
Aeronavtika - Vulkanizirane gume - Preskus občutljivosti na korozijo v vlažnem ozračju kovin v stiku z vulkaniziranimi gumami

Aerospace series - Vulcanized rubbers - Test on the susceptibility to corrosion in a damp atmosphere of metals in contact with vulcanized rubbers

Luft- und Raumfahrt - Vulkanisierte Elastomere - Prüfung der Korrosionsempfindlichkeit in Feuchtklima von Metallen bei Berührung mit vulkanisierten Elastomeren

Série aérospatiale - Élastomères vulcanisés - Essais de sensibilité à la corrosion en atmosphère humide des métaux au contact des élastomères vulcanisés

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ICS:

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EUROPEAN STANDARD

EN 2899

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English Version

Aerospace series - Vulcanized rubbers - Test on the susceptibility to corrosion in a damp atmosphere of metals in contact with vulcanized rubbers

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This European Standard was approved by CEN on 17 December 2017.

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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 CEN-CENELEC 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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European foreword

This document (EN 2899:2018) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-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 ASD, 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of an identical text or by endorsement, at the latest by November 2018, and conflicting national standards shall be withdrawn at the latest by November 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 2899:2018 (E)**1 Scope**

This document defines tests on the susceptibility to corrosion in a damp atmosphere of metals in contact with vulcanized rubbers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 2071, *Aerospace series — Sheets in aluminium and aluminium alloys — Thickness $0,25\text{ mm} \leq a \leq 6\text{ mm}$ — Dimensions*

EN 22171, *Steel FE-PL52 S — $1\ 080\text{ MPa} \leq R_m \leq 1\ 250\text{ MPa}$ — Sheets and plates $2\text{ mm} \leq a \leq 20\text{ mm}$ — Aerospace series*²

EN 2395, *Aerospace series — Aluminium alloy AL-P2014A — T4 or T42 — Sheet and strip — $0,4\text{ mm} \leq a \leq 6\text{ mm}$*

EN 3525, *Aerospace series — Steel FE-PL1505 (15CrMoV6) — Air melted — Hardened and tempered — Plate — $6\text{ mm} < a \leq 20\text{ mm}$ — $1\ 080\text{ MPa} \leq R_m \leq 1\ 280\text{ MPa}$*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

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3 Terms and definitions

SIST EN 2899:2018

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 contact corrosion

the visually perceptible deterioration of the metal surface in contact with rubbers, after exposure in a damp atmosphere

4 Principle

The rubber test pieces shall be directly placed after immersion in the test fluid between two test metal disks and exposed to a damp atmosphere under defined conditions. After exposure, the metal disks shall be visually examined so that deterioration due to corrosion can be noted.

¹ Inactive for new design, see EN 3525.

² Published as ASD-STAN Standard at the date of publication of this European Standard by AeroSpace and Defence industries Association of Europe - Standardization (ASD-STAN) (www.asd-stan.org).

5 Apparatus and auxiliary products

5.1 Apparatus

- test assembly which enables a compression of $(12 \pm 3) \%$ of the rubber test pieces by means of metal disks (Figure 1);
- a device for producing x 20 magnification;
- climatic chamber where a relative humidity of 95 % minimum can be obtained at $(23 \pm 2) ^\circ\text{C}$.

5.2 Auxiliary products

- polyethylene gloves;
- appropriate solvent;
- lint free cotton cloth;
- test fluids.

6 Specimens

6.1 Metal disks

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6.1.1 Material

Type 1 – Aluminium alloy AL-P2014A – T4 or T42 according to EN 2395.

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Type 2 – Steel FE-PL52S – $1\ 080\ \text{MPa} \leq R_m \leq 1\ 250\ \text{MPa}$ according to EN 2217.

6.1.2 Dimensions

The metal to be tested shall be circular disks of an outer diameter $(120 \pm 0,5)$ mm, with a $(20^{+0,2}_0)$ mm diameter hole in the centre (see Figure 1).

These disks shall be 5 mm thick minimum if they are in steel and 10 mm minimum thick if they are in aluminium so that they are not deformed when gripped.

6.1.3 Preparation

The metal disks shall have a roughness of $0,4\ \mu\text{m}$ maximum on all surfaces. The edges shall be rounded.

6.1.4 Number

For each test and exposure method, use two metal disks. The two disks may be made of the same metal or of two different metals.

6.2 Rubber test pieces

6.2.1 Material

According to the material standard.

EN 2899:2018 (E)**6.2.2 Dimensions**

(20 ± 1) mm x (20 ± 1) mm cut from test strips (2 ± 0,2) mm thick.

6.2.3 Number

Three test pieces for each test and exposure method.

6.2.4 Time lapse between vulcanization and testing

The test pieces shall be stored according to ISO 23529.

7 Test conditions**7.1 Test temperature**

The temperature shall be (23 ± 2) °C.

7.2 Testing time

The testing time shall be 7 d or a multiple of 7 d.

7.3 Humidity

The relative humidity shall be 95 % minimum.

8 Procedure

Clean all the surfaces of the metallic disks and the rubber test pieces with a lint free cotton cloth soaked in an appropriate solvent and leave to dry for 2 h minimum at (23 ± 2) °C.

After cleaning, the degreased test pieces shall not be touched with bare fingers; they shall only be handled with polyethylene gloves.

Depending on the method chosen, the rubber test pieces and the metallic disks shall be conditioned as follows:

Method A:

The rubber test pieces and metallic disks shall be immersed in the test liquid for 15 min at a temperature of (23 ± 2) °C, then allowed to drain.

Method B:

The rubber test pieces and metallic disks shall not undergo any conditioning.

Next, place the rubber test pieces and the annular isolating block between the two metallic disks.

The isolating block shall be chosen with a thickness such that the rubber test pieces are compressed by (12 ± 3) %.

Tighten the assembly until it comes to rest against the block.

Place the assembly in the test chamber in a damp atmosphere.

NOTE The test pieces shall be placed at a distance of at least 10 mm from the edges of the metallic disks and arranged symmetrically (Figure 1).

At the end of exposure time, the test assembly shall be placed in a normal atmosphere for (30 ± 5) min at (23 ± 2) °C. The metallic disks shall be separated from the rubber test pieces, then cleaned using appropriate solvents to eliminate all traces of rubber.

The two metallic disks shall be then subjected to a visual examination at x 20 magnification to detect any discolouration or sign of corrosion.

9 Interpretation of results

Any discolouration or surface deterioration of the metal strip shall be described in the test report.

10 Designation

EXAMPLE

EN2899 A A

Number of this standard _____

Type of material used for metallic disks (see Table 1) _____

Method used (A or B) _____

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Table 1

Type	Code
1 and 1	A
1 and 2 or 2 and 1	B
2 and 2	C