SLOVENSKI STANDARD
SIST EN 4244:2020

01-maj-2020

Aeronavtika - Toplotno odporna zlitina FE-PM1708 - Obločno pretaljeno v vakuumu - Utrjeno in mehko žarjeno - Palica - a ali D ≤ 200 mm - 1000 MPa ≤ Rm 1140 MPa

Aerospace series - Heat resisting alloy FE-PM1708 - Vacuum arc remelted - Hardened and tempered - Bar - a or D ≤ 200 mm - 1000 MPa ≤ Rm 1140 MPa

Luft- und Raumfahrt - Hochwarmfeste Legierung FE-PM1708 - Lichtbogenvakuumerschmolzen - Gehärtet und angelassen - Stangen - a oder D ≤ 200 mm - 1000 MPa ≤ Rm ≤ 1140 MPa

Série aérospatiale - Alliage résistant à chaud FE-PM1708 - Refondu sous vide par arc - Trempé et revenu - Barres - a ou D ≤ 200 mm - 1000 MPa ≤ Rm 1140 MPa

Ta slovenski standard je istoveten z: **EN 4244:2020**

ICS:

49.025.99	Drugi materiali	Other materials

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN 4244

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English Version

Aerospace series - Heat resisting alloy FE-PM1708 - Vacuum arc remelted - Hardened and tempered - Bars - a or D ≤ 200 mm - 1 000 MPa ≤ Rm ≤ 1 140 MPa

Série aérospatiale - Alliage résistant à chaud FE-PM1708 - Refondu sous vide par arc - Trempé et revenu - Barres - a ou D ≤ 200 mm - 1 000 MPa ≤ Rm ≤ 1 140 MPa

Luft- und Raumfahrt - Hochwarmfeste Legierung FE-PM1708 - Lichtbogenvakuumerschmolzen - Gehärtet und angelassen - Stangen - a oder D ≤ 200 mm - 1 000 MPa ≤ Rm ≤ 1 140 MPa

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

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

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European foreword

This document (EN 4244:2020) 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of an identical text or by endorsement, at the latest by August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

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.

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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 4500-003.

1 Scope

This document specifies the requirements relating to:

Heat resisting alloy FE-PM1708
Vacuum arc remelted
Hardened and tempered
Bars
a or $D \leq 200$ mm
1 000 MPa ≤ R_m ≤ 1 140 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 2344, *Aerospace series — Round bars, machined in heat resisting alloys — Diameter 10 mm ≤ D ≤ 180 mm — Dimensions*

EN 2600, *Aerospace series — Designation of metallic semi-finished products — Rules*

EN 4700-002, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 002: Bar and section* [1)]

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:

- ISO Online browsing platform: available at http://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

4 Requirements

See Table 1.

1) Published as ASD-STAN Standard at the date of publication of this document by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN), http://www.asd-stan.org/

Table 1 — Requirements for heat resisting alloy FE-PM1708

1	Material designation		Heat resisting alloy FE-PM1708														
2	Chemical composition %	Element	C	Si	Mn	P	S	B	Co	Cr	Mo	Nb	Ni	N_2	V	$\frac{Nb+2V}{9C}$	Fe
		min.	0,060	0,10	0,60	—	—	40*)	5,00	9,80	0,50	0,20	0,20	0,010	0,10	—	Base
		max.	0,11	0,70	1,15	0,030	0,020	120*)	7,00	11,2	1,00	0,48	0,80	0,035	0,35	1,40	
3	Method of melting		Vacuum arc remelted														
4.1	Form		Bars														
4.2	Method of production		—														
4.3	Limit dimension(s)	mm	a or $D \leq 200$														
5.1	Technical specification		EN 4700-002														
5.2	Dimensional standards		EN 2344														

6.1	Delivery condition	Softened and descaled	Hardened and tempered, machined, ground or descaled
	Heat treatment	720 °C ≤ θ ≤ 760 °C/t ≥ 2 h/AC	1 170 °C ± 10 °C/t ≥ 30 min/OQ + 610 °C ± 5 °C/2 h ≤ t ≤ 5 h/AC + 610 °C ≤ θ ≤ 640 °C/2 h ≤ t ≤ 5 h/AC
6.2	Delivery condition code	*A*	*U*
7	Use condition	Hardened and tempered, machined, ground or descaled	Delivery condition
	Heat treatment	1 170 °C ± 10 °C/t ≥ 30 min/OQ + 610 °C ± 5 °C/2 h ≤ t ≤ 5 h/AC + 610 °C ≤ θ ≤ 640 °C/2 h ≤ t ≤ 5 h/AC	—

Characteristics

8.1	Test sample(s)				—	—	
8.2	Test piece(s)				—	—	
8.3	Heat treatment				Softened and descaled	Use condition	
9	Dimensions concerned			mm	a or $D \leq 200$	a or $D \leq 125$	a or $D > 125$
10	Thickness of cladding on each face			%	—		
11	Direction of test piece				—	*L*	*T*
12	T	Temperature	θ	°C	—	Ambient	Ambient
13	T	Proof stress	$R_{p0,2}$	MPa	—	≥ 880	≥ 880
14	T	Strength	R_m	MPa	—	1 000 ≤ R_m ≤ 1 140	1 000 ≤ R_m ≤ 1 140
15	T	Elongation	A	%	—	≥ 12	≥ 8
16	T	Reduction of area	Z	%	—	≥ 40	≥ 30
17	Hardness		HB		≤ 277	321 ≤ HB ≤ 352	321 ≤ HB ≤ 352
18	Shear strength		R_c	MPa	—	—	
19	Bending		k	—	—	—	
20	Impact strength		—	J	—	—	
21	C	Temperature	θ	°C	—	590	
22	C	Time		h	—	t_R ≥ 60	
23	C	Stress	σ_a	MPa	—	—	
24	C	Elongation	a	%	—	—	
25	C	Rupture stress	σ_R	MPa	—	400	
26	C	Elongation at rupture	A	%	—	—	
27	Notes (see line 98)				*)		

30	Microstructure	—	See EN 4700-002
		7	The δ ferrite content shall not exceed 5 %
44	External imperfections (visual testing – VT)	—	See EN 4700-002
		1	Visual testing (VT)
61	Internal imperfections ultrasonic testing – UT)	—	See EN 4700-002
		7	Class 3
97	Designation	—	See EN 2600
98	Notes	—	*) p.p.m.
99	Typical use	—	—

100	Product qualification	—	See EN 4700-002
			Qualification programme to be agreed between manufacturer and purchaser.