International Standard 8538

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

Aerospace — Self-locking hexagon nuts with counterbore and captive washer, classification 1 100 MPa/235 °C

Aéronautique et espace — Écrous hexagonaux à freinage interne, avec chambrage et rondelle captive, classification 1 100 MPa/235 °C

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Foreword

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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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8538 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Aerospace — Self-locking hexagon nuts with counterbore and captive washer, classification 1 100 MPa/235 °C

0 Introduction

This International Standard is confined to those dimensional characteristics accepted to date. Sub-clauses 4.5 and 4.6 will be completed when the relevant International Standards become available.

Clauses relating to "Designation" and "Marking" will be added later.

1 Scope

This International Standard specifies requirements for hexagon nuts, with counterbore and captive washer, with a self-locking feature achieved by forming the upper portion out-of-round.

2 Field of application

These nuts are intended for use in airborne vehicle assemblies, in which the fasteners are mainly subjected to shear loads. The counterbore is deep enough to accommodate a bolt plain shank in excess of assembly thickness as well as the incomplete threads. The captive washer turning freely on the nut can ease the assembly process.

They are intended to be used with threaded parts of 1 100 MPa [1] tensile strength classification.

The cadmium plating restricts the use of these nuts to a temperature not exceeding 235 °C.

3 References

ISO 128, *Technical drawings — General principles of presentation.*

ISO 286, *ISO system for limits and fits.* [2]

ISO 468, *Surface roughness — Parameters, their values and general rules for specifying requirements.*

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

ISO 1302, *Technical drawings — Method of indicating surface texture on drawings.*

ISO 2692, *Technical drawings — Geometrical tolerancing — Maximum material principle.* [3]

ISO 5855/1, *Aerospace construction — MJ threads — Part 1: Basic profile.*

ISO 5855/2, *Aerospace construction — MJ threads — Part 2: Dimensions for bolts and nuts.*

ISO 5858, *Aerospace — Self-locking nuts with maximum operating temperature less than or equal to* 425 °C. [4]

ISO 8788, *Aerospace — Fasteners — Tolerances of form and position for nuts.* [4]

4 Required characteristics

4.1 Configuration

The configuration shall be in accordance with the figure, which is presented in conformity with ISO 128. Only maximum envelope dimensions and those affecting interchangeability are imposed. The minimum dimensions are limited by the strength requirements. Details of form, not stated, are left at the manufacturer's option.

4.2 Dimensions

All linear dimensions are in millimetres; they shall conform with the table and apply after cadmium plating, but before dry film lubricant.

1) This strength class applies at ambient temperature (≈ 20 °C).

2) At present at the stage of draft. (Revision of ISO/R 286-1962.)

3) At present at the stage of draft. (Revision of ISO 1101/2-1974.)

4) At present at the stage of draft.

Standard tolerance symbols and values for linear dimensions are in conformity with ISO 286. Symbols for tolerances of form and position conform with ISO 1101 and ISO 2692. The tolerance values for form and position conform with those given in ISO 8788.

4.3 Screw threads

MJ threads: ISO 5855.

4.4 Surface roughness

R_a max., in micrometres, $\overset{6,3}{\sqrt{}}$ ($\sqrt{}$) in accordance with ISO 468 and ISO 1302. These values are applicable before cadmium plating and dry film lubricant.

This requirement does not apply to threads where the surface texture will be as achieved by normal methods of manufacture. Tool marks are permissible to produce the self-locking feature.

4.5 Material and relevant characteristics

Steel — see clause 0.

4.6 Surface treatment

Nut: cadmium plated and dry film lubricated — see clause 0.

Washer: cadmium plated — see clause 0.

4.7 Procurement specification

See ISO 5858.

Dimensions in millimetres

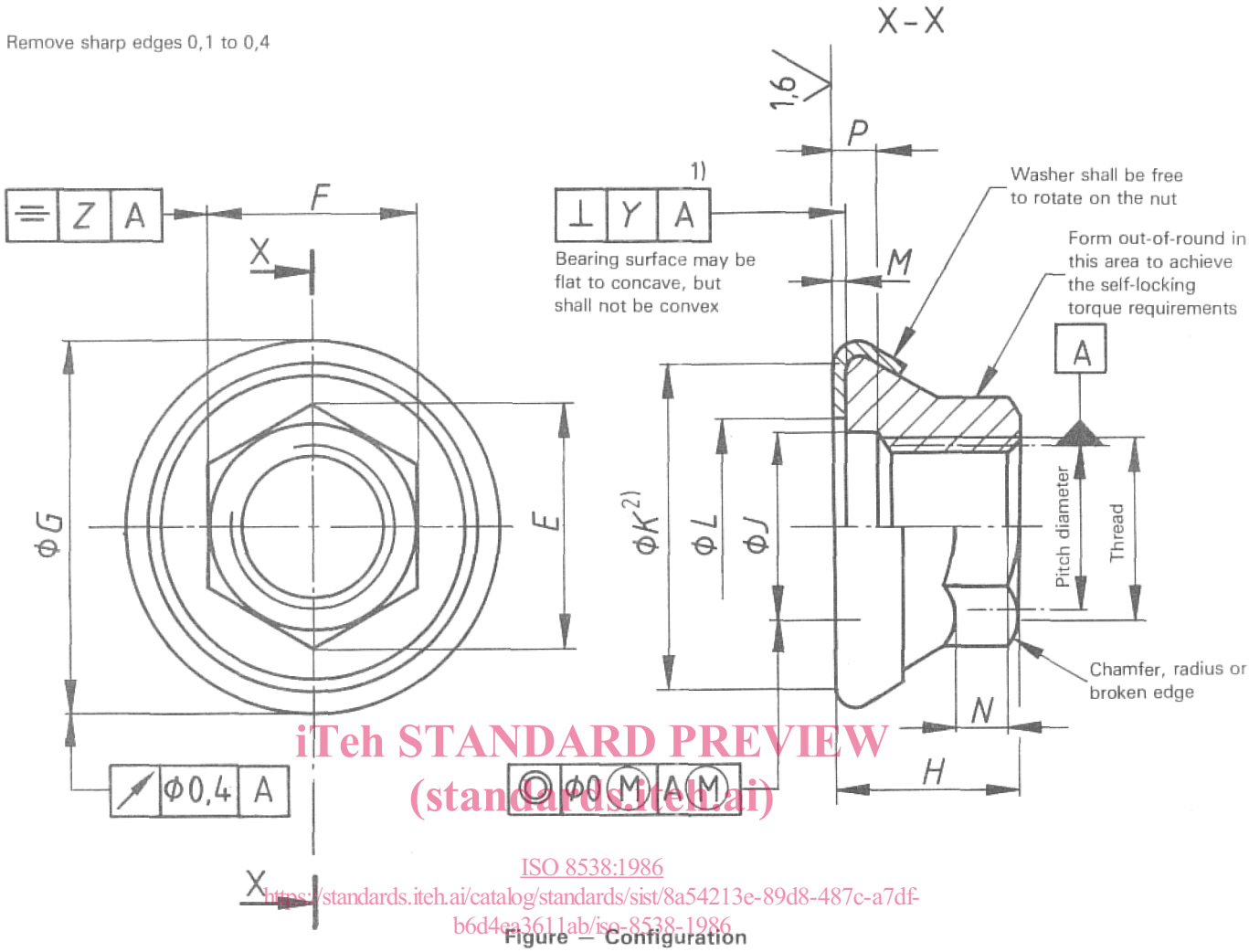

Figure — Configuration

Table — Dimensions and masses

Dimensions in millimetres

Diameter code	Thread[3]	E[4] min.	F[4]		G max.	H max.	J min.	K[2] min.	L max.	M min.	N[5] min.	P min.	Y	Z[6]	Mass kg/1 000 max.
030	MJ3 × 0,5 — 4H6H	4,2	4		6,7	4,6	3,4	5,2	3,8	0,4	1,2	1,6	0,1	0,2	0,4
040	MJ4 × 0,7 — 4H6H	5,3	5		8,4	6,2	4,4	6,4	4,8	0,4	1,5	2,2	0,1	0,2	0,85
050	MJ5 × 0,8 — 4H6H	6,5	6	h12	9,6	7,4	5,5	7,6	5,8	0,6	2	2,4	0,1	0,2	1,15
060	MJ6 × 1 — 4H5H	7,6	7		11,1	8,1	6,5	9	6,8	0,6	2,3	2,7	0,1	0,2	1,6
070	MJ7 × 1 — 4H5H	8,7	8		13,3	9	7,5	11	8	0,6	2,7	2,7	0,1	0,2	2,6
080	MJ8 × 1 — 4H5H	10,9	10		14,6	9,9	8,5	12	9	0,6	3,2	2,7	0,13	0,4	3,8
100	MJ10 × 1,25 — 4H5H	13,2	12	h13	17,2	12	10,5	14,7	11	0,6	3,8	3	0,13	0,4	7,5
120	MJ12 × 1,25 — 4H5H	15,5	14		21	13,8	12,5	18,5	13	0,6	4,5	3	0,15	0,4	11

1) See checking requirements in the procurement specification.

2) Bearing surface diameter of the washer.

3) In the self-locking zone, the tolerances apply before forming out-of-round.

4) Across flats and across corners dimensions apply before forming out-of-round, but finished nuts shall fit a standard socket wrench. Test requirements are laid down in the procurement specification.

5) Wrench pad engagement.

6) These values apply before forming out-of-round.