SLOVENSKI STANDARD
SIST EN 2221:2018

01-marec-2018

Aeronavtika - Jeklo FE-PL31 - Utrjeno in mehko žarjeno - Votle palice - 3,5 mm ≤ a ≤ 55 mm

Aerospace series - Steel FE-PL31 - Hardened and tempered - Hollow bars - 3,5 mm ≤ a ≤ 55 mm

Luft- und Raumfahrt - Stahl FE-PL31 - Gehärtet und Angelassen - Profilrohre - 3,5 mm ≤ a ≤ 55 mm

Série aérospatiale - Acier FE-PL31 - Trempé et revenu - Ébauches tubulaires - 3,5 mm ≤ a ≤ 55 mm

Ta slovenski standard je istoveten z: **EN 2221:2017**

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49.025.10	Jekla	Steels

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English Version

Aerospace series - Steel FE-PL31 - Hardened and tempered - Hollow bars - 3,5 mm ≤ a ≤ 55 mm

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Luft- und Raumfahrt - Stahl FE-PL31 - Gehärtet und Angelassen - Profilrohre - 3,5 mm ≤ a ≤ 55 mm

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 2221:2017) 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of an identical text or by endorsement, at the latest by June 2018 and conflicting national standards shall be withdrawn at the latest by June 2018.

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Introduction

This European 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 European Standard has been prepared in accordance with EN 4500-005.

1 Scope

This European Standard specifies the requirements relating to:

Steel FE-PL31
Hardened and tempered
Hollow bars
3,5 mm≤ *a* ≤ 55 mm

for aerospace applications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 steels*

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

3 Requirements

See Table 1.

Table 1 — Requirements for steel FE-PL31

1	Material designation		Steel FE-PL31							
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni
		min.	0,95	0,15	0,25	–	–	1,35	–	–
		max.	1,10	0,35	0,45	0,030	0,020	1,65	–	0,40
3	Method of melting		Air melted							
4.1	Form		–							
4.2	Method of production		Hollow bars							
4.3	Limit dimension(s)	mm	3,5 mm ≤ a ≤ 55 mm							
5	Technical specification		EN 4500-005							

6.1	Delivery condition	Spherodised and cold rolled	Spherodised	Hardened and tempered	Softened or hardened and tempered
	Heat treatment	–	–	830 °C ≤ θ ≤ 870 °C/OQ then 150 °C ≤ θ ≤ 190 °C Temper	–
6.2	Delivery condition code	–	–	–	–
7	Use condition	Hardened and tempered		Hardened and tempered	Hardened and tempered
	Heat treatment	Delivery condition then 830 °C ≤ θ ≤ 870 °C/OQ and then 150 °C ≤ θ ≤ 190 °C Temper		Delivery condition	830 °C ≤ θ ≤ 870 °C/OQ then 150 °C ≤ θ ≤ 190 °C Temper

			Characteristics			
8.1	Test sample(s)		–	–	–	Disc: a = 10 mm
8.2	Test piece(s)		–	–	–	Reference [a]
8.3	Heat treatment		See line 6.1.	See line 6.1.	Hardened and tempered	See line 29.
9	Dimensions concerned	mm	3,5 ≤ a ≤ 22	6 ≤ a ≤ 55	3,5 ≤ a ≤ 55	3,5 ≤ a ≤ 55
10	Thickness of cladding on each face	%	–			
11	Direction of test piece		–			
12	T Temperature	θ °C	–			
13	T Proof stress	$R_{p0,2}$ MPa*	–			
14	T Strength	R_m MPa*	–			
15	T Elongation	A %	–			
16	T Reduction of area	Z %	–			
17	Hardness		HV ≤ 309	HV ≤ 218	HV ≥ 740 [b] HRC ≥ 61	HV ≥ 740 [b] HRC ≥ 61
18	Shear strength	R_c MPa*	–			
19	Bending	k –	–			
20	Impact strength		–			
21	C Temperature	θ °C	–			
22	C Time	h	–			
23	C Stress	σ_a MPa*	–			
24	C Elongation	a %	–			
25	C Rupture stress	σ_R MPa*	–			
26	C Elongation at rupture	A %	–			
27	Notes (see line 98)		*, a, b			

28	–	–	–
29	Reference heat treatment	–	Hardened and tempered 830 °C ± 10 °C / OQ then temper 180 °C ± 5 °C
30	Microstructure	–	Carbides shall be fine and non-aligned
95	Marking inspection	–	–
96	Dimensional inspection	–	–
98	Notes	–	* 1 MPa = 1 N/mm². a Optional test. b Method to be used in case of conflict.
99	Typical use	–	Bearings