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**Aeronavtika - Toplotno odporne zlitine na nikljevi osnovi (Ni-P100HT) - Hladno obdelana in popuščana - Palice in žice za kontinuirno kovanje ali iztiskanje vezalnih elementov -  $3 \text{ mm} \leq D \leq 30 \text{ mm}$**

Aerospace series - Heat resisting nickel base alloy (Ni-P100HT) - Cold worked and softened - Bar and wire for continuous forging or extrusion for fasteners -  $3 \text{ mm} \leq D \leq 30 \text{ mm}$

Luft- und Raumfahrt - Hochwarmfeste Nickellegierung (Ni-P100HT) - Kaltverfestigt und abgeschreckt - Stangen und Drähte zum kontinuierlichen Verformen oder Strangpressen für Verbindungselemente -  $3 \text{ mm} \leq D \leq 30 \text{ mm}$

Série aérospatiale - Alliage résistant à chaud base nickel (Ni-P100HT) - Écroui et adouci - Barre et fil pour le forgeage ou l'extrusion en continu pour fixations -  $3 \text{ mm} \leq D \leq 30 \text{ mm}$

**Ta slovenski standard je istoveten z: EN 3219:2020**

**ICS:**

49.025.99      Drugi materiali      Other materials

**SIST EN 3219:2020**      en,fr,de

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EUROPEAN STANDARD

EN 3219

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2020

ICS 49.025.99

English Version

Aerospace series - Heat resisting nickel base alloy (NI-P100HT) - Cold worked and softened - Bar and wire for continuous forging or extrusion for fasteners -  $3 \text{ mm} \leq D \leq 30 \text{ mm}$

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This European Standard was approved by CEN on 14 January 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.

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

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<b>Contents</b>	<b>Page</b>
<b>European foreword</b> .....	<b>3</b>
<b>Introduction</b> .....	<b>4</b>
<b>1 Scope</b> .....	<b>5</b>
<b>2 Normative references</b> .....	<b>5</b>
<b>3 Terms and definitions</b> .....	<b>5</b>
<b>4 Requirements</b> .....	<b>5</b>
<b>Bibliography</b> .....	<b>8</b>

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## European foreword

This document (EN 3219:2020) 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.

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 3219:2020 (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-P100HT)  
Cold worked and softened  
Bar and wire for continuous forging or extrusion for fasteners  
 $3 \text{ mm} \leq D \leq 30 \text{ mm}$

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 2344, *Aerospace series — Round bars, machined in heat resisting alloys — Diameter  $10 \text{ mm} \leq D \leq 180 \text{ mm}$  — Dimensions*

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

EN 2600, *Aerospace series — Designation of metallic semi-finished products — Rules*

EN 4700-002, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 002: Bar and section 1)*

EN 4700-004, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 004: Wire*  
[standards.iteh.ai/catalog/standards/sist/cd60a3ad-f174-4787-9c58-b01f345be99e/sist-en-3219-2020](http://standards.iteh.ai/catalog/standards/sist/cd60a3ad-f174-4787-9c58-b01f345be99e/sist-en-3219-2020)

EN 4800-002, *Aerospace series — Titanium and titanium alloys — Technical specification — Part 002: Bar and section*

EN 4800-004, *Aerospace series — Titanium and titanium alloys — 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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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 nickel base alloy (Ni-P100HT)

1	Material designation	Heat resisting nickel base alloy (Ni-P100HT)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Ag	Al	B	Bi	Co
		min.	0,02	-	-	-	-	-	0,2	(20)	-	-
		max.	0,08	0,35	0,35	0,015	0,008	(5)	0,8	(60)	(1)	1,0
		Element	Cr	Cu	Fe	Mo	Nb+Ta	Pb	Ti	Ca	Mg	Ni
		min.	17,0	-	16,5	2,8	4,8	-	0,70	-	-	Base
max.	21,0	0,3	20,5	3,3	5,5	(10)	1,15	0,01	0,01			
3	Method of melting	Vacuum melted and consumable electrode remelted										
4.1	Form	Bar and wire for continuous forging or extrusion										
4.2	Method of production	Cold worked										
4.3	Limit dimension(s)	mm	$3 \leq D \leq 30$									
5	Technical specification	EN 4700-002, EN 4700-004, EN 4800-002, EN 4800-004										
		EN 2344						EN 2369				

6.1	Delivery condition	$10 \% \leq \text{cold worked} \leq 30 \%$ reduction temperature $\theta \leq 650 \text{ }^\circ\text{C}$										
	Heat treatment	Softened $930 \text{ }^\circ\text{C} \leq \theta \leq 1\ 010 \text{ }^\circ\text{C}/t > 15 \text{ min/AC}$ , equivalent or faster										
6.2	Delivery condition code	U										
7	Use condition	iTech STANDARD PREVIEW										
	Heat treatment	(standards.itech.ai) Delivery condition										

## Characteristics

8.1	Test sample(s)	SIST EN 3219:2020 <a href="https://standards.itech.ai/catalog/standards/sist/ed60a3ad-f174-4787-9c58-b01f345be99e/sist-en-3219-2020">https://standards.itech.ai/catalog/standards/sist/ed60a3ad-f174-4787-9c58-b01f345be99e/sist-en-3219-2020</a>										See line 29
8.2	Test piece(s)	—										
8.3	Heat treatment	Delivery condition						Reference treatment				
9	Dimensions concerned	mm	$3 \leq D \leq 30$									
10	Thickness of cladding on each face	%	—									
11	Direction of test piece	—										
12	Temperature	$\theta$	$^\circ\text{C}$	—			Ambient			650		
13	Proof stress	$R_{p0,2}$	$\text{MPa}^*$	—			$\geq 1\ 035$			$\geq 860$		
14	Strength	$R_m$	$\text{MPa}^*$	—			$\geq 1\ 270$			$\geq 1\ 000$		
15	Elongation	A	%	—			$\geq 11$			$\geq 11$		
16	Reduction of area	Z	%	—			$\geq 15$			$\geq 15$		
17	Hardness (HV)				$\leq 277$			$\geq 365$ $\leq 480$				
18	Shear strength	$R_c$	$\text{MPa}^*$	—			—					
19	Bending	k	—	—			—					
20	Impact strength	—										
21	Temperature	$\theta$	$^\circ\text{C}$	—			650					
22	Time			h	—			$\geq 23$				
23	Stress	$\sigma_a$	$\text{MPa}^*$	—			—					
24	Elongation	a	%	—			—					
25	Rupture stress	$\sigma_R$	$\text{MPa}^*$	—			690					
26	Elongation at rupture	A	%	—			$\geq 5$					
27	Notes (see line 98)	*, a										



29	Reference heat treatment	—	Solution treated and precipitation treated 930 °C ≤ $\theta$ ≤ 1 010 °C/ $t$ > 1 h/AC, equivalent or faster + 720 °C/8 h/FC at 50 °C to 60 °C/1 h to 620 °C/ $t$ = 8 h/AC
34	Grain size	—	Predominantly recrystallized grain size 4 or finer with isolated grain up to .18 mm (maximum dimension) allowed
95	Marking inspection	—	—
96	Dimensional inspection	—	—
97	Designation	—	<p>The rules governing the designation of semi-finished products are indicated in standard EN 2600. When the codified designation is used, the identification code shall be as follows:</p> <p style="text-align: right;"> <span style="margin-right: 20px;">EN 3219</span> <span style="margin-right: 20px;">U</span> <span style="margin-right: 20px;">XX</span> <span style="margin-right: 20px;">-----</span> </p> <p>Material standard number: _____</p> <p>Letter code (See 6.2) _____</p> <p>Appropriate dimensional standard code (See 5.3) _____</p> <p>Data concerning dimension (See EN 2600) _____</p>
98	Notes	—	<p>* 1 MPa = 1 N/mm<sup>2</sup>.</p> <p><sup>a</sup> Combination notched/unnotched test piece or separate notched and smooth test pieces. Rupture shall occur in the unnotched portion of the combined test piece. If separate test pieces are used, the time to rupture of the notched test piece shall exceed that of the unnotched test piece.</p>
99	Typical use	—	Nuts, bolts and studs for engines.
100	—	Product qualification	<p>(standards.iteh.ai) —</p> <p>Qualification programme to be agreed between manufacturer and purchaser.</p>
			<p><a href="https://standards.iteh.ai/catalog/standards/sist/cd60a3ad-f174-4787-9c58-b01f345be99e/sist-en-3219-2020">https://standards.iteh.ai/catalog/standards/sist/cd60a3ad-f174-4787-9c58-b01f345be99e/sist-en-3219-2020</a></p>