UDC 621.882.082.1

December 1986

ISO metric screw threads

Basic profile and maximum and minimum material profiles

DIN 13 Part 19

Metrisches ISO-Gewinde; Grundprofil und Fertigungsprofile

Supersedes May 1972 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

See Explanatory notes for connection with International Standard ISO 68-1973, published by the International Organization for Standardization (ISO).

Dimensions in mm

1 Field of application

This standard applies to ISO metric screw threads having the basic profile specified in ISO 68. It specifies the maximum and minimum material profiles for external and internal threads.

See DIN 2244 for terminology relating to screw threads.

2 Basic profile

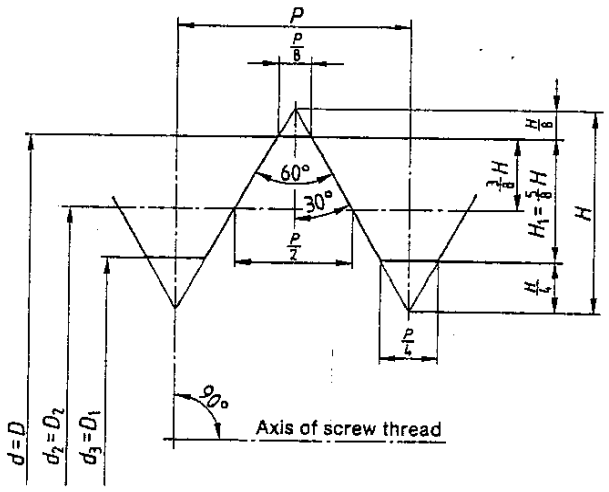

Figure 1. Basic profile

D = major diameter of internal thread } nominal
d = major diameter of external thread } diameter
D_1 = minor diameter of internal thread
d_3 = minor diameter of external thread [1])
D_2 = pitch diameter of internal thread
d_2 = pitch diameter of external thread
H = height of fundamental triangle
H_1 = thread overlap
P = pitch

$$H = \frac{\sqrt{3}}{2} P = 0{,}866\,025\,404\,P$$

$$\frac{5}{8} H = 0{,}541\,265\,877\,P$$

$$\frac{3}{8} H = 0{,}324\,759\,526\,P$$

$$\frac{H}{4} = 0{,}216\,506\,351\,P$$

$$\frac{H}{8} = 0{,}108\,253\,175\,P$$

[1]) See Explanatory notes.

Continued on pages 2 and 3

Table 1. **Dimensions of basic profile**

Pitch P	H	$H_1 = \frac{5}{8}H$	$\frac{3}{8}H$	$\frac{H}{4}$	$\frac{H}{8}$
0,2	0,173 205	0,108 253	0,064 952	0,043 301	0,021 651
0,25	0,216 506	0,135 316	0,081 190	0,054 127	0,027 063
0,3	0,259 808	0,162 380	0,097 428	0,064 952	0,032 476
0,35	0,303 109	0,189 443	0,113 666	0,075 777	0,037 889
0,4	0,346 410	0,216 506	0,129 904	0,086 603	0,043 301
0,45	0,389 711	0,243 570	0,146 142	0,097 428	0,048 714
0,5	0,433 013	0,270 633	0,162 380	0,108 253	0,054 127
0,6	0,519 615	0,324 760	0,194 856	0,129 904	0,064 952
0,7	0,606 218	0,378 886	0,227 332	0,151 554	0,075 777
0,75	0,649 519	0,405 949	0,243 570	0,162 380	0,081 190
0,8	0,692 820	0,433 013	0,259 808	0,173 205	0,086 603
1	0,866 025	0,541 266	0,324 760	0,216 506	0,108 253
1,25	1,082 532	0,676 582	0,405 949	0,270 633	0,135 316
1,5	1,299 038	0,811 899	0,487 139	0,324 760	0,162 380
1,75	1,515 544	0,947 215	0,568 329	0,378 886	0,189 443
2	1,732 051	1,082 532	0,649 519	0,433 013	0,216 506
2,5	2,165 063	1,353 165	0,811 899	0,541 266	0,270 633
3	2,598 076	1,623 798	0,974 279	0,649 519	0,324 760
3,5	3,031 089	1,894 431	1,136 658	0,757 772	0,378 886
4	3,464 102	2,165 063	1,299 038	0,866 025	0,433 013
4,5	3,897 114	2,435 696	1,461 418	0,974 279	0,487 139
5	4,330 127	2,706 329	1,623 798	1,082 532	0,541 266
5,5	4,763 140	2,976 962	1,786 177	1,190 785	0,595 392
6	5,196 152	3,247 595	1,948 557	1,299 038	0,649 519
8	6,928 203	4,330 127	2,598 076	1,732 051	0,866 025

3 Maximum and minimum material profiles for bolts and nuts

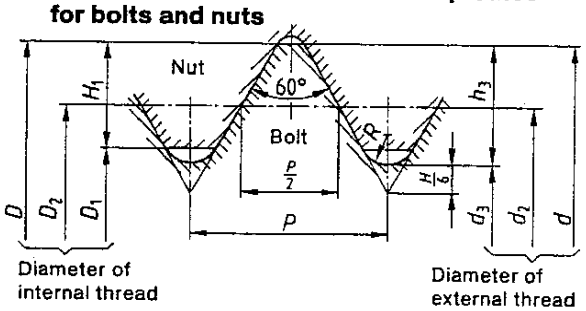

Figure 2. Zero profiles for thread mating without clearance on the flank

$D = d$ = major diameter (nominal diameter)

$$D_2 = d_2 = d - \frac{3}{4}H = d - 0{,}64952\,P$$

$$D_1 = d_2 - 2 \cdot \left(\frac{H}{2} - \frac{H}{4}\right) = d - 2\,H_1 = d - 1{,}08253\,P$$

$$d_3 = d_2 - 2 \cdot \left(\frac{H}{2} - \frac{H}{6}\right) = d - 1{,}22687\,P$$

$$H_1 = \frac{D - D_1}{2} = \frac{5}{8}H = 0{,}54127\,P$$

$$h_3 = \frac{d - d_3}{2} = \frac{17}{24}H = 0{,}61343\,P$$

$$R = \frac{H}{6} = 0{,}14434\,P$$

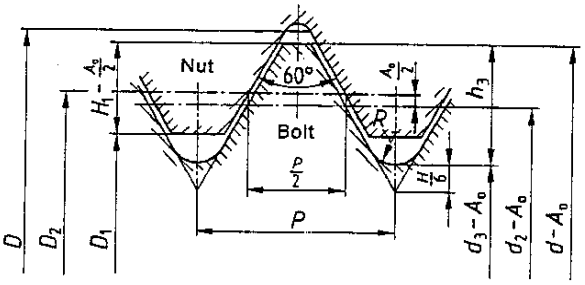

Figure 3. Profiles for thread mating with clearance on the flank resulting from fundamental deviation for bolt

A_o fundamental deviation for bolt

A_u fundamental deviation for nut

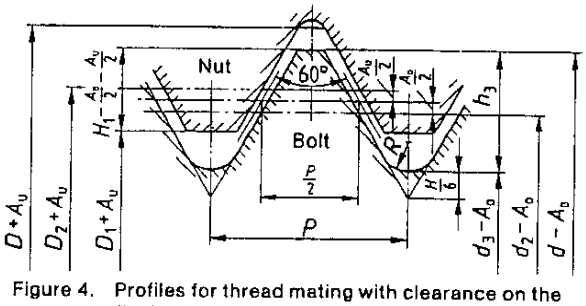

Figure 4. Profiles for thread mating with clearance on the flank resulting from fundamental deviations for bolt und nut

Re figures 2 to 4
The thread root contour at the major diameter of the nut is optional, the flank, however, has to be stralght up to diameters D and $D + A_u$.

Standards referred to

DIN 2244	Screw threads; terminology
ISO 68-1973	ISO general purpose screw threads; basic profile

Other relevant standards

DIN 13 Part 14	ISO metric screw threads; principles of a tolerance system for screw threads of 1 mm diameter and larger
DIN 202	Screw threads; general plan

Previous editions

DIN 13 Part 30: 08.60, 06.64.
DIN 13 Part 19: 05.72.

Amendments

The following amendments have been made to the May 1972 edition.

a) The reference to ISO 261-1973 has been omitted since the basic profile applies to all ISO metric screw threads specified in Standards DIN 13 Parts 1 to 11.

b) The symbol denoting the minor diameter of the external thread has been changed from d_1 to d_3.

c) The standard has been editorially revised and harmonized with existing standards.

Explanatory notes

The specifications of this standard are essentially in agreement with International Standard ISO 68-1973.

The following amendments have been made in comparison with this international standard.

a) The symbol denoting the minor diameter of the external thread has been changed from d_1 to d_3.

b) The present standard includes the maximum and minimum material profiles.

International Patent Classification

F16B 33/02