INTERNATIONAL STANDARD

ISO 8788

Third edition
2020-05

Aerospace — Nuts, metric — Tolerances of form and position

Aéronautique et espace — Écrous métriques — Tolérances de forme et de position

Reference number
ISO 8788:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 4, *Aerospace fastener systems*.

This third edition cancels and replaces the second edition (ISO 8788:2000), of which it constitutes a minor revision.

The changes compared to the previous edition are as follows:

— informative references changed from dated to undated and moved to the Bibliography;

— the document editorially revised.

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.

Aerospace — Nuts, metric — Tolerances of form and position

1 Scope

This document defines the tolerances of form and position of metric nuts meant for aerospace construction. These tolerances comply with ISO 1101, ISO 2692 and ISO 5459.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

4 Types of nuts, illustration of tolerances of form and position, values

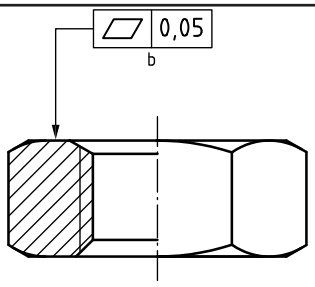
See Table 1 for the tolerances of form and position to be applied in relation to the type of nut, Table 2 to Table 11 for the illustration of tolerances of form and position for different types of nut. See Tables 12 and Table 13 for the values of the tolerances. In the "illustration" column, only one type of nut has been shown as an example, but the corresponding tolerance applies to all types of nut specified in the third column.

Table 1 — Tolerances of form and position to be applied in relation to the type of nut

Table	Tolerance of former position	Sequence number								
		Plain nuts	Slotted nuts	Self-locking nuts						
				with wrenching feature			clinch/shank	anchor		
				with plastic locking ring	formed out-of-round			two-lug	single-lug	corner
					hexagonal	bihexagonal				
2	Flatness of bearing surface	1	1	1	1	1				
3	Squareness of bearing surface	2	2	2	2	2	2	3	3	3
4	Across flats symmetry	4	4	4	5	6				
5	Symmetry of slots		7							
6	Locking wire hole position	8								
7	Flange run-out			9	9	9				
8	Counterbore coaxiality			10	10	10		10	10	10
9	Symmetry of flange of the clinch/ shank nuts						11			
10	Clinching shank coaxiality						12			
11	Rivet hole position							13	14	15
Annex										
A		X								
B			X							
C				X						
D					X					
E						X				
F							X			
G								X		
H									X	
I										X

Table 2 — Flatness of bearing surface

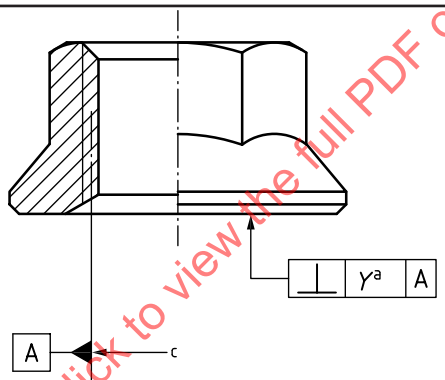
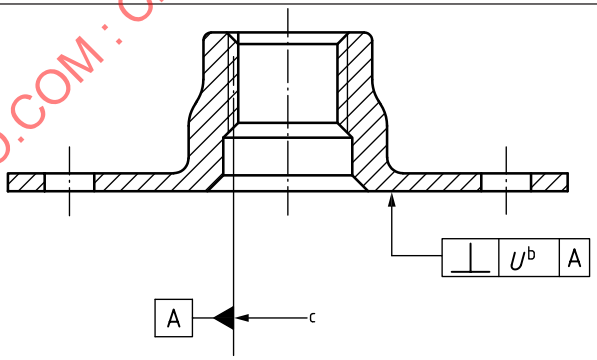
Tolerances in millimetres

Sequence number	Illustration	Type of nut
1		Plain[a], slotted and self-locking nuts with wrenching feature

[a] The flatness tolerance applies to both faces of plain nuts.

[b] Not convex.

Table 3 — Squareness of bearing surface

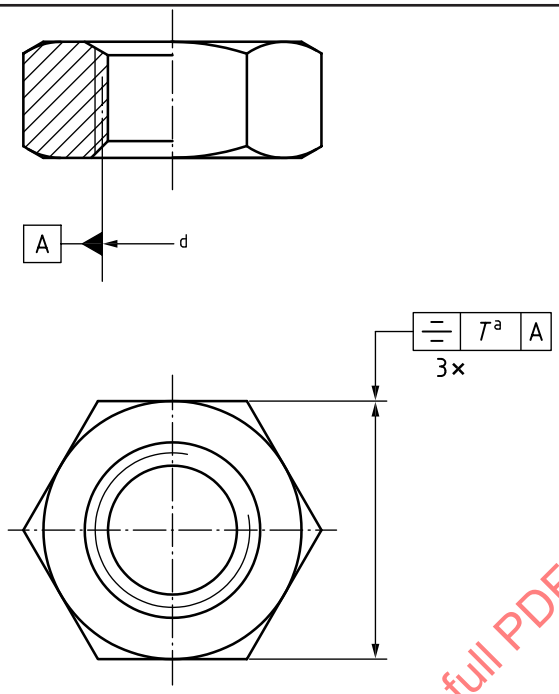
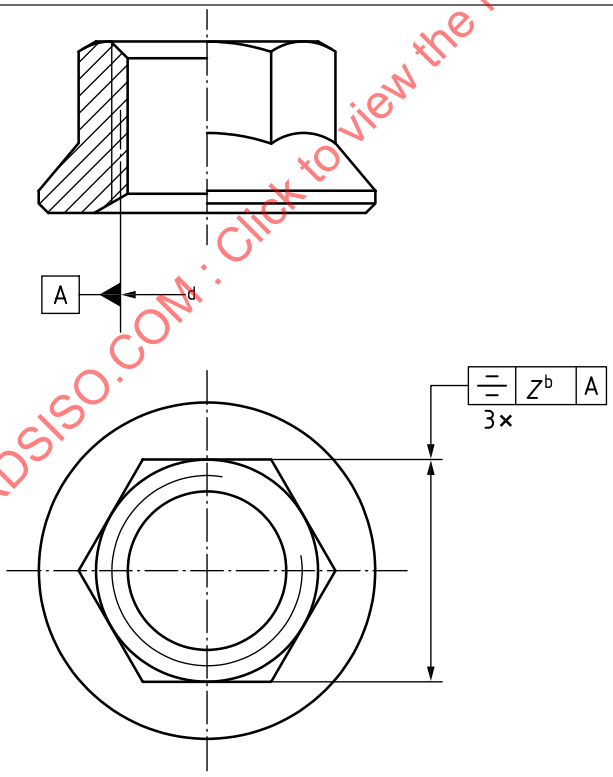
Sequence number	Illustration	Type of nut
2		Plain, slotted and self-locking nuts with wrenching feature, and clinch/shank nuts
3		Anchor nuts

[a] See Table 13. The squareness tolerance applies to both faces of plain nuts.

[b] Applicable over a diameter equal to *K*, see Table 13. For floating anchor nuts and gang channels, this requirement applies to the floating element only over a diameter equal to the width of this element.

[c] Pitch diameter.

Table 4 — Across flats symmetry

Sequence number	Illustration	Type of nut
4		Hexagonal nuts: — plain — slotted — with plastic locking ring
5		Self-locking hexagonal nuts formed out-of-round

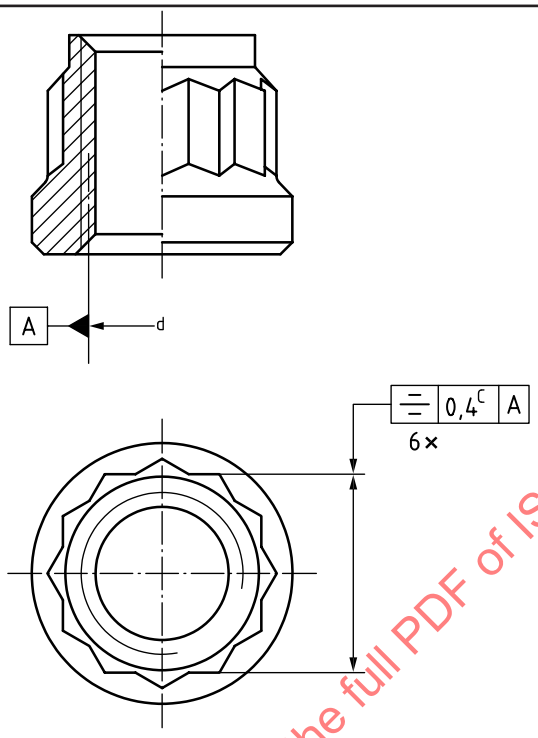
[a] See Table 12.

[b] See Table 13. Values apply before forming out-of-round.

[c] Value applies before forming out-of-round.

[d] Pitch diameter.

Table 4 *(continued)*

Sequence number	Illustration	Type of nut
6		Bihexagonal nuts

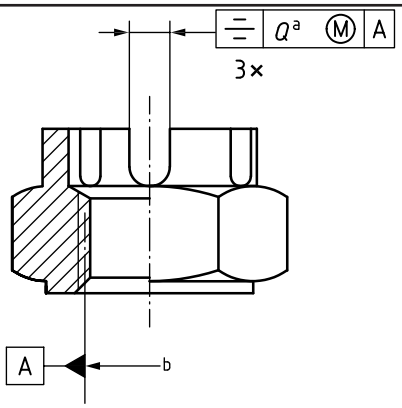
[a] See Table 12.

[b] See Table 13. Values apply before forming out-of-round.

[c] Value applies before forming out-of-round.

[d] Pitch diameter.

Table 5 — Symmetry of slots

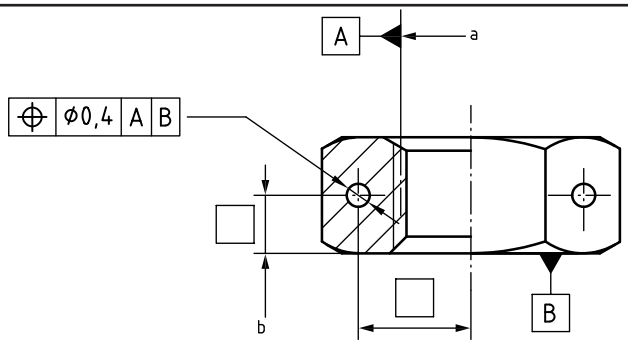
Sequence number	Illustration	Type of nut
7		Slotted nuts

[a] See Table 12.

[b] Pitch diameter.

Table 6 — Locking wire hole position

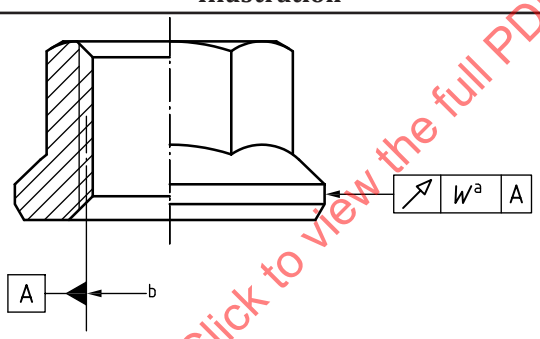
Tolerances in millimetres

Sequence number	Illustration	Type of nut
8		Plain hexagonal nuts

[a] Pitch diameter.

[b] From one face.

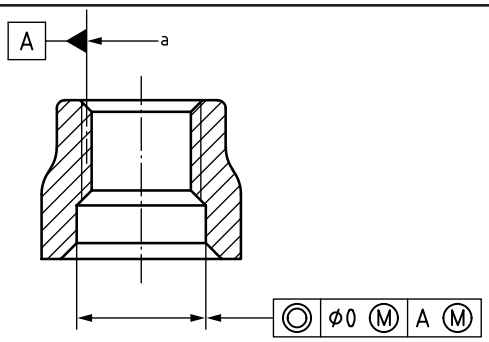
Table 7 — Flange run-out

Sequence number	Illustration	Type of nut
9		Hexagonal and bihexagonal nuts

[a] See Table 12.

[b] Pitch diameter.

Table 8 — Counterbore coaxiality

Sequence number	Illustration	Type of nut
10		Anchor nuts and nuts with wrenching feature

[a] Pitch diameter.

Table 9 — Symmetry of flange of the clinch/shank nuts

Tolerances in millimetres

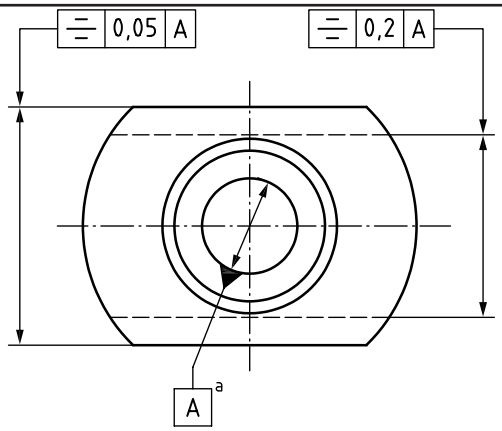
Sequence number	Illustration	Type of nut
11		Clinch/Shank nuts, self-locking
a Datum A is the thread pitch diameter.		

Table 10 — Clinching shank coaxiality

Tolerances in millimetres

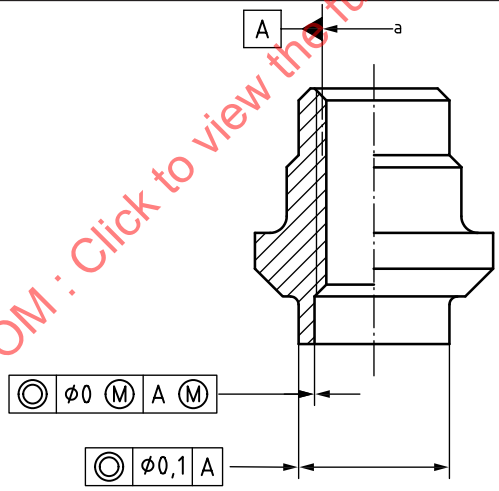
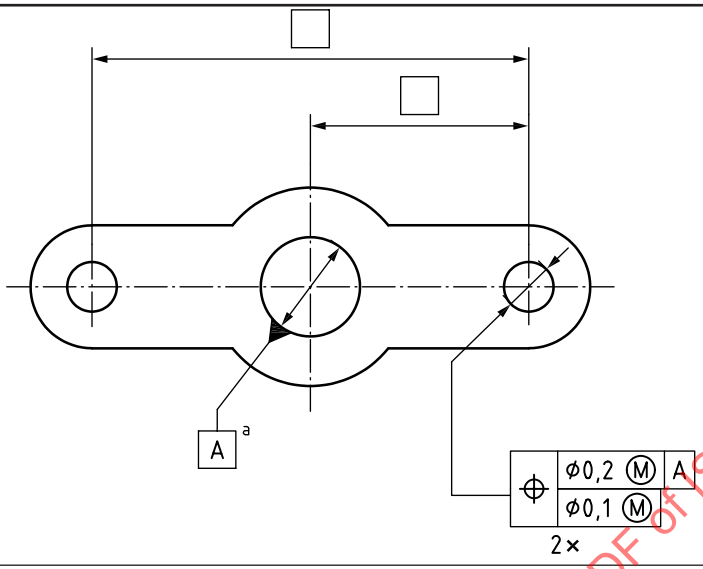
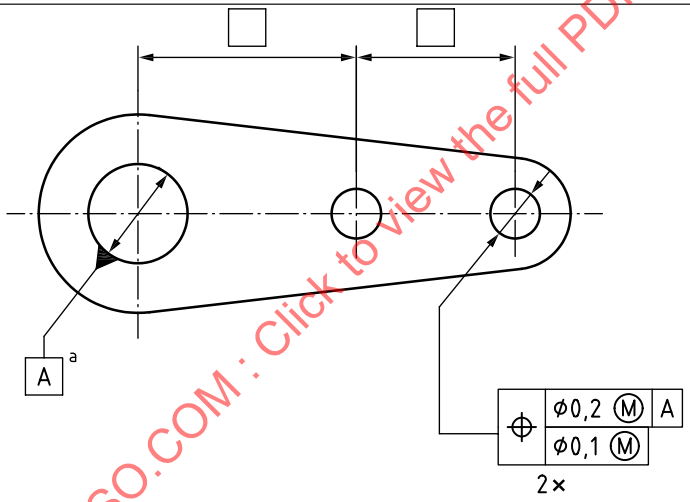
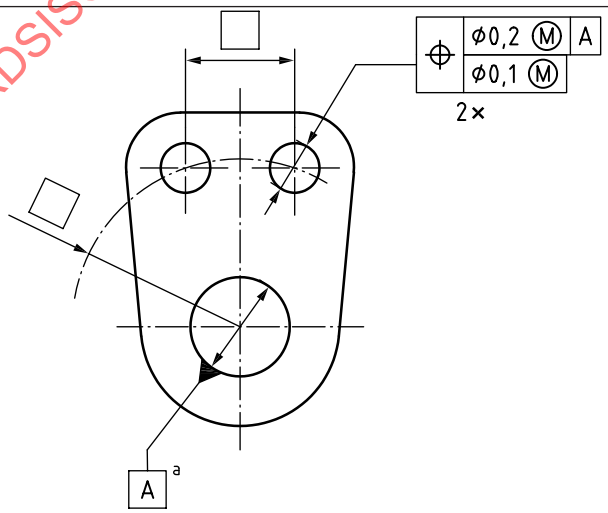
Sequence number	Illustration	Type of nut
12		Clinch/Shank nuts, self-locking
a Pitch diameter.		

Table 11 — Rivet hole position

Tolerances in millimetres

Sequence number	Illustration	Type of nut
13		Two-lug anchor nuts
14		Single-lug anchor nuts with two holes
15		Corner anchor nuts

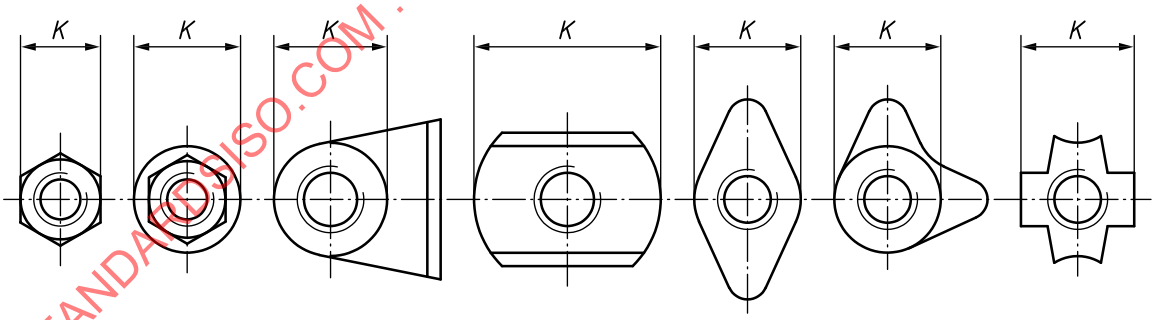
[a] For fixed anchor nuts, datum A is the thread pitch diameter; for floating anchor nuts, datum A is the hole diameter in the cage.

Table 12 — Values dependent on nominal thread diameter

Values in millimetres

Nominal thread diameter	*Q*	*T*	*W*
2	—	0,25	0,2
2,5	—		
3	—		
4	0,2	0,3	
5			
6			
7		0,36	
8			
10	0,25		0,3
12		0,43	
14			
16	0,3		0,4
18			
20		0,52	
22			
24			
27	—		
30	—		
33	—	0,62	
36	—		
39	—		

Table 13 — Values dependent on reference dimension *K*



Values in millimetres

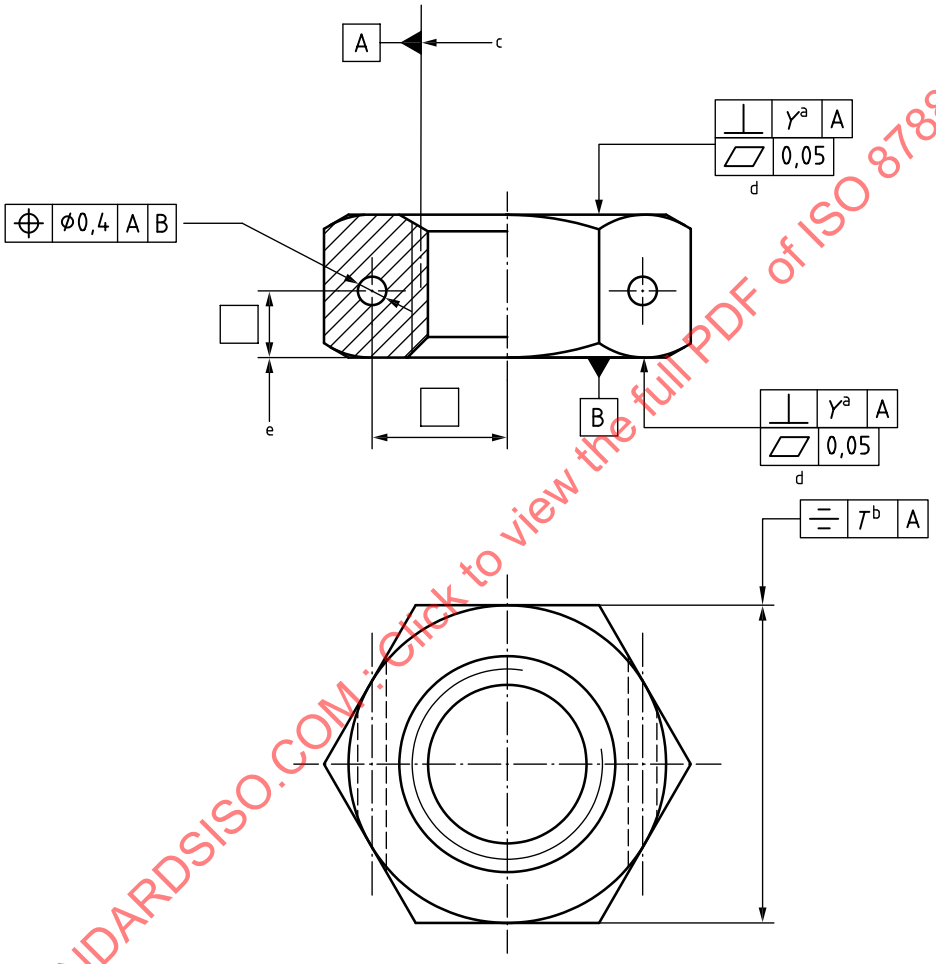
K	*U*	*Y*	*Z*
$K \leq 5$	0,1	0,08	0,2
$5 < K \leq 7$	0,13	0,1	
$7 < K \leq 10$	0,15		
$10 < K \leq 11$			0,4
$11 < K \leq 14$	0,18		
$14 < K \leq 17$	0,2	0,13	
$17 < K \leq 20$	0,23		
$20 < K \leq 23$	0,25	0,15	
$23 < K \leq 26$	0,28	0,18	
$K > 26$	0,2		

Annex A
(informative)

Plain nuts

See Figure A.1.

Tolerances in millimetres



a See Table 13.
b See Table 12.
c Pitch diameter.
d Not convex.
e From one face.

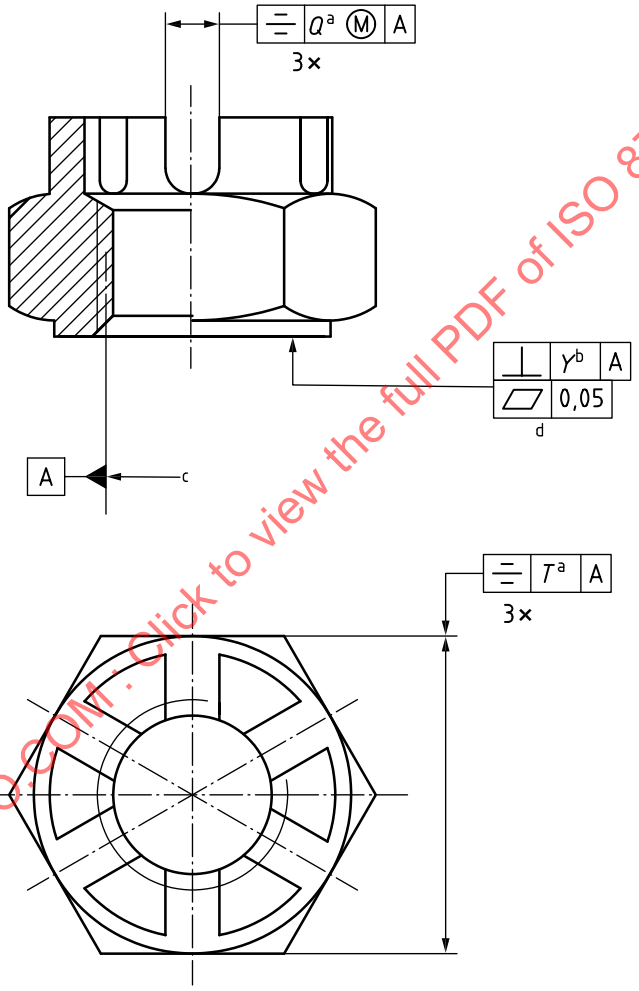
Figure A.1

Annex B
(informative)

Slotted nuts

See Figure B.1.

Tolerances in millimetres



a See Table 12.
b See Table 13.
c Pitch diameter.
d Not convex.

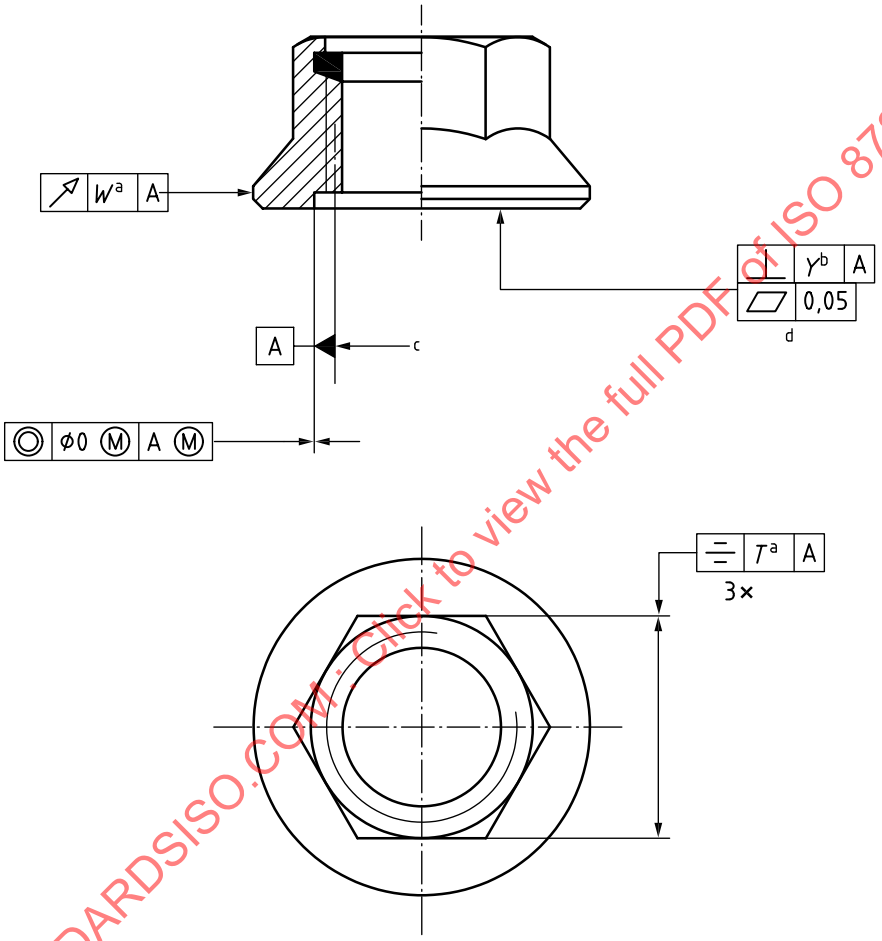
Figure B.1

Annex C
(informative)

Self-locking nuts with wrenching feature, with plastic locking ring

See Figure C.1.

Tolerances in millimetres



a See Table 12.
b See Table 13.
c Pitch diameter.
d Not convex.

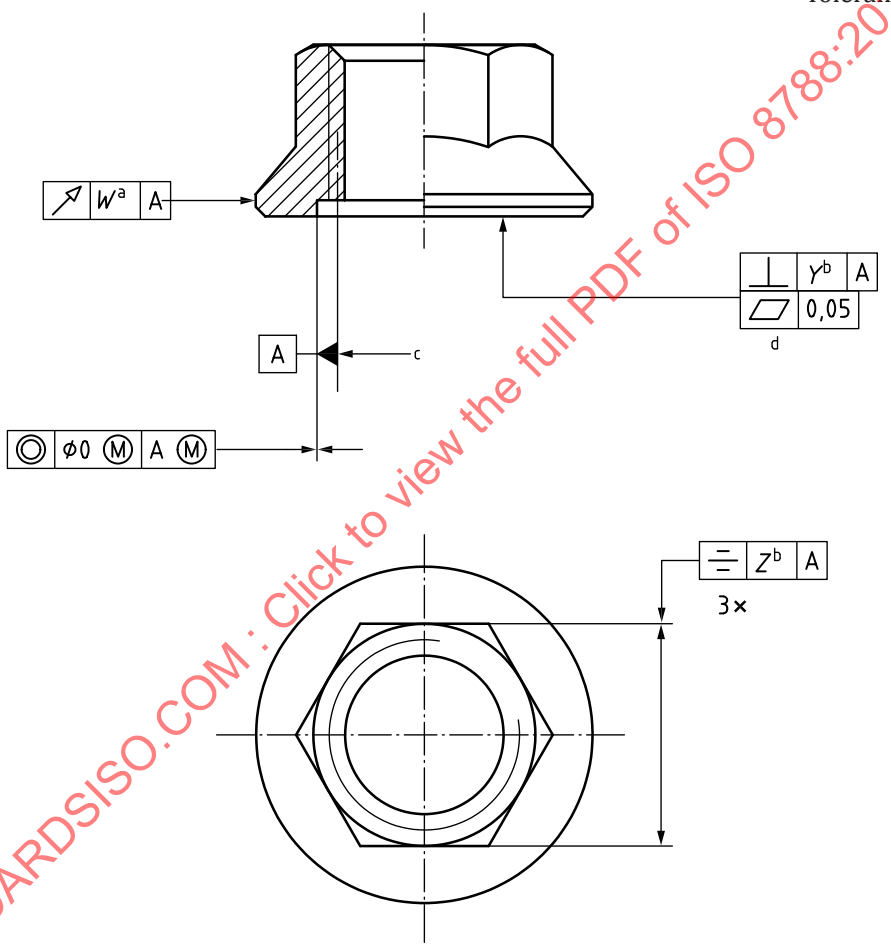
Figure C.1

Annex D
(informative)

Self-locking hexagonal nuts, with wrenching feature, formed out-of-round

See Figure D.1.

Tolerances in millimetres



a See Table 12.

b See Table 13.

c Pitch diameter.

d Not convex.

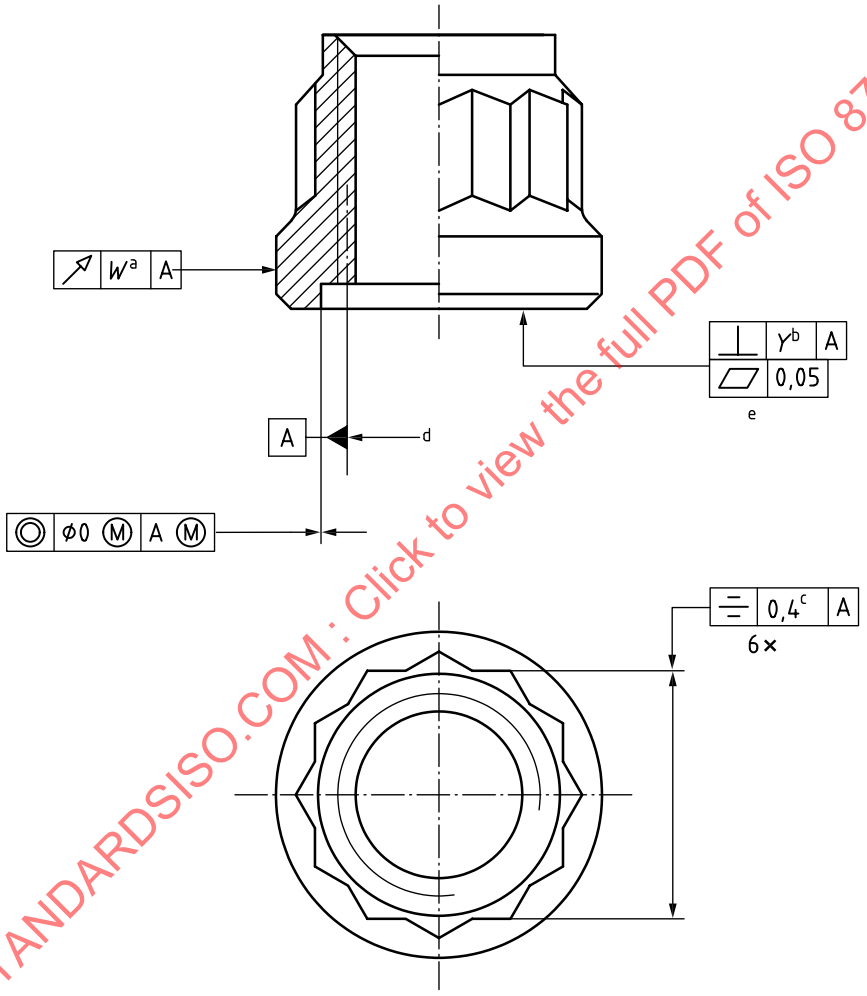
Figure D.1

Annex E
(informative)

Self-locking bihexagonal nuts, with wrenching feature, formed out-of-round

See Figure E.1.

Tolerances in millimetres



a See Table 12.
b See Table 13.
c Value applies before forming out-of-round.
d Pitch diameter.
e Not convex.

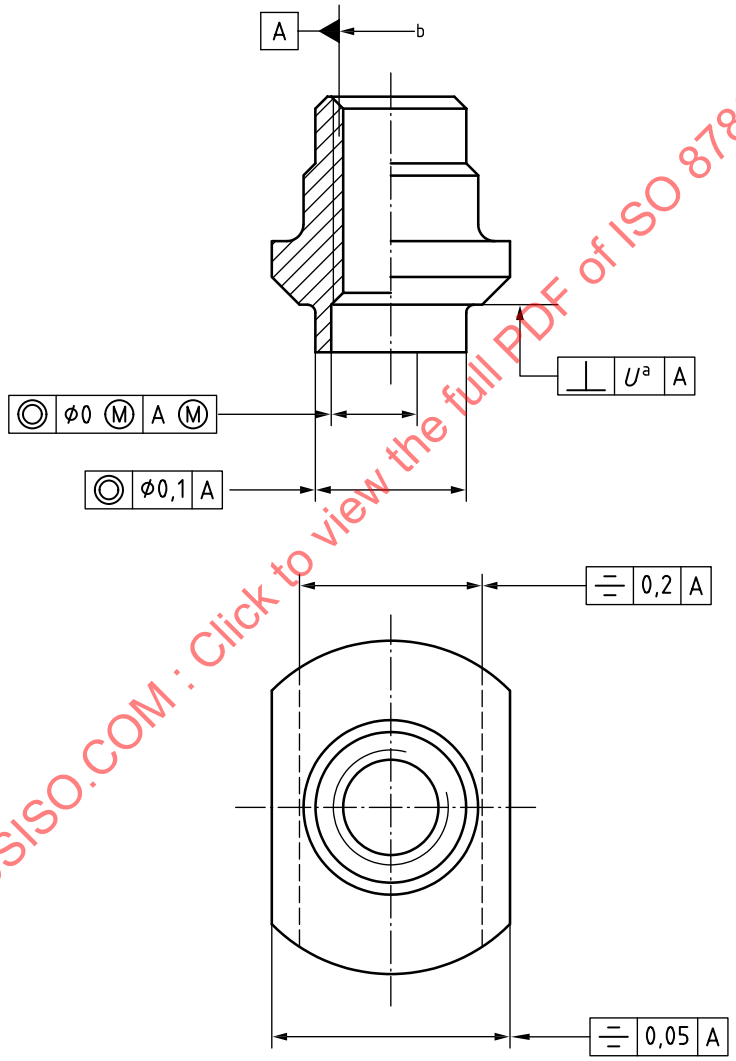
Figure E.1

Annex F
(informative)

Self-locking clinch/shank nuts

See Figure F.1.

Tolerances in millimetres



[a] See Table 13.

[b] Pitch diameter.

Figure F.1