



SLOVENSKI STANDARD

SIST EN 2943:2001

01-januar-2001

Aerospace series - Inserts, screw thread, helical coil, self-locking - Technical specification

Aerospace series - Inserts, screw thread, helical coil, self-locking - Technical specification

Luft- und Raumfahrt - Draht-Gewindeeinsätze, selbstsichernd - Technische Lieferbedingungen

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Ta slovenski standard je istoveten z: EN 2943:1998

ICS:

49.030.20 Sorniki, vijaki, stebelni vijaki Bolts, screws, studs

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 2943

September 1998

ICS 49.030.30

Descriptors: aircraft industry, screw thread, self-locking screw thread, definition, quality assurance, acceptance testing, specification, characteristic

English version

Aerospace series - Inserts, screw thread, helical coil, self-locking - Technical specification

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This European Standard was approved by CEN on 23 February 1998.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries 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 March 1999, and conflicting national standards shall be withdrawn at the latest by March 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai) Contents list

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1 Scope

This standard specifies the characteristics, qualification and acceptance requirements for self-locking helical coil screw thread inserts in NI-PH2801 or FE-PA3004, with or without surface coating.

It is applicable whenever referenced.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 2859-1	Sampling procedures for inspection by attributes - Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection
ISO 3353	Aerospace - Rolled threads for bolts - Lead and runout requirements
ISO 3534-1977	Statistics - Vocabulary and symbols
ISO 4288	Rules and procedures for the measurement of surface roughness using stylus instruments
ISO 5855-2	Aerospace - MJ threads - Part 2: Limit dimensions for bolts and nuts
EN 2398	Heat resisting steel FE-PA92-HT - $R_m \geq 900$ MPa - Bars for machined bolts - D \leq 25 mm - Aerospace series ¹⁾
EN 2404	Heat resisting nickel base alloy NI-P100-HT - Solution treated and precipitation treated Bars - Aerospace series ¹⁾ https://standards.itec.ai/en/standards/sist/9c8ef0e7-1b60-4ba5-95a8-b5119e0f3db0/sist-en-2943-2001
EN 2945	Aerospace series - Inserts, screw thread, helical coil, self-locking - Assembly procedure ²⁾
EN 3042	Aerospace Series - Quality assurance - EN aerospace products - Qualification procedure
EN 3044	Aerospace series - Installation holes and procedures for inserts, screw thread, helical coil, self-locking - Design standard ²⁾

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

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

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 Batch

Quantity of finished thread inserts, of the same type and same diameter, produced from a 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

3.2 Surface discontinuities

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

3.2.2 Seam: open surface defect

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

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

3.3 Test temperature

Ambient temperature, unless otherwise specified

3.4 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⁾

3.5 Critical defect

A 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⁾

3.6 Major defect

A 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⁾

3.7 Minor defect

A 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⁾

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⁾

3.9 Limiting quality

In a sampling plan, the quality level which corresponds to the specified 10 % probability of acceptance

3.10 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 ³⁾.

3.11 Finished thread insert

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

3.12 Definition document

Document specifying all the requirements for finished thread inserts

3.13 Self-locking torque

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

3.14 Seating torque

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

3.15 Unseating torque

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

3.16 Breakaway torque

The torque required to start unscrewing the associated bolt with respect to the installed thread 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

3) Definition taken from ISO 3534

4 Quality assurance

4.1 Qualification

EN 3042

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

- each type and diameter of thread insert;
- 26 thread 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 thread inserts provided that the design and manufacturing conditions are identical.

Table 2 indicates the allocation of thread insert specimens for the inspections and tests.

4.2 Acceptance

4.2.1 Purpose

The purpose of acceptance inspections and tests is to check, as simply as possible, by a method representative of actual use conditions, with the uncertainty inherent to statistical sampling, that the thread inserts constituting the batch satisfy the requirements of this standard.

4.2.2 Conditions

Acceptance inspections and tests (requirements, methods, numbers of thread inserts) are specified in table 1. They shall be carried out on each batch. Thread inserts from the batch to be tested shall be selected by simple random sampling.

Each thread insert may be submitted to several inspections or tests.

If a more stringent inspection is deemed necessary, all or part of the qualification inspections and tests may be performed during the acceptance inspection and testing. In this case, the number of thread inserts submitted to these inspections and tests is the same as that submitted for qualification inspection and tests.

4.2.3 Responsibility

Acceptance inspections and tests shall be carried out by the manufacturer, or under his responsibility.

4.2.4 Inspection and test report

A test report showing actual numerical values shall be provided if specified in the purchase order.

5 Requirements

See table 1.

Table 1: Technical requirements and test methods

Clause	Characteristic	Requirement	Inspection and test method	Q/A 1)	Sample size
5.1	Material	In accordance with the product standard or definition document	Chemical analysis or certificate of compliance issued by the manufacturer of the semi-finished product	Q A	
5.2	Dimensions, tolerances and tolerances of form and position	In accordance with the product standard or definition document	Standard gauging	Q A	26 Table 3
5.3	Manufacturing				
5.3.1	Surface roughness	In accordance with the product standard or definition document	ISO 4288 Visual examination	Q A	3 Table 3
5.3.2	Surface coating	In accordance with the product standard or definition document	See applicable coating standard.	Q A	23 Table 3
5.4	Mechanical properties	Thread inserts shall be assembled into test equipment according to EN 2945 (see table 4).			
5.4.1	Permanent set test (ambient temperature)	Measured torques of the thread inserts shall not exceed the maximum self-locking torque nor shall be less than the minimum breakaway torque, see table 5 When screwing and unscrewing the maximum and minimum mandrels, the rotation of the thread insert in its location shall not exceed $\pm 90^\circ$.	Lubricate the maximum mandrel using clean engine oil. Fit the maximum mandrel in the thread insert, until it protrudes at least two pitches beyond the locking zone of the thread insert, measuring the self-locking torque on screwing. Unscrew, removing the maximum mandrel completely from the thread insert. Carry out the same chronological sequence of operations using the minimum mandrel, measuring the breakaway torque. Check that the mandrel dimensions are within the limits given in annex A and that their threads have not been damaged. The rotation of the mandrels shall be sufficiently slow so that the temperature of the thread insert does not exceed 45 °C during operations.	Q	3
5.4.2	Reusability test	When screwing and unscrewing the bolt, the rotation of the thread insert in its location shall not exceed $\pm 90^\circ$.	Test equipment, see table 4. Assembly, see annex B. The self-locking torques shall be recorded for each cycle.		

continued