



SLOVENSKI STANDARD SIST EN 2502:2020

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**Aeronavtika - Jeklo X5CrNoMoCuNb14-5 (1.4594) - 930 MPa ≤ Rm ≤ 1080 MPa -
Palice**

Aerospace series - Steel X5CrNoMoCuNb14-5 (1.4594) - 930 MPa ≤ Rm ≤ 1 080 MPa -
Bars

Luft- und Raumfahrt - Stahl Acier X5CrNoMoCuNb14-5 (1.4594) - 930 MPa ≤ Rm ≤ 1
080 MPa - Stangen - De ≤ 150 mm

Série aérospatiale - Acier X5CrNoMoCuNb14-5 (1.4594) - 930 MPa ≤ Rm ≤ 1 080 MPa -
Barres

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Ta slovenski standard je istoveten z: EN 2502:2019

ICS:

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

SIST EN 2502:2020

en,fr,de

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EUROPEAN STANDARD

EN 2502

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2019

ICS 49.025.10

English Version

Aerospace series - Steel X5CrNoMoCuNb14-5 (1.4594) - 930 MPa ≤ Rm ≤ 1 080 MPa - Bars

Série aérospatiale - Acier X5CrNoMoCuNb14-5
(1.4594) - 930 MPa ≤ Rm ≤ 1 080 MPa - Barres

Luft- und Raumfahrt - Stahl Acier X5CrNoMoCuNb14-5
(1.4594) - 930 MPa ≤ Rm ≤ 1 080 MPa - Stangen - De ≤
150 mm

This European Standard was approved by CEN on 4 February 2019.

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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.

CEN members are the national standards bodies of 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 United Kingdom.



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 (EN 2502:2019) 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 June 2020, and conflicting national standards shall be withdrawn at the latest by June 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 2502:2019 (E)

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 X5CrNoMoCuNb14-5 (1.4594)
 $930 \text{ MPa} \leq R_m \leq 1\,080 \text{ MPa}$
 Bars
 $D_e \leq 150 \text{ mm}$

for aerospace applications.

ASD-STAN designation: FE-PM66.

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 2034, *Round steel bars drawn and/or descaled — Dimensions — Tolerance h 11 — Aerospace series*

EN 2035, *Round steel bars — Drawn — Dimensions — Tolerance h 9 — Aerospace series*¹⁾

EN 2036, *Round steel bars — Ground — Dimensions — Tolerance h 8 — Aerospace series*

EN 2037, *Hexagonal steel bars — Drawn — Dimensions — Tolerances h 11 and h 12 — Aerospace series*

EN 2038, *Hexagonal steel bars — Drawn — Dimensions — Tolerance h 9 — Aerospace series*¹⁾

EN 2039, *Rectangular steel bars — Drawn — Dimensions — Tolerances h 11/h 12 — Aerospace series*¹⁾

EN 2040, *Rectangular steel bars — Rolled — Dimensions — Tolerance js 16 — Aerospace series*

EN 2041, *Square steel bars — Drawn — Dimensions — Tolerances h 11/h 12 — Aerospace series*¹⁾

EN 2042, *Square steel bars — Rolled — Dimensions — Tolerance js 16 — Aerospace series*¹⁾

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

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 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/>

EN 2502:2019 (E)

Table 1 — Requirements for steel X5CrNoMoCuNb14-5 (1.4594)

1	Material designation	Steel X5CrNoMoCuNb14-5 (1.4594)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Nb	Cu
		min.	-	-	-	-	-	13,2	1,2	5,0	0,10	1,2
		max.	0,07	0,60	1,00	0,035	0,025	14,7	2,0	5,8	0,40	2,0
3	Method of melting	Air melted										
4.1	Form	Bars										
4.2	Method of production	-										
4.3	Limit dimension(s)	mm	$D_e \leq 150$									
5	Technical specification	EN 4700-002										
	Dimensional standards	EN 2034 to EN 2042										

6.1	Delivery condition	Solution annealed, primary hardened and precipitation hardened										
	Heat treatment	$1\ 000\ ^\circ\text{C} \leq \theta \leq 1050\ ^\circ\text{C}/t \geq 30\ \text{min}/\text{Air quenched}^a$ $+ 740\ ^\circ\text{C} \leq \theta \leq 760\ ^\circ\text{C}/t = 2\ \text{h}/\text{Air cool}^a$ $+ 530\ ^\circ\text{C} \leq \theta \leq 550\ ^\circ\text{C}/t = 2\ \text{h}/\text{Air cool}$										
6.2	Delivery condition code	-										
7	Use condition	Solution annealed, primary hardened and precipitation hardened										
	Heat treatment	Delivery condition										

Characteristics

8.1	Test sample(s)	iTech STANDARD PREVIEW Bar: $D = 16\ \text{mm}$												
8.2	Test piece(s)	(standards.itech.ai) Reference (see line 29) ^b												
8.3	Heat treatment	Use condition -												
9	Dimensions concerned	mm	≤ 150											
10	Thickness of cladding on each face	%	https://standards.itech.ai/catalog/standards/sist/8aa0041c-6e5e-4f9d-b5da-b7895c0bb432/sist-en-2502-2020											
11	Direction of test piece	L												
12	Temperature	θ	$^\circ\text{C}$	Ambient										
13	Proof stress	$R_{p0,2}$	MPa^*	≥ 780					$\geq 1\ 030$					
14	T Strength	R_m	MPa^*	$930 \leq R_m \leq 1\ 080$					$1\ 270 \leq R_m \leq 1\ 470$					
15	Elongation	A	%	≥ 15					≥ 10					
16	Reduction of area	Z	%	-					-					
17	Hardness				$277 \leq \text{HB} \leq 341$					$375 \leq \text{HB} \leq 429$				
18	Shear strength	R_c	MPa^*	-					-					
19	Bending	k	-	-					-					
20	Impact strength (J)				≥ 40					≥ 15				
21	Temperature	θ	$^\circ\text{C}$	-										
22	Time			h										
23	C Stress	σ_a	MPa^*	-										
24	Elongation	a	%	-										
25	Rupture stress	σ_R	MPa^*	-										
26	Elongation at rupture	A	%	-										
27	Notes (see line 98)	*, a, b												

29	Reference heat treatment	-	Solution annealed and precipitation hardened (950 ± 10) °C/t = 30 min/Air cool ^a (450 ± 10) °C/t = 2 h/Air cool ^a
95	Marking inspection	-	-
96	Dimensional inspection	-	-
98	Notes	-	* 1 MPa = 1 N/mm ² . a Cool to $\theta \leq 30$ °C. b Optional test.
99	Typical use	-	Precipitation hardening stainless steel.
100	-	Product qualification	-
			Qualification programme to be agreed between manufacturer and purchaser.

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