



SLOVENSKI STANDARD

SIST EN 2569:2001

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Aerospace series - Control cable fittings and turnbarrels - Technical specification

Aerospace series - Control cable fittings and turnbarrels - Technical specification

Luft- und Raumfahrt - Seilschuhe und Spannschlösser für Steuerseile - Technische Lieferbedingungen

Série aérospatiale - Embouts et tendeurs de câbles de commandes - Spécification technique

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ICS:

49.030.99 Drugi vezni elementi Other fasteners

SIST EN 2569:2001 **en**

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EUROPEAN STANDARD

EN 2569

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EUROPAISCHE NORM

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English version

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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.

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CEN

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 successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

According to the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.

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1 Scope and field of application

This standard specifies the required characteristics, the qualification and acceptance inspections and tests for :

- end fittings swaged onto control cables ;
- cable turnbarrel components ;
- cable turnbarrel assemblies.

2 References

- ISO 2020, Aerospace - Mechanical system parts - Preformed flexible steel wire rope for aircraft controls - Technical specification
- ISO 2859, Sampling procedures and tables for inspection by attributes
- ISO 5855/1, Aerospace constructions - MJ threads - Part 1 : General requirements
- ISO 5855/2 Aerospace constructions - MJ threads - Part 2 : Limit dimensions bolts and nuts
- EN 2000, Aerospace series - Quality assurance - EN aerospace products - Approval of the quality system of manufacturers ¹⁾
- EN 2348, Aerospace series - Control cable assemblies - Technical specification
- EN 2353, Aerospace series - Turnbarrels, control cable in corrosion resisting steel - Dimensions and loads
- EN 2354, Aerospace series - Eye-ends, threaded, control cable in corrosion resisting steel - Dimensions and loads
- EN 2355, Aerospace series - Fork-ends, threaded, control cable in corrosion resisting steel - Dimensions and loads
- EN 2356, Aerospace series - Fork-ends, threaded, control cable for rolling bearings in corrosion resisting steel - Dimensions and loads
- EN 2357, Aerospace series - Stud-ends in corrosion resisting steel swaged on type, control cable - Dimensions and loads
- EN 2358, Aerospace series - Eye-ends in corrosion resisting steel swaged on type, control cable - Dimensions and loads
- EN 2359, Aerospace series - Fork-ends in corrosion resisting steel swaged on type, control cable - Dimensions and loads
- EN 2360, Aerospace series - Fork-ends for rolling bearings in corrosion resisting steel swaged on type, control cable - Dimensions and loads
- EN 2361, Aerospace series - Ball-ends, double shank in corrosion resisting steel swaged on type, control cable - Dimensions and loads

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

- EN 2362, Aerospace series - Ball-ends, in corrosion resisting steel swaged on type, control cable - Dimensions and loads
- EN 2363, Aerospace series - Locking clips for turnbuckles of control cables - Dimensions
- EN 2516, Aerospace series - Passivation of corrosion resistant steels ¹⁾
- EN 2609, Aerospace series - Turnbarrels, control cable in copper-zinc alloy - Dimensions and loads.

3 Definitions

3.1 End fittings for swaging onto control cables

Defined by standards EN 2357, EN 2358, EN 2359, EN 2360, EN 2361 and EN 2362.

3.2 Cable turnbarrel components

Defined by standards EN 2353, EN 2354, EN 2355, EN 2356, EN 2363 and EN 2609.

3.3 Cable turnbarrel assembly

Defined as the assembly of the following components :

- turnbarrel ;
- locking clip ;
- threaded junction parts (2) which can be fork-ends, eye-ends or stud-ends swaged on type.

These various assemblies are not the subject of product standards.

3.4 Surface discontinuities

Crack : Rupture in the material which may extend in all directions and which may be intercrystalline or transcrystalline in character.

Score : Open surface defect which is the result from a metallic tearing.

Lap : Surface defect caused by folding over metal particles or sharp edges which are then rolled or forged into the surface.

Seam : Unwelded lap which appears as an open defect in the material.

3.5 Production Batch

A production batch comprises parts having the same identity block, manufactured in the same production sequence, produced from the same material batch and having undergone together the heat treatments.

¹⁾ In preparation at the date of publication of the present standard.

3.6 Delivery batch

Two cases may arise :

- Homogeneous batch made up of one and the same production batch :
The sampling plan is applicable to the whole of the delivery batch.
- Heterogenous batch made up of different production batches :
The sampling plan is applicable to each production batch.

4 Required characteristics, inspection and test methods

See table 1.

Table 1

Clause	Charac- teristics	Requirements	Inspection and test methods	Q 1)	A 2)
4.1	Dimensions tolerances and masses	Conforming with the product standards.	Usual measuring instruments ; threads : « go/no-go » gauge.	X	X
4.2	Materials	Conforming with the product standards.	Manufacturer's test and acceptance certificates for semi-finished products may possibly be used for this check.	X	
4.3	Surface treatment	Applies only for end-fittings for treatment swaging and turnbarrels (in corrosion- resisting steel. Conforming with the product standards.	According to EN 2516.	X	X
4.4	Surface roughness	Conforming with the product standards.	Usual instruments or visuo-tactile test samples.	X	
4.5	Surface appearance	No surface discontinuities except those permitted in 4.8 and 4.9.	Usual inspection methods.	X	X
4.6	Marking	Conforming with the product standards. Shall neither damage the material nor be detrimental to service quality.	Visual inspection.	X	X
4.7	Left hand thread mark	Conforming with the product standards.	Visual inspection.	X	X
1) Q = Qualification 2) A = Acceptance					

Table 1 (Continued)

Clause	Charac- teristics	Requirements	Inspection and test methods	Q 1)	A 2)
4.8	External thread	Rolled and without burrs.	Visual inspection.	X	X
		See figure 1.	Microscopic section : - on the finished parts for qualification ; - during manufacturing for acceptance.	X	X
4.9	Internal thread	See figure 2.	Microscopic section : - on the finished parts for qualification ; - during manufacturing for acceptance.	X	X
4.10	Turnbarrel assembly device locking play	Angular movement of the end-fittings in relation to the turnbarrel : see table 2.	<ul style="list-style-type: none"> . Hold the turnbarrel assemblies in a vice. . Apply a torque to each end-fitting in turn : <ul style="list-style-type: none"> - value : see table 2 ; - direction : clockwise then anti-clockwise. . Measure the angle of rotation of each end-fitting in relation to the barrel : <ul style="list-style-type: none"> - while the torque is being applied ; - by means of the usual instruments. 	X	
4.11	Effectiveness of turnbarrel assemblies locking	Locking clip : - remain in place ; - retain its effectiveness.	Apply to the turnbarrel for 25 hours : - a longitudinal tensile load equal to 25 % of the minimum breaking load specified in table 4 ; - vibrations with a frequency of 50 Hz and of 3,15 mm amplitude along a direction at right angle to the turnbarrel. . Check the turnbarrel assembly visually.	X	

Table 1 (concluded)

Clause	Charac- teristics	Requirements	Inspection and test methods	Q 1)	A 2)
4.12	Torsional strength of turnbarrel assemblies	After the test : - neither cracks ; - nor distortions ; - nor failures ; on any of the turnbarrel components.	<ul style="list-style-type: none"> . Hold one end of the turnbarrel assembly in a vice. . Apply to the other end a torque of the value indicated in table 3 in the clockwise then in the anti-clockwise direction. . Carry out this operation 5 times (i.e. 10 reversals). . Check visually and/or by means of usual equipment. 	X	
4.13	Fatigue strength of turnbarrel assemblies under tensile load	After the test in the right hand column : - neither permanent elongation greater than 0,1 % ; - nor failure ; on any of the turnbarrel components.	<ul style="list-style-type: none"> . Use a device which can transmit the test load to the turnbarrel assembly under the conditions identical to those of its normal use. Note : If this device has a swaged cable, the latter shall be : <ul style="list-style-type: none"> - flexible ; - in conformity with ISO 2020 ; - of a diameter corresponding to that of the turnbarrel used ; - swaged in accordance with EN 2348. . Screw the threaded end-fittings until their threads are no longer visible. . Apply an increasing and decreasing force between the maximum and minimum tensile loads specified in table 4, longitudinally to the turnbarrel assembly. . Carry out this operation 300 times (i.e. 600 reversals). . Check visually and/or by means of usual equipment. 	X	
4.14	Ultimate strength of turnbarrel assemblies under tension	After the test in the right hand column : no failure of the turnbarrel assembly components.	<ul style="list-style-type: none"> . Use the same device as in 4.13. . Apply a tensile load equal to or greater than the cable breaking load given in table 4, longitudinally to the turnbarrel assembly. . Check visually and/or by means of usual equipment. 	X	