

BS EN 4800-006:2010



BSI Standards Publication

Aerospace series — Titanium and titanium alloys — Technical specification

Part 006: Pre-production and production
forgings

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee ACE/61/-/49, Titanium and its Alloys for Aerospace Purposes.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 53380 8

ICS 49.025.30

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2010.

Amendments issued since publication

Date	Text affected
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 4800-006

November 2010

ICS 49.025.30

English Version

**Aerospace series - Titanium and titanium alloys - Technical
specification - Part 006: Pre-production and production forgings**

Série aérospatiale - Titane et alliages de titane -
Spécification technique - Partie 006: Pièces types et pièces
de série, forgées et matricées

Luft- und Raumfahrt - Titan und Titanlegierungen
Knetzeugnisse - Technische Lieferbedingungen - Teil
006: Ausfallmuster- und Serienschmiedestücke

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Ref. No. EN 4800-006:2010: E

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Foreword

This document (EN 4800-006:2010) 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of an identical text or by endorsement, at the latest by May 2011, and conflicting national standards shall be withdrawn at the latest by May 2011.

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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.

1 Scope

This standard defines the requirements for the ordering, manufacture, testing, inspection and delivery of titanium and titanium alloy pre-production and production forgings. It shall be applied when referred to and in conjunction with the EN material standard unless otherwise specified on the drawing, order or inspection schedule.

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 2002-001, *Aerospace series — Metallic materials — Test methods — Part 001: Tensile testing at ambient temperature*

EN 2002-002, *Aerospace series — Metallic materials — Test methods — Part 002: Tensile testing at elevated temperature*

EN 2002-005, *Aerospace series — Test methods for metallic materials — Part 005: Uninterrupted creep and stress-rupture testing*

EN 2002-16, *Aerospace series — Metallic materials — Test methods — Part 16: Non-destructive testing — Penetrant testing*

EN 2003-009, *Aerospace series — Test methods — Titanium and titanium alloys — Part 009: Determination of surface contamination*

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

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

EN 2078, *Aerospace series — Metallic materials — Manufacturing schedule, inspection schedule, inspection and test report — Definition, general principles, preparation and approval*

EN 2954-002, *Aerospace series — Macrostructure of titanium and titanium alloy wrought products — Part 002: Macrostructure of bar, section, forging stock and forgings*

EN 3114-001, *Aerospace series — Test method — Microstructure of ($\alpha + \beta$) titanium alloy wrought products — Part 001: General requirements*

EN 3114-002, *Aerospace series — Test method — Microstructure of ($\alpha + \beta$) titanium alloy wrought products — Part 002: Microstructure of bars, sections, forging stock and forgings*

EN 3683, *Aerospace series — Test methods — Titanium alloy wrought products — Determination of primary α content — Point count method and line intercept method*

EN 3874, *Aerospace series — Test methods for metallic materials — Constant amplitude force-controlled low cycle fatigue testing*¹⁾

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

EN 3976, *Aerospace series — Titanium and titanium alloys — Test method — Chemical analysis for the determination of hydrogen content*

EN 3987, *Aerospace series — Test methods for metallic materials — Constant amplitude force-controlled high cycle fatigue testing*

EN 3988, *Aerospace series — Test methods for metallic materials — Constant amplitude strain-controlled low cycle fatigue testing* ²⁾

EN 4050-1, *Aerospace series — Test method for metallic materials — Ultrasonic inspection of bars, plates, forging stock and forgings — Part 1: General requirements* ²⁾

EN 4050-4, *Aerospace series — Test method for metallic materials — Ultrasonic inspection of bars, plates, forging stock and forgings — Part 4: Acceptance criteria* ²⁾

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

EN 4259, *Aerospace series — Metallic materials — Definition of general terms* ²⁾

EN 4800-005, *Aerospace series — Titanium and titanium alloys — Technical specification — Par 005: Forging stock*

EN 9100, *Quality Management Systems — Requirements for Aviation, Space and Defense Organizations*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

EN ISO 643, *Steels — Micrographic determination of the apparent grain size (ISO 643:2003)*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2009)*

prEN ISO 6892-2, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature (ISO/DIS 6892-2:2009)*

TR 2410, *Aerospace series — Metallic materials — Relationship between dimensional standards and material standards* ³⁾

AMS 2750, *Pyrometry* ⁴⁾

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 4259 apply.

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

3) Published as ASD-STAN Technical Report at the date of publication of this standard.

4) Published by: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959 USA.

4 Wording of order

The order shall clearly indicate:

- quantities to be supplied;
- dates of delivery;
- material standard number;
- part number;
- delivery condition and metallurgical code of products;
- dimensions and tolerances or reference to an appropriate dimensional standard;
- product designation, when required;
- forwarding address;
- nature and type of packing, if required;
- definition and frequency of any special tests and their retest procedures, if required.

5 Health and safety

Products in the delivery condition shall fulfil the health and safety laws of the area of the country when and where it is to be delivered.

A product safety data sheet shall be available.

6 Technical requirements

6.1 General

The product shall satisfy the requirements of the order, drawing inspection schedule or material standard: see Table 1, line 5.

The order, drawing or inspection schedule shall specify the tests to be performed upon:

- a) pre-forgings for qualification and/or requalification;
- b) serial production forgings for process control testing (Procedure X: see 6.5); and
- c) batch release when cut-up testing or forgings is required.

Unless otherwise specified on the order, drawing or inspection schedule, acceptance criteria for the tests are stated in the material standard, the requirements for each line of which are detailed in Tables 2 and 3 of this technical specification.

Table 2 related to lines 1 to 29 (inclusive) of the material standard and Table 3 relates to lines 30 onwards in which the sub-line format is also used. If a particular test is needed but not shown in a specific line in Tables 2 and 3, the requirement shall be specified on the order, drawing, inspection schedule or material standard.