
Aeronavtika - Toplotno odporna zlitina NiCr19Fe19Nb5Mo3 (2.4668) - Toplotno neobdelana - Material za kovanje - a ali $D \leq 300$ mm

Aerospace series - Heat resisting alloy NiCr19Fe19Nb5Mo3 (2.4668) - Non heat treated - Forging stock - a or $D \leq 300$ mm

Luft- und Raumfahrt - Hochwarmfeste Legierung NiCr19Fe19Nb5Mo3 (2.4668) - Schmiedezustand - Schmiedevormaterial - a oder $D \leq 300$ mm

Série aérospatiale - Alliage résistant à chaud NiCr19Fe19Nb5Mo3 (2.4668) - Non traité - Produits destinés à la forge - a ou $D \leq 300$ mm

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Ta slovenski standard je istoveten z: EN 4377:2015

ICS:

49.025.01 Materiali za letalsko in Materials for aerospace
vesoljsko gradnjo na splošno construction in general

SIST EN 4377:2015

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EUROPEAN STANDARD

EN 4377

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2015

ICS 49.025.01

English Version

Aerospace series - Heat resisting alloy
NiCr19Fe19Nb5Mo3 (2.4668) - Non heat treated - Forging
stock - a or D ≤ 300 mm

Série aérospatiale - Alliage résistant à chaud
NiCr19Fe19Nb5Mo3 (2.4668) - Non traité - Produits
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Luft- und Raumfahrt - Hochwarmfeste Legierung
NiCr19Fe19Nb5Mo3 (2.4668) - Schmiedezustand -
Schmiedevormaterial - a oder D ≤ 300 mm

This European Standard was approved by CEN on 8 November 2014.

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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

Contents

	Page
European foreword	3
Introduction	4
1 Scope.....	4
2 Normative references.....	4

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European foreword

This document (EN 4377:2015) 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 European 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of an identical text or by endorsement, at the latest by March 2016, and conflicting national standards shall be withdrawn at the latest by March 2016.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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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 4500-003.

1 Scope

This European Standard specifies the requirements relating to:

Heat resisting alloy NiCr19Fe19Nb5Mo3 (2.4668)
Non heat treated
Forging stock
 a or $D \leq 300$ 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 2043, *Aerospace series — Metallic materials — General requirements for semi-finished product qualification (excluding forgings and castings)*

prEN 2860-02, *Aerospace series — Heat resisting alloys — Forging stock and forgings — Technical specification — Part 2: Forging stock*¹⁾

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

EN 4500-003, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 003: Specific rules for heat resisting alloys*

1) Published as ASD-STAN Prestandard at the date of publication of this standard (www.asd-stan.org).

1	Material designation	Heat resisting alloy NiCr19Fe19Nb5Mo3 (2.4668)										
2	Chemical composition %	Element	C	Si	Mn	P	S	Al	B	Co	Cr	Cu
		min.	0,02	–	–	–	–	0,20	20 *)	–	17,0	–
		max.	0,080	0,35	0,35	0,015	0,015	0,80	60 *)	1,00	21,0	0,30
		Element	Fe	Mg	Mo	Nb+Ta	Ti	Ag	Bi	Ca	Pb	Ni
		min.	16,5	–	2,80	4,80	0,70	–	–	–	–	Base
max.	20,5	0,010	3,30	5,50	1,15	5 *)	1 *)	0,010	5 *)			
3	Method of melting	Consumable electrode remelted										
4.1	Form	Forging stock										
4.2	Method of production	–										
4.3	Limit dimension(s)	mm	a or $D \leq 300$									
5	Technical specification	prEN 2860-02										

6.1	Delivery condition	Non heat treated										
	Heat treatment	–										
6.2	Delivery condition code	U										
7	Use condition	Delivery condition										
	Heat treatment	–										

Characteristics

8.1	Test sample(s)	See prEN 2860-02										
8.2	Test piece(s)	See prEN 2860-02										
8.3	Heat treatment	See line 29										
9	Dimensions concerned	mm	SIST EN 4377:2015 $D_e \leq 200$									
10	Thickness of cladding on each face	%	https://standards.iteh.ai/catalog/standards/sist/1815859f-862d-412d-a811-2d9ecc9a577a/sist-en-4377-2015									
11	Direction of test piece	L 1)					LT 1)					
12	Temperature	θ	°C	Ambient		650		Ambient		650		
13	Proof stress	$R_{p0,2}$	MPa	1 035		860		1 035		860		
14	Strength	R_m	MPa	1 270		1 000		1 240		960		
15	Elongation	A	%	≥ 10		≥ 9		≥ 10		≥ 9		
16	Reduction of area	Z	%	≥ 15		≥ 15		≥ 8		≥ 8		
17	Hardness	≥ 331 HB										
18	Shear strength	R_c	MPa	–								
19	Bending	k	–	–								
20	Impact strength	–										
21	Temperature	θ	°C	650 2)								
22	Time		h	$t_R \geq 23$								
23	Stress	σ_a	MPa	–								
24	Elongation	a	%	–								
25	Rupture stress	σ_R	MPa	690								
26	Elongation at rupture	A	%	≥ 5								
27	Notes (see line 98)	*) 1) 2)										

EN 4377:2015 (E)

29	Reference heat treatment	–	Solution treated and precipitation treated $940\text{ °C} \leq \theta \leq 980\text{ °C}/t = 1/\text{AC}$ or faster $+ \theta = 720\text{ °C} \pm 10\text{ °C}/t = 8\text{ h}/\text{FC}$ at $50\text{ °C per h} \leq \theta \leq 60\text{ °C per h}$ ³⁾ to $\theta = 620\text{ °C} \pm 10\text{ °C}/t = 8\text{ h}/\text{AC}$
44	External defects	–	See prEN 2860-02.
51	Macrostructure	–	See prEN 2860-02.
		7	No harmful defects.
61	Internal defects	–	See prEN 2860-02.
		7	Class 3
			<p>iTeh STANDARD PREVIEW (standards.iteh.ai)</p> <p><u>SIST EN 4377:2015</u> https://standards.iteh.ai/catalog/standards/sist/1815859f-862d-412d-a811-2d9ecc9a577a/sist-en-4377-2015</p>
95	Marking inspection	–	See prEN 2860-02.
96	Dimensional inspection	–	See prEN 2860-02.
98	Notes	–	*) p.p.m. ¹⁾ If test results in LT direction are successful, L test direction is not requested. ²⁾ Combined notched-unnotched test piece. ³⁾ If the rate of furnace cooling is outside this range then the precipitation time at $620\text{ °C} \pm 10\text{ °C}$ shall be increased to $\geq 18\text{ h}$.
99	Typical use	–	–