



# SLOVENSKI STANDARD

## SIST EN 4573:2020

01-april-2020

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**Aeronavtika - Toplotno odporna zlitina X12CrNiCoMoW21-20 - Topilno žarjena in izločevalno utrjena - Palice in profili - De ≤ 100 mm**

Aerospace series - Heat resisting alloy X12CrNiCoMoW21-20 - Solution treated and precipitation treated - Bars and sections - De ≤ 100 mm

Luft- und Raumfahrt - Hochwarmfeste Legierung X12CrNiCoMoW21-20 - Lösungsgeglüht und ausscheidungsgehärtet - Stangen und Profile - De ≤ 100 mm

Série aérospatiale - Alliage résistant à chaud X12CrNiCoMoW21-20 - Mis en solution et précipité - Barres et profilés - De ≤ 100 mm

<https://standards.iteh.ai/catalog/standards/sist/6314d82f-f74d-4501-9a2a-6e68b150aa14/en-en-4573-2020>

**Ta slovenski standard je istoveten z: EN 4573:2020**

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**ICS:**

49.025.05      Železove zlitine na splošno      Ferrous alloys in general

**SIST EN 4573:2020**

**en,fr,de**

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EUROPEAN STANDARD

EN 4573

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2020

ICS 49.025.05

English Version

## Aerospace series - Heat resisting alloy X12CrNiCoMoW21-20 - Solution treated and precipitation treated - Bars and sections - $D_e \leq 100$ mm

Série aérospatiale - Alliage résistant à chaud  
X12CrNiCoMoW21-20 - Mis en solution et précipité -  
Barres et profilés -  $D_e \leq 100$  mm

Luft- und Raumfahrt - Hochwarmfeste Legierung  
X12CrNiCoMoW21-20 - Lösungsgeglüht und  
ausscheidungsgehärtet - Stangen und Profile -  $D_e \leq 100$   
mm

This European Standard was approved by CEN on 8 December 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.

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>
<b>Bibliography</b> .....	<b>8</b>

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## European foreword

This document (EN 4573:2020) 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 August 2020, and conflicting national standards shall be withdrawn at the latest by August 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 4573:2020 (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 4500-003.

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## 1 Scope

This document specifies the requirements relating to:

Heat resisting alloy X12CrNiCoMoW21-20  
Solution treated and precipitation treated  
Bars and sections  
 $De \leq 100$  mm

for aerospace applications.

ASD-STAN Designation: FE-PA4901.

## 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)*

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

## 3 Terms and definitions (standards.iteh.ai)

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.

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1) Published as ASD-STAN Standard at the date of publication of this document by AeroSpace and Defence industries Association of Europe - Standardization (ASD-STAN), <http://www.asd-stan.org/>

## EN 4573:2020 (E)

Table 1 — Requirements for heat resisting alloy (X12CrNiCoMoW21-20)

1	Material designation		Heat resisting alloy X12CrNiCoMoW21-20													
2	Chemical composition %	Element	C	Si	Mn	P	S	Co	Cr	Cu	Mo	Nb	Ni	N <sub>2</sub>	W	Fe
		min.	0,08	—	1,00	—	—	18,5	20,0	—	2,50	0,75	19,0	0,10	2,00	Base
		max.	0,16	1,00	2,00	0,020	0,015	21,0	22,5	0,50	3,50	1,25	21,0	0,20	3,00	
3	Method of melting		Air or vacuum melted													
4.1	Form		Bars and sections													
4.2	Method of production		Wrought													
4.3	Limit dimension(s)	mm	De ≤ 100													
5	Technical specification		EN 4700-002													

6.1	Delivery condition		Solution treated													
	Heat treatment		1 100 °C ≤ $\theta$ ≤ 1 180 °C / t = 1 h/WQ													
6.2	Delivery condition code		W													
7	Use condition		Solution treated and precipitation treated													
	Heat treatment		Delivery condition + $\theta = 815 \text{ °C} \pm 15 \text{ °C} / t \geq 4 \text{ h/AC}$													

## iTeh STANDARD PREVIEW

Characteristics

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8.1	Test sample(s)		See EN 4700-002.													
8.2	Test piece(s)		See EN 4700-002.													
8.3	Heat treatment		Use condition-4501-9a2a- <a href="https://standards.iteh.ai/catalog/standards/sist/6a68b150aa14/sist-en-4573-2020">https://standards.iteh.ai/catalog/standards/sist/6a68b150aa14/sist-en-4573-2020</a>													
9	Dimensions concerned	mm	De ≤ 100													
10	Thickness of cladding on each face	%	—													
11	Direction of test piece		See EN 4700-002.													
12	Temperature	$\theta$	°C	Ambient												
13	Proof stress	$R_{p0,2}$	MPa	≥ 345												
14	T Strength	$R_m$	MPa	690 ≤ $R_m$ ≤ 960												
15	Elongation	A	%	≥ 30												
16	Reduction of area	Z	%	—												
17	Hardness		192 ≤ HB ≤ 247													
18	Shear strength	$R_c$	MPa	—												
19	Bending	k	—	—												
20	Impact strength		—													
21	Temperature	$\theta$	°C	815 <sup>a</sup>												
22	Time		h	$t_R \geq 30$												
23	Stress	$\sigma_a$	MPa	—												
24	C Elongation	a	%	—												
25	Rupture stress	$\sigma_R$	MPa	125												
26	Elongation at rupture	A	%	≥ 10												
27	Notes (see line 98)		a													



34	Grain size	—	See EN 4700-002.	
		7	Grain size number	% of area
			$G \geq 4$	$\geq 95$
			$0 \leq G < 4$	$< 5$
			$G < 0$	Not acceptable
44	External imperfections visual testing (VT)	—	See EN 4700-002.	
		1	Visual	
		7	See EN 4700-002.	
61	Internal imperfections ultrasonic testing (UT)	—	See EN 4700-002.	
			Class 4	
95	Marking inspection	—	See EN 4700-002.	
96	Dimensional inspection	—	See EN 4700-002.	
98	Notes	—	<sup>a</sup> Proportional round test piece	
99	Typical use	—	—	
100	—	Product qualification	—	See EN 2043.
				Qualification programme to be agreed between manufacturer and purchaser.

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