

INTERNATIONAL STANDARD

ISO
5855-1

Second edition
1988-12-15

Corrected and reprinted
1989-09-01



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

Aerospace — MJ threads —

Part 1 :
General requirements

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Aéronautique et espace — Filetage MJ —

Partie 1 : Exigences générales

ISO 5855-1:1988

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Reference number
ISO 5855-1 : 1988 (E)

Contents

	Page
Foreword	iii
Introduction	iv
1 Scope	1
2 Normative reference	1
3 Basic profile	1
4 Position and form of limit profiles	3
5 Tolerances	5
6 Limit dimensions	5
7 Nominal diameter/Pitch combinations	5
8 Designation	5
9 Calculation formulae	7

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5855-1 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*.

ISO 5855-1:1988

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This second edition cancels and replaces the first edition (ISO 5855-1 : 1981), of which it constitutes a technical revision.

ISO 5855 consists of the following parts, under the general title *Aerospace — MJ threads*:

- *Part 1: General requirements*
- *Part 2: Limit dimensions for bolts and nuts*
- *Part 3: Limit dimensions for fittings for fluid systems*

Introduction

MJ threads differ from M threads specified in ISO 68, *ISO general purpose screw threads — Basic profile*, by an increase in the root radius of the external thread.

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Aerospace — MJ threads —

Part 1 :

General requirements

1 Scope

This part of ISO 5855 specifies the general requirements for MJ threads for aerospace construction.

ISO 965-1: 1980, *ISO general purpose metric screw threads — Tolerances — Part 1 : Principles and basic data.*

2 Normative reference

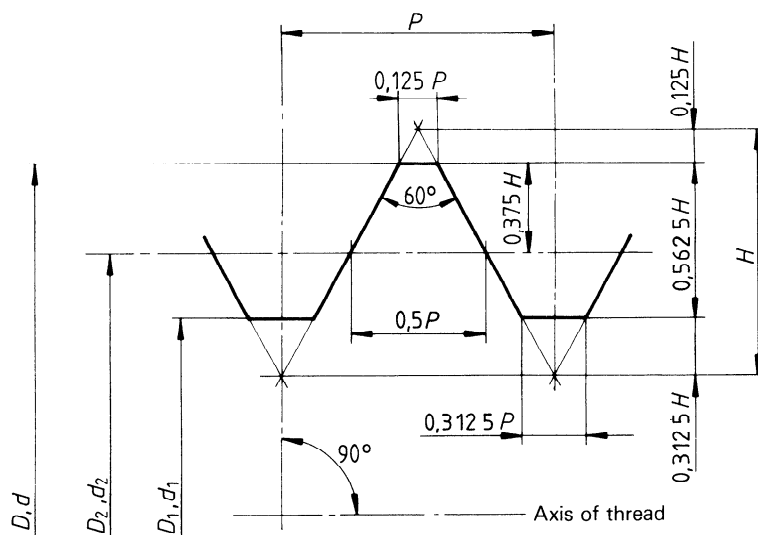
The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 5855. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5855 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

3 Basic profile

3.1 Definition

basic profile : The theoretical profile, in an axial plane, corresponding to the basic dimensions (without tolerances) of the thread, i.e. major diameter, pitch diameter and minor diameter (see figure 1).

Basic deviations shall be applied to these basic dimensions.



- | | |
|---|---|
| D = basic major diameter of internal thread | d_2 = basic pitch diameter of external thread |
| D_2 = basic pitch diameter of internal thread | d_1 = basic minor diameter of external thread |
| D_1 = basic minor diameter of internal thread | H = height of fundamental triangle |
| d = basic major diameter of external thread | P = pitch |

Figure 1 — Basic profile

3.2 Dimensions

See table 1.

Table 1

Dimensions in millimetres

<i>P</i>	0,125 <i>P</i>	0,312 5 <i>P</i>	<i>H</i> 0,866 025 403 8 <i>P</i>	0,125 <i>H</i> 0,108 25 <i>P</i>	0,312 5 <i>H</i> 0,270 63 <i>P</i>	0,375 <i>H</i> 0,324 76 <i>P</i>	0,562 5 <i>H</i> 0,487 14 <i>P</i>
0,2	0,025	0,062 5	0,173 21	0,021 65	0,054 13	0,064 95	0,097 43
0,25	0,031 25	0,078 13	0,216 51	0,027 06	0,067 66	0,081 19	0,121 79
0,35	0,043 75	0,109 38	0,303 11	0,037 89	0,094 72	0,113 67	0,170 5
0,4	0,05	0,125	0,346 41	0,043 3	0,108 25	0,129 9	0,194 86
0,45	0,056 25	0,140 62	0,389 71	0,048 71	0,121 78	0,146 14	0,219 21
0,5	0,062 5	0,156 25	0,433 01	0,054 13	0,135 32	0,162 38	0,243 57
0,6	0,075	0,187 5	0,519 62	0,064 95	0,162 38	0,194 86	0,292 28
0,7	0,087 5	0,218 75	0,606 22	0,075 78	0,189 44	0,227 33	0,341
0,75	0,093 75	0,234 38	0,649 52	0,081 19	0,202 97	0,243 57	0,365 36
0,8	0,1	0,25	0,692 82	0,086 6	0,216 51	0,259 81	0,389 71
1	0,125	0,312 5	0,866 03	0,108 25	0,270 63	0,324 76	0,487 14
1,25	0,156 25	0,390 62	1,082 53	0,135 32	0,338 29	0,405 95	0,608 92
1,5	0,187 5	0,468 75	1,299 04	0,162 38	0,405 95	0,487 14	0,730 71
1,75	0,218 75	0,546 88	1,515 54	0,189 44	0,473 6	0,568 33	0,852 5
2	0,25	0,625	1,732 05	0,216 51	0,541 27	0,649 52	0,974 28
2,5	0,312 5	0,781 25	2,165 06	0,270 63	0,676 58	0,811 9	1,217 85
3	0,375	0,937 5	2,598 08	0,324 75	0,811 89	0,974 28	1,461 42
3,5	0,437 5	1,093 75	3,031 09	0,378 88	0,947 21	1,136 66	1,704 99
4	0,5	1,25	3,464 1	0,433	1,082 52	1,299 04	1,948 56
4,5	0,562 5	1,406 25	3,897 11	0,487 13	1,217 84	1,461 42	2,192 13
5	0,625	1,562 5	4,330 13	0,541 25	1,353 15	1,623 8	2,435 7
5,5	0,687 5	1,718 75	4,763 14	0,595 38	1,488 47	1,786 18	2,679 27
6	0,75	1,875	5,196 15	0,649 5	1,623 78	1,948 56	2,922 84

4 Position and form of limit profiles

Within these limits, any continuous, non-reversing curve is permitted, provided that it comprises radii not less than $0,150\ 11P$.

4.1 External threads

The actual thread profile is located between the limit profiles shown on figures 2 and 3.

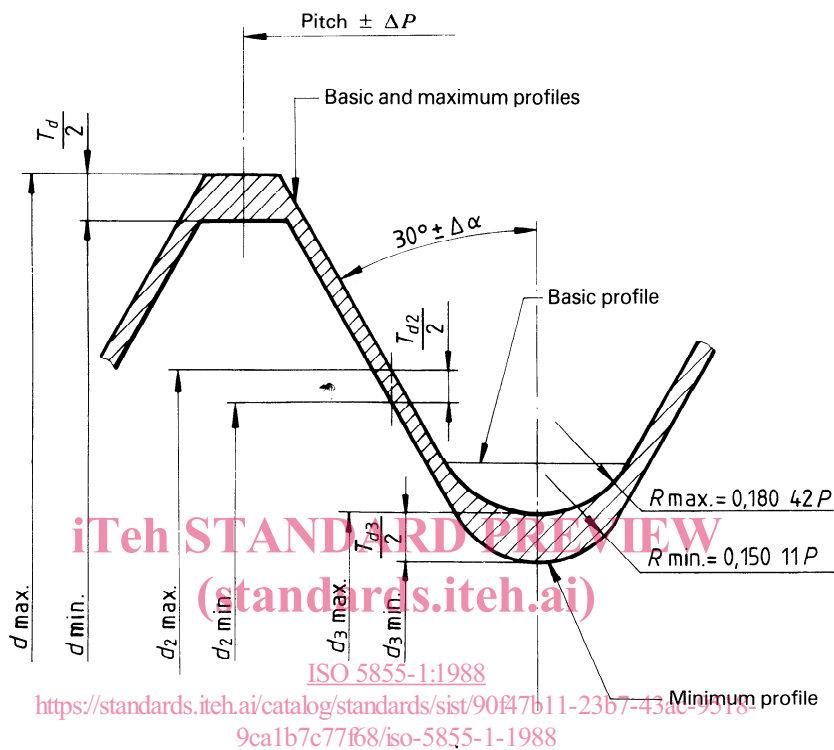


Figure 2 — Limit profiles for external threads (clearance may be nil)

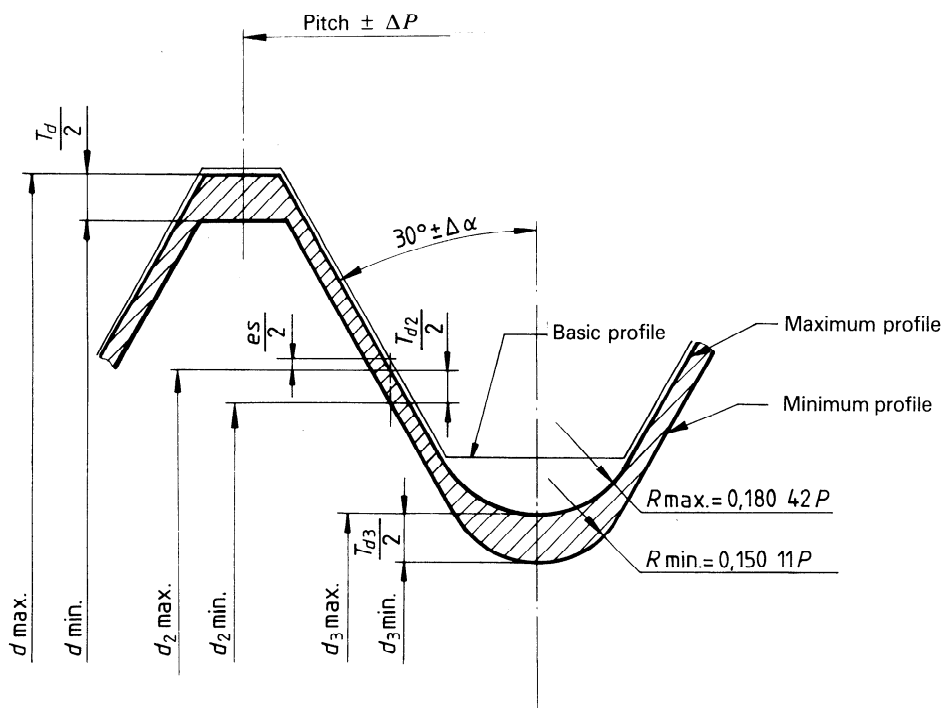


Figure 3 — Limit profiles for external threads (systematic clearance)

4.2 Internal threads

The actual thread profile is located between the limit profiles shown on figures 4 and 5.

The form of the connection between the root (corresponding to diameter D_3) and the thread flanks is not mandatory. The root is generally rounded beyond the nominal diameter. The radius is not specified.

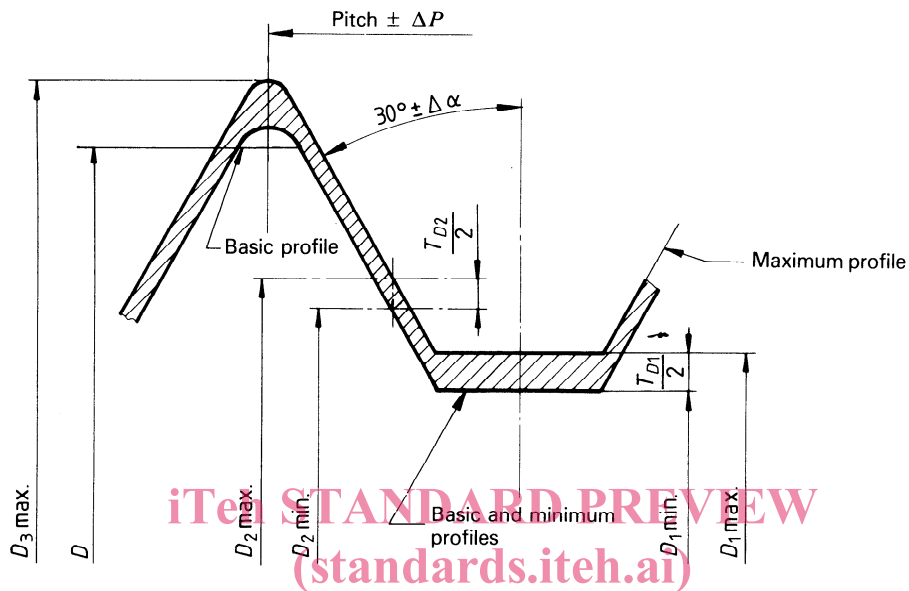


Figure 4 – Limit profiles for internal threads (clearance may be nil)

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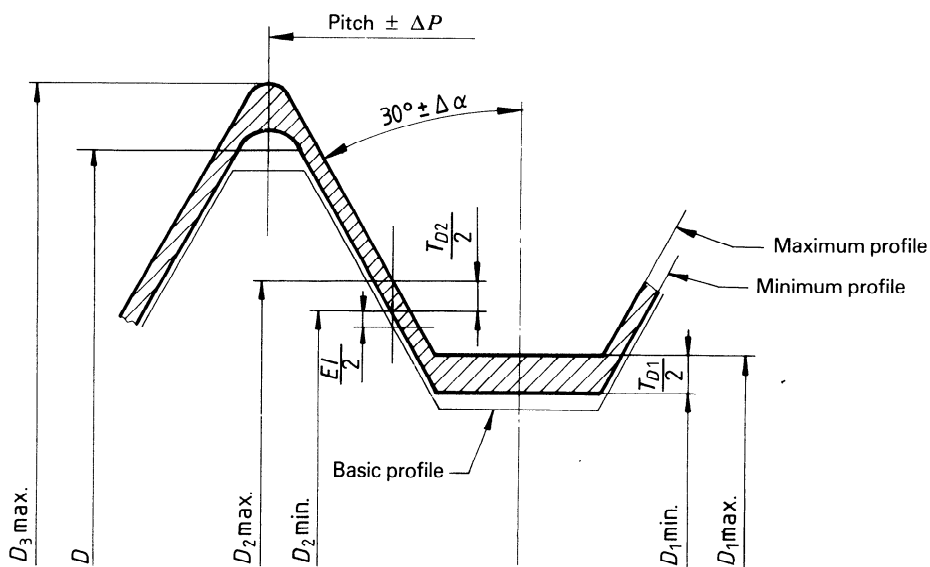


Figure 5 – Limit profiles for internal threads (systematic clearance)

5 Tolerances

5.1 Tolerances on diameters

The grades, positions and basic upper and lower (*es* and *EI*) tolerance deviations (see figures 3 and 5) shall be as specified in ISO 965-1.

5.2 Tolerances on other parameters

Tolerances on pitch ΔP and on the half flank angle $\Delta\alpha$ shall be determined from the formulae given in clause 9.

Within the limits of the thread pitch diameter, and over the chosen length of measurement, the sum of the effects of variations in the pitch, flank angle, helix, taper and circularity and all other variations affecting the form of the thread shall not exceed 0,5 times the tolerance on the pitch diameter. The following information is therefore given for information only.

The thread pitch may vary by $\pm \Delta P$ from the basic profile, but the total variation between any two threads located within the length of engagement should not exceed ΔP .

5.3 Provisions for coated threads

In order to reduce the number of manufacturing and inspection tools, it is recommended that, where possible, standardized tolerance classes for threads (grade and position) as specified in ISO 965-1 be used.

6 Limit dimensions

The limit dimensions, shown on figures 2 to 5, shall be determined from the formulae given in clause 9.

7 Nominal diameter/Pitch combinations

See table 2.

8 Designation

8.1 General

The threads specified in this part of ISO 5855 are designated by

- M, a letter identifying metric threads;
- J, a letter symbolizing the thread profile;
- the nominal diameter \times pitch, expressed in millimetres;
- the tolerance class on pitch diameter, followed by the tolerance class on the major diameter or on the minor

diameter. If a single tolerance class is indicated, it refers to the pitch diameter d_2 or D_2 and the major diameter d or minor diameter D_1 .

EXAMPLES

An external MJ thread, of nominal diameter 6 mm, pitch 1 mm and tolerance classes 4h6h is designated as follows:

MJ6 \times 1 — 4h6h

An internal MJ thread, of nominal diameter 6 mm, pitch 1 mm and tolerance classes 4H5H is designated as follows:

MJ6 \times 1 — 4H5H

8.2 Special cases

MJ threads not specified in this part of ISO 5855 are special threads.

They shall be calculated in accordance with clause 9 and designated by

— MJ, see 8.1;

— S, a letter symbolizing a special thread;

— all the information necessary to produce the thread.

EXAMPLES

An external MJ thread, of nominal diameter 13 mm, pitch 1 mm and tolerance class 4h¹⁾, is designated as follows:

MJS13 \times 1 — 4h

Major diameter $d = 12,888$ mm

Pitch diameter $d_2 = 12,275$ mm

Minor diameter $d_3 = 11,709$ mm

Root radius = 0,15 mm

An internal MJ thread of nominal diameter 13 mm, pitch 1 mm and tolerance class 4H5H, is designated as follows:

MJS13 \times 1 — 4H5H

Major diameter D_3 max. = 13,244 mm

Pitch diameter $D_2 = 12,350$ mm

Minor diameter $D_1 = 12,026$ mm

1) If a single tolerance class is given, it refers to the pitch diameter d_2 or D_2 and the major diameter d or minor diameter D_1 .