

**Aerospace series - Heat resisting steel FE-PA2601
(X6NiCrTiMoV26-15) - Rm = 900 MPa - Bars for
machined bolts - D = 25 mm**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 2398:2008 sisaldab Euroopa standardi EN 2398:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 19.05.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 26.03.2008.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 2398:2008 consists of the English text of the European standard EN 2398:2008.

This standard is ratified with the order of Estonian Centre for Standardisation dated 19.05.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 26.03.2008.

The standard is available from Estonian standardisation organisation.

ICS 49.025.10

Võtmesõnad:

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
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ICS 49.025.10

English Version

Aerospace series - Heat resisting steel FE-PA2601
(X6NiCrTiMoV26-15) - Rm = 900 MPa - Bars for machined bolts
- D = 25 mm

Série aérospatiale - Acier résistant à chaud FE-PA2601
(X6NiCrTiMoV26-15) - Rm = 900 MPa - Barres pour
boulonnerie usinée D = 25 mm

Luft- und Raumfahrt - Hochwarmfester Stahl FE-PA2601
(X6NiCrTiMoV26-15) - Rm = 900 MPa - Stangen zur
Spanabhebenden Formgebung für Schrauben - D = 25 mm

This European Standard was approved by CEN on 10 November 2007.

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 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 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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This document (EN 2398:2008) 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 September 2008, and conflicting national standards shall be withdrawn at the latest by September 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.

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 steel FE-PA2601 (X6NiCrTiMoV26-15)

$R_m \geq 900$ MPa

Bars for machined bolts

$D \leq 25$ 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 2002-16, *Aerospace series — Metallic materials — Test methods — Part 16: Non-destructive testing — Penetrant testing.* ¹⁾

EN 2344, *Aerospace series — Round bars, machined in heat resisting alloys — Diameter $10 \text{ mm} \leq D \leq 180 \text{ mm}$ — Dimensions.*

EN 2399, *Aerospace series — Heat resisting steel FE-PA92-HT — $R_m \geq 900$ MPa — Bars for forged bolts $D \leq 25$ mm.* ²⁾

EN 2951, *Aerospace series — Metallic materials — Test method — Micrographic determination of content of non-metallic inclusions.* ¹⁾

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

EN 4050-4, *Aerospace series — Test method for metallic materials — Ultrasonic inspection of bars, plates, forging stock and forgings — Part 4: Acceptance criteria.* ¹⁾

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

EN 4700-2, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 2: Bar and section.* ¹⁾

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

2) Published as ASD Standard at the date of publication of this standard.

1	Material designation	Heat resisting steel FE-PA2601 (X6NiCrTiMoV26-15)														
2	Chemical composition %	Element	C	Si	Mn	P	S	Al	B ^a	Cr	Mo	Ni	Pb ^a	Ti	V	Fe
		min.	-	-	-	-	-	-	(30)	13,5	1,0	24,0	-	1,9	0,10	Base
		max.	0,08	1,0	2,0	0,020	0,015	0,35	(100)	16,0	1,5	27,0	(50)	2,3	0,50	
3	Method of melting	Consumable electrode remelted ^b														
4.1	Form	Bars for machining ^c														
4.2	Method of production	-														
4.3	Limit dimension(s)	mm	$D \leq 25$													
5	Technical specification	EN 4700-2														

6.1	Delivery condition	Softened, cold worked, solution treated and machined		Softened, cold worked, solution treated, precipitation treated and machined	
	Heat treatment	900 °C ± 10 °C / t = 1 h / air cool or faster Cold worked ^d + 980 °C ± 10 °C / t = 1 h / air cool or faster		900 °C ± 10 °C / t = 1 h / air cool or faster Cold worked ^d + 980 °C ± 10 °C / t = 1 h / air cool or faster + 720 °C ± 10 °C / t = 16 h / air cool	
6.2	Delivery condition code	W		U	
7	Use condition	Softened, cold worked ^d , solution treated, precipitation treated and machined		Delivery condition	
	Heat treatment	Delivery condition + 720 °C ± 10 °C / t = 16 h/air cool		-	

Characteristics

8.1	Test sample(s)	See EN 4700-2.				
8.2	Test piece(s)	See EN 4700-2.				
8.3	Heat treatment	Delivery condition		Condition of use		
9	Dimensions concerned	mm	$D \leq 25$			
10	Thickness of cladding on each face	%	-			
11	Direction of test piece	L				
12	Temperature	θ	°C	Room temperature		
13	Proof stress	$R_{p0.2}$	MPa	-	≥ 590	
14	T Strength	R_m	MPa	-	≥ 900	
15	Elongation	A	%	-	≥ 13	
16	Reduction of area	Z	%	-	≥ 20	
17	Hardness	≤ 200 HB		$248 \leq HB \leq 341$		
18	Shear strength	R_c	MPa	-		
19	Bending	k	-	-		
20	Impact strength	-				
21	Temperature	θ	°C	-	650	
22	Time	h		-	≥ 23	
23	Stress	σ_a	MPa	-	-	
24	C Elongation	a	%	-	-	
25	Rupture stress	σ_R	MPa	-	480 ^e	
26	Elongation at rupture	A	%	-	$\geq 4,5$ for tr ≤ 48 h $\geq 2,5$ for tr > 48 h	
27	Notes (see line 98)	a, b, c, d, e				