

SLOVENSKI STANDARD

SIST EN 2583:2019

01-julij-2019

Nadomešča:
SIST EN 2583:2001

Aeronavtika - Sorniki, navoj MJ, iz toplotnoodporne zlitine na nikljevi osnovi NI-PH2601 (Inconel 718) - Klasifikacija: 1270 MPa (pri okoljski temperaturi)/650 °C - Tehnična specifikacija

Aerospace series - Bolts, MJ threads, in heat resisting nickel base alloy NI-PH2601 (Inconel 718) - Classification: 1 275 MPa (at ambient temperature)/650°C - Technical specification

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Luft- und Raumfahrt - Schrauben, MJ-Gewinde, aus hochwarmfester Nickelbasislegierung NI-PH2601 (Inconel 718) - Klasse: 1 275 MPa (bei Raumtemperatur)/650°C - Technische Lieferbedingungen

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Série aérospatiale - Vis à filetage MJ, en alliage résistant à chaud à base de nickel NI-PH2601 (Inconel 718) - Classification: 1 275 MPa (à température ambiante)/350°C - Spécification technique

Ta slovenski standard je istoveten z: EN 2583:2019

ICS:

21.060.10	Sorniki, vijaki, stebelni vijaki	Bolts, screws, studs
49.030.20	Sorniki, vijaki, stebelni vijaki	Bolts, screws, studs

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en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 2583

May 2019

ICS 49.030.20

Supersedes EN 2583:1997

English Version

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nickel base alloy NI-PH2601 (Inconel 718) - Classification:
1 275 MPa (at ambient temperature)/650°C - Technical
specification**

Série aérospatiale - Vis à filetage MJ, en alliage résistant
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(Inconel 718) - Klasse: 1 275 MPa (bei
Raumtemperatur)/650°C - Technische
Lieferbedingungen

This European Standard was approved by CEN on 10 December 2018.

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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.

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

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European foreword

This document (EN 2583:2019) 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 November 2019, and conflicting national standards shall be withdrawn at the latest by November 2019.

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 2583:1997.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 2583:2019 (E)

1 Scope

This standard specifies the characteristics, qualification and acceptance requirements for bolts with MJ threads in NI-PH2601.

Classification: 1 275 MPa¹/650 °C².

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.

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

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

ISO 3534:1977, *Statistics — Vocabulary and symbols*

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

ISO 5855-2, *Aerospace — MJ threads — Part 2: Limit dimensions for bolts and nuts*
<https://standards.iteh.ai/catalog/standards/sist/080ae06c-fa4c-495d-ad1b-73506a7b9fb3/sist-en-2583-2019>

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

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 7961, *Aerospace — Bolts — Test methods*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ASTM E 112-13, *Standard Test Methods for Determining Average Grain Size*³

3 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:

1 Minimum tensile strength of the material at ambient temperature.

2 Maximum test temperature of the parts.

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

— IEC Electropedia: available at <http://www.electropedia.org/>

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

batch

quantity of finished bolts, 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

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. These particles may 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

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[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. 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 bolt**

bolt 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 bolts

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 bolts) are specified in Table 1. They shall be carried out on:

- each type and diameter of bolt;
- 25 bolts 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 bolts provided that the design and manufacturing conditions are identical.

Table 2 indicates the allocation of bolt specimens 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 bolts constituting the batch satisfy the requirements of this standard.

4.2.2 Conditions

Acceptance inspections and tests (requirements, methods, numbers of bolts) are specified in Table 1. They shall be carried out on each batch. Bolts 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 this case, the number of bolts 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 and tolerances of form and position	In accordance with the product standard or definition document.	Standard gauging	Q	25
				A	Table 3 and Table 4

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Clause	Characteristic	Requirement	Inspection and test method	Q/A ^a	Sample size
5.3	Manufacturing				
5.3.1	Forging	<p>The head of the bolts shall be formed by hot or cold forging. If hot forged, the forging temperature shall not exceed 1 150 °C and they shall be air cooled.</p> <p>The equipment shall ensure a uniform temperature throughout the batch.</p>	The method of forging shall be indicated.	Q	
5.3.2	Heat treatment	<p>The heat treatment medium or atmosphere shall not cause any surface contamination except as permitted in 5.5.6.</p> <p>Any scale which will not be removed by subsequent machining shall be removed by abrasive blasting with appropriate equipment.</p> <p>The headed blanks shall be solution treated at a temperature of 930 °C to 1 010 °C, held at the selected temperature within ± 15 °C for not less than 1 h and air cooled or faster.</p> <p>The headed and solution treated blanks shall be precipitation heat treated at (720 ± 5) °C, held at temperature for 8 h ± 15 min, furnace cooled at (55 ± 5) °C per hour to (620 ± 5) °C, held at 620 °C for 8 h ± 15 min, followed by air cooling or faster.</p> <p>Instead of the 55 °C per hour cooling rate to 620 °C, parts may be furnace cooled at any rate provided the time at 620 °C is adjusted to give a total precipitation time of 18 h min.</p>	<p>Calibration of the heat treatment equipment shall be confirmed.</p> <p>Visual examination</p> <p>Examination of the heat treatment specification</p>	Q	
5.3.3	Removal of surface contamination by machining	<p>After solution and precipitation treatment the headed blanks shall have the shank and bearing surface of the head machined:</p> <p>a) for the removal of all surface contamination and oxide penetration;</p> <p>b) to obtain a clean smooth surface.</p> <p>The amount of material removed (see Figure 1) shall be as little as practicable but shall not exceed the limits of Table 5.</p>	<p>See 5.5.6</p> <p>See 5.5.1</p>		

Clause	Characteristic	Requirement	Inspection and test method	Q/A ^a	Sample size
5.3.4	Head to shank fillet	After completion of solution, precipitation treatment and machining, the underhead radius shall be cold rolled to remove all visual signs of machining and to create cold working.	Dimensional check (see 5.2) and visual examination.	Q	25
				A	Table 3 and Table 4
		This may cause distortion which shall not exceed the values in Figure 2, unless otherwise specified on the product standard or definition document.			
		For parts with compound radii between head and shank (e.g. T head bolts), cold work only the radius that blends with the head, however it is acceptable for cold work to extend over the compound radius.			
		The fillet shall not show seams or inclusions (see Table 6).			
5.3.5	Threads	Shall be formed by a single rolling process after full heat treatment (see Figure 3).		Q	
5.3.6	Surface roughness	In accordance with the product standard or definition document.	ISO 4288 — Visual examination	Q	3
				A	Table 3 and Table 4
5.3.7	Passivation treatment	Uncoated finished bolts shall be passivated in accordance with Annex A. After 2 h of salt spray, bolts shall show no evidence of corrosion or staining.	ISO 9227 — Visual examination	Q	5
				A	100 %
5.3.8	Surface coating	In accordance with the product standard or definition document.	See applicable coating standard.	Q	3
				A	Table 3 and Table 4
5.4	Mechanical properties	A test sample shall be selected from each diameter of bar/wire taken from each cast, and shall be heat treated together with a production batch of bolts. The sample selected shall be sufficient to provide tensile and stress rupture test pieces. The test pieces shall meet the mechanical properties required by the material standard.			