SLOVENSKI STANDARD
SIST EN 4627:2014

01-julij-2014

Nadomešča:
SIST EN 4627:2008

Aeronavtika - Jeklo X4CrNiMo16-5-1 (1.4418) - Taljeno - Utrjeno in mehko žarjeno - Izkovki - De =< 200 mm - 1150 MPa =< Rm =< 1300 MPa

Aerospace series - Steel X4CrNiMo16-5-1 (1.4418) - Air melted - Hardened and tempered - Forgings - De ≤ 200 mm - 1 150 MPa ≤ Rm ≤ 1 300 MPa

Luft und Raumfahrt - Stahl X4CrNiMo16-5-1 (1.4418) - Lufterschmolzen - Gehärtet- und angelassen - Schmiedestücke - De ≤ 200 mm - 1 150 MPa ≤ Rm ≤ 1 300 MPa

Série aérospatiale - Acier X4CrNiMo16-5-1 (1.4418) - Élaboré à l'air - Trempé et revenu - Pièces forgées - De ≤ 200 mm - 1 150 MPa ≤ Rm ≤ 1 300 MPa

Ta slovenski standard je istoveten z: **EN 4627:2014**

ICS:

49.025.10	Jekla	Steels

SIST EN 4627:2014 **en,fr,de**

EUROPEAN STANDARD
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EN 4627

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English Version

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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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Foreword

This document (EN 4627:2014) 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of an identical text or by endorsement, at the latest by October 2014, and conflicting national standards shall be withdrawn at the latest by October 2014.

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This document will supersede EN 4627:2007.

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.

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 4500-005.

1 Scope

This standard specifies the requirements relating to:

Steel X4CrNiMo16-5-1 (1.4418)
Air melted
Hardened and tempered
Forgings
$D_e \leq 200$ mm
1 150 MPa ≤ R_m ≤ 1 300 MPa

for aerospace applications.

NOTE Other common designation:
AIR: Z 8 CND 17-04.

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 2950, *Aerospace series - Test method - Wrought heat resisting alloys Semi-finished products and parts - Conditions for macrographic and micrographic examination - Atlas of structures and defects*

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*

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 4629, *Aerospace series - Steel X4CrNiMo16-5-1 (1.4418) - Air melted - Softened - Forging stock - De ≤ 300 mm*

EN 4700-006, *Aerospace series - Steel and heat resisting alloys - Wrought products - Technical specification - Part 006: Pre-production and production forgings*

EN ISO 643, *Steels - Micrographic determination of the apparent grain size (ISO 643:2012)*

AMS 2315, *Determination of delta ferrite content* [2)]

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

2) Published as SAE National (US) Society of Automotive Engineers (http://www.sae.org/).

1	Material designation		Steel X4CrNiMo16-5-1 (1.4418)									
2	Chemical composition %	Element	C	Si	Mn [a]	P [b]	S [b]	N	Cr	Mo	Ni	Fe
		min.	–	–	–	–	–	0,020	15,00	0,80	4,00	Base
		max.	0,06	0,70	1,50	0,030	0,005	–	17,00	1,50	6,00	
3	Method of melting		Air melted									
4.1	Form		Forgings									
4.2	Method of production		Forged from forging stock EN 4629									
4.3	Limit dimension(s) mm		$D_e \leq 200$									
5	Technical specification		EN 4700-006									

6.1	Delivery condition	Annealed	Hardened + Tempered
	Heat treatment	–	1 010 °C ≤ θ ≤ 1 060 °C / OQ or WQ [c] + Tempered 375 °C ≤ θ ≤ 405 °C [d]
6.2	Delivery condition code	A	U
7	Use condition	Hardened and tempered	Delivery condition
	Heat treatment	Delivery condition + 1 010 °C ≤ θ ≤ 1 060 °C / OQ or WQ [b] + Tempered 375 °C ≤ θ ≤ 405 °C	–

					Characteristics			
8.1	Test sample(s)				EN 4700-006 Procedure A, B, C or D	EN 4700-006 Procedure A or B (separately forged)	EN 4700-006 Procedure C (integral) and Procedure D (machined from forging)	
8.2	Test piece(s)				See EN 4700-006.		See EN 4700-006.	
8.3	Heat treatment				Annealed	Use condition	Use condition	
9	Dimensions concerned			mm	$D \leq 200$	25 ≤ a or $D \leq 30$	$D \leq 200$	
10	Thickness of cladding on each			%	–		–	
11	Direction of test piece				–	L	L	LT
12	T	Temperature	θ	°C	Ambient	Ambient	Ambient	Ambient
13	T	Proof stress	$R_{p0,2}$	MPa	–	≥ 900	≥ 900	
14	T	Strength	R_m	MPa	–	1 150 ≤ R_m ≤ 1 300	1 150 ≤ R_m ≤ 1 300	
15	T	Elongation	A	%	–	≥ 14	≥ 14	≥ 8
16	T	Reduction of area	Z	%	–	–	–	–
17	Hardness				HBW ≤ 293	341 ≤ HBW ≤ 401	341 ≤ HBW ≤ 401	
18	Shear strength		R_c	MPa	–		–	
19	Bending		k	–	–		–	
20	Impact strength		KV	J	–	≥ 100 J at 20 °C Notch direction T ≥ 60 J at − 30 °C Notch direction T	≥ 100 J at 20 °C Notch direction T ≥ 60 J at − 30 °C Notch direction T	≥ 50 J at 20 °C Notch direction L ≥ 20 J at − 30 °C Notch direction L
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	A	%	–			

27	Notes (see line 98)	a, b, c, d

30	Microstructure	–	EN 4700-006
		1	See AMS 2315.
		7	The δ ferrite content shall not exceed 5 %.
34	Grain size	–	EN 4700-006
		1	See EN ISO 643.
		7	G ≥ 5
44	External defects (visual)	–	EN 4700-006
50	Cleanliness/inclusion content (micro cleanness)	–	EN 4700-006
		1	See EN 2951.
		7	Category 2
51	Macrostructure (grain flow)	–	EN 4700-006
		1	See EN 2950.
61	Internal defects	–	EN 4700-006
		1	See EN 4050-4.
		7	Class 4
95	Marking inspection	–	EN 4700-006
96	Dimensional inspection	–	EN 4700-006
98	Notes	–	a Where a more stringent impact strength is required (e.g. ≥ 20 J at − 40 °C direction L and ≥ 50 J at − 40 °C direction T), the maximum Mn content may be increased to 2 % subject to agreement between the customer and the supplier. b For specific welding applications (e.g. high power beam), and after agreement between manufacturer and purchaser, S+P should be equal or less than 0,023 %. c Air quenching may be used for D_e ≤ 20 mm. d The temperature range may be increased subject to agreement between the customer and the supplier.
99	Typical use	–	–