
Aeronavtika - Jeklo FE-PM1503 (X3CrNiMoAl13-8-2) - Taljeno z vakuumsko indukcijo in pretaljeno s talilno elektrodo - Topilno žarjeno in izločevalno utrjeno - Izkovki - a ali $D \leq 150$ mm - $1200 \text{ MPa} \leq R_m \leq 1400 \text{ MPa}$

Aerospace series - Steel FE-PM1503 (X3CrNiMoAl13-8-2) - Vacuum induction melted and consumable electrode remelted - Solution treated and precipitation treated - Forgings - a or $D \leq 150$ mm - $1200 \text{ MPa} \leq R_m \leq 1400 \text{ MPa}$

Luft- und Raumfahrt - Stahl FE-PM1503 (X3CrNiMoAl13-8-2) - Vakuuminduktionserschmolzen und mit selbstverzehrender Elektrode umgeschmolzen Lösungsgeglüht und ausgelagert - Schmiedestücke - a or $D \leq 150$ mm - $1200 \text{ MPa} \leq R_m \leq 1400 \text{ MPa}$

iTeh STANDARD PREVIEW
(standards.it-eh.ai)
<https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019>

Série aérospatiale - Acier FE-PM1503 (X3CrNiMoAl13-8-2) - Élaboré sous vide par induction et refondu à l'électrode consommable - Mis en solution vieilli - Pièces forgées et pièces matricées - a or $D \leq 150$ mm - $1200 \text{ MPa} \leq R_m \leq 1400 \text{ MPa}$

Ta slovenski standard je istoveten z: EN 3470:2019

ICS:

49.025.10	Jekla	Steels
77.140.85	Železni in jekleni kovani izdelki	Iron and steel forgings

SIST EN 3470:2019**en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 3470:2019

<https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019>

EUROPEAN STANDARD

EN 3470

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2019

ICS 49.025.10

English Version

**Aerospace series - Steel FE-PM1503 (X3CrNiMoAl13-8-2) -
Vacuum induction melted and consumable electrode
remelted - Solution treated and precipitation treated -
Forgings - a or D ≤ 150 mm - 1 200 MPa ≤ Rm ≤ 1 400 MPa**

Série aérospatiale - Acier FE-PM1503 (X3CrNiMoAl13-8-2) - Élaboré sous vide par induction et refondu à l'électrode consommable - Mis en solution et vieilli - Pièces forgées ou matricées - a ou D ≤ 150 mm - 1 200 MPa ≤ Rm ≤ 1 400 MPa

Luft- und Raumfahrt - Stahl FE-PM1503 (X3CrNiMoAl13-8-2) - Vakuuminduktionserschmolzen und mit selbstverzehrender Elektrode umgeschmolzen - Lösungsgeglüht und ausgelagert - Schmiedestücke - a or D ≤ 150 mm - 1 200 MPa ≤ Rm ≤ 1 400 MPa

This European Standard was approved by CEN on 30 December 2018.

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.

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



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Requirements	5

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 3470:2019](https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019)
<https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019>

European foreword

This document (EN 3470:2019) 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 October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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 organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 3470:2019](https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019)

<https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019>

EN 3470:2019 (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 4500-005.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 3470:2019

<https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019>

1 Scope

This document specifies the requirements relating to:

Steel FE-PM1503 (X3CrNiMoAl13-8-2)
Vacuum induction melted and consumable electrode remelted
Solution treated and precipitation treated
Forgings
 a or $D \leq 150$ mm
 $1\ 200\ \text{MPa} \leq R_m \leq 1\ 400\ \text{MPa}$

for aerospace applications.

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 2157-3, *Aerospace series — Steel — Forging stock and forgings — Technical specification — Part 3: Pre-production and production forgings*

EN 3359, *Aerospace series — Steel FE-PM1503 (X3CrNiMoAl13-8-2) — Vacuum induction melted and consumable electrode remelted, softened, forging stock a or $D \leq 300$ mm*

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

EN 4500-005, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 005: Specific rules for steel*

EN 4700-002, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 002: Bar and section*

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:

IEC Electropedia: available at <http://www.electropedia.org/>

ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Requirements

See Table 1.

EN 3470:2019 (E)

Table 1 — Requirements for steel FE-PM1503 (X3CrNiMoAl13-8-2)

1	Material designation		Steel FE-PM1503 (X3CrNiMoAl13-8-2)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Al	N ₂	Fe
		min.	—	—	—	—	—	12,25	2,00	7,50	0,90	—	Base
		max.	0,05	0,10	0,10	0,010	0,008	13,25	2,50	8,50	1,35	0,010	
3	Method of melting		Vacuum induction melted and consumable electrode remelted										
4.1	Form		Forgings										
4.2	Method of production		Forged from forging stock EN 3359										
4.3	Limit dimension(s)	mm	a or $D \leq 150$ mm										
5	Technical specification		EN 2157-3										

6.1	Delivery condition		Solution treated				Solution treated and precipitation treated			
	Heat treatment		900 °C ≤ θ ≤ 950 °C / t ≥ 30 min / AC, OQ or WQ + cool to θ ≤ 15 °C				900 °C ≤ θ ≤ 950 °C / t ≥ 30 min / AC, OQ or WQ + cool to θ ≤ 15 °C + 545 °C ≤ 575 °C ≤ / t * 4 h			
6.2	Delivery condition code		W				U			
7	Use condition		Solution treated and precipitation treated				Delivery condition			
	Heat treatment		Delivery condition + 545 °C ≤ 575 °C ≤ / t * 4 h				—			

iTech STANDARD PREVIEW

Characteristics

8.1	Test sample(s)		See EN 2157-3.											
8.2	Test piece(s)		See EN 2157-3.											
8.3	Heat treatment		Delivery condition				Use condition							
9	Dimensions concerned	mm	a or $D \leq 150$				a or $D \leq 150$		$70 \leq a$ or $D \leq 150$					
10	Thickness of cladding on each face	%	—				—		—					
11	Direction of test piece		—				L		T					
12	Temperature	θ	°C		—				Ambient		Ambient			
13	Proof stress	R _{p0,2}	MPa		—				≥ 1 140		≥ 1 140			
14	T Strength	R _m	MPa		—				1 200 ≤ R _m ≤ 1 400		1 200 ≤ R _m ≤ 1 400			
15	Elongation	A	%		—				≥ 10		≥ 10			
16	Reduction of area	Z	%		—				≥ 50		≥ 45			
17	Hardness		≤ 363 HB				38 ≤ HRC ≤ 43		38 ≤ HRC ≤ 43					
18	Shear strength	R _c	MPa		—				—		—			
19	Bending	k	—		—				—		—			
20	Impact strength		—				KV ≥ 40J; Notch direction T		KV ≥ 20J; Notch direction T					
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)		—											

34	Grain size	—	See EN 4700-002.		
			Dimensions (mm)	Grain size number	% of area
			a or $D \leq 80$	$G \geq 5$	≥ 95
				$3 \leq G \leq 5$	≤ 5
				$G < 3$	Not acceptable
			$80 < \text{or } D < 150$	$G \geq 4$	≥ 95
				$3 \leq G \leq 4$	≤ 5
$G < 3$	Not acceptable				
44	External defects	—	See EN 2157-3.		
61	Internal defects	—	See EN 2157-3.		
82	Batch uniformity	—	See EN 2157-3.		
<p>iTeh STANDARD PREVIEW (standards.iteh.ai)</p> <p>SIST EN 3470:2019 https://standards.iteh.ai/catalog/standards/sist/6879348f-e611-4d66-9523-954878809663/sist-en-3470-2019</p>					
95	Marking inspection	—	See EN 2157-3.		
96	Dimensional inspection	—	See EN 2157-3.		
98	Notes	—	—		
99	Typical use	—	—		