SLOVENSKI STANDARD
SIST EN 3510:2019

01-december-2019

Aeronavtika - Toplotno odporna zlitina FE-PA2602 (X4NiCrTiMoV26-15) - Topilno žarjena in izločevalno utrjena - Palice in profili - De ≤ 100 mm

Aerospace series - Heat resisting alloy FE-PA2602 (X4NiCrTiMoV26-15) - Solution treated and precipitation treated - Bar and section - De ≤ 100 mm

Luft- und Raumfahrt - Hochcarmfeste Legierung FE-PA2602 (X4NiCrTiMoV26-15) - Lösungsgeglüht und ausgehärtet - Stangen und Profile - De ≤ 100 mm

Série aérospatiale - Alliage résistant à chaud FE-PA2602 (X4NiCrTiMoV26-15) - Mis en solution et précipité - Barres et profilés - De ≤ 100 mm

Ta slovenski standard je istoveten z: **EN 3510:2019**

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49.025.05	Železove zlitine na splošno	Ferrous alloys in general

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Aerospace series - Heat resisting alloy FE-PA2602 (X4NiCrTiMoV26-15) - Solution treated and precipitation treated - Bars and sections - De ≤ 100 mm

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

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European foreword

This document (EN 3510:2019) 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of an identical text or by endorsement, at the latest by March 2020, and conflicting national standards shall be withdrawn at the latest by March 2020.

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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 4500-005.

1 Scope

This document specifies the requirements relating to:

Heat resisting alloy FE-PA2602 (X4NiCrTiMoV26-15)
Solution treated and precipitation treated
Bars and sections
$D_e \leq 100$ mm

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 2043, *Aerospace series — Metallic materials — General requirements for semi-finished product qualification (excluding forgings and castings)*

EN 3235-3, *Aerospace series —Heat resisting alloys — Wrought products — Technical specification — Part 3: 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 standard by AeroSpace and Defence industries Association of Europe - Standardization (ASD-STAN), http://www.asd-stan.org/

Table 1 — Requirements for heat resisting alloy FE-PA2602 (X4NiCrTiMoV26-15)

1	Material designation		Heat resisting alloy FE-PA2602 (X4NiCrTiMoV26-15)													
2	Chemical composition %	Element	C	Si	Mn	P	S	Al	B	Cr	Mo	Ni	Ti	V	Pb	Fe
		min.	–	–	–	–	–	–	30 *)	13,5	1,00	24,0	1,70	0,10	–	Base
		max.	0,060	0,50	2,00	0,020	0,015	0,35	100 *)	16,0	1,50	27,0	2,00	0,50	20 *)	
3	Method of melting		Consumable electrode remelted													
4.1	Form		Bars and sections													
4.2	Method of production		Wrought													
4.3	Limit dimension(s)	mm	$De \leq 100$													
5	Technical specification		EN 3235-3													

6.1	Delivery condition	Solution treated	Solution and precipitation treated
	Heat treatment	$\boldsymbol{q}$ = 980 °C ± 10 °C/t ≥ 14 h/AC	$\boldsymbol{q}$ = 980 °C ± 10 °C/t ≥ 14 h/AC + $\boldsymbol{q}$ = 720 °C ± 10 °C [a]/t = 16 h/AC
6.2	Delivery condition code	W	U
7	Use condition	Solution and precipitation treated	Solution and precipitation treated
	Heat treatment	Delivery condition + $\boldsymbol{q}$ = 720 °C ± 10 °C [a]/t = 16 h/AC	Delivery condition

					Characteristics
8.1	Test sample(s)				EN 3235-3
8.2	Test piece(s)				EN 3235-3
8.3	Heat treatment				Use condition
9	Dimensions concerned			mm	$D_e \leq 100$
10	Thickness of cladding on each face			%	–
11	Direction of test piece				EN 3235-3
12	T	Temperature	θ	°C	Ambient temperature
13	T	Proof stress	$R_{p0,2}$	MPa	≥ 580
14	T	Strength	R_m	MPa	≥ 850
15	T	Elongation	A	%	≥ 20
16	T	Reduction of area	Z	%	–
17	Hardness				≥ 235 HB
18	Shear strength		R_c	MPa	–
19	Bending		k	–	–
20	Impact strength				–
21	C	Temperature	θ	°C	650 [b]
22	C	Time		h	$t_R \geq 30$
23	C	Stress	σ_a	MPa	–
24	C	Elongation	a	%	–
25	C	Rupture stress	σ_R	MPa	410
26	C	Elongation at rupture	A	%	≥ 3,5
27	Notes (see line 98)				*, a , b

34	Grain size	–	EN 3235-3
		7	G ≥ 5, 3 ≤ G ≤ 5 accepted up to 5 % max. area
44	External defects	–	EN 3235-3
		1	Only visual testing (VT) is required.
51	Macrostructure	–	EN 3235-3
		7	To be defined on the order
61	Internal defects	–	EN 3235-3
		7	Class 2
96	Marking inspection	–	EN 3235-3
97	Dimensional inspection	–	EN 3235-3
98	Notes	–	* p.p.m a Heat from q = 550 °C to q = 720 °C in a minimum of 1 h. b Combined notched-unnotched test piece. The rupture shall occur in the unnotched section.
99	Typical use	–	–