



SLOVENSKI STANDARD

SIST EN 3163:2007

01-november-2007

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Aerospace series - Steel FE-PM3801 (X5CrNiCu17-4) - Air melted, softened, forging stock a or D <= 300 mm

Luft- und Raumfahrt - Stahl FE-PM3801 (X5CrNiCu17-4) - Lufterschmolzen, geglüht, Schmiedevormaterial a oder D <= 300 mm

Série aérospatiale - Acier FE-PM3801 (X5CrNiCu17-4) - Elaboré a l'air, adouci, produits destinés a la forge a ou D <= 300 mm

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Ta slovenski standard je istoveten z: EN 3163:2007

ICS:

49.025.10 Jekla Steels

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ICS 49.025.10

English Version

Aerospace series - Steel FE-PM3801 (X5CrNiCu17-4) - Air melted, softened, forging stock a or D \leq 300 mm

Série aérospatiale - Acier FE-PM3801 (X5CrNiCu17-4) -
Élaboré à l'air, adouci, produits destinés à la forge a ou D \leq
300 mm

Luft- und Raumfahrt - Stahl FE-PM3801 (X5CrNiCu17-4) -
Lufterschmolzen, gegläht, Schmiedevormaterial a oder D \leq
300 mm

This European Standard was approved by CEN on 24 February 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.

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.

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

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Contents

Page

Foreword.....	3
Introduction	4
1 Scope	4
2 Normative references	4

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Foreword

This document (EN 3163:2007) 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 4500-5.

1 Scope

This standard specifies the requirements relating to:

Steel FE-PM3801 (X5CrNiCu17-4) — Air melted, softened, forging stock a or $D \leq 300$ 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)*¹⁾

EN 2157-2, *Aerospace series — Steel-forging stock and forgings — Technical specification — Part 2: Forging stock*

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

EN 4436, *Aerospace series — Steel — Test methods — Determination of δ ferrite content*¹⁾

EN 4500-5, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 5: Specific rules for steels*¹⁾

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

1	Material designation		Steel FE-PM3801 (X5CrNiCu17-4)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb+Ta	Fe
		min.	–	–	–	–	–	15,0	–	3,0	3,0	5 x C	Base
		max.	0,07	1,00	1,00	0,040	0,030	17,5	0,50	5,0	5,0	0,45	
3	Method of melting		Air melted										
4.1	Form		Forging stock										
4.2	Method of production		–										
4.3	Limit dimension(s)	mm	a or $D \leq 300$										
5	Technical specification		EN 2157-2										

6.1	Delivery condition		Softened										
	Heat treatment		–										
6.2	Delivery condition code		U										
7	Use condition		Delivery condition										
	Heat treatment		–										

Characteristics

8.1	Test sample(s)		See EN 2157-2.				Forged or machined					
8.2	Test piece(s)		See EN 2157-2.				See EN 2157-2.					
8.3	Heat treatment		Delivery condition				See line 29					
9	Dimensions concerned	mm	a or $D \leq 300$				a or $D \leq 75$		$75 < a$ or $D \leq 300$			
10	Thickness of cladding on each face	%	–				–		–			
11	Direction of test piece		L				L		T			
12	Temperature	θ	°C		–				Ambient		Ambient	
13	Proof stress	$R_{p0,2}$	MPa		–				$\geq 1\ 170$		$\geq 1\ 170$	
14	T Strength	R_m	MPa		–				$1\ 310 \leq R_m \leq 1\ 550$		$1\ 310 \leq R_m \leq 1\ 550$	
15	Elongation	A	%		–				$\geq 7,5$		≥ 7	
16	Reduction of area	Z	%		–				≥ 30		≥ 25	
17	Hardness		≤ 363 HB				$388 \leq HB \leq 444$		$388 \leq HB \leq 444$			
18	Shear strength	R_c	MPa		–							
19	Bending	k	–		–							
20	Impact strength		–									
21	Temperature	θ	°C		–							
22	Time		h		–							
23	Stress	σ_a	MPa		–							
24	C Elongation	a	%		–							
25	Rupture stress	σ_R	MPa		–							
26	Elongation at rupture	A	%		–							
27	Notes (see line 98)		–									

29	Reference heat treatment	–	Solution treated and precipitation treated $1\ 025\ ^\circ\text{C} \leq \theta \leq 1\ 055\ ^\circ\text{C} / t \geq 30\ \text{min} / \text{AC}$ or OQ + cool to $\theta \leq 30\ ^\circ\text{C}$ + $470\ ^\circ\text{C} \leq \theta \leq 490\ ^\circ\text{C} / t \geq 1\ \text{h} / \text{AC}$
30	Microstructure	1	EN 4436
		2	One per cast
		3	Corresponding to the top of ingot
		5	See line 29.
		7	The δ -ferrite content shall not exceed 5 %.
44	External defects	–	See EN 2157-2.
		1	Visual
50	Cleanliness/inclusion content (micro-cleanness)	–	See EN 2157-2.
		7	Category 2
61	Internal defects	–	See EN 2157-2.
		1	EN 4050-4
		6	a or $D \leq 100\ \text{mm}$ may be tested either on the product or at an earlier stage of manufacturing.
		7	Class 2
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95	Marking inspection	–	See EN 2157-2.
96	Dimensional inspection	–	See EN 2157-2.
98	Notes	–	–
99	Typical use	–	–