
Aeronavtika - Titan Ti10V2Fe3Al - Drogovi - D < 110 mm - Rm ≥ 1240 MPa

Aerospace series - Titanium Ti10V2Fe3Al - Bars - D < 110 mm - Rm ≥ 1 240 MPa

Luft- und Raumfahrt - Titan Ti10V2Fe3Al - Stangen - D < 110 mm - Rm ≥ 1 240 MPa

Série aérospatiale - Titane Ti10V2Fe3Al - Barres - D < 110 mm - Rm ≥ 1 240 MPa

Ta slovenski standard je istoveten z: EN 4685:2011

[SIST EN 4685:2011](https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011)

<https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011>

ICS:

49.025.30 Titan Titanium

SIST EN 4685:2011 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 4685:2011](#)

<https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 4685

June 2011

ICS 49.025.30

English Version

**Aerospace series - Titanium Ti10V2Fe3Al - Bars - D < 110 mm -
Rm ≥ 1 240 MPa**

Série aérospatiale - Titane Ti10V2Fe3Al - Barres - D < 110
mm - Rm ≥ 1 240 MPa

Luft- und Raumfahrt - Titan Ti10V2Fe3Al - Stangen - D <
110 mm - Rm ≥ 1 240 MPa

This European Standard was approved by CEN on 27 November 2010.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, 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.

[SIST EN 4685:2011](https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011)

<https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents		Page
Foreword.....		3
Introduction.....		4
1	Scope	4
2	Normative references	4

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 4685:2011](https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011)

<https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011>

Foreword

This document (EN 4685:2011) 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 December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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, 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.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 4685:2011](https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011)

<https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011>

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 4500-4.

1 Scope

This European Standard specifies the requirements relating to:

Titanium Ti-10V-2Fe-3Al
Bars
 $D < 110$ mm
 $R_m \geq 1\,240$ MPa

for aerospace applications.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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

EN 2954 (all parts), *Aerospace series — Macrostructure of titanium and titanium alloy wrought products*

EN 3684, *Aerospace series — Test methods — Titanium alloy wrought products — Determination of β transus temperature — Metallographic method*

EN 4050-1, *Aerospace series — Test method for metallic materials — Part 1: General requirements*

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

EN 4500-4, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 4: Specific rules for titanium and titanium alloys*¹⁾

EN 4800-002, *Aerospace series — Titanium and titanium alloys — Technical specification — Part 002: Bar and section*¹⁾

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

1	Material designation		Titanium Ti-10V-2Fe-3Al									
2	Chemical composition %	Element	Al	V	Fe	O	C	N	Y	Other		Ti
			Each	Total								
		min.	2,60	9,00	1,60	–	–	–	–	–	–	–
max.	3,40	11,00	2,20	0,13	0,05	0,05	0,005	0,10	0,30			
3	Method of melting		Vacuum melted. Last melting by consumable electrode									
4.1	Form		Bars									
4.2	Method of production		Hot rolling									
4.3	Limit dimension(s)	mm	< 110									
5	Technical specification		EN 4800-002									
6.1	Delivery condition		Not heat treated									
	Heat treatment		–									
6.2	Delivery condition code		F according to EN 2032-2									
7	Use condition		Solution treated and aged									
	Heat treatment		[33-56] °C below the beta transus / ≥ 1 h / WQ + ≥ 480 °C / ≥ 8 h / AC									

Characteristics

8.1	Test sample(s)		–								
8.2	Test piece(s)		–								
8.3	Heat treatment		Solution treated and aged								
9	Dimensions concerned	mm	≤ 75						75 < D < 110		
10	Thickness of cladding on each face	%	–								
11	Direction of test piece		L			L			T ^a		
12	Temperature	θ	°C		Ambient						
13	Proof stress	R _{p0,2}	MPa		≥ 1 110			≥ 1 110		≥ 1 110	
14	T Strength	R _m	MPa		≥ 1 240			≥ 1 240		≥ 1 240	
15	Elongation	A	%		≥ 4			≥ 4		≥ 4	
16	Reduction of area	Z	%		≥ 10			≥ 10		≥ 8	
17	Hardness		–								
18	Shear strength	R _c	MPa		–						
19	Bending	k	–		–						
20	Impact strength		–								
21	Temperature	θ	°C		–						
22	Time		h		–						
23	C Stress	σ_a	MPa		–						
24	Elongation	a	%		–						
25	Rupture stress	σ_R	MPa		–						
26	Elongation at rupture	A	%		–						
27	Notes (see line 98)		a								

EN 4685:2011 (E)

30	Microstructure	–	[33-56] °C below the beta transus / ≥ 1 h / WQ + ≥ 480 °C / ≥ 8 h / AC			
		7	Shall consist of primary alpha phase in a matrix of aged beta phase. An unbroken continuous alpha phase network along prior beta phase grain boundaries is not acceptable.			
44	External defects	–	See EN 4800-002.			
		6	Visual			
51	Macrostructure	1	See EN 4800-002.			
		7	Delivery condition		Beta transus – 25 °C / 1 h / WQ	
			<i>D</i> mm	Maximum acceptable macrostructure EN 2954		No beta fleck. (No area without primary alpha phase greater than [0,76 × 0,76] mm). Inspection from locations representing the top and the bottom end of each batch.
			≤ 50	2MA2		
$50 < D \leq 110$	2MA3					
61	Internal defects	–	See EN 4800-002.			
		1	EN 4050-1			
		7	Class 5			
86	β -transus temperature	–	See EN 3684.			
<p>iTeh STANDARD PREVIEW (standards.iteh.ai)</p> <p>SIST EN 4685:2011 https://standards.iteh.ai/catalog/standards/sist/4aa450c4-5778-4862-bef8-63451ffcebeb/sist-en-4685-2011</p>						
95	Marking inspection	–	–			
96	Dimensional inspection	–	–			
98	Notes	–	^a Test sample over 55 mm thickness.			
99	Typical use	–	–			