SLOVENSKI STANDARD
SIST EN 2541:2018

01-oktober-2018

Aeronavtika - Jeklo FE-PA18 - Poboljšano in hladno vlečeno - Vzmetna žica - D ≤ 4,0 mm

Aerospace series - Steel FE-PA18 - Quenched and cold drawn - Wire for spring - D ≤ 4,0 mm

Luft- und Raumfahrt - Stahl FE-PA18 - Abgeschreckt und kaltgezogen - Drähte für Feder - D ≤ 4,0 mm

Série aérospatiale - Acier FE-PA18 - Trempé et étiré à froid - Fils pour ressort - D ≤ 4,0 mm

Ta slovenski standard je istoveten z: **EN 2541:2018**

ICS:

49.025.10	Jekla	Steels
77.140.25	Vzmetna jekla	Spring steels

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EUROPEAN STANDARD

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English Version

Aerospace series - Steel FE-PA18 - Quenched and cold drawn - Wire for spring - D ≤ 4,0 mm

Série aérospatiale - Acier FE-PA18 - Trempe et étiré à froid - Fils pour ressort - D ≤ 4,0 mm

Luft- und Raumfahrt - Stahl FE-PA18 - Abgeschreckt und kaltgezogen - Drähte für Feder - D ≤ 4,0 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 2541:2018) 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of an identical text or by endorsement, at the latest by February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

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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-PA18
Quenched and cold drawn
Wire for spring
$D \leq 4{,}0$ 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 2032-001, *Aerospace series — Metallic materials — Part 001: Conventional designation*

EN 2032-2, *Aerospace series — Metallic materials — Part 2: Coding of metallurgical condition in delivery condition*

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 4700-004, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 004: Wire*

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

The requirements for steel FE-PA18 are given in Table 1.

Table 1 — Requirements for steel FE-PA18

1	Material designation		Steel FE-PA18							
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Ni	Fe
		min.	–	–	–	–	–	17,0	7	Rem.
		max.	0,15	1,5	2,0	0,035	0,025	20,0	10	
3	Method of melting		Air melted							
4.1	Form		Wire for spring							
4.2	Method of production		Cold drawn							
4.3	Limit dimension(s)	mm	$D \leq 4{,}0$ mm							
5	Technical specification		EN 4700-004							

6.1	Delivery condition	Quenched and cold drawn
	Heat treatment	1 050 °C ≤ θ ≤ 1 100 °C/WQ or AQ + Cold drawn
6.2	Delivery condition code	U
7	Use condition	–
	Heat treatment	As delivered

Characteristics

8.1	Test sample(s)			–						
8.2	Test piece(s)			–						
8.3	Heat treatment			In the delivery condition						
9	Dimensions concerned		mm*	≤ 0,2	0,2 < D ≤ 0,4	0,4 < D ≤ 0,7	0,7 < D ≤ 1,0	1,0 < D ≤ 2,8	2,8 < D ≤ 4,0	
10	Thickness of cladding on each face		%	–						
11	Direction of test piece			–						
12	T	Temperature	θ	°C	Ambient					
13		Proof stress	$R_{p0,2}$	MPa*	–					
14		Strength	R_m	MPa*	2 150 ≤ R_m ≤ 2 400	2 050 ≤ R_m ≤ 2 350	1 950 ≤ R_m ≤ 2 250	1 850 ≤ R_m ≤ 2 150	1 550 ≤ R_m ≤ 1 850	1 450 ≤ R_m ≤ 1 800
15		Elongation	A	%	–					
16		Reduction of area	Z	%	–					
17	Hardness				–					
18	Shear strength		R_c	MPa*	–					
19	Bending		k	–	–					
20	Impact strength				–					
21	C	Temperature	θ	°C	–					
22		Time		h	–					
23		Stress	σ_a	MPa*	–					
24		Elongation	a	%	–					
25		Rupture stress	σ_R	MPa*	–					
26		Elongation at rupture	A	%	–					
27	Notes (see line 98)				*					

28	–	–	–
36	Reverse torsion test for wires	–	$r = 3 \times D$: Reverse bend number $N_b = 5$ for 0,7 mm ≤ De ≤ 4,0 mm
43	Wrapping test for wires	–	A sample of 500 mm in length in wrapped in closely spaced turns around a pin of a diameter being three (3) times the nominal diameter of the wire but at least 1 mm. The spring produced in this way shall be expanded successively to five (5) times and 10 times its original length. After elastic recovery the turns shall be regularly spaced and no splinters or cracks shall be found.
		–	For wire D > 1,5 mm in diameter at least three (3) samples (per lot) 100 times the diameter in length are twisted two (2) turns in one (1) direction and two (2) turns backwards. Thereafter no splits or other imperfections shall be found with the nacked eye.
95	Marking inspection	–	–
96	Dimensional inspection	–	–
98	Notes	–	* 1 MPa = 1 N/m².
99	Typical use	–	Locking pins for turnbuckles of control cables, springs.