
**Aerospace — Nuts, metric —
Tolerances of form and position**

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

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Foreword

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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).

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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	with wrenching feature				Self-locking nuts		two-lug	anchor single-lug	corner
				with plastic locking ring	formed hexagonal	out-of-round bihexagonal	clinch/shank					
2	Flatness of bearing surface	1	1	1	1	1				3	3	3
3	Squareness of bearing surface	2	2	2	2	2						
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

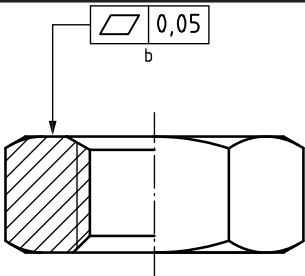
Sequence number	Illustration	Type of nut
1		Plain ^a , slotted and self-locking nuts with wrenching feature
^a The flatness tolerance applies to both faces of plain nuts. ^b Not convex.		

Table 3 — Squareness of bearing surface

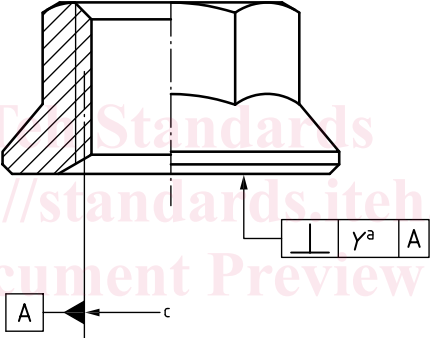
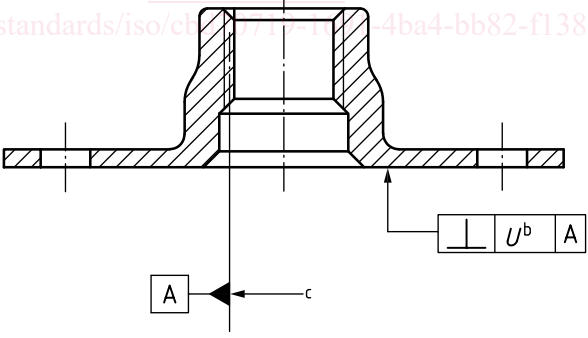
Sequence number	Illustration	Type of nut
2		Plain, slotted and self-locking nuts with wrenching feature, and clinch/shank nuts
3		Anchor nuts
^a See Table 13. The squareness tolerance applies to both faces of plain nuts. ^b Applicable over a diameter equal to K , see Table 13. For floating anchor nuts 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	<p>Technical drawing of a hexagonal nut. The side view shows a hexagonal nut with a central hole. The top view shows the hexagonal shape with a central circular hole. A dimension line 'd' indicates the pitch diameter. A feature control frame points to the top surface with the symbol for across flats symmetry (three horizontal lines), a tolerance of 7^a, and a feature control letter 'A'. A multiplicity of 3x is indicated.</p>	Hexagonal nuts: — plain — slotted — with plastic locking ring
5	<p>Technical drawing of a self-locking hexagonal nut. The side view shows a hexagonal nut with a central hole. The top view shows the hexagonal shape with a central circular hole. A dimension line 'd' indicates the pitch diameter. A feature control frame points to the top surface with the symbol for across flats symmetry (three horizontal lines), a tolerance of Z^b, and a feature control letter 'A'. A multiplicity of 3x is indicated.</p>	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
<p>a See Table 12.</p> <p>b See Table 13. Values apply before forming out-of-round.</p> <p>c Value applies before forming out-of-round.</p> <p>d Pitch diameter.</p>		

Table 5 — Symmetry of slots

Sequence number	Illustration	Type of nut
7		Slotted nuts
<p>a See Table 12.</p> <p>b Pitch diameter.</p>		

Table 6 — Locking wire hole position

Tolerances in millimetres

Sequence number	Illustration	Type of nut
8		Plain hexagonal nuts
<p>^a Pitch diameter. ^b From one face.</p>		

Table 7 — Flange run-out

Sequence number	Illustration	Type of nut
9		Hexagonal and bihexagonal nuts
<p>^a See Table 12. ^b Pitch diameter.</p>		

Table 8 — Counterbore coaxiality

Sequence number	Illustration	Type of nut
10		Anchor nuts and nuts with wrenching feature
<p>^a Pitch diameter.</p>		