Aerospace series - Steel FE-PM1802 (X5CrNiCu15-5) - Consumable electrode remelted - Solution treated and precipitation treated - Bar for machining - a or D ≤ 200 mm – Rm ≥ 1 310 Mpa

Aerospace series - Steel FE-PM1802 (X5CrNiCu15-5) - Consumable electrode remelted - Solution treated and precipitation treated - Bar for machining - a or D ≤ 200 mm – Rm ≥ 1 310 Mpa

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 2821:2007 sisaldab Euroopa standardi EN 2821:2007 ingliskeelset teksti. Käesolev dokument on jõustatud 31.05.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 2821:2007 consists of the English text of the European standard EN 2821:2007. This document is endorsed on 31.05.2007 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This standard specifies the requirements relating to: Steel FE-PM1802 (X5CrNiCu15-5) Consumable electrode remelted Solution treated and precipitation treated Bar for machining a or D ≤ 200 mm Rm ≥ 1 310 Mpa for aerospace applications.	**Scope:** This standard specifies the requirements relating to: Steel FE-PM1802 (X5CrNiCu15-5) Consumable electrode remelted Solution treated and precipitation treated Bar for machining a or D ≤ 200 mm Rm ≥ 1 310 Mpa for aerospace applications.

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EUROPEAN STANDARD

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English Version

Aerospace series - Steel FE-PM1802 (X5CrNiCu15-5) - Consumable electrode remelted - Solution treated and precipitation treated - Bar for machining - a or D ≤ 200 mm - Rm ≥ 1 310 MPa

Série aérospatiale - Acier FE-PM1802 (X5CrNiCu15-5) - Refondu à l'électrode consommable - Mis en solution et vieilli - Barres pour usinage - a ou D ≤ 200 mm - Rm ≥ 1 310 MPa

Luft- und Raumfahrt - Stahl FE-PM1802 (X5CrNiCu15-5) - Mit selbstverzehrender Elektrode umgeschmolzen - Lösungsgeglüht und ausgelagert - Stangen zur spanenden Bearbeitung - a oder D ≤ 200 mm - Rm ≥ 1 310 MPa

This European Standard was approved by CEN on 5 October 2006.

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 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 Management Centre has the same status as the official versions.

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

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Ref. No. EN 2821:2007: E

Foreword

This document (EN 2821:2007) 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 September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This 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 standard has been prepared in accordance with EN 4500-5.

1 Scope

This standard specifies the requirements relating to:

Steel FE-PM1802 (X5CrNiCu15-5)
Consumable electrode remelted
Solution treated and precipitation treated
Bar for machining
a or $D \leq 200$ mm
$R_m \geq 1\,310$ MPa

for aerospace applications.

2 Normative references

The following referenced documents are indispensable for the application 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).* [1)]

EN 2951, *Aerospace series — Metallic materials — Test method — Micrographic determination of content of non-metallic inclusions*. [1)]

EN 4050-4, *Aerospace series — Test method for metallic materials — Ultrasonic inspection of bars, plates, forging stock and forgings — Part 4: Acceptance criteria.* [1)]

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

EN 4436, *Aerospace series — Steel — Test methods — Determination of δ ferrite content.* [1)]

EN 4500-5, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 5: Specific rules for steels.* [1)]

EN 4700-2, *Aerospace series — Steel and heat resisting alloys — Wrought products — Technical specification — Part 2: Bar and section.* [1)]

1) Published as ASD Prestandard at the date of publication of this standard.

1	Material designation		Steel FE-PM1802 (X5CrNiCu15-5)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Nb + Ta	Fe
		min.	–	–	–	–	–	14,0	–	3,5	2,5	5 × C	Base
		max.	0,07	1,00	1,00	0,030	0,005	15,5	0,50	5,5	4,5	0,45	
3	Method of melting		Consumable electrode remelted										
4.1	Form		Bar										
4.2	Method of production		–										
4.3	Limit dimension(s)	mm	*a* or *D* ≤ 200										
5	Technical specification		EN 4700-2										

6.1	Delivery condition	Solution treated	Solution treated and precipitation treated
	Heat treatment	1 025 °C ≤ θ ≤ 1 055 °C / t ≥ 30 min / AC or faster + cool to θ ≤ 30 °C	1 025 °C ≤ θ ≤ 1 055 °C / t ≥ 30 min / AC or faster + cool to θ ≤ 30 °C + 465 °C ≤ θ ≤ 495 °C / t ≥ 1 h / AC
6.2	Delivery condition code	W	U
7	Use condition	Solution treated and precipitation treated	Delivery condition
	Heat treatment	Delivery condition + 465 °C ≤ θ ≤ 495 °C / t ≥ 1 h / AC	–

Characteristics

8.1	Test sample(s)			See EN 4700-2.				
8.2	Test piece(s)			See EN 4700-2.				
8.3	Heat treatment			Solution treated	Use condition			
9	Dimensions concerned		mm	*a* or *D* ≤ 200	*a* or *D* ≤ 75	75 < *a* or *D* ≤ 200		
10	Thickness of cladding on each face		%	–	–	–		
11	Direction of test piece			–	L	L	T	
12	T	Temperature	θ	°C	–	Ambient	Ambient	Ambient
13	T	Proof stress	$R_{p0,2}$	MPa	–	≥ 1 170	≥ 1 170	≥ 1 170
14	T	Strength	R_m	MPa	–	≥ 1 310	≥ 1 310	≥ 1 310
15	T	Elongation	A	%	–	≥ 9	≥ 7	≥ 5
16	T	Reduction of area	Z	%	–	≥ 35	≥ 25	≥ 15
17	Hardness				HB ≤ 363	388 ≤ HB ≤ 444 or 40 ≤ HRC ≤ 47	388 ≤ HB ≤ 444 or 40 ≤ HRC ≤ 47	
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)				–			