



BSI Standards Publication

**Aerospace series — Heat  
resisting alloy FE-PA4901  
(X12CrNiCoMoW21-20) — As  
forged — Forging stock — a or  
 $D \leq 200$  mm —  $690 \text{ MPa} \leq R_m$   
 $\leq 960 \text{ MPa}$**

**National foreword**

This British Standard is the UK implementation of EN 4263:2013.

The UK participation in its preparation was entrusted to Technical Committee ACE/61/-/48, Heat Resisting Alloys for Aerospace Purposes.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

**EN 4263**

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2013

ICS 49.025.01

English Version

**Aerospace series - Heat resisting alloy FE-PA4901  
(X12CrNiCoMoW21-20) - As forged - Forging stock - a or D ≤  
200 mm - 690 MPa ≤ Rm ≤ 960MPa**

Série aéronautique - Alliage résistant à chaud FE-PA4901  
(X12CrNiCoMoW21-20) - Non traité - Produits destinés à la  
forge - a ou D ≤ 200mm - 690 MPa ≤ Rm ≤ 960MPa

Luft- und Raumfahrt - Hochwarmfeste Legierung FE-  
PA4901 (X12CrNiCoMoW21-20) - Nicht wärmebehandelt -  
Schmiedevormaterial - a oder D ≤ 200 mm - 690 MPa ≤ Rm  
≤ 960 MPa

This European Standard was approved by CEN on 8 May 2013.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 4263:2013) 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of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

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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 4500-003.

## 1 Scope

This European Standard specifies the requirements relating to:

Heat resisting alloy FE-PA4901 (X12CrNiCoMoW21-20)  
As forged  
Forging stock  
 $a$  or  $D \leq 200$  mm  
 $690 \text{ MPa} \leq R_m \leq 960 \text{ MPa}$

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)*<sup>1)</sup>

prEN 2860-2, *Aerospace series — Heat resisting alloys — Forging stock and forgings — Technical specification — Part 2: Forging stock*<sup>1)</sup>

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

EN 4500-003, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 003: Specific rules for heat resisting alloys*

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1) Published as ASD-STAN Prestandard at the date of publication of this standard.

1	Material designation		Heat resisting alloy FE-PA4901 (X12CrNiCoMoW21-20)													
2	Chemical Composition %	Element	C	Si	Mn	P	S	Co	Cr	Cu	Mo	Nb	Ni	N2	W	Fe
		min.	0,080	–	1,00	–	–	18,5	20,0	–	2,50	0,75	19,0	0,10	2,00	Base
		max.	0,16	1,00	2,00	0,040	0,030	21,0	22,5	0,50	3,50	1,25	21,0	0,20	3,00	
3	Method of melting		Air melted													
4.1	Form		Forging stock													
4.2	Method of production		–													
4.3	Limit dimension(s)	mm	a or D ≤ 200													
5	Technical specification		EN 2860-2													

6.1	Delivery condition		As forged													
	Heat treatment		–													
6.2	Delivery condition code		U													
7	Use condition		Delivery condition													
	Heat treatment		–													

#### Characteristics

8.1	Sample(s)		Cut from forging stock															
8.2	Test piece(s)		–															
8.3	Heat treatment		See line 29															
9	Dimensions concerned	mm	a or D ≤ 200															
10	Thickness of cladding on each face	%	–															
11	Direction of test piece		See EN 2860-2															
12	T	Temperature	$\theta$	°C	Ambient													
13		Proof stress	$R_{p0,2}$	MPa	≥ 345													
14		Strength	$R_m$	MPa	690 ≤ $R_m$ ≤ 960													
15		Elongation	A	%	≥ 30													
16		Reduction of area	Z	%	–													
17	Hardness		192 ≤ HB ≤ 241															
18	Shear strength	$R_c$	MPa	–														
19	Bending	k	-	–														
20	Impact strength		–															
21	C	Temperature	$\theta$	°C	730 <sup>a)</sup>													
22		Time		h	$t_R$ ≥ 100													
23		Stress	$\sigma_a$	MPa	–													
24		Elongation	a	%	–													
25		Rupture stress	$\sigma_R$	MPa	165													
26		Elongation at rupture	A	%	≥ 8													
27	Notes (see line 98)		a)															



29	Reference heat treatment	–	Solution treated Nominal temperature according to the manufacturing schedule $\pm 15 \text{ }^\circ\text{C/t} = 1 \text{ h/WQ} + \theta 0 815 \text{ }^\circ\text{C} \pm 15 \text{ }^\circ\text{C/t} \geq 4 \text{ h / AC}$
44	External defects	–	See EN 2860-2
51	Macrostructure	–	See EN 2860-2
		7	To be defined on the order
61	Internal defects	–	See EN 2860-2
		7	Class 3
95	Marking inspection	–	See EN 2860-2
96	Dimensional inspection	–	See EN 2860-2
98	Notes	–	a) Proportional round test pieces.
99	Typical use	–	–

100	–	Product qualification	–	See EN 2043 Qualification programme to be agreed between manufacturer and purchaser



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