SLOVENSKI STANDARD
SIST EN 4500-004:2014

01-marec-2014

Aeronavtika - Kovinski materiali - Pravila za načrtovanje in predstavljanje standarov za materiale - 004. del: Posebna pravila za titan in titanove zlitine

Aerospace series - Metallic materials - Rules for drafting and presentation of material standards - Part 004: Specific rules for titanium and titanium alloys

Luft- und Raumfahrt - Metallische Werkstoffe - Regeln für das Erstellen und die Gestaltung von Werkstoffnormen - Teil 004: Besondere Regeln für Titan und Titanlegierungen

Série aérospatiale - Matériaux métalliques - Règles pour la rédaction et la présentation des normes de matériaux - Partie 004: Règles spécifiques au titane et aux alliages de titane

Ta slovenski standard je istoveten z: **EN 4500-004:2012**

ICS:

49.025.30 Titan Titanium

SIST EN 4500-004:2014 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4500-004

October 2012

ICS 49.025.30

English Version

Aerospace series - Metallic materials - Rules for drafting and presentation of material standards - Part 004: Specific rules for titanium and titanium alloys

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Ref. No. EN 4500-004:2012: E

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Foreword

This document (EN 4500-004:2012) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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Introduction

This standard is part of the series of EN metallic material standards for aerospace applications. The general organisation of this series is described in EN 4258.

1 Scope

This European Standard specifies the specific rules for the drafting and presentation of titanium and titanium alloy material standards for aerospace applications.

It should be used in conjunction with EN 4500-001.

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 2032-1, *Aerospace series — Metallic materials — Part 1: Conventional designation*

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

EN 4500-001, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards — Part 001: General rules*

EN 4800-001, *Aerospace series — Titanium and titanium alloys — Technical specification — Part 001: Plate, sheet and strip*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4500-001 apply.

4 Rules for drafting and presentation

4.1 Page 1 – Title

4.1.1 General

Use material designation according EN 2032-1.

See EN 4500-001 and Example 1 of this standard.

The following are examples of descriptions which shall be used.

4.1.2 Method of melting

For forging stock and forgings, only the required grade shall be indicated in accordance with EN 4800-001.

For other forms, use one or more of the following terms:

— non consumable electrode vacuum melted;

— consumable electrode vacuum arc melted;

— consumable electrode vacuum arc remelted;

— multiple melted;

— plasma cold hearth melted (P.C.H.M.);

— electron-beam melted.

4.1.3 Form entries

a) sheet, strip, plate;

The terms may be qualified with one of the following terms:

— cold rolled;

— hot rolled.

b) bar;

The term may be qualified with one or more of the following terms:

— rolled;

— extruded;

— forged.

c) section;

The term may be qualified with the following term:

— extruded.

d) tube;

The term may be qualified with one or more of the following terms:

— rolled;

— drawn;

— extruded;

— seamless;

— welded.

e) wire;

The term may be qualified with one or more of the following terms:

— extruded;

— rolled;

— drawn.

f) forging stock;

g) forgings;

h) remelting stock;

i) castings;

The term may be qualified with one or more of the following terms:

— investment;

— rammed graphite mould;

— hot isostatically pressed (hipped).

j) ring;

The term may be qualified with one or more of the following terms:

— rolled;

— forged;

— welded.

4.1.4 Additional information entries

— for structural applications;

— for pressure applications;

— for superplastic forming;

— for machining;

— for forged fasteners;

— for machined fasteners;

— for welding.

4.2 Page 2

See EN 4500-001.

4.3 Page 3

See EN 4500-001 and Example 2 of this standard.

4.4 Page 4

4.4.1 Page 4, line 1: Material designation

See EN 4500-001 and Example 3 of this standard.

4.4.2 Page 4, line 2: Chemical composition

The chemical composition shall be written in accordance with EN 4500-001 and the order of presentation of elements shall conform to the following rules:

— alloy elements in decreasing maximum content order;

— gas elements in decreasing maximum content order;

— trace elements in decreasing maximum content order;

— ratio and/or total elements;

— other elements : each and total.

4.4.3 Page 4, line 3: Method of melting

See EN 4500-001 and Example 3 of this standard, using the terms listed in 4.1.2.

4.4.4 Page 4, line 4.1: Form

See EN 4500-001 and Example 3 of this standard.

4.4.5 Page 4, line 4.2: Method of production

See EN 4500-001 and Example 3 of this standard, using the applicable terms given in 4.1.

4.4.6 Page 4, line 4.3: Limit dimension(s)

See EN 4500-001 and Example 3 of this standard.

4.4.7 Page 4, line 5: Technical specification

See EN 4500-001 and Example 3 of this standard.

4.4.8 Page 4, line 6.1: Delivery condition and Heat treatment

See EN 4500-001 and Example 3 of this standard. Use one or more of the following terms:

- not heat treated;
- annealed;
- solution treated;
- quenched;
- aged;
- cold worked;
- hot isostatically pressed (hipped);
- descaled;
- machined;
- ground;
- pickled;
- stress relieved.

4.4.9 Page 4, line 6.2: Delivery condition code

See EN 4500-001 and Example 3 of this standard.

4.4.10 Page 4, line 7: Use condition and Heat treatment

See EN 4500-001 and Example 3 of this standard. Use the terms given in 4.4.8 or state:

- Delivery condition.

4.4.11 Page 4, line 8.1: Test sample(s)

See EN 4500-001 and Example 3 of this standard.

4.4.12 Page 4, line 8.2: Test piece(s)

See EN 4500-001 and Example 3 of this standard.

4.4.13 Page 4, line 8.3: Heat treatment

See EN 4500-001 and Example 3 of this standard.

4.4.14 Page 4, line 9: Dimensions concerned

See EN 4500-001 and Example 3 of this standard.

4.4.15 Page 4, line 10: Thickness of cladding on each face

Not applicable to titanium and titanium alloys.

4.4.16 Page 4, line 11: Direction of test piece

See EN 4500-001 and Example 3 of this standard.

4.4.17 Page 4, lines 12 to 16: Tensile (T)

See EN 4500-001 and Example 3 of this standard.

4.4.18 Page 4, line 17: Hardness

See EN 4500-001 and Example 3 of this standard.

4.4.19 Page 4, line 18: Shear strength

See EN 4500-001 and Example 3 of this standard.

4.4.20 Page 4, line 19: Bending

See EN 4500-001 and Example 3 of this standard.

4.4.21 Page 4, line 20: Impact strength

See EN 4500-001 and Example 3 of this standard.

4.4.22 Page 4, lines 21 to 26: Creep (C)

See EN 4500-001 and Example 3 of this standard.

4.4.23 Page 4, line 27: Notes (see line 98)

See EN 4500-001 and Example 3 of this standard.

4.5 Page 5, lines 28 to 99

4.5.1 Page 5, line 29: Reference heat treatment

See EN 4500-001 and Example 4 of this standard.

4.5.2 Page 5, lines 30 to 94

The relevant lines shall be completed in accordance with EN 4500-001, see Example 4 of this standard.

4.5.3 Page 5, line 95: Marking inspection

See EN 4500-001 and Example 4 of this standard.

4.5.4 Page 5, line 96: Dimensional inspection

See EN 4500-001 and Example 4 of this standard.