SLOVENSKI STANDARD
SIST ISO 4759-1:1996

01-april-1996

Tolerance za vezne elemente - 1. del: Vijaki in matice, ki imajo premer navojev 1,6-150 mm in so razredov izdelave A, B in C

Tolerances for fasteners -- Part 1: Bolts, screws and nuts with thread diameters between 1,6 (inclusive) and 150 mm (inclusive) and product grades A, B and C

Tolérances pour éléments de fixation -- Partie 1: Boulons, vis et écrous de diamètre de filetage compris entre 1,6 (inclus) et 150 mm (inclus) et de niveaux de finition A, B et C

Ta slovenski standard je istoveten z: **ISO 4759-1:1978**

ICS:

21.060.10	Sorniki, vijaki, stebelni vijaki	Bolts, screws, studs
21.060.20	Matice	Nuts

SIST ISO 4759-1:1996 **en**

INTERNATIONAL STANDARD 4759/I

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

Tolerances for fasteners — Part I : Bolts, screws and nuts with thread diameters ≥ 1,6 and ≤ 150 mm and product grades A, B and C

Tolérances pour éléments de fixation — Partie I : Boulons, vis et écrous de diamètre de filetage ≥ 1,6 et ≤ 150 mm et de niveau de finition A, B et C

First edition — 1978-12-15

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Ref. No. ISO 4759/I-1978 (E)

Descriptors : fasteners, bolts, screws, nuts (fasteners), dimensional tolerances, form tolerances, tolerances of position.

Price based on 18 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

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.

International Standard ISO 4759/I was developed by Technical Committee ISO/TC 2, *Fasteners*, and was circulated to the member bodies in April 1977.

It has been approved by the member bodies of the following countries :

Austria	Germany	Norway
Belgium	Hungary	Poland
Brazil	India	Romania
Bulgaria	Ireland	South Africa, Rep. of
Canada	Italy	Spain
Chile	Japan	Switzerland
Czechoslovakia	Korea, Rep. of	Turkey
Denmark	Mexico	United Kingdom
Finland	Netherlands	U.S.S.R.
France	New Zealand	Yugoslavia

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Australia
Sweden
U.S.A.

Printed in Switzerland

Tolerances for fasteners — Part I : Bolts, screws and nuts with thread diameters ≥ 1,6 and ≤ 150 mm and product grades A, B and C

1 SCOPE AND FIELD OF APPLICATION

This International Standard gives a selection of tolerances specified in ISO/R 286, *ISO system of limits and fits — Part I : General, tolerances and deviations*, and in ISO 965/III, *ISO general purpose metric screw threads — Tolerances — Part III : Deviations for constructional threads*, for use in the preparation of ISO product standards for bolts, screws and nuts with thread diameters from 1,6 up to an including 150 mm and product grades A, B and C.

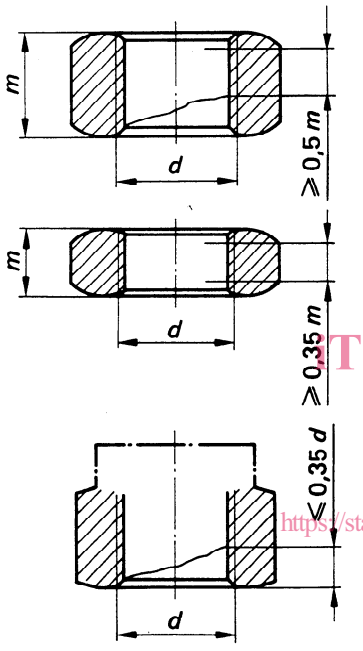
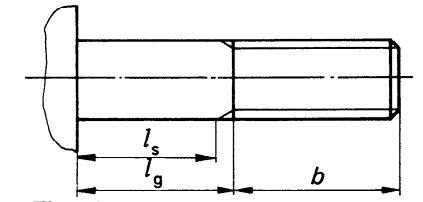
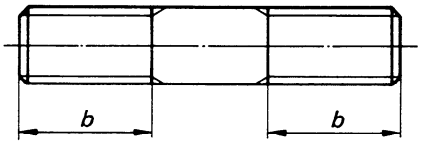
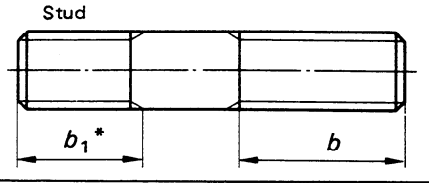
Deviations from the tolerances in this International Standard are permitted in product standards only for valid technical reasons.

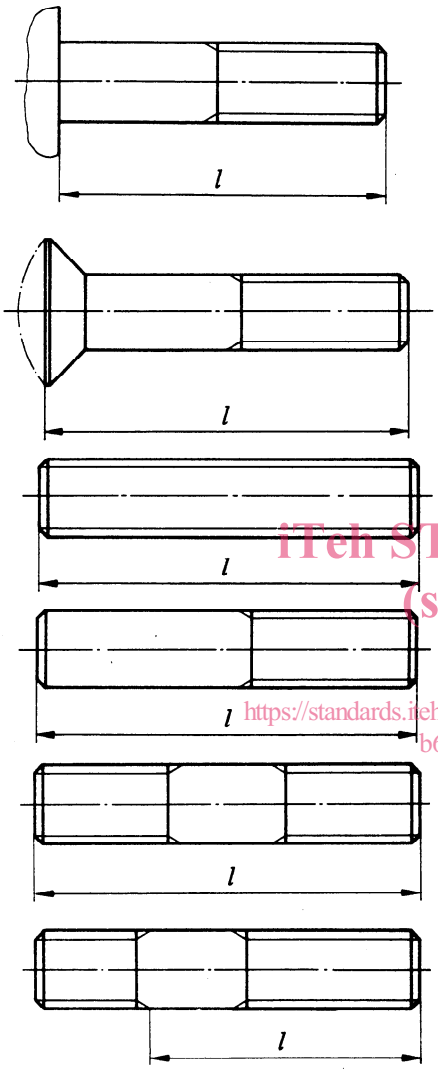
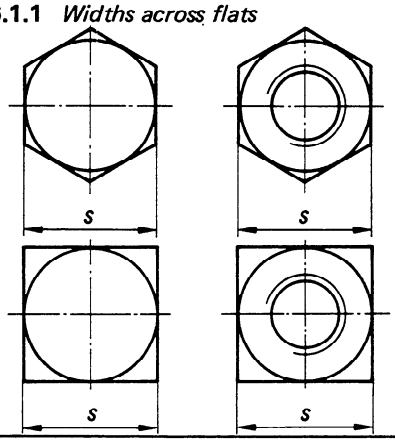
It is recommended that these tolerances should also be used for non-standardized fasteners.

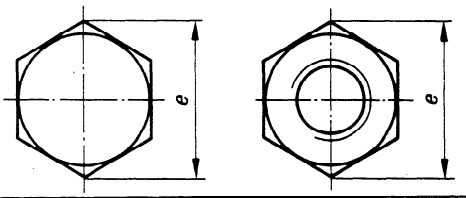
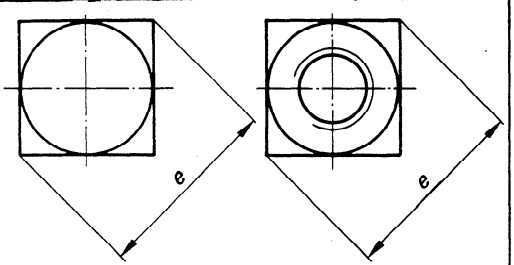
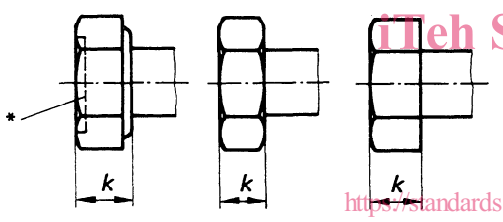
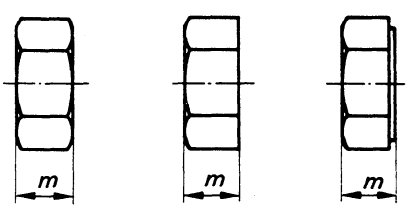
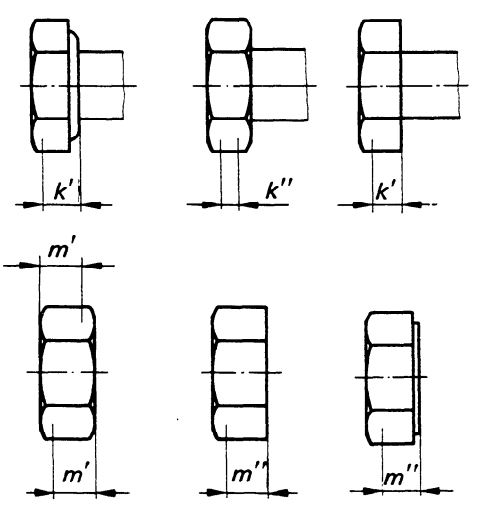
The tolerances of form and of position conform to ISO/R 1101/I, *Technical drawings — Tolerances of form and of position — Part I : Generalities, symbols, indications on drawings.*

In cases where the maximum material principle according to ISO 1101/II, *Technical drawings — Tolerances of forms and of position — Part II : Maximum material principle*, is appropriate to certain features of certain products in these ISO product standards, other tolerances may be applicable.

NOTE — The product grades refer to the quality of the product and to the size of the tolerances where grade A is the most precise and grade C is the least precise.

Feature	Tolerance for product grades A	B	C	Notes
2 TOLERANCE LEVEL				
Shank and bearing surface	close	close	wide	
Other features	close	wide	wide	
3 THREAD				
3.1 Internal (nuts)	6H	6H	7H	For electroplated coatings and hot dip galvanizing, International Standards are in preparation.
	For all nuts of heights ⩾ 0,8 d the minor diameter shall be within the specified tolerances for a minimum of 0,5 m nominal (only for sizes ⩾ M3). For all nuts of heights ⩾ 0,5 d < 0,8 d the minor diameter shall be within the specified tolerances for a minimum of 0,35 m nominal. For prevailing torque type nuts the minor diameter may exceed the specified tolerance for a maximum height of 0,35 d from the non-restricted end.			
3.2 External (bolts and screws)	6g	6g	8g	For electroplated coatings and hot dip galvanizing, International Standards are in preparation.
4 THREAD LENGTH				P = pitch of thread l_s is the minimum length of the unthreaded (plain) shank. l_g is the maximum length of the unthreaded shank (thread run-out included) and is therefore the minimum clamping length. Tolerance + 2 P only for such bolts where l_s and l_g are not fixed in the product standard * Only stud end of studs.
 Tie rod	b^{+2P}_{0}	b^{+2P}_{0}	b^{+2P}_{0}	
 Stud	b^{+2P}_{0}	b^{+2P}_{0}	b^{+2P}_{0}	
	b^{+2P}_{0} b_1 js16	b^{+2P}_{0} b_1 js17	b^{+2P}_{0} b_1 js17	

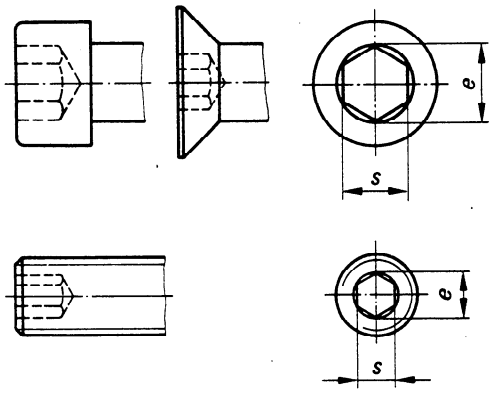
Feature	Tolerance for product grades A	B	C	Notes
5 NOMINAL LENGTH 	j_s 15 j_s 16 for machine screws with $l > 50$ mm	j_s 17	$l \leqslant 150$: j_s 17 $l > 150$: 2 j_s 17	
6 DRIVING GEOMETRIES **6.1 External** **6.1.1** *Widths across flats* 	s ⩽ 32: Tolerance h13 s > 32: Tolerance h14	s ⩽ 19: h14 19 < s ⩽ 60: h15 60 < s ⩽ 180: h16 s > 180: h17		

Feature	Tolerance for product grades A	B	C	Notes
6.1.2 *Widths across corners*  	e_1 min. $\geqslant$ 1,13 s min. e_1 min. $\geqslant$ 1,12 s min. for flanged products and other cold forged heads without trimming operation			
 	e_2 min. $\geqslant$ 1,3 s min.			
6.1.3 *Height of heads*  	j_s14	j_s15	k < 10: j_s16; k ⩾ 10: j_s17	* Shape of indentation by agreement between customer and supplier.
6.1.4 *Height of nuts*  	⩽M12 : h14 >M12⩽M18 : h15 >M18 : h16		h17	
6.1.5 *Effective gauging position*  	$k' \geqslant 0{,}7\ k$ min. k'' see product standard $m' \geqslant 0{,}8\ m$ min. $m'' \geqslant 0{,}7\ m$ min.			

<table>
<tr><th>Feature</th><th colspan="3">Tolerance for product grades</th><th>Notes</th></tr>
<tr><th></th><th>A</th><th>B</th><th>C</th><th></th></tr>
<tr><td>

6.2 Internal

6.2.1 *Hexagon sockets*



</td><td>

<table>
<tr><th>s</th><th colspan="2">Tolerance
* | **</th></tr>
<tr><td>0,7</td><td colspan="2">EF8</td></tr>
<tr><td>0,9</td><td colspan="2">JS9</td></tr>
<tr><td>1,3</td><td colspan="2">K9</td></tr>
<tr><td>1,5</td><td rowspan="2">D9</td><td rowspan="2">D10</td></tr>
<tr><td>2</td></tr>
<tr><td>2,5</td><td>D10</td><td rowspan="2">D11</td></tr>
<tr><td>3</td><td>D11</td></tr>
<tr><td>4</td><td rowspan="5">E11</td><td>E11</td></tr>
<tr><td>5</td><td rowspan="5">E12</td></tr>
<tr><td>6</td></tr>
<tr><td>8</td></tr>
<tr><td>10</td></tr>
<tr><td>12</td><td rowspan="3">D12</td></tr>
<tr><td>14</td></tr>
<tr><td>> 14</td></tr>
</table>

</td><td>—</td><td>—</td><td>

* Tolerance fields for socket set screws (at present under consideration with the aim to use this tolerance field for 12.9 socket head cap screws too).

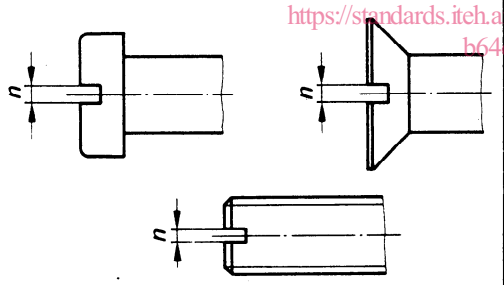
** Tolerance fields for socket head cap screws.

e min. $\geqslant 1{,}14\ s$ min.

Values for e min. see product standards.

</td></tr>
<tr><td>

6.2.2 *Slots*



</td><td>

<table>
<tr><th>n</th><th>Tolerance*</th></tr>
<tr><td>⩽ 1</td><td>+ 0,20
+ 0,06</td></tr>
<tr><td>> 1 ⩽ 3</td><td>+ 0,31
+ 0,06</td></tr>
<tr><td>> 3 ⩽ 6</td><td>+ 0,37
+ 0,07</td></tr>
</table>

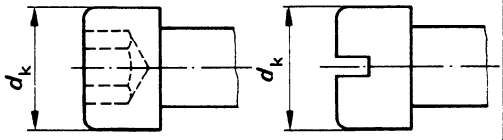
</td><td>—</td><td>—</td><td>

* Tolerance field
C13 for $n \leqslant 1$
C14 for $n > 1$

</td></tr>
<tr><td colspan="3">**6.2.3** *Depth of hexagon sockets and slots*</td><td>Tolerance depends on the method of measurement. See product standard.</td></tr>
<tr><td>

7 HEAD DIMENSIONS OF ROUND HEAD SCREWS

7.1 Diameters

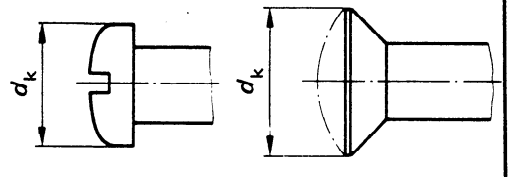


</td><td>h13*</td><td>h14**</td><td>—</td><td>

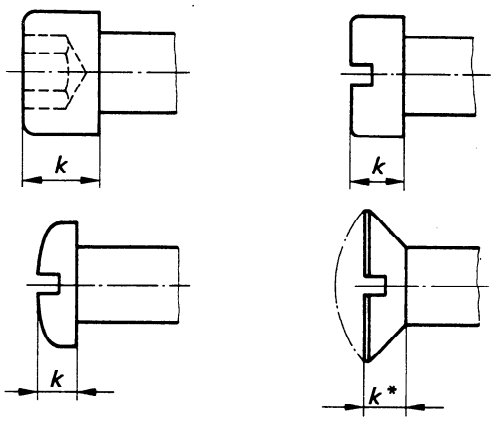
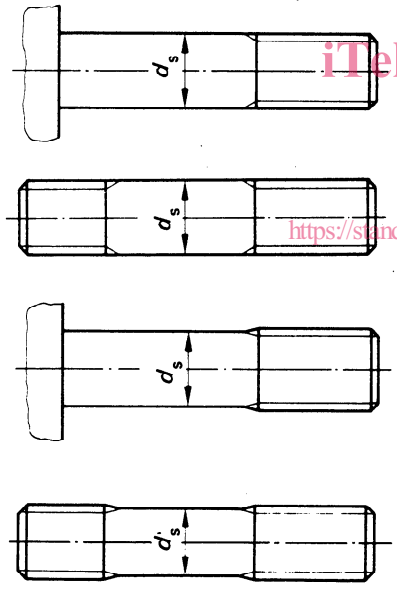
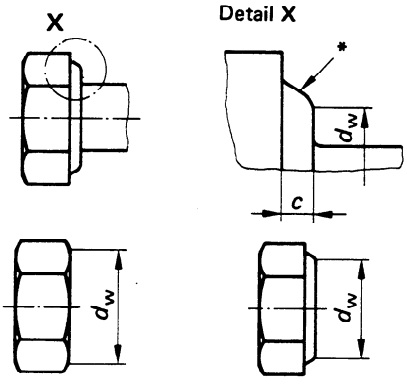
* ± IT13 for knurled heads

** ± IT14 for knurled heads

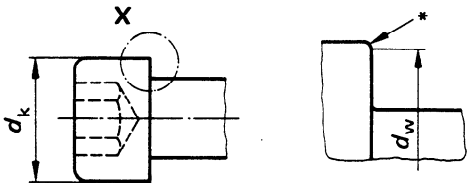
</td></tr>
<tr><td>

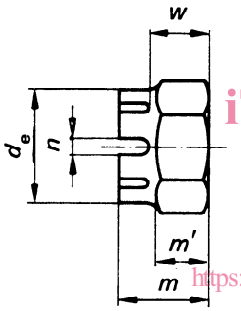


</td><td>h14</td><td>h14</td><td>—</td><td>Combined control of diameter and height for countersunk head screws is recommended.</td></tr>
</table>

Feature	Tolerance for product grades A	B	C	Notes
7.2 Heights 	≤ M 5 : h13 > M 5 : h14	h14	–	* Tolerance for heights of countersunk heads, see product standard. Combined control of diameter and height for countersunk head screws is recommended.
8 SHANK DIAMETERS 	h13	h14	± IT15	Allowance for the swelling under the head, see the relevant product standard.
	Shank diameter ≈ pitch diameter			
9 BEARING AREA 	d_w min. = s min. − IT16 for width across flats < 21 mm d_w min. = 0,95 s min. for width across flats ⩾ 21 mm d_w max. = s effective			For product grade C a washer face is not mandatory. Values for d_w min., see product standard. * Form of the runout at the manufacture's discretion.

Thread diameter	c min.	c max.
3 and 4	0,15	0,4
5 and 6	0,15	0,5
8 to 14	0,15	0,6
16 to 36	0,2	0,8
over 36	0,3	1

<table>
<tr><th>Feature</th><th colspan="3">Tolerance for product grades
A | B | C</th><th>Notes</th></tr>
<tr><td>9 BEARING AREA (concluded)
 
</td><td colspan="3"><table>
<tr><th colspan="2">Thread diameter
over | to</th><th>d_w min.</th></tr>
<tr><td></td><td>2,5</td><td>d_k min. – 0,14</td></tr>
<tr><td>2,5</td><td>5</td><td>d_k min. – 0,25</td></tr>
<tr><td>5</td><td>10</td><td>d_k min. – 0,4</td></tr>
<tr><td>10</td><td>16</td><td>d_k min. – 0,5</td></tr>
<tr><td>16</td><td>24</td><td>d_k min. – 0,8</td></tr>
<tr><td>24</td><td>36</td><td>d_k min. – 1</td></tr>
<tr><td>36</td><td></td><td>d_k min. – 1,2</td></tr>
</table></td><td>Values for d_w min. see product standard.

* Form of the edge (rounded or chamferred) at the manufacture's discretion.</td></tr>
<tr><td>10 OTHER DIMENSIONS
 
</td><td colspan="3"><table>
<tr><td>d_e</td><td>h14</td><td>h15</td><td>h16</td></tr>
<tr><td>m</td><td>h14</td><td>h15</td><td>h17</td></tr>
<tr><td>m'</td><td colspan="3">see 6.1.4</td></tr>
<tr><td>n</td><td>H14</td><td>H14</td><td>H15</td></tr>
<tr><td>w</td><td>h14</td><td>h15</td><td>h17</td></tr>
</table></td><td></td></tr>
</table>