



BSI Standards Publication

## AEROSPACE SERIES

Specification for nuts, plain  
and slotted (unified  
hexagons and unified  
threads)  
for shear bolts for aircraft  
in  
corrosion-resisting steel

raising standards worldwide™

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## Foreword

### Publishing information

This British Standard is published by BSI and came into effect on 30 September 2010. It was prepared by Technical Committee ACE/12, Aerospace fasteners and fastening systems. A list of organizations represented on this committee can be obtained on request to its secretary.

### Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

### Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

## 1 Scope

This British Standard specifies the materials, dimensions, finish and inspection requirements for corrosion-resisting steel nuts with unified hexagons and unified threads for use with shear bolts for aircraft. It makes provision for ranges of plain and slotted nuts.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS S 80, High chromium-nickel corrosion resisting steel forging stock, bars, forgings and parts (880 to 1 080 MPa: limiting ruling section 100 mm)

BS A 100, Specification for general requirements for bolts and free running nuts of tensile strength not exceeding 1 249 MPa

BS EN 2516, Passivation of corrosion resisting steels and decontamination of nickel base alloys

## 3 General requirements

The nuts shall not be used as direct replacements for those conforming to BS A 110 without the authority of the original equipment manufacturer's Design Authority.

NOTE This standard has been created to provide a cadmium free alternative to plain and slotted nuts conforming to BS A 110.

The nuts shall conform to BS A 100 in respect of manufacture, screw threads, identification and marking.

## 4 Material and manufacture

The nuts shall be machined all over from corrosion-resisting steel conforming to BS S 80 (condition: hardened and tempered).

## 5 Dimensions

All finished nuts shall conform to the dimensions and tolerances given in Table 1 or Table 2 as appropriate.

NOTE The values in inch units are to be regarded as the standard. A table is given in Annex A to provide a ready means of calculating the approximate millimetre equivalents of the inch dimensions. More accurate conversions should be based on the tables in BS 350.

## 6 Screw threads

The nuts shall have unified threads of the form and class of fit specified in BS A 100.



## 7 Anti-corrosion treatment

All finished nuts shall be passivated in accordance with BS EN 2516 (material type: ferritic and martensitic chromium steels).

## 8 Inspection procedure

The nuts shall be inspected in accordance with BS A 100.

## 9 Designation

The nuts shall be designated A400-XX<sup>1)</sup>, where XX is the part reference suffix specified in Table 1 or Table 2 as appropriate.

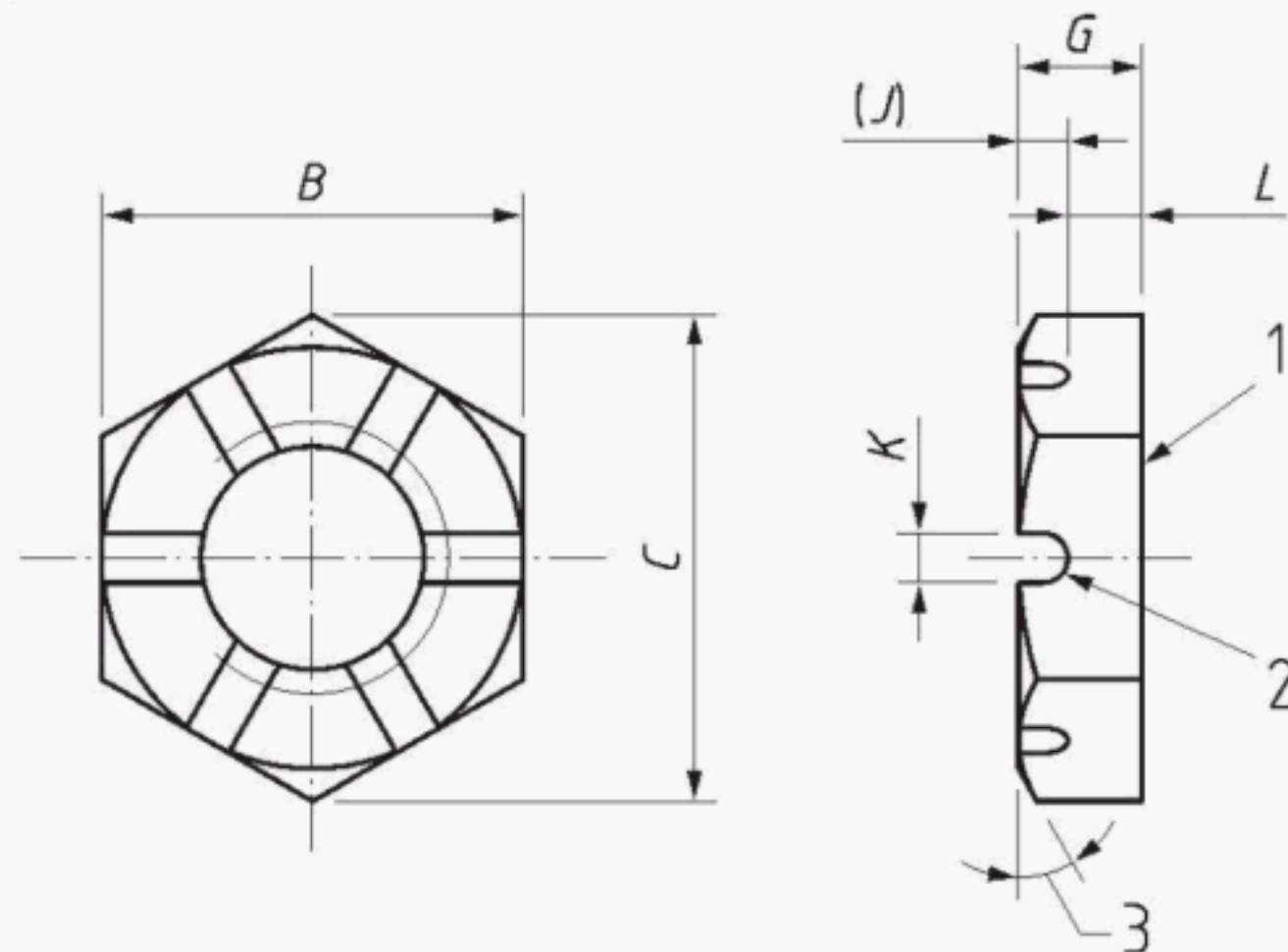
NOTE For example: A400-ES, A400-ST.

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1) Marking A400 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

Table 1 Dimensions of slotted nuts  
Dimensions in inches

Slotted nut – Third angle projection



Key

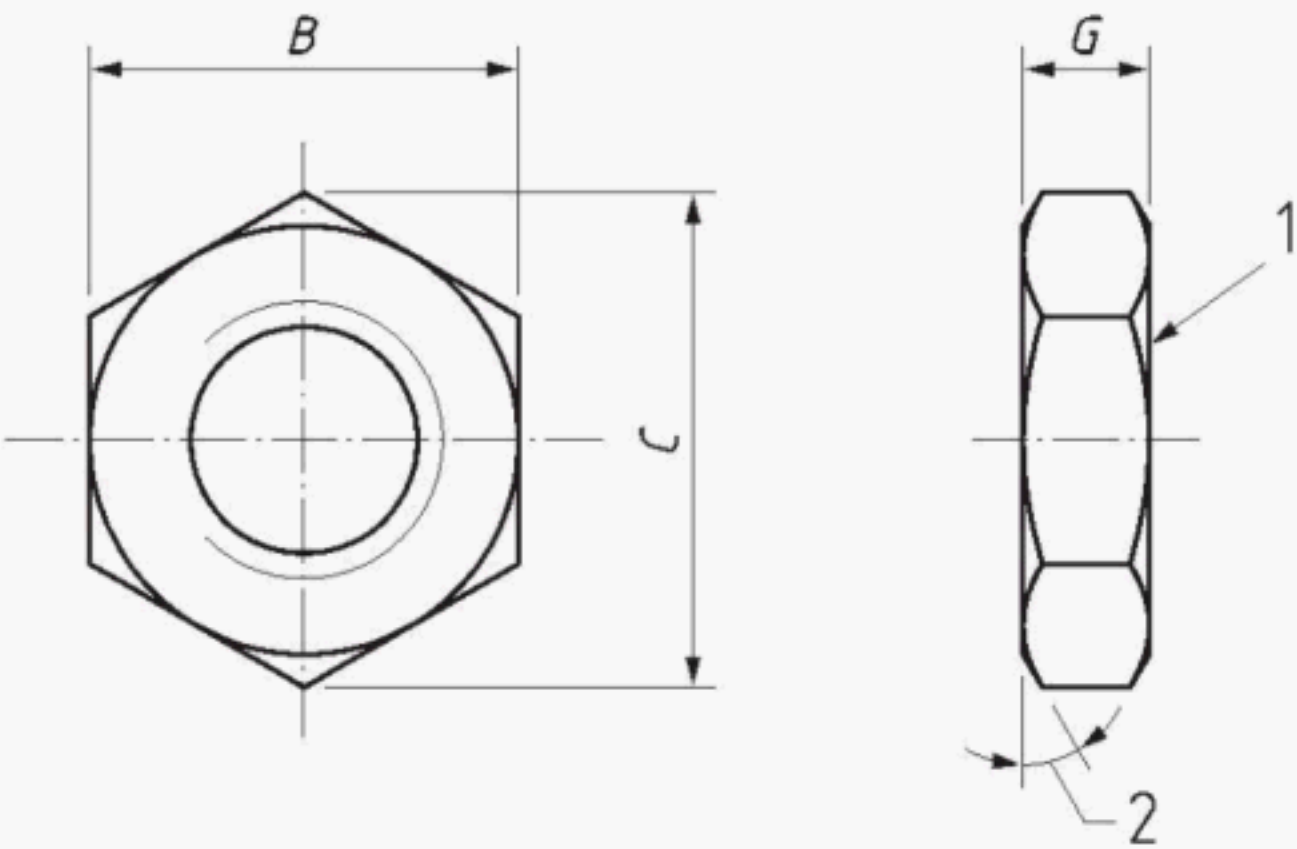
- 1 Countersink 90°–120° on this face only to major diameter of thread.
- 2 Tan-R rounded slots.
- 3 Chamfer 25°–35° on this face only to across flats (AF).

1	2	3	4	5	6	7	8	9	10	11	12	13
Nominal size	Decimal equivalent of nominal size	Part reference suffix	Width across flats		Width across corners	Thickness		Slot			Lower face of nut to bottom of slot	
			B		C	G		Depth J	Width K		L	
			min.	max.	max.	min.	max.	ref.	min.	max.	min.	max.
1/4"-28 UNF	0.250	ES	0.370	0.375	0.433	0.190	0.200	0.090	0.080	0.090	0.100	0.110
5/16"-24 UNF	0.3125	GS	0.431	0.438	0.505	0.190	0.200	0.090	0.080	0.090	0.100	0.110
3/8"-24 UNF	0.375	JS	0.493	0.500	0.577	0.190	0.200	0.090	0.080	0.090	0.100	0.110
7/16"-20 UNF	0.4375	LS	0.554	0.562	0.650	0.190	0.200	0.090	0.080	0.090	0.100	0.110
1/2"-20 UNF	0.500	NS	0.679	0.688	0.794	0.190	0.200	0.090	0.080	0.090	0.100	0.110
9/16"-18 UNF	0.5625	PS	0.741	0.750	0.866	0.190	0.200	0.090	0.080	0.090	0.100	0.110
5/8"-18 UNF	0.625	QS	0.866	0.875	1.010	0.190	0.200	0.090	0.125	0.135	0.100	0.110
3/4"-16 UNF	0.750	SS	0.929	0.938	1.083	0.190	0.200	0.090	0.125	0.135	0.100	0.110



Table 2 Dimensions of plain nuts  
Dimensions in inches

Plain nut – Third angle projection



Key

- 1 Countersink 90°–120° on one face only to major diameter of thread.
- 2 Chamfer 25°–35° on both faces to across flats (AF).

1	2	3	4	5	6	7	8
Nominal size	Decimal equivalent of nominal size	Part reference suffix	Width across flats		Width across corners	Thickness	
			B		C	G	
			min.	max.	max.	min.	max.
$\frac{5}{16}$ "-28 UNF	0.250	ET	0.370	0.375	0.433	0.190	0.200
$\frac{3}{16}$ "-24 UNF	0.3125	GT	0.431	0.438	0.505	0.190	0.200
$\frac{7}{16}$ "-24 UNF	0.375	JT	0.493	0.500	0.577	0.190	0.200
$\frac{1}{2}$ "-20 UNF	0.4375	LT	0.554	0.562	0.650	0.190	0.200
$\frac{9}{16}$ "-20 UNF	0.500	NT	0.679	0.688	0.794	0.190	0.200
$\frac{5}{8}$ "-18 UNF	0.5625	PT	0.741	0.750	0.866	0.190	0.200
$\frac{3}{4}$ "-18 UNF	0.625	QT	0.866	0.875	1.010	0.190	0.200
$\frac{3}{4}$ "-16 UNF	0.750	ST	0.929	0.938	1.083	0.190	0.200



## Annex A (informative)

## Inch to millimetre conversion

Table A.1 Conversion of inches to approximate millimetre equivalents (rounded to one decimal place)

in	mm
$\frac{1}{4}$	6.4
$\frac{5}{16}$	7.9
$\frac{3}{8}$	9.5
$\frac{7}{16}$	11.1
$\frac{1}{2}$	12.7
$\frac{9}{16}$	14.3
$\frac{5}{8}$	15.9
$\frac{3}{4}$	19.1
$\frac{7}{8}$	22.2
1	25.4
2	50.8



## Bibliography

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS A 110, Specification for steel nuts (unified hexagons and unified threads) for shear bolts for aircraft

BS 350, Conversion factors for units

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