SLOVENSKI STANDARD
oSIST prEN 3004:2025

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Aeronavtika - Matice, samozapiralne, navoj MJ, iz toplotnoodpornega jekla FE-PA2601 (A286), klasifikacija: 1 100 MPa (pri temperaturi okolice)/650 °C - Tehnična specifikacija

Aerospace series - Nuts, self-locking, MJ threads, in heat resisting steel FE-PA2601 (A286), classification: 1 100 MPa (at ambient temperature)/650 °C - Technical specification

Luft- und Raumfahrt - Muttern, selbstsichernd, MJ-Gewinde, aus hocharmfestem Stahl FE-PA2601 (A286), klasse: 1 100 MPa (bei Raumtemperatur)/650 °C - Technische Lieferbedingungen

Série aérospatiale - Écrous à freinage interne, à filetage MJ, en acier résistant à chaud FE-PA2601 (A286), classification : 1 100 MPa (à température ambiante)/650 °C - Spécification technique

Ta slovenski standard je istoveten z: **prEN 3004**

ICS:

49.030.30 Matice Nuts

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EUROPEAN STANDARD

NORME EUROPÉENNE

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English Version

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 3004:2024) has been prepared by ASD-STAN.

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

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 3004:1997.

This document includes the following significant technical changes with respect to EN 3004:1997:

— Clause 2: EN 2516, ISO 3497 and ISO 1463 added;

— Table 1, Clause 5.3.2: heat treating temperature tolerances and duration modified;

— Table 1, Clause 5.3.4: thread and thread deformation requirements modified;

— Table 1, Clause 5.3.6.1: EN 2516 visual requirements added;

— Table 1, Clause 5.3.6.2: thickness measurements only applicable to silver plated parts and thickness measurement methods added;

— Table 1, Clause 5.3.6.3: adhesion requirements only applicable to silver plated parts;

— Table 1, Clause 5.4.1.1: axial load requirements at ambient temperature modified and axial load at 100 % load added;

— Table 1, Clause 5.4.9: hardness requirements modified and Vickers method added;

— Table 5: push out load and torque out test torque values modified for diameters range from MJ5x0,8 to MJ10x1,25.

1 Scope

This document specifies the characteristics, qualification and acceptance requirements for self-locking nuts with MJ threads in FE-PA2601.

Classification: 1 100 MPa[1]/650 °C[2].

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 2516, *Aerospace series — Passivation of corrosion resisting steels and decontamination of nickel or cobalt base alloys*

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

ISO 1463,[3] *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method*

ISO 3452-1,[3] *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 3497,[3] *Metallic coatings — Measurement of coating thickness — X-ray spectrometric methods*

ISO 21920-3,[3] *Geometrical product specifications (GPS) — Surface texture: Profile — Part 3: Specification operators*

ISO 8642:2008,[3] *Aerospace — Self-locking nuts with maximum operating temperature greater than 425 °C — Test methods*

ASTM E 112-88, [4] *Standard Test Methods for Determining Average Grain Size*

3 Terms and definitions

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

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

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

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

3.1
batch
quantity of finished nuts, of the same type and same diameter, produced from a 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

[1] Corresponds to the minimum tensile stress which the nut is able to withstand at ambient temperature without breaking or cracking when tested with a bolt of a higher strength class.
[2] Maximum test temperature of the parts.
[3] Published by: ISO International Organization for Standardization http://www.iso.ch/.
[4] Published by: ASTM International (US) https://www.astm.org/.

3.2 Surface discontinuities

3.2.1
crack
rupture in the material which may extend in any direction and which may be intercrystalline or transcrystalline in character

3.2.2
seam
open surface defect

3.2.3
lap
surface defect caused by folding over metal fins or sharp corners and then compressing them into the surface

3.2.4
inclusions
non-metallic particles originating from the material manufacturing process

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

3.3
test temperature
ambient temperature, unless otherwise specified

3.4
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 3534:1977]

3.5
critical defect
defect that, according to judgement and experience, is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the considered product, or that is likely to prevent performance of the function of a major end item

[SOURCE: ISO 3534:1977]

3.6
major defect
defect other than critical, that is likely to result in a failure or to reduce materially the usability of the considered product for its intended purpose

[SOURCE: ISO 3534:1977]

3.7
minor defect
defect that is not likely to reduce materially the usability of the considered product for its intended purpose, or that is a departure from established specification having little bearing on the effective use or operation of this product

[SOURCE: ISO 3534:1977]

3.8
sampling plan
plan according to which one or more samples are taken in order to obtain information and possibly to reach a decision

[SOURCE: ISO 3534:1977]

3.9
limiting quality
in a sampling plan, the quality level which corresponds to the specified 10 % probability of acceptance

3.10
acceptable quality level
AQL
quality level which, in a sampling plan, corresponds to a specified but relatively high probability of acceptance

Note 1 to entry: It is the maximum per cent defective (or the maximum number of defects per hundred units) that, for purposes of sampling inspection can be considered satisfactory as a process average

[SOURCE: ISO 3534:1977]

3.11
finished nut
nut ready for use, inclusive of any possible treatments and/or surface coatings, as specified in the product standard or definition document

3.12
definition document
document specifying all the requirements for finished nuts

3.13
self-locking torque
torque to be applied to the nut or bolt to maintain its movement of rotation in relation to the associated part, the assembly being under no axial load and the nut locking zone being completely engaged with the bolt (minimum protrusion of two pitches, including the end chamfer)

3.14
seating torque
tightening torque to be applied to the nut or bolt to introduce or to increase the axial load in the assembly

3.15
unseating torque
untightening torque to be applied to the nut or bolt to reduce or remove the axial load in the assembly

3.16
breakaway torque
torque required to start unscrewing the nut or bolt with respect to the associated part, with the nut locking zone still fully engaged on the bolt, but after the axial load in the assembly has been removed by unscrewing half a turn followed by a halt in rotational movement

3.17
torque for testing the wrench feature
torque to be applied to the wrenching feature of the nut

4 Quality assurance

4.1 Qualification

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.

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

— each type and diameter of nut;

— 46 nuts 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 types and diameters of nuts provided that the design and manufacturing conditions are identical.

Table 2 indicates the allocation of nut sample for the inspections and tests.

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 constituting the batch satisfy the requirements of this document.

4.2.2 Conditions

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

Each nut 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 case, the number of nuts 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

Requirements and testing shall be according to 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	Q	
			certificate of compliance issued by the manufacturer of the semi-finished product	A	
5.2	**Dimensions, tolerances and tolerances of form and position**	In accordance with the product standard or definition document	Standard gauging	Q	46
				A	Table 3 and Table 4
5.3	**Manufacturing**				
5.3.1	**Forming**	Nuts shall be formed by a hot or cold forming process.	The method of forming shall be indicated	Q	
		If hot formed, the forming temperature shall not exceed 1 150 °C and they shall be air cooled or faster. The equipment shall ensure a uniform temperature throughout the batch.			
5.3.2	**Heat treatment**	The heat treatment medium or atmosphere shall not cause any surface contamination except as permitted by 5.5.4.	Calibration of the heat treatment equipment shall be confirmed.	Q	
		Any scale which will not be removed by subsequent machining shall be removed by abrasive blasting with an appropriate equipment.	Visual examination		
		Solution treat (if applicable) at a temperature of 900 °C ± 10°C to 980 °C ± 10°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. Precipitation treat at (720 ± 10) °C held at temperature for at least 16 h cooled in air or faster.	Examination of the heat treatment specification		
5.3.3	**Bearing surface perpendicularity**	In accordance with the product standard or definition document.	ISO 8642	Q	46