



SLOVENSKI STANDARD
oSIST prEN 4904:2021

01-november-2021

Aeronavtika - Jeklo 36NiCrMo16 - $1000 \text{ MPa} \leq R_m \leq 1200 \text{ MPa}$ - Palice - $100 \leq D \leq 250 \text{ mm}$

Aerospace series - Steel 36NiCrMo16 - $1\ 000 \text{ MPa} \leq R_m \leq 1\ 200 \text{ MPa}$ - Bars - $100 \leq D \leq 250 \text{ mm}$

Luft- und Raumfahrt - Stahl 36NiCrMo16 - $1\ 000 \text{ MPa} \leq R_m \leq 1\ 200 \text{ MPa}$ - Stangen - $100 \text{ mm} \leq D \leq 250 \text{ mm}$

Série aérospatiale - Acier 36NiCrMo16 - $1\ 000 \text{ MPa} \leq R_m \leq 1\ 200 \text{ MPa}$ - Barres - $100 \text{ mm} \leq D \leq 250 \text{ mm}$

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Ta slovenski standard je istoveten z: prEN 4904

ICS:

49.025.10 Jekla Steels

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 4904

September 2021

ICS 49.025.10

English Version

Aerospace series - Steel 36NiCrMo16 - $1\ 000\ \text{MPa} \leq R_m \leq 1\ 200\ \text{MPa}$ - Bars - $100 \leq D \leq 250\ \text{mm}$

Série aérospatiale - Acier 36NiCrMo16 - $1\ 000\ \text{MPa} \leq R_m \leq 1\ 200\ \text{MPa}$ - Barres - $100\ \text{mm} \leq D \leq 250\ \text{mm}$

Luft- und Raumfahrt - Stahl 36NiCrMo16 - $1\ 000\ \text{MPa} \leq R_m \leq 1\ 200\ \text{MPa}$ - Stangen - $100\ \text{mm} \leq D \leq 250\ \text{mm}$

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

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

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European foreword

This document (prEN 4904:2021) 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 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.

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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 4500-005.

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1 Scope

This document specifies the requirements relating to:

Steel 36NiCrMo16

$$1\ 000\ \text{MPa} \leq R_m \leq 1\ 200\ \text{MPa}$$

Bars

$$100\ \text{mm} \leq D \leq 250\ \text{mm}$$

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 2951, *Aerospace series - Metallic materials - Micrographic determination of content of non-metallic inclusions*

EN 4050-4, *Aerospace series - Test method for metallic materials - Ultrasonic inspection of bars, plates, forging stock and forgings - Part 4: Acceptance criteria*

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

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 <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Requirements

See Table 1.

Table 1 — Requirements for steel 36NiCrMo16 — Bars

1	Material designation		Steel 36NiCrMo16								
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Fe
		min.	0,30	0,15	0,30	—	—	1,60	0,25	3,50	Rem.
		max.	0,40	0,40	0,60	0,025	0,020	2,00	0,60	4,20	
3	Method of melting		Air melted								
4.1	Form		Bars								
4.2	Method of production		—								
4.3	Limit dimension(s)	mm	100 ≤ D ≤ 250								
5	Technical specification		EN 4700-002								

6.1	Delivery condition		Annealed			Hardened and tempered		
	Heat treatment		—			860 °C ≤ θ ≤ 880 °C / AQ ^a + temperature θ ≥ 560 °C		
6.2	Delivery condition code		—			—		
7	Use condition		Hardened and tempered			—		
	Heat treatment		860 °C ≤ θ ≤ 880 °C / AQ ^a + temperature θ ≥ 560 °C			—		

Characteristics

8.1	Test sample(s)		EN 4700-002								
8.2	Test piece(s)		EN 4700-002								
8.3	Heat treatment		Annealed			Hardened and tempered					
9	Dimensions concerned	mm	125 ≤ D ≤ 250								
10	Thickness of cladding on each face	%	—								
11	Direction of test piece		—			T					
12	T	Temperature	θ	°C		Ambient					
13		Proof stress	R _{p0,2}	MPa*		—					
14		Strength	R _m	MPa*		1 000 ≤ R _m ≤ 1 200					
15		Elongation	A	%		≥ 11					
16		Reduction of area	Z	%		≥ 50					
17	Hardness		HB	—		HB ≤ 293 HV ≤ 309			—		
18	Shear strength		R _c	MPa*		—					
19	Bending		k	—		—					
20	Impact strength		KV	J		—			≥ 45		
21	C	Temperature	θ	°C		—					
22		Time		h		—					
23		Stress	σ _a	MPa*		—					
24		Elongation	a	%		—					
25		Rupture stress	σ _R	MPa*		—					
26		Elongation at rupture	A	%		—					
27	Notes (see line 98)		*, a								

28	—	—	—
34	Grain size	—	See EN 4700-002
		7	$G \geq 5$
44	External imperfections (visual testing - VT)	—	See EN 4700-002
		1	Visual
50	Inclusion content	—	See EN 4700-002
		1	EN 2951
		7	Category 2
61	Internal imperfections (ultrasonic testing - UT)	—	See EN 4700-002
		1	EN 4050-4
		7	Class 2
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95	Marking inspection	—	See EN 4700-002
96	Dimensional inspection	—	See EN 4700-002
98	Notes	—	* 1 MPa = 1 N/mm ² . a Or a quicker method that allows to reach the required characteristics.
99	Typical use	—	—

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100	—	Product qualification	—	EN 4700-002 Qualification programme to be agreed between manufacturer and purchaser.
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