SLOVENSKI STANDARD
SIST EN 2278:2015

01-januar-2015

Aeronavtika - Jeklo X12CrNiMoV12-3 (1.4933) - 900 MPa ≤ Rm ≤ 1 100 MPa - Palice - De ≤ 150 mm

Aerospace series - Steel X12CrNiMoV12-3 (1.4933) - 900 MPa ≤ Rm ≤ 1 100 MPa - Bars - De ≤ 150 mm

Luft- und Raumfahrt - Stahl X12CrNiMoV12-3 (1.4933) - 900 MPa ≤ Rm ≤ 1 100 MPa - Stangen - De ≤ 150 mm

Série aérospatiale - Acier X12CrNiMoV12-3 (1.4933) - 900 MPa ≤ Rm ≤ 1 100 MPa - Barres - De ≤ 150 mm

Ta slovenski standard je istoveten z: **EN 2278:2014**

ICS:

49.025.10	Jekla	Steels

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EUROPEAN STANDARD

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English Version

Aerospace series - Steel X12CrNiMoV12-3 (1.4933) - 900 MPa ≤ Rm ≤ 1 100 MPa - Bars - De ≤ 150 mm

S?ie a?ospatiale - Acier X12CrNiMoV12-3 (1.4933) - 900 MPa ≤ Rm ≤ 1 100 MPa - Barres - De ≤ 150 mm

Luft- und Raumfahrt - Stahl X12CrNiMoV12-3 (1.4933) - 900 MPa ≤ Rm ≤ 1 100 MPa - Stangen - De ≤ 150 mm

This European Standard was approved by CEN on 28 June 2014.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 2278:2014) 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 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of an identical text or by endorsement, at the latest by April 2015, and conflicting national standards shall be withdrawn at the latest by April 2015.

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Introduction

This standard 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 standard has been prepared in accordance with EN 4500-005.

1 Scope

This European Standard specifies the requirements relating to:

Steel X12CrNiMoV12-3 (1.4933)
900 MPa ≤ R_m ≤ 1 100 MPa
Bars
D_e ≤ 150 mm

for aerospace applications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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)*

EN 4258, *Aerospace series — Metallic materials — General organization of standardization — Links between types of EN standards and their use*

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: Bar and section*

1	Material designation		Steel X12CrNiMoV12-3 (1.4933)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	V	N	Fe
		min.	0,08	–	0,50	–	–	11,0	1,50	2,00	0,25	0,020	Base
		max.	0,13	0,35	0,90	0,030	0,025	12,5	2,00	3,00	0,40	0,040	
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										

6.1	Delivery condition	Softened	Hardened and tempered
	Heat treatment	–	1 020 °C ≤ $\theta \leq$ 1 050 °C [a] / OQ or AC + $\theta \geq$ 640 °C
6.2	Delivery condition code	A	U
7	Use condition	Hardened and tempered	Delivery condition
	Heat treatment	Delivery condition + 1 020 °C ≤ $\theta \leq$ 1 050 °C [a] / OQ or AC + $\theta \geq$ 640 °C	—

					Characteristics	
8.1	Test sample(s)				See EN 4700-002.	
8.2	Test piece(s)				See EN 4700-002.	
8.3	Heat treatment				Softened	Hardened and tempered
9	Dimensions concerned			mm	$D_e \leq 150$	
10	Thickness of cladding on each face			%	–	
11	Direction of test piece				–	L or T [b]
12	T	Temperature	θ	°C	Ambient	
13	T	Proof stress	$R_{p0,2}$	MPa	–	≥ 750
14	T	Strength	R_m	MPa	–	900 ≤ $R_m \leq$ 1 100
15	T	Elongation	A	%	–	≥ 14 [c]
16	T	Reduction of area	Z	%	–	≥ 40
17	Hardness				HBW ≤ 311	269 ≤ HBW ≤ 331
18	Shear strength		R_c	MPa	–	
19	Bending		k	–	–	
20	Impact strength				–	≥ 30 J at 20 °C Notch direction T
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, b, c	

34	Grain size	–	See EN 4700-002.
		7	G ≥ 5 some 3 permitted
44	External defects	–	See EN 4700-002.
		1	Visual
50	Cleanliness/inclusion content	–	See EN 4700-002.
		7	Category 2
61	Internal defects	–	See EN 4700-002.
		7	$D_e \leq 75$ mm – class 3 75 mm < $D_e \leq 150$ mm – class 2
95	Marking inspection	–	See EN 4700-002.
96	Dimensional inspection	–	See EN 4700-002.
98	Notes	–	a For optimum corrosion resistance 990 °C ≤ $\theta \leq$ 1 030 °C is recommended. b 75 mm ≤ $D_e \leq$ 150 mm may be tested in L or T direction. c A ≥ 10 % if material is cold worked.
99	Typical use	–	–