SLOVENSKI STANDARD
oSIST prEN 2821:2021

01-september-2021

Aeronavtika - Jeklo X5CrNiCu15 5 (1.4545) - Pretaljeno s talilno elektrodo - Žarjeno v topilu in utrjeno - Palice za obdelavo - a ali D ≤ 200 mm - Rm ≥ 1310 MPa

Aerospace series - Steel X5CrNiCu15 5 (1.4545) - Consumable electrode remelted - Solution treated and precipitation treated - Bars for machining - a or D ≤ 200 mm - Rm ≥ 1 310 MPa

Luft- und Raumfahrt - Stahl X5CrNiCu15 5 (1.4545) - Mit selbstverzehrender Elektrode umgeschmolzen - Lösungsgeglüht und ausscheidungsgehärtet - Stangen zur spanenden Bearbeitung - a oder D ≤ 200 mm - Rm ≥ 1 310 MPa

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Série aérospatiale - Acier X5CrNiCu15 5 (1.4545) - Refondu à l'électrode consommable - Mis en solution et vieilli - Barres pour usinage - a ou D ≤ 200 mm - Rm ≥ 1 310 MPa

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Ta slovenski standard je istoveten z: **prEN 2821**

ICS:

49.025.10	Jekla	Steels

oSIST prEN 2821:2021 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 2821

July 2021

ICS 49.025.10

Will supersede EN 2821:2007

English Version

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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.

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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.

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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 2821:2021) 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.

This document will supersede EN 2821:2007.

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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 X5CrNiCu15-5 (1.4545)

Consumable electrode remelted

Solution treated and precipitation treated

Bars for machining

a or $D \leq 200$ mm

$R_m \geq 1\,310$ MPa

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 2043, *Aerospace series — Metallic materials — General requirements for semi-finished product qualification (excluding forgings and castings)*

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

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

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EN 4436, *Steel — Test methods — Determination of δ ferrite content*[1]

EN 4500-005, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 005: Specific rules for steels*

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.

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) (https://asd-stan.org/).

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Table 1 — Requirements for Steel X5CrNiCu15-5 (1.4545)

1	Material designation		Steel X5CrNiCu15-5 (1.4545)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb + Ta	Fe
		min.	—	—	—	—	—	14,0	—	3,5	2,5	5 × C	Base
		max.	0,07	1,00	1,00	0,030	0,005	15,5	0,50	5,5	4,5	0,45	
3	Method of melting		Consumable electrode remelted										
4.1	Form		Bars										
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	1 025 °C ≤ θ ≤ 1 055 °C / t ≥ 30 min / AC or faster + cool to θ ≤ 30 °C	1 025 °C ≤ θ ≤ 1 055 °C / t ≥ 30 min / AC or faster + cool to θ ≤ 30 °C + 465 °C ≤ θ ≤ 495 °C / t ≥ 1 h / AC
6.2	Delivery condition code	W	U
7	Use condition	Solution treated and precipitation treated	Delivery condition
	Heat treatment	Delivery condition +465 °C ≤ θ ≤ 495 °C / t ≥ 1 h / AC	—

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					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	L / T
12	T	Temperature	θ	°C	—	Ambient	Ambient / Ambient
13	T	Proof stress	$R_{p0,2}$	MPa	—	≥ 1 170	≥ 1 170 / ≥ 1 170
14	T	Strength	R_m	MPa	—	≥ 1 310	≥ 1 310 / ≥ 1 310
15	T	Elongation	A	%	—	≥ 9	≥ 7 / ≥ 5
16	T	Reduction of area	Z	%	—	≥ 35	≥ 25 / ≥ 15
17	Hardness				HB ≤ 363	388 ≤ HB ≤ 444 or 40 ≤ HRC ≤ 47	388 ≤ HB ≤ 444 or 40 ≤ HRC ≤ 47
18	Shear strength		R_c	MPa	—		
19	Bending		k	—	—		
20	Impact strength				—		
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)				—		

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30	Microstructure	—	EN 4436		
		2	One per cast		
		3	Corresponding to ingot top		
		7	The δ ferrite content shall not exceed 2 %.		
34	Grain size	—	See EN 4700-002.		
		7	G ≥ 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 4		
51	Macrostructure	—	See EN 4700-002.		
		7	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.		
		1	EN 4050-4		
		6	a or D ≤ 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	—	—		
99	Typical use	—	—		

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100	—	Product qualification	—	See EN 2043. Qualification programme to be agreed between manufacturer and purchaser.

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