SLOVENSKI STANDARD

SIST EN 4216:2007

01-november-2007

Aeronavtika - Jeklo FE-CM3801 (GX5CrNiCuNb16-4) - Ulitki De <= 50 mm, Rm >= 900 MPa, homogenizirani, obdelani v raztopini in utrjeni

Aerospace series - Steel FE-CM3801 (GX5CrNiCuNb16-4) - Homogenized, solution treated and precipitation hardened, investment casting De <= 50 mm, Rm >= 900 MPa

Luft- und Raumfahrt - Stahl FE-CM3801 (GX5CrNiCuNb16-4) - Diffusionsgeglüht, lösungsgeglüht und ausgelagert, Gußstücke Wachsausschmelzung De <= 50 mm, Rm >= 900 MPa

Série aérospatiale - Acier FE-CM3801 (GX5CrNiCuNb16-4) - Homogénéisé, mis en solution et durci par précipitation - Pieces moulées a la cire perdue De <= 50 mm, Rm >= 900 MPa

Ta slovenski standard je istoveten z: **EN 4216:2007**

ICS:

49.025.10 Jekla Steels

SIST EN 4216:2007 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4216

August 2007

ICS 49.025.10

English Version

Aerospace series - Steel FE-CM3801 (GX5CrNiCuNb16-4) - Homogenized, solution treated and precipitation hardened, investment casting De ≤ 50 mm, Rm ≥ 900 MPa

Série aérospatiale - Acier FE-CM3801 (GX5CrNiCuNb16-4) - Homogénéisé, mis en solution et durci par précipitation - Pièces moulées à la cire perdue De ≤ 50 mm, Rm ≥ 900 MPa

Luft- und Raumfahrt - Stahl FE-CM3801 (GX5CrNiCuNb16-4) - Diffusionsgeglüht, lösungsgeglüht und ausgelagert, Gußstücke Wachsausschmelzung De ≤ 50 mm, Rm ≥ 900 MPa

This European Standard was approved by CEN on 15 March 2007.

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.

CEN members are the national standards bodies of 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 United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 4216:2007: E

Contents

Page

Foreword 3
Introduction 4
1 Scope 4
2 Normative references 4

Foreword

This document (EN 4216:2007) 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 February 2008, and conflicting national standards shall be withdrawn at the latest by February 2008.

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-CM3801 (GX5CrNiCuNb16-4) — Homogenized, solution treated and precipitation hardened, investment casting $D_e \leq 50$ mm, $R_m \geq 900$ 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 2103-3, *Aerospace series — Steel, nickel base and cobalt base alloy remelting stock and castings — Technical specifications — Part 3: Pre-production and production castings*

EN 3484, *Aerospace series — Steel FE-CM61 — As cast — Reference heat treatment: homogenised, solution treated, precipitation hardened and sub zero — Remelting stock*[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)]

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

1	Material designation		Steel FE-CM3801 (GX5CrNiCuNb16-4)									
2	Chemical composition %	Element	C	Si	Mn	P	S	Cr	Ni	Cu	N_2	Nb+Ta	Fe
		min.	–	0,50	–	–	–	15,5	3,60	2,80	–	0,15	Base
		max.	0,06	1,00	0,70	0,04	0,03	16,7	4,60	3,50	0,05	0,40	
3	Method of melting		Air melted										
4.1	Form		Investment casting										
4.2	Method of production		Cast from remelting stock EN 3484										
4.3	Limit dimension(s)	mm	$D_e \leq 50$										
5	Technical specification		EN 2103-3										

6.1	Delivery condition	Homogenized, solution treated and precipitation treated
	Heat treatment	1 150 °C / t = 1 h 30 min / AC or OQ + 1 040 °C / $t \geq$ 30 min / AC or OQ / cool to $\theta \leq$ 20 °C + 590 °C / t = 1 h 30 min / AC
6.2	Delivery condition code	U
7	Use condition	Delivery condition
	Heat treatment	–

Characteristics

8.1	Test sample(s)				Cut from the casting	Separately cast
8.2	Test piece(s)				See EN 2103-3	See EN 2103-3
8.3	Heat treatment				Delivery condition	Delivery condition
9	Dimensions concerned			mm	Wall thickness ≤ 25[a]	Wall thickness ≤ 25[a]
10	Thickness of cladding on each face			%	–	–
11	Direction of test piece				–	–
12	T	Temperature	θ	°C	Ambient	Ambient
13	T	Proof stress	$R_{p0,2}$	MPa	≥ 830	≥ 830
14	T	Strength	R_m	MPa	≥ 900	≥ 900
15	T	Elongation	A	%	≥ 6	≥ 8
16	T	Reduction of area	Z	%	≥ 15	≥ 15
17	Hardness				≥ 30 HRC	
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	

30	Microstructure	1	See EN 4436
		2	One per batch
		3	Test piece appended to casting
		7	Delta ferrite content ≤ 15 %
35	Repair by welding	–	See EN 2103-3
44	External defects	–	See EN 2103-3
61	Internal defects	–	See EN 2103-3
95	Marking inspection	–	See EN 2103-3
96	Dimensional inspection	–	See EN 2103-3
98	Notes	–	[a] For wall thickness > 25 mm, properties to be agreed between manufacturer and purchaser.
99	Typical use	–	–