



**SLOVENSKI STANDARD**  
**SIST EN 4317:2007**  
**01-november-2007**

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Hcd`c]bc`bYcVXYUb]a UhYf]U]nU\_cj UbYU]8`01`&\$a a

Aerospace series - Heat resisting alloy FE-PA2601 (X6NiCrTiMoV26-15) - Non heat treated, forging stock a or D <= 200 mm

Luft- und Raumfahrt - Hochwarmfeste Legierung FE-PA2601 (X6NiCrTiMoV26-15) - Schmiedezustand, Schmiedevormaterial a oder D <= 200 mm

**iTeh STANDARD PREVIEW**

Série aérospatiale - Alliage résistant a chaud FE-PA2601 (X6NiCrTiMoV26-15) - Non traité, produits destinés a la forge a ou D <= 200 mm

[SIST EN 4317:2007](https://standards.iteh.ai/catalog/standards/sist/c845b290-d589-4925-8edd-29da45a4f7d9/sist-en-4317-2007)

Ta slovenski standard je istoveten z: **EN 4317:2007**

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**ICS:**

49.025.05      Železove zlitine na splošno      Ferrous alloys in general

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**en**

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EUROPEAN STANDARD

EN 4317

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2007

ICS 49.025.05

English Version

Aerospace series - Heat resisting alloy FE-PA2601  
(X6NiCrTiMoV26-15) - Non heat treated, forging stock a or D  $\leq$   
200 mm

Série aérospatiale - Alliage résistant à chaud FE-PA2601  
(X6NiCrTiMoV26-15) - Non traité, produits destinés à la  
forge a ou D  $\leq$  200 mm

Luft- und Raumfahrt - Hochwarmfeste Legierung FE-  
PA2601 (X6NiCrTiMoV26-15) - Schmiedezustand,  
Schmiedevormaterial a oder D  $\leq$  200 mm

This European Standard was approved by CEN on 15 March 2007.

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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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

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## Foreword

This document (EN 4317:2007) 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 February 2008, and conflicting national standards shall be withdrawn at the latest by February 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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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 4500-3.

## 1 Scope

This standard specifies the requirements relating to:

Heat resisting alloy FE-PA2601 (X6NiCrTiMoV26-15) — Non heat treated, forging stock  $a$  or  $D \leq 200$  mm for aerospace applications.

## 2 Normative references

The following referenced documents are indispensable for the application 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)*<sup>1)</sup>

EN 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 4500-3, Aerospace series — *Metallic materials — Rules for drafting and presentation of material standards — Part 3: Specific rules for heat resisting alloys*<sup>1)</sup>

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<sup>1)</sup> Published as ASD prestandard at the date of publication of this standard.

1	Material designation		Heat resisting alloy FE-PA2601 (X6NiCrTiMoV26-15)													
2	Chemical composition %	Element	C	Si	Mn	P	S	Al	B	Cr	Mo	Ni	Ti	V	Pb	Fe
		min.	–	–	–	–	–	–	30 <sup>a</sup>	13,5	1,00	24,0	1,90	0,10	–	Base
		max.	0,080	1,00	2,00	0,020	0,015	0,35	100 <sup>a</sup>	16,0	1,50	27,0	2,30	0,50	20 <sup>a</sup>	
3	Method of melting		Consumable electrode remelted													
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		Non heat treated													
	Heat treatment		–													
6.2	Delivery condition code		U													
7	Use condition		Delivery condition													
	Heat treatment		–													

## Characteristics

8.1	Test sample(s)		See EN 2860-2															
8.2	Test piece(s)		See EN 2860-2															
8.3	Heat treatment		See line 29															
9	Dimensions concerned	mm	$D_e \leq 75$										$75 < D_e \leq 100$					
10	Thickness of cladding on each face	%	–															
11	Direction of test piece		L											T				
12	Temperature	$\theta$	°C		Ambient													
13	Proof stress	$R_{p0,2}$	MPa		≥ 655													
14	T Strength	$R_m$	MPa		≥ 960													
15	Elongation	A	%		≥ 10													
16	Reduction of area	Z	%		≥ 15													
17	Hardness		277 ≤ HB ≤ 363															
18	Shear strength	$R_c$	MPa		–													
19	Bending	k	–		–													
20	Impact strength		–															
21	Temperature	$\theta$	°C		650													
22	Time		h		$t_R \geq 23$													
23	Stress	$\sigma_a$	MPa		–													
24	C Elongation	a	%		–													
25	Rupture stress	$\sigma_R$	MPa		480													
26	Elongation at rupture	A	%		≥ 5 for $t_R \leq 48$ h ≥ 3 for $t_R > 48$ h													
27	Notes (see line 98)		a															

29	Reference heat treatment	–	Solution and precipitation treated $\theta = 980 \text{ }^\circ\text{C} \pm 10 \text{ }^\circ\text{C} / t \geq 1 \text{ h} / \text{OQ or WQ} + \theta = 720 \text{ }^\circ\text{C} \pm 10 \text{ }^\circ\text{C}$ (Heating from $\theta = 550 \text{ }^\circ\text{C}$ to $\theta = 710 \text{ }^\circ\text{C} / t \geq 1 \text{ h}$ ) / $t = 16 \text{ h} / \text{AC}$
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 2
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96	Marking inspection	–	See EN 2860-2
97	Dimensional inspection	–	See EN 2860-2
98	Notes	–	<sup>a</sup> p.p.m.
99	Typical use	–	–