SLOVENSKI STANDARD
SIST EN 3666:2020

01-marec-2020

Aeronavtika - Toplotno odporna zlitina NI-PH2601 - Topilno žarjena in hladno preoblikovana - Palice za kovane vezne elemente - D ≤ 50 mm - 1550 MPa ≤ Rm ≤ 1830 MPa

Aerospace series - Heat resisting alloy NI-PH2601 - Solution treated and cold worked - Bar for forged fasteners - D ≤ 50 mm - 1 550 MPa ≤ Rm ≤ 1 830 MPa

Luft- und Raumfahrt - Hochwarmfeste Legierung NI-PH2601 - Lösungsgeglüht und kaltverfestigt - Stangen zum Stauchen für Verbindungselemente - D ≤ 50 mm - 1 550 MPa ≤ Rm ≤ 1 830 MPa

Série aérospatiale - Alliage résistant à chaud NI-PH2601 - Mis en solution et écroui - Barres pour éléments de fixation forgés - D ≤ 50 mm - 1 550 MPa ≤ Rm ≤ 1 830 MPa

Ta slovenski standard je istoveten z: **EN 3666:2020**

ICS:

49.025.99	Drugi materiali	Other materials

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English Version

Aerospace series - Heat resisting alloy NI-PH2601 - Solution treated and cold worked - Bar for forged fasteners - D ≤ 50 mm - 1 550 MPa ≤ Rm ≤ 1 830 MPa

Série aérospatiale - Alliage résistant à chaud NI-PH2601 - Mis en solution et écroui - Barre pour éléments de fixation forgés - D ≤ 50 mm - 1 550 MPa ≤ Rm ≤ 1 830 MPa

Luft- und Raumfahrt - Hochwarmfeste Legierung NI-PH2601 - Lösungsgeglüht und kaltverfestigt - Stange für geschmiedete Verbindungselemente - D ≤ 50 mm - 1 550 MPa ≤ Rm ≤ 1 830 MPa

This European Standard was approved by CEN on 14 July 2019.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 3666:2020) 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 document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2020, and conflicting national standards shall be withdrawn at the latest by July 2020.

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Introduction

This document is part of the series of EN metallic material standards for aerospace applications. The general organization of this series is described in EN 4258.

This document has been prepared in accordance with EN 4500-003.

1 Scope

This document specifies the requirements relating to:

Heat resisting alloy NI-PH2601
Solution treated and cold worked
Bar for forged fasteners
$D \leq 50$ mm
1 550 MPa $\leq R_m \leq$ 1 830 MPa

for aerospace applications.

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 2002-16, *Aerospace series — Metallic materials — Test methods — Part 016: Non-destructive testing — Penetrant testing* [1)]

EN 4700-002, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 002: Bars and sections* [1)]

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 Requirements

See Table 1.

1) Published as ASD-STAN Standard at the date of publication of this standard by AeroSpace and Defence industries Association of Europe - Standardization (ASD-STAN), http://www.asd-stan.org/

Table 1 — Requirements for heat resisting alloy NI-PH2601

1	Material designation		Heat resisting alloy NI-PH2601									
2	Chemical composition %	Element	C	Si	Mn	P	S	Al	B	Ca	Co	Cr
		min.	0,02	–	–	–	–	0,20	20)*	–	–	17,0
		max.	0,08	0,35	0,35	0,015	0,015	0,80	60)*	0,010	1,00	21,0
		Element	Cu	Fe	Mg	Mo	Nb + Ta	Ti	Ag	Bi	Pb	Ni
		min.	–	16,5	–	2,80	4,80	0,70	–	–	–	Base
		max.	0,30	20,5	0,010	3,30	5,50	1,15	5)*	1)*	5)*	
3	Method of melting		Vacuum induction melted and consumable electrode remelted (vacuum or slag)									
4.1	Form		Bar for forged fasteners									
4.2	Method of production		Cold worked, straightened and ground									
4.3	Limit dimension(s)	mm	$D \leq 50$									
5	Technical specification		See EN 4700-002.									

6.1	Delivery condition	Solution treated and cold worked
	Heat treatment	930 °C ≤ θ ≤ 1 010 °C/t = 1 h/AC or faster + 15 % ≤ cold worked ≤ 30 % at θ ≤ 650 °C
6.2	Delivery condition code	U
7	Use condition	Delivery condition
	Heat treatment	–

Characteristics

8.1	Test sample(s)				Cut from bar
8.2	Test piece(s)				–
8.3	Heat treatment				Reference heat treatment: see line 29.
9	Dimensions concerned			mm	–
10	Thickness of cladding on each face			%	–
11	Direction of test piece				L
12	T	Temperature	θ	°C	Ambient
13	T	Proof stress	$R_{p0,2}$	MPa	≥ 1 380
14	T	Strength	R_m	MPa	1 550 ≤ R_m ≤ 1 830
15	T	Elongation	A	%	≥ 7
16	T	Reduction of area	Z	%	≥ 15
17	Hardness				≥ 45 HRC or ≥ 390 HB [a]
18	Shear strength		R_c	MPa	–
19	Bending		k	–	–
20	Impact strength				
21	C	Temperature	θ	°C	
22	C	Time		h	–
23	C	Stress	σ_a	MPa	–
24	C	Elongation	a	%	–
25	C	Rupture stress	σ_R	MPa	–
26	C	Elongation at rupture	A	%	–
27	Notes (see line 98)				*, a

29	Reference heat treatment	–	Precipitation treated Delivery condition + θ = 720 °C/t = 8 h/FC at θ = 50 °C per h to θ = 620 °C/t = 8 h/FC or faster
34	Grain size	–	See EN 4700-002.
		2	1 (one) per batch
		3	L and LT
		7	5 (five) or finer – No duplex structure
44	External defects	–	See EN 4700-002.
		1	See EN 2002-16.
51	Macrostructure	–	See EN 4700-002.
		2	1 (one) per batch
61	Internal defects	–	See EN 4700-002.
		7	Class 5
97	Designation	–	–
98	Notes	–	* p.p.m. a The product cannot be rejected on the sole basis of the hardness measurements if the measured tensile characteristics are in conformity with the requirements in line 14.
99	Typical use	–	–
100	–	Product qualification	–	–
				Qualification programme to be agreed between manufacturer and purchaser.