



SLOVENSKI STANDARD
SIST ISO 2903:1998
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Metrski trapezni navoj ISO - Tolerance

ISO metric trapezoidal screw threads -- Tolerances

Filetages métriques trapézoïdaux ISO -- Tolérances

Ta slovenski standard je istoveten z: **ISO 2903:1993**

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INTERNATIONAL
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Second edition
1993-11-01

**ISO metric trapezoidal screw threads —
Tolerances**

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Contents

	Page
1 Scope	1
2 Normative references	1
3 Definitions	1
4 Symbols	1
5 Structure of the tolerance system	1
6 Tolerance grades	2
7 Tolerance positions	2
8 Lengths of thread engagement	3
9 Crest and root diameter tolerances	3
10 Pitch diameter tolerances	3
11 Recommended tolerance classes	9
12 Multiple-start threads	9
13 Formulae	9
14 Designation	10

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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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 2903 was prepared by Technical Committee ISO/TC 1, *Screw threads*, Sub-Committee SC 2, *Tolerances*.

This second edition cancels and replaces the first edition (ISO 2903:1977), tables 1 and 7 of which have been technically revised.

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ISO metric trapezoidal screw threads — Tolerances

1 Scope

This International Standard specifies a tolerance system for metric trapezoidal screw threads in accordance with ISO 2902. The tolerances refer to the basic profile ISO 2901.

The tolerance system does not apply to trapezoidal screw threads with special requirements on axial displacement, for example lead screws.

2 Normative references

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

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

ISO 2901:1993, *ISO metric trapezoidal screw threads — Basic profile and maximum material profiles*.

ISO 2902:1977, *ISO metric trapezoidal screw threads — General plan*.

ISO 5408:1983, *Cylindrical screw threads — Vocabulary*.

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5408 apply.

4 Symbols

(See figures 1 to 4)

D_4	basic major diameter of nut thread, in millimetres
D_1	basic minor diameter of nut thread, in millimetres
D_2	basic pitch diameter of nut thread, in millimetres
d	basic major diameter of bolt thread, in millimetres
d_3	basic minor diameter of bolt thread, in millimetres
d_2	basic pitch diameter of bolt thread, in millimetres
P	pitch, in millimetres
P_h	lead, in millimetres
N	designation for thread engagement group "Normal"
L	designation for thread engagement group "Long"
l_N	thread engagement, in millimetres
T	tolerance, in micrometres
T_{D1}	} tolerances for D_1, D_2, d, d_3, d_2 (for D_4 no tolerances are specified), in micrometres
T_{D2}	
T_d	
T_{d3}	
T_{d2}	
ei, EI	lower deviations (EI for nut threads is equal to zero), in micrometres
es, ES	upper deviations, in micrometres

5 Structure of the tolerance system

The system is based on the tolerance system for ISO general-purpose metric screw threads of ISO 965-1, completed with tolerance positions c and e, and with values for pitches above 6 mm.

The recommended tolerance classes are, however, not the same as those for ISO metric screw threads in ISO 965-1.

6 Tolerance grades

The following tolerance grades are established:

	Tolerance grades		
Minor diameter of nut threads D_1 :	4		
Major diameter of bolt threads d :	4		
Pitch diameter of nut threads D_2 :	7	8	9
Pitch diameter of bolt threads d_2 :	(6)	7	8 9
Minor diameter of bolt threads d_3 :	7	8	9

Tolerance grade 6 for the pitch diameter (d_2) of the bolt thread has been included only as a means to establish the pitch diameter tolerances of grades 7, 8 and 9. See 13.4.2.

The tolerance grade for the minor diameter (d_3) of the bolt thread is always the same as for the pitch diameter (d_2).

However, the values for T_{d_3} and T_{d_2} are not the same for a same grade because $T_{d_3} = 1,25T_{d_2} + |es|$.

7 Tolerance positions

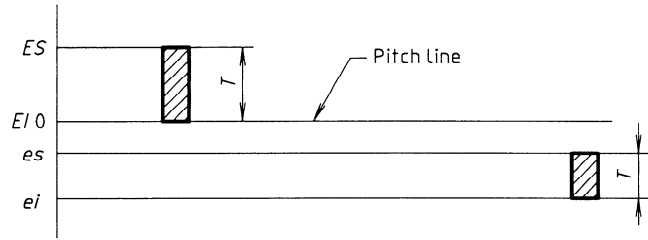


Figure 1 — Tolerance positions with respect to zero line (basic size)

The following tolerance positions are standardized for the pitch diameter.

- For nut threads: H with zero fundamental deviation (see figure 2 and table 1).
- For both threads: c and e with negative fundamental deviation (see figure 3 and table 1).

The tolerance position for the minor diameter D_1 and the major diameter D_4 of the nut threads is always H, i.e. with zero fundamental deviation. The tolerance position for the major diameter d and minor diameter d_3 of the bolt threads is in all cases h, i.e. with zero fundamental deviation, and it is independent of the tolerance position of the pitch diameter.

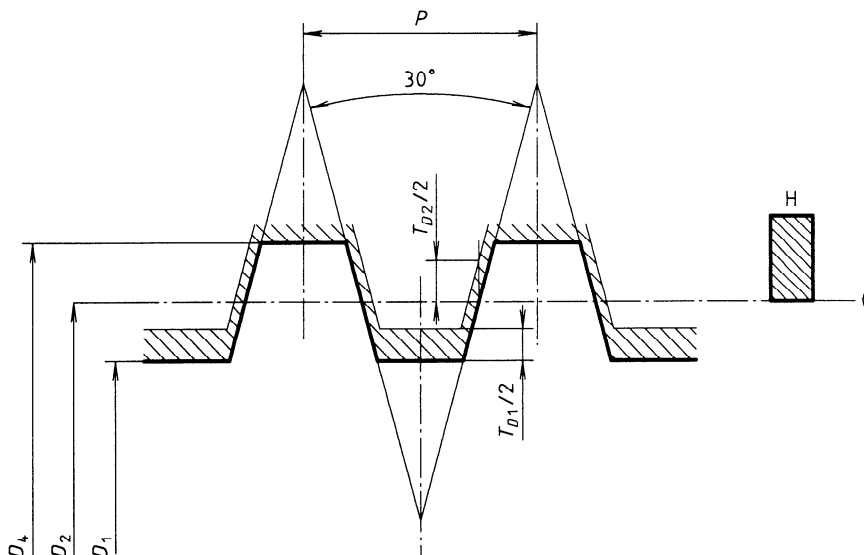


Figure 2 — Nut threads with tolerance position H for the pitch diameter

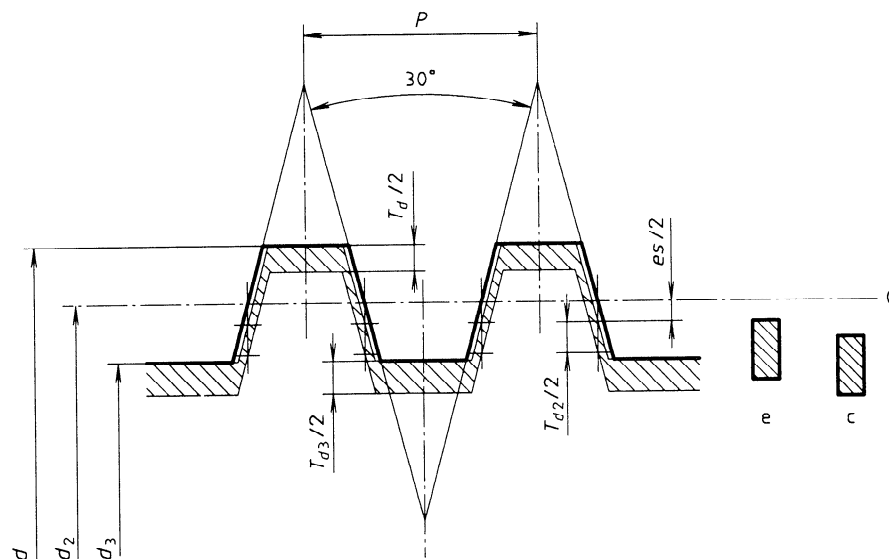


Figure 3 — Bolt threads with tolerance positions c and e for the pitch diameter

Table 1 — Fundamental deviations for the pitch diameter of nut threads and bolt threads

Pitch P	Fundamental deviation		
	Nut thread	Bolt thread	
	D_2	d_2	d_2
	H	c	e
	El	es	es
mm	μm	μm	μm
1,5	0	-140	-67
2	0	-150	-71
3	0	-170	-85
4	0	-190	-95
5	0	-212	-106
6	0	-236	-118
7	0	-250	-125
8	0	-265	-132
9	0	-280	-140
10	0	-300	-150
12	0	-335	-160
14	0	-355	-180
16	0	-375	-190
18	0	-400	-200
20	0	-425	-212
22	0	-450	-224
24	0	-475	-236
28	0	-500	-250
32	0	-530	-265
36	0	-560	-280
40	0	-600	-300
44	0	-630	-315

8 Lengths of thread engagement

The length of thread engagement is classified into the groups N or L, in accordance with table 2.

9 Crest and root diameter tolerances

9.1 Minor diameter tolerances of nut thread (T_{D1})

For the minor diameter tolerance of the nut thread, T_{D1} , there is only one tolerance grade, 4 (see table 3).

9.2 Major diameter tolerances of bolt thread (T_d)

For the major diameter tolerance of the bolt thread, T_d , there is only one tolerance grade, 4 (see table 4).

9.3 Minor diameter tolerances of bolt thread (T_{d3})

For the minor diameter tolerance of the bolt thread, T_{d3} , there are three tolerance grades, 7, 8, and 9, in accordance with table 5.

10 Pitch diameter tolerances

For the pitch diameter tolerances there are three tolerance grades, 7, 8 and 9 for nut threads, in accordance with table 6, and four tolerance grades, 6, 7, 8 and 9 for bolt threads, in accordance with table 7.