

SLOVENSKI STANDARD

SIST EN 3299:2019

01-september-2019

Nadomešča:
SIST EN 3299:2009

Aeronavtika - Gredne matice in navojni obroči, samozapiralni, levi ali desni navoj MJ, iz toplotnoodpornega jekla FE-PA2601 (A286), posrebreni - Tehnična specifikacija

Aerospace series - Shaft-nuts and threaded rings, self-locking, right- or left-hand MJ threads, in heat resisting steel FE-PA2601 (A286), silver plated - Technical specification

Luft- und Raumfahrt - Wellenmuttern und Gewindinge, selbstsichernd, Rechts- oder Links-MJ-Gewinde, aus hochwarmfestem Stahl FE-PA2601 (A286), versilbert - Technische Lieferbedingungen

Série aérospatiale - Écrous d'arbres et bagues filetés à freinage interne, filetage MJ à droite ou à gauche, en acier résistant à chaud FE-PA2601 (A286), argentés - Spécification technique

Ta slovenski standard je istoveten z: EN 3299:2019

ICS:

49.030.30	Matice	Nuts
49.030.50	Podložke in drugi blokirni elementi	Washers and other locking elements

SIST EN 3299:2019

en,fr,de

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EUROPEAN STANDARD

EN 3299

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2019

ICS 49.030.30; 49.030.50

Supersedes EN 3299:2007

English Version

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This European Standard was approved by CEN on 1 March 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 3299:2019) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2020, and conflicting national standards shall be withdrawn at the latest by January 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 3299:2007.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 3299:2019 (E)**1 Scope**

This European standard specifies the characteristics, qualification and acceptance requirements for self-locking shaft-nuts and threaded rings, with right- or left-hand MJ threads, in FE-PA2601, silver-plated, for aerospace applications.

Temperature class: 450 °C¹.

It is applicable whenever referenced.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 2786, *Aerospace series — Electrolytic silver plating of fasteners*

EN ISO 4288, *Geometrical product specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture*

EN ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

EN ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 3452-1, *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 5855-2, *Aerospace series — MJ threads — Part 2: Limit dimensions for bolts and nuts*

ASTM E112-13, *Standard Test Methods for Determining Average Grain Size*²

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

¹ Maximum test temperature of the parts.

² Published by: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, USA.

3.1**finished nut or ring**

nut or ring ready for use, inclusive of any possible treatments and/or surface coatings, as specified in the product standard or definition document

3.2**definition document**

document specifying all the requirements for finished nuts or rings

3.3**batch**

quantity of finished nuts or rings, of the same type and same diameter, produced from the same material obtained from the same melt, manufactured in the course of the same production cycle, following the same manufacturing route and having undergone all the relevant heat treatments and surface treatments

3.4**production cycle**

period during which production proceeds without any voluntary or unforeseen change in manufacturing parameters

3.5**heat treatment cycle**

period during which the oven continuously remains at nominal treatment temperature

3.6**surface treatment cycle**

period during which the surface treatment proceeds without any voluntary or unforeseen change in surface treatment parameters

3.7 Surface discontinuities**3.7.1****crack**

rupture in the material which may extend in any direction and which may be intercrystalline or transcrystalline in character

3.7.2**seam**

open surface discontinuity

3.7.3**lap**

surface discontinuity caused by folding over metal fins or sharp corners

3.7.4**inclusions**

non-metallic particles originating from the material manufacturing process

Note 1 to entry: These particles may be isolated or arranged in strings.

EN 3299:2019 (E)**3.8****sampling plan**

plan according to which one or more samples are taken in order to obtain information and possibly reach a decision

3.9**simple random sampling**

taking of n items from a population of N items in such a way that all possible combinations of n items have the same probability of being chosen

[SOURCE: ISO 3534-2:2006, 1.3.4, modified]

3.10**self-locking torque**

torque to be applied to the nut or ring to maintain its movement of rotation in relation to the associated part, the assembly being under no axial load and the locking zone being completely engaged on the associated part (minimum protrusion of two pitches, including the end chamfer)

3.11**breakaway torque**

torque required to start unscrewing the nut or ring with respect to the associated part, with the locking zone still fully engaged, but after the axial load in the assembly has been removed by unscrewing half a turn followed by a halt in rotational movement

3.12**effective seating torque**

part of the apparent seating torque which introduces or increases the axial load in the assembly; the effective seating torque is equal to the difference between the apparent seating torque and the self-locking torque

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3.13**apparent seating torque**

torque indicated by the dynamometric wrench when tightening

4 Quality assurance**4.1 Qualification**

See EN 9133.

Qualification inspections and tests (requirements, methods, numbers of nuts or rings) are specified in Table 1. They shall be carried out on

- each type and diameter of nut or ring, and
- 12 nuts or rings selected from a single batch by simple random sampling.

The test programme may possibly be reduced or the qualification be granted without inspection or testing; any such decision shall be based on the results obtained on similar diameters of nuts or rings, provided that the design and manufacturing conditions are identical.

Table 2 indicates the allocation of nut or ring samples for the inspections and tests.

4.1.1 Approval of manufacturers

The manufacturer's operations shall be an approved production organisation for aerospace products and shall demonstrate that it has implemented and is able to maintain a quality management system (e.g. according to EN 9100 or an equivalent aerospace accepted and established quality management system).

4.1.2 Qualification of screws

The qualification procedure for aerospace standard products (e.g. according to EN 9133 or an equivalent aerospace accepted and established qualification procedure) shall be used and documented according to the specified tests if not otherwise agreed between customer and supplier.

4.2 Acceptance

4.2.1 Purpose

The purpose of acceptance inspections and tests is to check, as simply as possible, by a method representative of actual use conditions, with the uncertainty inherent to statistical sampling, that the nuts or rings constituting the batch satisfy the requirements of this document.

4.2.2 Conditions

Acceptance inspections and tests (requirements, methods, numbers of nuts or rings) are specified in Table 1. They shall be carried out on each batch. Nuts or rings from the batch to be tested shall be selected by simple random sampling.

Each nut or ring may be submitted to several inspections or tests.

If a more stringent inspection is deemed necessary, all or part of the qualification inspections and tests may be performed during the acceptance inspection and testing. In this case, the sample submitted to these inspections and tests is the same as that submitted for qualification inspection and tests.

4.2.3 Responsibility

Acceptance inspections and tests shall be carried out by the manufacturer, or under his responsibility.

4.2.4 Inspection and test report

A test report showing actual numerical values shall be provided if specified in the purchase order.

5 Requirements

See Table 1.

Table 1 — Technical requirements and test methods

Clause	Characteristic	Requirement	Inspection and test method	Q/A ^a	Sample size
5.1	Material	In accordance with the product standard or definition document.	Chemical analysis or certificate of compliance issued by the manufacturer of the semi-finished product	Q	
				A	
5.2	Dimensions, tolerances of form and position	In accordance with the product standard or definition document.	Standard gauging	Q	9
				A	Table 3
5.3	Manufacturing	The nuts or rings shall be manufactured by machining.	Examination of the manufacturing process	Q	
5.3.1	Heat treatment	<p>The heat treatment medium or atmosphere shall not cause any surface contamination except as permitted by 5.5.4.</p> <p>Solution treat (if applicable) at a temperature of 900 °C to 980 °C held at the selected temperature within ± 15 °C for between 1 h min. and 2 h max. quench in oil, or alternative medium or faster.</p> <p>Precipitation treat at (720 ± 10) °C held at temperature for 16 h -0 +30 minutes cooled in air or faster process.</p> <p>Any scale shall be removed by mechanical or chemical processes. It shall not deteriorate the dimensions, surface finish and mechanical properties of the parts. In particular, it shall not result in embrittlement of the metallic substrate.</p>	Examination of the heat treatment equipment	Q	
			Examination of the heat treatment process	Q	
			Visual examination		
5.3.2	Bearing surface perpendicularity	In accordance with the product standard or definition document.	See Annex A.	Q	3
				A	Table 3

Clause	Characteristic	Requirement	Inspection and test method	Q/A ^a	Sample size
5.3.3	Threads and thread deformation	Threads in the locking region may be deformed in any manner provided that the nut or ring meets the requirements of this European standard.	Visual examination Standard gauging	Q	9
		A		Table 3	
		A tool mark and distortion are permissible in the locking area. The marks must be without any abrupt changes.			
		The finished nuts or rings shall allow the "GO" thread plug or ring gauge to enter a minimum of 1 turn before engagement of the locking element. Thread has to be checked for conformance prior to the deformation process.			
5.3.4	Surface roughness	In accordance with the product standard or definition document.	EN ISO 4288 Visual examination	Q	3
				A	Table 3
5.3.5	Surface coating	In accordance with the product standard or definition document.	EN 2786		
5.3.5.1	Appearance	See 5.3.5. SIST EN 3299:2019 https://standards.iteh.ai/catalog/standards/sist/024a1584-4b30-4c69-9f0a-1838855bee45/sist-en-3299-2019	See 5.3.5.	Q	9
				A	Table 3
5.3.5.2	Thickness	See 5.3.5.	See 5.3.5. Inspection can be carried out at the same time as inspection per 5.5.1.	Q	3
				A	Table 3
5.3.5.3	Adhesion	See 5.3.5.	See 5.3.5. Inspection can be carried out at the same time as inspection per 5.4.1.3.	Q	3
				A	Table 3