
Aeronavtika - Toplotnoodporne zlitine na nikljevi osnovi Ni-P96-HT - Hladno vlečene in izločevalno utrjene - Žice $D \leq 10$ mm

Aerospace series - Heat resisting nickel base alloy Ni-P96-HT - Cold drawn and precipitation treated - Wires $D \leq 10$ mm

Luft- und Raumfahrt - Hochwarmfeste Nickelbasislegierung Ni-P96-HT - Kaltgezogen und Ausgelagert - Draht $D \leq 10$ mm

Série aérospatiale - Alliage résistant à chaud à base de nickel Ni-P96-HT - Écroui et précipité - Fils $D \leq 10$ mm

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Ta slovenski standard je istoveten z: EN 2400:2019

ICS:

49.025.15	Neželezove zlitine na splošno	Non-ferrous alloys in general
77.120.40	Nikelj, krom in njune zlitine	Nickel, chromium and their alloys

SIST EN 2400:2020

en,fr,de

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EUROPEAN STANDARD

EN 2400

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2019

ICS 49.025.15

English Version

Aerospace series - Heat resisting nickel base alloy NI-P96-HT - Cold drawn and precipitation treated - Wire - $D \leq 10$ mm

Série aérospatiale - Alliage résistant à chaud à base de nickel NI-P96-HT - Étiré à froid et précipité - Fil - $D \leq 10$ mm

Luft- und Raumfahrt - Hochwarmfeste Nickelbasislegierung NI-P96-HT - Kaltgezogen und ausgehärtet - Draht - $D \leq 10$ mm

This European Standard was approved by CEN on 8 July 2018.

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.

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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 2400:2019) 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 May 2020, and conflicting national standards shall be withdrawn at the latest by May 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.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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 2400:2019 (E)

Introduction

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

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

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1 Scope

This document specifies the requirements relating to:

Heat resisting nickel base alloy Ni-P96-HT
Cold drawn and precipitation treated
Wire
 $D \leq 10$ mm

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 2369, *Aerospace series — Wires, heat resisting alloys — Diameter $0,2\text{ mm} \leq D \leq 8\text{ mm}$ — Dimensions*

EN 4700-004, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 004: Wire*

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.

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EN 2400:2019 (E)

Table 1 — Requirements for heat resisting nickel base alloy NI-P96

1	Material designation		Heat resisting nickel base alloy Ni-P96-HT															
2	Chemical composition % ^a	Element	C	Si	Mn	S	Ag	Al	B	Bi	Co	Cr	Cu	Fe	Pb	Ti	Zr	Ni
		min.	—	—	—	—	—	1,0	—	—	15,0	18,0	—	—	—	2,0	—	Base
		max.	0,13	1,0	1,0	0,015	(5)	2,0	0,020	(1)	21,0	21,0	0,2	1,5	(10)	3,0	0,15	
3	Method of melting ^b		Air melt and vacuum refine or vacuum melt or consumable electrode remelt															
4.1	Form		Wire															
4.2	Method of production		—															
4.3	Limit dimension(s)	mm	$D \leq 10$															
5	Technical specification		EN 4700-004 and EN 2369															

6.1	Delivery condition		Cold drawn															
	Heat treatment		—															
6.2	Delivery condition code		—															
7	Use condition		Cold drawn and precipitation treated															
	Heat treatment		Delivery condition + 600 °C ± 10 °C/t = 16 h/air cool															

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Characteristics

8.1	Test sample(s)		—																			
8.2	Test piece(s)		SIST EN 2400:2020 —																			
8.3	Heat treatment		Delivery condition								Condition of use ^c											
9	Dimensions concerned	mm	≤ 2				$2 < D \leq 10$				$0,4 < D \leq 1,0$				$1,0 < D \leq 5,0$				$5,0 < D \leq 10$			
10	Thickness of cladding on each face	%	—																			
11	Direction of test piece		—																			
12	Temperature	θ	°C		Ambient																	
13	Proof stress	$R_{p0,2}$	MPa*		—				—				$\geq 1\ 160$				$\geq 1\ 000$					
14	T Strength	R_m	MPa*		—				$\geq 1\ 540$				$\geq 1\ 390$				$\geq 1\ 310$					
15	Elongation	A	%		—				—				—				$A_{50\ mm} \geq 10$					
16	Reduction of area	Z	%		—				—				—				—					
17	Hardness		—																			
18	Shear strength	R_c	MPa*		—																	
19	Bending	k	—		—																	
20	Impact strength		—																			
21	Temperature	θ	°C		—																	
22	Time		h		—																	
23	Stress	σ_a	MPa*		—																	
24	C Elongation	a	%		—																	
25	Rupture stress	σ_R	MPa*		—																	
26	Elongation at rupture	A	%		—																	
27	Notes (see line 98)		*, a, b, c																			

36	Reverse torsion test for wires	—	—	3 (three) bends on 3 D mandrel	—	—	—
42	Simple torsion	—	—	—	8 (eight) turns in 1 (one) direction (test length 100 D)	8 (eight) turns in 1 (one) direction (test length 100 D)	—
43	Wrapping test for wires	—	8 (eight) turns (mandrel diameter equals wire diameter)	—	—	—	—
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95	Marking inspection	—	—				
96	Dimensional inspection	—	—				
98	Notes	—	<p>* 1 MPa = 1N/mm²</p> <p>a Bracketed figures indicate composition expressed as parts per million (ppm). The method of analysis for lead, bismuth and silver shall be agreed between manufacturer and purchaser.</p> <p>b The method of melting required shall be agreed between manufacturer and purchaser.</p> <p>c If requested by the purchaser the test samples may be given the alternative heat treatment of 650 °C ± 10 °C/t = 4 h/air cool.</p>				
99	Typical use	—	—				