



# SLOVENSKI STANDARD

## SIST EN 12373-16:2002

01-februar-2002

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### Aluminij in aluminijeve zlitine - Anodizacija - 16. del: Kontrola zveznosti tanke anodizirane plasti - Preskus z bakrovim sulfatom

Aluminium and aluminium alloys - Anodizing - Part 16: Check for continuity of thin anodic oxydation coatings - Copper sulfate test

Aluminium und Aluminiumlegierungen - Anodisieren - Teil 16: Prüfung der Kontinuität dünner anodisch erzeugter Oxidschichten - Kupfersulfatversuch

Aluminium et alliages d'aluminium - Anodisation - Partie 16: Contrôle de la continuité des couches anodiques minces - Essai au sulfate de cuivre

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Ta slovenski standard je istoveten z: EN 12373-16:2001

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#### **ICS:**

25.220.20	Površinska obdelava	Surface treatment
77.120.10	Aluminij in aluminijeve zlitine	Aluminium and aluminium alloys

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**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 12373-16**

May 2001

ICS 25.220.20; 77.120.10

English version

## Aluminium and aluminium alloys - Anodizing - Part 16: Check for continuity of thin anodic oxydation coatings - Copper sulfate test

Aluminium et alliages d'aluminium - Anodisation - Partie 16:  
Contrôle de la continuité des couches anodiques minces -  
Essai au sulfate de cuivre

Aluminium und Aluminiumlegierungen - Anodisieren - Teil  
16: Prüfung der Kontinuität dünner anodisch erzeugter  
Oxidschichten - Kupfersulfatversuch

This European Standard was approved by CEN on 20 April 2001.

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.

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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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 132 "Aluminium and aluminium alloys" the Secretariat of which is held by AFNOR.

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 2001, and conflicting national standards shall be withdrawn at the latest by November 2001.

It is based on ISO 2085:1976.

EN 12373, Aluminium and aluminium alloys — Anodizing, comprises the following parts:

- Part 1: Method for specifying decorative and protective anodic oxidation coatings on aluminium
- Part 2: Determination of mass per unit area (surface density) of anodic oxidation coatings – Gravimetric method
- Part 3: Determination of thickness of anodic oxidation coatings – Non-destructive measurement by split beam microscope
- Part 4: Estimation of loss of absorptive power of anodic oxidation coatings after sealing by dye spot test with prior acid treatment
- Part 5: Assessment of quality of sealed anodic oxidation coatings by measurement of admittance
- Part 6: Assessment of quality of sealed anodic oxidation coatings by measurement of the loss in mass after immersion in phosphoric acid/chromic acid solution without prior acid treatment
- Part 7: Assessment of quality of sealed anodic oxidation coatings by measurement of the loss in mass after immersion in phosphoric acid/chromic acid solution with prior acid treatment
- Part 8: Determination of the comparative fastness to ultra-violet light and heat of coloured anodic oxidation coatings
- Part 9: Measurement of wear resistance and wear index of anodic oxidation coatings using an abrasive wheel wear test apparatus
- Part 10: Measurement of mean specific abrasion resistance of anodic oxidation coatings using an abrasive jet test apparatus
- Part 11: Measurement of specular reflectance and specular gloss of anodic oxidation coatings at angles of 20°, 45°, 60° or 85°

- Part 12: Measurement of reflectance characteristics of aluminium surfaces using integrating-sphere instruments
- Part 13: Measurement of reflectivity characteristics of aluminium surfaces using a goniophotometer or an abridged goniophotometer
- Part 14: Visual determination of image clarity of anodic oxidation coatings – Chart scale method
- Part 15: Assessment of resistance of anodic oxidation coatings to cracking by deformation
- Part 16: Check for continuity of thin anodic oxidation coatings – Copper sulfate test
- Part 17: Determination of electric breakdown potential
- Part 18: Rating system for the evaluation of pitting corrosion – Chart method
- Part 19: Rating system for the evaluation of pitting corrosion – Grid method

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.

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## 1 Scope

This Part of this European Standard specifies a method of checking the continuity of thin anodic oxidation coatings on aluminium and its alloys by a copper sulfate contact test.

The use of this method is limited to anodic oxidation coatings of less than 5 µm thickness, or coatings that have been deformed.

NOTE The method described enables a rapid check to be made for the continuity of a thin coating of aluminium oxide on aluminium and its alloys. In cases of doubt regarding a visible fault on the surface of a coating, the use of this method makes it possible to verify whether the fault corresponds to a local gap in the coating which exposes bare metal.

## 2 Principle

Drops of copper sulfate reagent are placed on surface areas of about 100 mm<sup>2</sup>, chosen at will on the test pieces, avoiding the anodizing contact areas. If the area includes points where the metal is either bare or poorly covered, chemical deposition of copper takes place on the aluminium, accompanied by a release of gas. The drops of applied reagent can be examined immediately upon application, either with the naked eye or with a magnifying glass, for the release of gas from points where the metal is bare, which is almost instantaneous. After the test, dark or reddish spots can be seen where the coating is not continuous.

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## 3 Reagent <https://standards.iteh.ai/catalog/standards/sist/25bec3af-99d9-4b80-89ec-b5d539849a92/sist-en-12373-16-2002>

Copper sulfate solution, prepared as follows:

- copper (II) sulfate pentahydrate, (CuSO<sub>4</sub>.5H<sub>2</sub>O): 20 g
- hydrochloric acid, (ρ 1,18 g/ml): 20 ml
- distilled water: to 1 000 ml

#### 4 Procedure

Carry out the test at room temperature.

Remove all grease from the test piece. Mark out a test area of approximately 100 mm<sup>2</sup> on a horizontal part of the test piece using a wax crayon or a rapidly drying lacquer to delineate the test area, leaving the test area itself unmasked.

Cover the test area with reagent (see clause 3), using approximately four drops. Leave the reagent in contact with the surface for 5 min, noting any release of gas, then rinse the area with clean water. Examine the surface and count the number of dark or reddish spots per 100 mm<sup>2</sup>.

NOTE For a more quantitative measurement, the average diameter of the dark or reddish spots can also be estimated.

#### 5 Expression of results

Record the number of dark or reddish spots per 100 mm<sup>2</sup> for each area examined and, if appropriate, their average diameter.

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#### 6 Test report

The test report shall include at least the following information:

- a) the type and identification of the product tested;
- b) a reference to this European Standard;
- c) the result of the test (see clause 5);
- d) anything unusual noticed during the determination;
- e) the date of the test.