



# SLOVENSKI STANDARD

## SIST EN 4574:2020

01-april-2020

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

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

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

Série aérospatiale - Alliage résistant à chaud X12CrNiCoMoW21-20 - Mis en solution et précipité - Pièces forgées ou matriçées - De ≤ 100 mm

**Ta slovenski standard je istoveten z: EN 4574:2020**

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**ICS:**

49.025.05      Železove zlitine na splošno      Ferrous alloys in general

**SIST EN 4574:2020**

**en,fr,de**

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EUROPEAN STANDARD

EN 4574

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2020

ICS 49.025.05

English Version

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

Série aérospatiale - Alliage résistant à chaud  
X12CrNiCoMoW21-20 - Mis en solution et précipité -  
Pièces forgées et pièces matricées - De ≤ 100 mm

Luft- und Raumfahrt - Hochwarmfeste Legierung  
X12CrNiCoMoW21-20 - Lösungsgeglüht und  
ausgelagert - Gesenk- und Freiformschmiedestücke - De  
≤ 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.

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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 (EN 4574:2020) 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 4574:2020 (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  
Forgings  
 $D_e \leq 100$  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 4263, *Aerospace series — Heat resisting alloy FE-PA4901 (X12CrNiCoMoW21-20) — As forged — Forging stock — a or D  $\leq 200$  mm —  $690$  MPa  $\leq R_m \leq 960$  MPa*

EN 4700-006, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 006: Pre-production and production forgings*

## 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.

## EN 4574:2020 (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	Forgings														
4.2	Method of production	Forged from forging stock EN 4263														
4.3	Limit dimension(s)	mm	$D_e \leq 100$													
5	Technical specification	EN 4700-006														

6.1	Delivery condition	Solution treated and precipitation treated														
	Heat treatment	$1\ 100\ ^\circ\text{C} \leq q\ 1\ 180\ ^\circ\text{C}/t = 1\ \text{h}/\text{WQ}$ $+ q = 815\ ^\circ\text{C} \pm 15\ ^\circ\text{C}/t \geq 4\ \text{h}/\text{AC}$														
6.2	Delivery condition code	U														
7	Use condition	Delivery condition														
	Heat treatment	—														

## Characteristics

8.1	Test sample(s)	See EN 4700-006															
8.2	Test piece(s)	See EN 4700-006															
8.3	Heat treatment	Use condition															
9	Dimensions concerned	mm	$D_e \leq 100$														
10	Thickness of cladding on each face	%	—														
11	Direction of test piece	See EN 4700-006															
12	T	Temperature	$\theta$	$^\circ\text{C}$	Ambient												
13		Proof stress	$R_{p0,2}$	MPa	$\geq 345$												
14		Strength	$R_m$	MPa	$690 \leq R_m \leq 960$												
15		Elongation	A	%	$\geq 30$												
16		Reduction of area	Z	%	—												
17		Hardness	$192 \leq \text{HB} \leq 241$														
18	Shear strength	$R_c$	MPa	—													
19	Bending	k	—	—													
20	Impact strength	—															
21	C	Temperature	$\theta$	$^\circ\text{C}$	730 <sup>a</sup>												
22		Time		h	$t_R \geq 100$												
23		Stress	$\sigma_a$	MPa	—												
24		Elongation	a	%	—												
25		Rupture stress	$\sigma_R$	MPa	165												
26		Elongation at rupture	A	%	$\geq 8$												
27		Notes (see line 98)	a														



44	External imperfections visual testing (VT)	—	See EN 4700-006.	
		1	Only macrographic testing is required.	
		2	1 (one) per batch.	
		7	To be agreed between manufacturer and purchaser.	
95	Marking inspection	—	See EN 4700-006.	
96	Dimensional inspection	—	See EN 4700-006.	
98	Notes	—	<sup>a</sup> Proportional round test piece	
99	Typical use	—	—	
100	—	Product qualification	—	EN 4700-006
				Qualification programme to be agreed between manufacturer and purchaser.

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