

Lockbolts, 100° countersunk normal head or protruding head, tension- / sheartype, close tolerance, in titanium alloy TI-P64001, anodized or with aluminium pigmented coating — Collars in titanium TI-P99002 or aluminium alloy 2024 — Metric series — Technical specification

The European Standard EN 4176:2005 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 4176:2005.

The UK participation in its preparation was entrusted to Technical Committee ACE/12, Aerospace fasteners and fastening systems, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 19 and a back cover.

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English Version

Aerospace series - Lockbolts, 100 countersunk normal head or protruding head, tension- / sheartype, close tolerance, in titanium alloy TI-P64001, anodized or with aluminium pigmented coating - Collars in titanium TI-P99002 or aluminium alloy 2024 - Metric series - Technical specification

Série aérospatiale - Rivets à bague sertie, à tête fraisée
100 normale ou à tête cylindrique, à traction ou à
cisaillement, à tolérance serrée, en alliage de titane TI-
P64001, anodisés ou avec revêtement aluminé-organique -
Bagues en titane TI-P99002 ou en alliage d'aluminium
2024 - Série métrique - Spécification technique

Luft- und Raumfahrt - Paßniete, mit 100 normalem
Senkkopf oder Universalkopf, Zug- Schertyp, aus
Titanlegierung TI-P64001, anodisiert oder mit Aluminium
pigmentierter Beschichtung - Ringe aus Titan TI-P99002
oder Aluminiumlegierung 2024 - Metrische Reihe -
Technische Lieferbedingung

This European Standard was approved by CEN on 26 October 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This European Standard (EN 4176:2005) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-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 AECMA, 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 June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

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.

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1 Scope

This standard specifies the characteristics, qualification and acceptance requirements for tension- / sheartype 100° countersunk normal head or protruding head close tolerance lockbolts in titanium alloy TI-P64001, anodized or with aluminium pigmented coating and collars in titanium TI-P99002 or aluminium alloy 2024, metric series, for use as permanent attachment fasteners in shear applications.

It is applicable whenever referenced.

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 4172, *Aerospace series – Lockbolts, protruding head, sheartype, close tolerance, in titanium alloy TI-P64001, anodized, metric series - Classification: 1 100 MPa (at ambient temperature) / 315 °C.*

EN 4173, *Aerospace series – Lockbolts, 100° countersunk normal head, sheartype, close tolerance, in titanium alloy TI-P64001, anodized, metric series – Classification: 1 100 MPa (at ambient temperature) / 315 °C.*

EN 4174, *Aerospace series – Collars, swage locking, sheartype, in aluminium alloy 2024, anodized or chromated, metric series.*

EN 4175, *Aerospace series – Collars, flanged swage locking, sheartype, in titanium TI-P99002, metric series.*

EN 4401, *Aerospace series – Lockbolts, protruding head, sheartype, close tolerance, in titanium alloy TI-P64001, with aluminium pigmented coating, metric series – Classification: 1 100 MPa (at ambient temperature) / 315 °C. ¹⁾*

EN 4402, *Aerospace series – Lockbolts, 100° countersunk normal head, sheartype, close tolerance, in titanium alloy TI-P64001, with aluminium pigmented coating, metric series – Classification: 1 100 MPa (at ambient temperature) / 315 °C. ¹⁾*

EN 9133, *Aerospace series – Quality management systems – Qualification Procedure for aerospace standard parts.*

B46.1:1995, *Surface Texture (Surface Roughness, Waviness, and Lay). ²⁾*

MIL-STD-1916, *Department of defense test method standard – DOD preferred methods for acceptance of product. ³⁾*

NASM1312-8, *Fastener test methods – Method 8 Tensile strength. ⁴⁾*

NASM1312-16, *Fastener test methods – Method 16 Clamping force for installationformed fasteners. ⁴⁾*

NAS 527:1962, *Inspection Procedure for Flush Fasteners. ⁴⁾*

NAS 1413:1997, *Pins and Collars, Swage Locking. ⁴⁾*

1) Published as AECMA Prestandard at the date of publication of this standard.

2) Published by: American Society of Mechanical Engineers (ASME), 3, Park Avenue, New York, NY 10017, USA.

3) Published by: Department of Defense (DOD), the Pentagon, Washington, DC 20301, USA.

4) Published by: Aerospace Industries Association of America, Inc. (AIA), 1250 Eye Street, NW; Suite 1100, Washington, DC 20005, USA.

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply.

3.1

inspection lot

shall consist of finished parts which are of the same part number, fabricated by the same process, that are treated together in one furnace lot from the same heat of material and submitted for manufacturer's inspection of the same time

3.2

crack

a clear crystalline break passing through the grain boundary without inclusion of foreign elements

3.3

seam

open surface defect

3.4

lap

surface defect caused by folding over metal fins or sharp corners and then compressing them into the surface

3.5

nick

surface defect caused by the sharp edge of a cutting element

3.6

gouge

surface defect caused by a scratch

3.7

inclusions

non-metallic particles originating from the material manufacturing process. These particles may be isolated or arranged in strings.

3.8

sampling plan

a plan according to which one or more samples are taken in order to obtain information and possibly to reach a decision

3.9

acceptable quality level

AQL

a quality level which in a sampling plan corresponds to a specified but relatively high probability of acceptance

It is the maximum per cent defective (or the maximum number of defects per hundred units) that, for purposes of sampling inspection can be considered satisfactory as a process average.

4 Quality assurance

4.1 EN 9133

Qualification requirements shall consist of test as specified in Tables 1 and 2. Evidence shall be submitted, satisfactory to the user, that the manufacturer has produced a fastener of the same basic part number (excluding grip designation), diameter and material as those for which quotations are asked. This fastener shall meet the requirements of this specification.