SLOVENSKI STANDARD
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Aerospace series - Clips, spring tension - Technical specification

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Luft- und Raumfahrt - Federklammern - Technische Lieferbedingungen

Ta slovenski standard je istoveten z: **EN 4585:2003**

ICS:

49.030.50	Podložke in drugi blokirni elementi	Washers and other locking elements

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Aerospace series - Clips, spring tension - Technical specification

This European Standard was approved by CEN on 1 November 2002.

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 Management Centre 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 Management Centre has the same status as the official versions.

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

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Contents

Foreword

This document EN 4585:2003 has been prepared by the European Association of Aerospace Manufacturers (AECMA).

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of an identical text or by endorsement, at the latest by August 2003, and conflicting national standards shall be withdrawn at the latest by August 2003.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, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This standard specifies the characteristics, qualification and acceptance requirements for spring tension clips for the support of electrical harnesses, in alloy steel for aerospace applications.

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 (including amendments).

ISO 2859-1 *Sampling procedures for inspection by attributes -Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-Iot inspection.*

ISO 3452 *Non-destructive testing - Penetrant inspection - General principles.*

ISO 3534 *Statistics -Vocabulary and symbols.*

ISO 4288 *Geometrical product Specifications (GPS) - Surface texture : Profile method - Rules and procedures for the assessment of surface texture.*

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

TR 4586 *Aerospace series - Clips, spring tension - Design recommendations* [1].

1) Published as AECMA Technical Repor1 at the date of publication of this standard

TR 4587 *Aerospace series - Clips, spring tension - Assembly recommendations* [1)].

3 Terms and definitions

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

3.1
batch
quantity of finished spring clips, 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
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

3.5
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

3.6
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

3.7
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

3.8
sampling plan
plan according to which one or more samples are taken in order to obtain information and possibly to reach a decision

3.9
limiting quality
in a sampling plan, the quality limit which corresponds to the specified 10 % probability of acceptance

3.10
acceptance quality limit (AQL)
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

3.11
retention resistance
minimum radial forces that the spring clip shall oppose to the removal of the retained part

3.12
grip range
all harness nominal diameters which can be retained by a spring clip size

4 Quality assurance

4.1 Qualification

EN 9133

Qualification inspections and tests (requirements, methods, sample size) are specified in Table 1. They shall be carried out on:

- each type and size of spring clip;

- 5 spring clips 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 spring clips provided that the design and manufacturing conditions are identical. It shall be clearly identified on the test report.

Table 2 indicates the allocation of spring clip samples 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 spring clips constituting the batch satisfy the requirements of this standard.

4.2.2 Conditions

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

Each spring clip 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 spring clips 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 [a]	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 of form and position	In accordance with the product standard or definition document	Standard gauging Caution shall be taken because some measurements should be made under stress condition.	Q	5
				A	Tables 3 and 4
5.3	Manufacturing				
5.3.1	Surface roughness	In accordance with the product standard or definition document	ISO 4288 Visual examination	Q	1
				A	Tables 3 and 4
5.3.2	Surface discontinuities	Spring clips shall be free from surface defects indicated in 3.2 liable to have an adverse affect on their characteristics and endurance. Cracks are not permitted.	ISO 3452	Q	5
				A	Tables 3 and 4
			In the event of any doubt arising as to the nature of the defects detected, inspect spring clips under low magnification after sectioning		
5.3.3	Surface coating	In accordance with the product standard or definition document	See applicable coating standard	Q	5
				A	Tables 3 and 4
5.4	Mechanical properties				
5.4.1	Mandrel assembly for mechanical properties tests		Spring clips shall be installed by the method given in TR 4587 on the upper horizontal surface of a test block designed in accordance with TR 4586. Unless otherwise specified, the installed spring clips shall be tested individually with a stainless steel mandrel having a surface roughness R_a = 1,6 per ISO 4288 with a diameter equal to the maximum value of the grip range given in the product standard or definition document. The mandrel shall be installed radially into the spring clip (see annex A, normative). NOTE A tube may also be used instead of a mandrel for the test.		

continued