SLOVENSKI STANDARD
SIST EN 4904:2023

01-marec-2023

Aeronavtika - Jeklo 36NiCrMo16 (1.6773) - 1000 MPa ≤ Rm ≤ 1200 MPa - Palice - 100 mm ≤ D ≤ 250 mm

Aerospace series - Steel 36NiCrMo16 (1.6773) - 1 000 MPa ≤ Rm ≤ 1 200 MPa - Bars - 100 mm ≤ D ≤ 250 mm

Luft- und Raumfahrt - Stahl 36NiCrMo16 (1.6773) - 1 000 MPa ≤ Rm ≤ 1 200 MPa - Stangen - 100 mm ≤ D ≤ 250 mm

Série aérospatiale - Acier 36NiCrMo16 (1.6773) - 1 000 MPa ≤ Rm ≤ 1 200 MPa - Barres - 100 mm ≤ D ≤ 250 mm

Ta slovenski standard je istoveten z: **EN 4904:2022**

ICS:

49.025.10	Jekla	Steels

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EUROPEAN STANDARD

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English Version

Aerospace series - Steel 36NiCrMo16 (1.6773) - 1 000 MPa ≤ Rm ≤ 1 200 MPa - Bars - 100 mm ≤ D ≤ 250 mm

Série aérospatiale - Acier 36NiCrMo16 (1.6773) - 1 000 MPa ≤ Rm ≤ 1 200 MPa - Barres - 100 mm ≤ D ≤ 250 mm

Luft- und Raumfahrt - Stahl 36NiCrMo16 (1.6773) - 1 000 MPa ≤ Rm ≤ 1 200 MPa - Stangen - 100 mm ≤ D ≤ 250 mm

This European Standard was approved by CEN on 2 October 2022.

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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 4904:2022) 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 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of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by June 2023 .

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.

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Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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.

1 Scope

This document specifies the requirements relating to:

Steel 36NiCrMo16 (1.6773)

1 000 MPa ≤ R_m ≤ 1 200 MPa

Bars

100 mm ≤ D ≤ 250 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 terminology 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

According to Table 1.

Table 1 — Requirements for steel 36NiCrMo16 (1.6773) — Bars

1	Material designation		Steel 36NiCrMo16 (1.6773)								
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	$100 \leq D \leq 250$								
5	Technical specification		EN 4700-002								

6.1	Delivery condition	Annealed	Hardened and tempered
	Heat treatment	—	860 °C ≤ θ ≤ 880 °C / AQ[a] + temperature $\theta \geq$ 560 °C
6.2	Delivery condition code	—	—
7	Use condition	Hardened and tempered	—
	Heat treatment	860 °C ≤ θ ≤ 880 °C / AQ[a] + temperature $\theta \geq$ 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	$125 \leq D \leq 250$	
10	Thickness of cladding on each face			%	—	
11	Direction of test piece				—	T
12	T	Temperature	θ	°C	Ambient	
13	T	Proof stress	$R_{p0,2}$	MPa*	—	≥ 800
14	T	Strength	R_m	MPa*	—	1 000 ≤ R_m ≤ 1 200
15	T	Elongation	A	%	—	≥ 11
16	T	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	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	

28	—	—	—
34	Grain size	—	According to EN 4700-002
		7	$G \geq 5$
44	External imperfections (visual testing – VT)	—	According to EN 4700-002
		1	Visual
50	Inclusion content	—	According to EN 4700-002
		1	EN 2951
		7	Category 2
61	Internal imperfections (ultrasonic testing – UT)	—	According to EN 4700-002
		1	EN 4050-4
		7	Class 2
95	Marking inspection	—	According to EN 4700-002
96	Dimensional inspection	—	According to 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	—	—

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