

# SLOVENSKI STANDARD

## SIST EN 2465:2019

01-november-2019

Nadomešča:

SIST EN 2465:2008

---

**Aeronavtika - Jeklo X2CrNi18-9 (1.4307) - Popuščano -  $450 \text{ MPa} \leq R_m \leq 680 \text{ MPa}$  -  
Palice za obdelavo -  $4 \text{ mm} \leq De \leq 100 \text{ mm}$**

Aerospace series - Steel X2CrNi18-9 (1.4307) - Softened -  $450 \text{ MPa} \leq R_m \leq 680 \text{ MPa}$  -  
Bar for machining -  $4 \text{ mm} \leq De \leq 100 \text{ mm}$

Luft- und Raumfahrt - Stahl X2CrNi18-9 (1.4307) - Weichgeglüht -  $450 \text{ MPa} \leq R_m \leq 680$   
MPa - Stangen zur spanenden Bearbeitung -  $4 \text{ mm} \leq De \leq 100 \text{ mm}$

Série aérospatiale - Acier X2CrNi18-9 (1.4307) - Adouci -  $450 \text{ MPa} \leq R_m \leq 680 \text{ MPa}$  -  
Barres pour usinage -  $4 \text{ mm} \leq De \leq 100 \text{ mm}$

<https://standards.iteh.ai/catalog/standards/sist/a50141a2-78f9-46de-b937-1a3b4ebd9c06/sist-en-2465-2019>

**Ta slovenski standard je istoveten z: EN 2465:2019**

---

**ICS:**

49.025.10      Jekla

Steels

**SIST EN 2465:2019**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 2465:2019

<https://standards.iteh.ai/catalog/standards/sist/a50141a2-78f9-46de-b937-1a3b4ebd9c06/sist-en-2465-2019>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 2465**

September 2019

ICS 49.025.10

Supersedes EN 2465:2007

English Version

**Aerospace series - Steel X2CrNi18-9 (1.4307) - Softened -  
450 MPa ≤ Rm ≤ 680 MPa - Bars for machining - 4 mm ≤  
De ≤ 100 mm**

Série aérospatiale - Acier X2CrNi18-9 (1.4307) -  
Adouci - 450 MPa ≤ Rm ≤ 680 MPa - Barres pour  
usinage - 4 mm ≤ De ≤ 100 mm

Luft- und Raumfahrt - Stahl X2CrNi18-9 (1.4307) -  
Weichgeglüht - 450 MPa ≤ Rm ≤ 680 MPa - Stangen zur  
spanenden Bearbeitung - 4 mm ≤ De ≤ 100 mm

This European Standard was approved by CEN on 12 May 2019.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

**iTeh STANDARD PREVIEW**

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**

<b>Contents</b>	<b>Page</b>
<b>European foreword .....</b>	<b>3</b>
<b>Introduction .....</b>	<b>4</b>
<b>1 Scope.....</b>	<b>5</b>
<b>2 Normative references.....</b>	<b>5</b>
<b>3 Terms and definitions.....</b>	<b>5</b>
<b>4 Requirements.....</b>	<b>5</b>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 2465:2019

<https://standards.iteh.ai/catalog/standards/sist/a50141a2-78f9-46de-b937-1a3b4ebd9c06/sist-en-2465-2019>

## European foreword

This document (EN 2465:2019) 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 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 March 2020, and conflicting national standards shall be withdrawn at the latest by March 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.

This document supersedes EN 2465:2007.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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.

ITEH STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN 2465:2019

<https://standards.iteh.ai/catalog/standards/sist/a50141a2-78f9-46de-b937-1a3b4ebd9c06/sist-en-2465-2019>

EN 2465:2019 (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.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 2465:2019

<https://standards.iteh.ai/catalog/standards/sist/a50141a2-78f9-46de-b937-1a3b4ebd9c06/sist-en-2465-2019>

## 1 Scope

This document specifies the requirements relating to:

Steel X2CrNi18-9 (1.4307)  
Softened  
 $450 \text{ MPa} \leq R_m \leq 680 \text{ MPa}$   
Bars for machining  
 $4 \text{ mm} \leq D_e \leq 100 \text{ mm}$

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 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*

## 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:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

## 4 Requirements

See Table 1.

## EN 2465:2019 (E)

Table 1 — Requirements for steel X2CrNi18-9 (1.4307)

1	Material designation		Steel X2CrNi18-9 (1.4307)								
2	Chemical composition %	Element	C	Si	Mn	S <sup>a</sup>	P <sup>a</sup>	Cr <sup>a</sup>	Ni <sup>b</sup>	N	Fe
		min.	–	–	–	–	–	17,5	9,0	–	Base
		max.	0,030	1,0	2,0	0,015	0,035	19,5	10,5	0,10	
3	Method of melting		Air melted								
4.1	Form		Bars for machining								
4.2	Method of production		EN 4700-002								
4.3	Limit dimension(s)	mm	$4 \leq D_e \leq 100$								
5	Technical specification		EN 4700-002								

6.1	Delivery condition		Softened								
	Heat treatment		$1\ 000\ ^\circ\text{C} \leq \theta \leq 1\ 100\ ^\circ\text{C}$ / AC or WQ								
6.2	Delivery condition code		U								
7	Use condition		Delivery condition								
	Heat treatment		–								

## iTeh STANDARD PREVIEW

Characteristics  
(standards.iteh.ai)

8.1	Test sample(s)			(standards.itech.ai) EN 4700-002		
8.2	Test piece(s)			EN 4700-002		
8.3	Heat treatment			SIST EN 2465-2019 Delivery condition		
9	Dimensions concerned	mm	12 ≤ D <sub>e</sub> ≤ 50 <sup>c</sup>		50 < D <sub>e</sub> ≤ 100	
10	Thickness of cladding on each face	%	–			
11	Direction of test piece			L		
12	T	Temperature	θ	°C	Ambient	
13		Proof stress	R <sub>p0,2</sub>	MPa	≥ 180	≥ 170
14		Strength	R <sub>m</sub>	MPa	450 ≤ R <sub>m</sub> ≤ 680 <sup>c</sup>	
15		Elongation	A	%	≥ 45 <sup>c</sup>	
16		Reduction of area	Z	%	–	
17	Hardness			HB ≤ 200 <sup>c</sup>		
18	Shear strength	R <sub>c</sub>	MPa	–		
19	Bending	k	–	–		
20	Impact strength			–		
21	C	Temperature	θ	°C	–	
22		Time		h	–	
23		Stress	σ <sub>a</sub>	MPa	–	
24		Elongation	a	%	–	
25		Rupture stress	σ <sub>R</sub>	MPa	–	
26		Elongation at rupture	A	%	–	
27	Notes (see line 98)			a, b, c, d		



44	External defects	–	EN 4700-002		
50	Cleanliness/inclusion content	–	EN 4700-002		
		1	ASTM E45 – Method A		
		7	Inclusion types	Thin	Heavy
			A (Sulphides)	≤ 2,5	≤ 2
			B (Aluminates)	≤ 3 <sup>d</sup>	≤ 2,5
			C (Silicates)	≤ 2,5	≤ 2
			D (Globular oxides)	≤ 2	≤ 2
61	Internal defects	–	EN 4700-002		
		7	Class 2		
			<p><b>iTeh STANDARD PREVIEW</b>  <b>(standards.iteh.ai)</b></p> <p>SIST EN 2465:2019  <a href="https://standards.iteh.ai/catalog/standards/sist/a50141a2-78f9-46de-b937-1a3b4ebd9c06/sist-en-2465-2019">https://standards.iteh.ai/catalog/standards/sist/a50141a2-78f9-46de-b937-1a3b4ebd9c06/sist-en-2465-2019</a></p>		
95	Marking inspection	–	EN 4700-002		
96	Dimensional inspection	–	EN 4700-002		
98	Notes	–	<p><sup>a</sup> For specific welding applications (e.g. high power beam), and after agreement between manufacturer and purchaser:</p> <ul style="list-style-type: none"> <li>— maximum content of S and P should be reduced to 0,005 % and 0,020 %, respectively;</li> <li>— ratio between Cr and Ni according to SUUTALA Formula should be &gt; 1,67 %;</li> <li>— S + P + B should be ≤ 0,025 %.</li> </ul> <p><sup>b</sup> 8 % is allowed under agreement between customer and manufacturer (9 % nickel content stabilize the austenite, it's recommended for less ferrite content, improve forging capability, improve machining and avoid martensite strain hardening).</p> <p><sup>c</sup> The maximum HB-values may be raised by 100 HB, the tensile strength value may be raised by 200 MPa and the minimum elongation value may be lowered to 20 % for sections and bars of ≤ 35 mm thickness having a final cold deformation and for hot formed sections and bars of ≤ 8 mm thickness.</p> <p><sup>d</sup> One field of B 3,5 thin permitted per sample examined.</p>		
99	Typical use	–	–		