

Inserts, thickwall, self-locking, MJ threads, in heat resisting steel FE-PM3801 (17-4PH) — Technical specification

The European Standard EN 3899:2004 has the status of a
British Standard

ICS 49.030.30

National foreword

This British Standard is the official English language version of EN 3899:2004. It supersedes BS EN 3899:2003, which is withdrawn.

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 the 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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English version

**Aerospace series - Inserts, thickwall, self-locking, MJ threads, in
heat resisting steel FE-PM3801 (17-4PH) - Technical
specification**

Série aérospatiale - Douilles filetées, à paroi renforcée, à
freinage interne, à filetage MJ, en acier résistant à chaud
FE-PM3801 (17-4PH) - Spécification technique

Luft- und Raumfahrt - Gewindeeinsätze, dickwandig,
selbstsichernd, MJ-Gewinde, aus hochwarmfestem Stahl
FE-PM3801 (17-4PH) - Technische Lieferbedingungen

This European Standard was approved by CEN on 11 September 2003.

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 document (EN 3899:2004) 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 May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document supersedes EN 3899:2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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.

1 Scope

This standard specifies the characteristics, qualification and acceptance requirements for self-locking thickwall inserts with MJ threads, in FE-PM3801, for aerospace 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.

- | | |
|-------------|---|
| ISO 2859-1, | <i>Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection</i> |
| ISO 3452, | <i>Non-destructive testing – Penetrant inspection – General principles</i> |
| ISO 4288, | <i>Geometrical Product Specifications (GPS) – Surface texture: Profile method – Rules and procedures for the assessment of surface texture</i> |
| ISO 5855-2, | <i>Aerospace – MJ threads – Part 2: Limit dimensions for bolts and nuts</i> |
| ISO 7481, | <i>Aerospace – Nuts, self-locking, with maximum operating temperature less than or equal to 425 °C – Test methods</i> |
| EN 2638, | <i>Aerospace series – Aluminium alloy 2024-T3, extruded bar and section – $1,2 \leq (a \text{ or } D) \leq 150 \text{ mm}$ with coarse peripheral grain control ¹⁾</i> |
| EN 3906, | <i>Aerospace series – Martensitic corrosion resisting steel FE-PM3801 – Air melted – Solution treated – Bar – $D \leq 50 \text{ mm}$ – For the manufacture of fasteners – $1\,100 \text{ MPa} \leq R_m \leq 1\,300 \text{ MPa}$ ¹⁾</i> |
| EN 4014, | <i>Aerospace series – Inserts, thickwall, self-locking – Design standard</i> |
| EN 4015, | <i>Aerospace series – Inserts, thickwall, self-locking – Installation and removal procedure</i> |
| EN 9133, | <i>Aerospace series – Quality management systems – Qualification procedure for aerospace standard parts ¹⁾</i> |
- ASTM E112-96, *Standard Test Methods for Determining Average Grain Size* ²⁾

3 Terms and definitions

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

3.1

batch

quantity of finished parts, of the same type and same diameter, produced from the same material obtained from the same melt, manufactured in the course of the same production cycle, following the same manufacturing route and having undergone all the relevant heat treatments and surface treatments

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

2) Published by: American Society for Testing and Materials (ASTM), 1916, Race street, Philadelphia, PA 19106, USA

3.2**Inspection lot**

quantity of parts from a single production batch with the same part number which completely defines the part

3.3 Surface discontinuities**3.3.1****crack**

rupture in the material which may extend in any direction and which may be intercrystalline or transcrystalline in character

3.3.2**seam**

open surface defect

3.3.3**lap**

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

3.3.4**inclusions**

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

3.4**test temperature**

ambient temperature, unless otherwise specified

3.5**simple random sampling**

the taking of n items from a population of N items in such a way that all possible combinations of n items have the same probability of being chosen

3.6**critical defect**

defect that, according to judgement and experience, is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the considered product, or that is likely to prevent performance of the function of a major end item

3.7**major defect**

defect other than critical, that is likely to result in a failure or to reduce materially the usability of the considered product for its intended purpose

3.8**minor defect**

defect that is not likely to reduce materially the usability of the considered product for its intended purpose, or that is a departure from established specification having little bearing on the effective use or operation of this product

3.9**sampling plan**

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

3.10**limiting quality (LQ₁₀)**

in a sampling plan, the quality limit which corresponds to a specified 10 % probability of acceptance

3.11

acceptance quality limit (AQL)

a quality limit 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.

3.12

finished thickwall insert

thickwall insert ready for use, inclusive of any possible treatments and/or surface coatings, as specified in the product standard or definition document

3.13

definition document

document specifying all the requirements for finished thick wall inserts

3.14

self-locking torque

torque to be applied to the associated bolt to maintain its movement of rotation in relation to the thickwall insert assembly which is under no axial load and the insert locking zone being completely engaged with the bolt (minimum protrusion of two pitches, including the end chamfer)

3.15

seating torque

tightening torque to be applied to the thickwall insert and bolt assembly to introduce or to increase the axial load in the assembly

3.16

unseating torque

untightening torque to be applied to the thickwall insert and bolt assembly to reduce or remove the axial load in the assembly

3.17

breakaway torque

torque required to start unscrewing the associated bolt with respect to the installed thickwall insert, with the insert locking zone still fully engaged on the bolt, but after the axial load in the assembly has been removed by unscrewing half a turn followed by a halt in rotational movement

4 Quality assurance

4.1 Qualification

EN 9133

Qualification inspections and tests (requirements, methods, numbers of thickwall inserts) are specified in Table 1. They shall be carried out on:

- each type and diameter of thickwall inserts;
- 44 thick wall inserts selected from a single batch by simple random sampling.

The test programme may possibly be reduced, or the qualification be granted without inspection or testing. Any such decision shall be based on the results obtained on similar types and diameters of thickwall inserts provided that the design and manufacturing conditions are identical.

Table 2 indicates the allocation of thickwall insert samples for the inspections and tests.