
Aeronavtika - Jeklo X3CrNiMoAl (13-8-2) - Indukcijsko taljeno v vakuumu in pretaljeno s taljivo elektrodo - Topilno žarjena in izločevalno utrjena - Palice za obdelavo - a ali $D \leq 200$ mm - $1200 \text{ MPa} \leq R_m \leq 1350 \text{ MPa}$

Aerospace series - Steel X3CrNiMoAl (13-8-2) - Vacuum induction melted and consumable electrode remelted - Solution treated and precipitation treated - Bars for machining - a or $D \leq 200$ mm - $1200 \text{ MPa} \leq R_m \leq 1350 \text{ MPa}$

Luft- und Raumfahrt - Stahl X3CrNiMoAl (13-8-2) - Vakuuminduktionserschmolzen und mit selbstverzehrender Elektrode umgeschmolzen - Stangen für die Bearbeitung - a oder $D \leq 200$ mm - $1200 \text{ MPa} \leq R_m \leq 1350 \text{ MPa}$

Série aérospatiale - Acier X3CrNiMoAl (13-8-2) - Elaboré sous vide par induction et refondu à l'électrode consommable - Mis en solution et précipité - Barres pour usinage - a ou $D \leq 200$ mm - $1200 \text{ MPa} \leq R_m \leq 1350 \text{ MPa}$

Ta slovenski standard je istoveten z: prEN 4884

ICS:

49.025.10	Jekla	Steels
77.140.60	Jeklene palice in drogovi	Steel bars and rods

oSIST prEN 4884:2021**en,fr,de**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 4884

May 2021

ICS 49.025.10

English Version

Aerospace series - Steel X3CrNiMoAl (13-8-2) - Vacuum induction melted and consumable electrode remelted - Solution treated and precipitation treated - Bars for machining - a or D ≤ 200 mm - 1 200 MPa ≤ Rm ≤ 1 350 MPa

Série aérospatiale - Acier X3CrNiMoAl (13-8-2) -
Élaboré sous vide par induction et refondu à l'électrode
consommable - Mis en solution et précipité - Barres
pour usinage - a ou D ≤ 200 mm - 1 200 MPa ≤ Rm ≤ 1
350 MPa

Luft- und Raumfahrt - Stahl X3CrNiMoAl (13-8-2) -
Vakuuminduktionserschmolzen und mit
selbstverzehrender Elektrode umgeschmolzen -
Stangen für die Bearbeitung - a oder D ≤ 200 mm - 1
200 MPa ≤ Rm ≤ 1 350 MPa

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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 4884:2021) 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 X3CrNiMoAl (13-8-2);
- Vacuum induction melted and consumable electrode remelted;
- Solution treated and precipitation treated;
- Bars for machining;
- a or $D \leq 200$ mm;
- $1\ 200\ \text{MPa} \leq R_m \leq 1\ 350\ \text{MPa}$

for aerospace applications.

WL: 1.4534.

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

AMS 2315, *Determination of delta ferrite content*¹⁾
<https://standards.iteh.ai/catalog/standards/sist/3bb30a5f-949c-4a67-a8ab-5bca365ee014/osist-pren-4884-2021>

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 by SAE international (US) Society of Automotive Engineers (<http://www.sae.org/>).

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Table 1 — Requirements for steel X3CrNiMoAl (13-8-2)

1	Material designation	Steel X3CrNiMoAl (13-8-2)											
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Al	N ²	Fe
		min.	—	—	—	—	—	12,25	2,0	7,5	0,90	—	Base
		max.	0,05	0,10	0,10	0,010	0,008	13,25	2,5	8,5	1,35	0,010	
3	Method of melting	Vacuum induction melted and consumable electrode remelted											
4.1	Form	Bars for machining											
4.2	Method of production	—											
4.3	Limit dimension(s)	mm	a or $D \leq 200$										
5	Technical specification	EN 4700-002											

6.1	Delivery condition	Solution treated	Solution treated and precipitation treated
	Heat treatment	900 °C ≤ θ ≤ 950 °C/ $t \geq 30$ min/AC, OQ, WQ or PQ + cool to $\theta \leq 15$ °C	900 °C ≤ θ ≤ 950 °C/ $t \geq 30$ min/AC, OQ, WQ or PQ + cool to $\theta \leq 15$ °C 550 °C ≤ θ ≤ 570 °C/ $t = 4$ h/AC or WQ
6.2	Delivery condition code	W	U
7	Use condition	Solution treated and precipitation treated	Delivery condition
	Heat treatment	Delivery condition + 540 °C ≤ θ ≤ 560 °C/ $t \geq 4$ h/AC	—

Characteristics

8.1	Test sample(s)	See EN 4700-002.										
8.2	Test piece(s)	See EN 4700-002.										
8.3	Heat treatment	Solution treated	Use condition									
9	Dimensions concerned	mm	a or $D \leq 200$	a or $D \leq 75$	$75 < a$ or $D \leq 200$							
10	Thickness of cladding on each face	%	—									
11	Direction of test piece	—		L			T					
12	Temperature	θ	°C	Ambient			Ambient			Ambient		
13	Proof stress	$R_{p0,2}$	MPa	≥ 1 150			≥ 1 150			≥ 1 150		
14	Strength	R_m	MPa	1 200 ≤ R_m ≤ 1 350 MPa			1 200 ≤ R_m ≤ 1 350 MPa			1 200 ≤ R_m ≤ 1 350 MPa		
15	Elongation	A	%	≥ 10			≥ 10			≥ 10		
16	Reduction of area	Z	%	≥ 50			≥ 50			≥ 45		
17	Hardness	≤ 363 HBW		38 ≤ HRC ≤ 43 ^a			38 ≤ HRC ≤ 43 ^a					
18	Shear strength	R_c	MPa	—			—					
19	Bending	k	—	—			—					
20	Impact strength	KV	J	—			At ambient temperature KV ≥ 60 J notch direction L at -30 °C KV ≥ 30 J notch direction L			At ambient temperature KV ≥ 30 J notch direction T at -30 °C KV ≥ 15 J notch direction T		
21	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										

30	Microstructure	—	See EN 4700-002.		
		1	See AMS 2315.		
		7	The δ ferrite content shall not exceed 3 %.		
34	Grain size	—	See EN 4700-002.		
		7	a or $D < 150$ mm	$G \geq 6$ with occasional grains as large as $G = 4$ permissible	
			a or $D \geq 150$ mm	$G \geq 5$ with occasional grains as large as $G = 4$ permissible	
44	External imperfections (visual testing-VT)	—	See EN 4700-002.		
		1	Visual testing (VT)		
50	Inclusion content	—	See EN 4700-002.		
		7	Category 3		
51	Macrostructure	—	See EN 4700-002.		
			Class	Condition	Severity
			1	Freckles	A
			2	White spots	A
			3	Radial segregation	A
	4	Ring pattern	B		
61	Internal imperfections (ultrasonic testing-UT)	—	See EN 4700-002.		
		6	a or $D \leq 100$ mm may be tested either on the product or at an earlier stage of manufacturing		
		7	Class 3		
95	Marking inspection	—	See EN 4700-002.		
96	Dimensional inspection	—	See EN 4700-002.		
98	Notes	—	a The hardness values determined may deviate from the requirements of the material data sheet if the values of the relevant tensile test conform to the requirements of the material data sheet.		
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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