriques ISO pour usages généraux — Dimensions de base

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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 of 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 www.iso.org/iso/foreword.html www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 1, *Screw threads*.

This third edition cancels and replaces the second edition (ISO 724:1993, including Cor 1:2009), which has been technically revised.

The main changes are as follows:

— "basic profile" has been replaced with "design profile" in the Scope;

— a second paragraph has been added in the Scope;

— three symbols, d_3, H_1 and h_3, have been added in Clause 4; Clause 4;

— the values and formula for the minor diameter of external thread, d_3, have been added in Table 1 Table 1 and Clause 5; Clause 5;

— ISO 68-1 and ISO 261 have been added in the Bibliography.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

ISO general purpose metric screw threads — Basic dimensions

1 Scope

This document specifies the basic dimensions of ISO general purpose metric screw threads according to ISO 261. The values refer to the design profiles according to ISO 68-1.

This document is applicable to the metric fastening screw threads.

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 5408, *Screw threads — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5408 apply.

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

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

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

4 Symbols

For the purposes of this document, the following symbols apply.

D	major diameter of internal thread (nominal diameter)
d	major diameter of external thread (nominal diameter)
D_2	pitch diameter of internal thread
d_2	pitch diameter of external thread
D_1	minor diameter of internal thread
d_3	minor diameter of external thread on design profile
P	pitch
H	fundamental triangle height
H_1	thread height of internal thread on design profile
h_3	thread height of external thread on design profile

5 Basic dimensions

Basic dimensions shown in Figure 1 are given in Table 1.
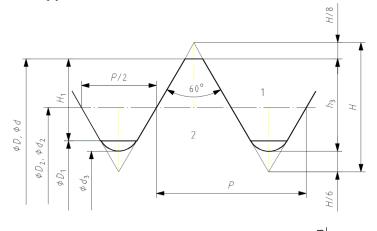
The values of D_2, d_2, D_1, and d_3, in Table 1, have been calculated from the following formulae and rounded to the third decimal place.

$$D_2 = d_2 = d - 2 \times 3H/8 = d - 0{,}649\ 519\ P$$

$$D_1 = d - 2 \times H_1 = d - 1{,}082\ 532\ P$$

$$d_3 = d - 2 \times h_3 = d - 1{,}226\ 869\ P$$

Key
1   internal thread
2   external thread

Figure 1 — Basic dimensions on design profiles

Table 1 — Basic dimensions

Nominal diameter, major diameter	Pitch	Pitch diameter	Minor diameter	
			Internal thread flat crest	External thread rounded root
D, d	P	D_2, d_2	D_1	d_3
1	0,2	0,870	0,783	0,755
	0,25	0,838	0,729	0,693
1,1	0,2	0,970	0,883	0,855
	0,25	0,938	0,829	0,793
1,2	0,2	1,070	0,983	0,955
	0,25	1,038	0,929	0,893
1,4	0,2	1,270	1,183	1,155

Nominal diameter, major diameter	Pitch	Pitch diameter	Minor diameter	
			Internal thread flat crest	External thread rounded root
D, d	P	D_2, d_2	D_1	d_3
	0,3	1,205	1,075	1,032
1,6	0,2	1,470	1,383	1,355
	0,35	1,373	1,221	1,171
1,8	0,2	1,670	1,583	1,555
	0,35	1,573	1,421	1,371
2	0,25	1,838	1,729	1,693
	0,4	1,740	1,567	1,509
2,2	0,25	2,038	1,929	1,893
	0,45	1,908	1,713	1,648
2,5	0,35	2,273	2,121	2,071
	0,45	2,208	2,013	1,948
3	0,35	2,773	2,621	2,571
	0,5	2,675	2,459	2,387
3,5	0,35	3,273	3,121	3,071
	0,6	3,110	2,850	2,764
4	0,5	3,675	3,459	3,387
	0,7	3,545	3,242	3,141
4,5	0,5	4,175	3,959	3,887
	0,75	4,013	3,688	3,580
5	0,5	4,675	4,459	4,387
	0,8	4,480	4,134	4,019
5,5	0,5	5,175	4,959	4,887
6	0,75	5,513	5,188	5,080
	1	5,350	4,917	4,773
7	0,75	6,513	6,188	6,080
	1	6,350	5,917	5,773
8	0,75	7,513	7,188	7,080
	1	7,350	6,917	6,773
	1,25	7,188	6,647	6,466
9	0,75	8,513	8,188	8,080
	1	8,350	7,917	7,773
	1,25	8,188	7,647	7,466
10	0,75	9,513	9,188	9,080
	1	9,350	8,917	8,773
	1,25	9,188	8,647	8,466
	1,5	9,026	8,376	8,160

Nominal diameter, major diameter	Pitch	Pitch diameter	Minor diameter	
			Internal thread flat crest	External thread rounded root
D, d	P	D_2, d_2	D_1	d_3
11	0,75	10,513	10,188	10,080
	1	10,350	9,917	9,773
	1,5	10,026	9,376	9,160
12	1	11,350	10,917	10,773
	1,25	11,188	10,647	10,466
	1,5	11,026	10,376	10,160
	1,75	10,863	10,106	9,853
14	1	13,350	12,917	12,773
	1,5	13,026	12,376	12,160
	2	12,701	11,835	11,546
15	1	14,350	13,917	13,773
	1,5	14,026	13,376	13,160
16	1	15,350	14,917	14,773
	1,5	15,026	14,376	14,160
	2	14,701	13,835	13,546
17	1	16,350	15,917	15,773
	1,5	16,026	15,376	15,160
18	1	17,350	16,917	16,773
	1,5	17,026	16,376	16,160
	2	16,701	15,835	15,546
	2,5	16,376	15,294	14,933
20	1	19,350	18,917	18,773
	1,5	19,026	18,376	18,160
	2	18,701	17,835	17,546
	2,5	18,376	17,294	16,933
22	1	21,350	20,917	20,773
	1,5	21,026	20,376	20,160
	2	20,701	19,835	19,546
	2,5	20,376	19,294	18,933
24	1	23,350	22,917	22,773
	1,5	23,026	22,376	22,160
	2	22,701	21,835	21,546
	3	22,051	20,752	20,319
25	1	24,350	23,917	23,773
	1,5	24,026	23,376	23,160
	2	23,701	22,835	22,546

Nominal diameter, major diameter	Pitch	Pitch diameter	Minor diameter	
			Internal thread flat crest	External thread rounded root
D, d	P	D_2, d_2	D_1	d_3
26	1,5	25,026	24,376	24,160
27	1	26,350	25,917	25,773
	1,5	26,026	25,376	25,160
	2	25,701	24,835	24,546
	3	25,051	23,752	23,319
28	1	27,350	26,917	26,773
	1,5	27,026	26,376	26,160
	2	26,701	25,835	25,546
30	1	29,350	28,917	28,773
	1,5	29,026	28,376	28,160
	2	28,701	27,835	27,546
	3	28,051	26,752	26,319
	3,5	27,727	26,211	25,706
32	1,5	31,026	30,376	30,160
	2	30,701	29,835	29,546
33	1,5	32,026	31,376	31,160
	2	31,701	30,835	30,546
	3	31,051	29,752	29,319
	3,5	30,727	29,211	28,706
36	1,5	35,026	34,376	34,160
	2	34,701	33,835	33,546
	3	34,051	32,752	32,319
	4	33,402	31,670	31,093
38	1,5	37,026	36,376	36,160
39	1,5	38,026	37,376	37,160
	2	37,701	36,835	36,546
	3	37,051	35,752	35,319
	4	36,402	34,670	34,093
40	1,5	39,026	38,376	38,160
	2	38,701	37,835	37,546
	3	38,051	36,752	36,319
42	1,5	41,026	40,376	40,160
	2	40,701	39,835	39,546
	3	40,051	38,752	38,319
	4	39,402	37,670	37,093
	4,5	39,077	37,129	36,479

Nominal diameter, major diameter	Pitch	Pitch diameter	Minor diameter	
			Internal thread flat crest	External thread rounded root
D, d	P	D₂, d₂	D₁	d₃
45	1,5	44,026	43,376	43,160
	2	43,701	42,835	42,546
	3	43,051	41,752	41,319
	4	42,402	40,670	40,093
	4,5	42,077	40,129	39,479
48	1,5	47,026	46,376	46,160
	2	46,701	45,835	45,546
	3	46,051	44,752	44,319
	4	45,402	43,670	43,093
	5	44,752	42,587	41,866
50	1,5	49,026	48,376	48,160
	2	48,701	47,835	47,546
	3	48,051	46,752	46,319
52	1,5	51,026	50,376	50,160
	2	50,701	49,835	49,546
	3	50,051	48,752	48,319
	4	49,402	47,670	47,093
	5	48,752	46,587	45,866
55	1,5	54,026	53,376	53,160
	2	53,701	52,835	52,546
	3	53,051	51,752	51,319
	4	52,402	50,670	50,093
56	1,5	55,026	54,376	54,160
	2	54,701	53,835	53,546
	3	54,051	52,752	52,319
	4	53,402	51,670	51,093
	5,5	52,428	50,046	49,252
58	1,5	57,026	56,376	56,160
	2	56,701	55,835	55,546
	3	56,051	54,752	54,319
	4	55,402	53,670	53,093
60	1,5	59,026	58,376	58,160
	2	58,701	57,835	57,546
	3	58,051	56,752	56,319
	4	57,402	55,670	55,093
	5,5	56,428	54,046	53,252