
**Aluminij in aluminijeve zlitine - Anodna oksidacija - 4. del: Ocena izgube
absorbirnosti anodnooksidiranih prevlek po tesnjenju por s kapljičnim preskusom
z barvilom ob predhodni kislinski obdelavi**

Aluminium and aluminium alloys - Anodizing - Part 4: Estimation of loss of absorptive
power of anodic oxidation coatings after sealing by dye spot test with prior acid treatment

Aluminium und Aluminiumlegierungen - Anodisieren - Teil 4: Abschätzung der
Anfärbbarkeit von anodisch erzeugten Oxidschichten nach dem Verdichten durch
Farbtropfentest mit vorheriger Säurebehandlung

Aluminium et alliages d'aluminium - Anodisation - Partie 4: Appréciation de la perte du
pouvoir absorbant des couches d'oxydes anodiques par essai à la goutte de colorant
avec action acide préalable

Ta slovenski standard je istoveten z: EN 12373-4:1998

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English version

Aluminium and aluminium alloys - Anodizing - Part 4: Estimation of loss of absorptive power of anodic oxidation coatings after sealing by dye spot test with prior acid treatment

Aluminium et alliages d'aluminium - Anodisation - Partie 4: Appréciation de la perte du pouvoir absorbant des couches d'oxydes anodiques par essai à la goutte de colorant avec action acide préalable

Aluminium und Aluminiumlegierungen - Anodisieren - Teil 4: Abschätzung der Anfärbbarkeit von anodisch erzeugten Oxidschichten nach dem Verdichten durch Farbtropfentest mit vorheriger Säurebehandlung

This European Standard was approved by CEN on 5 November 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.



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

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

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ISTITUTO ITALIANO DI STANDARDIZZAZIONE
VIA SAN GIULIANO, 15 - 00100 ROMA
TELEFONO 06/498081 - TELEGRAMMI 32092
FAX 06/49808211 - WWW.ISTITUTOITALIANO.IT



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 May 1999, and conflicting national standards shall be withdrawn at the latest by May 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.

It is based upon ISO 2143 : 1981.

In this standard, annex A is normative.

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 of 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 of 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

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- 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

Introduction

The resistance of anodic oxidation coatings to the absorption of dyes can give information on the quality of sealing, total resistance indicating that the quality of sealing is good. Slight loss of resistance to absorption, however, does not necessarily mean that the sealing of the coating is poor; it may be a consequence of certain agents having been added to the sealing bath. In cases of doubt, the quality of sealing can be established using a reference method such as that described in EN 12373-6¹⁾ or EN 12373-7¹⁾.

1 Scope

This Part of this European Standard specifies a method of estimating the loss of absorptive power of anodic oxidation coatings that have undergone a sealing treatment, by dye absorption after acid pretreatment.

The method is suitable for use as a production control method and is applicable to anodic oxidation coatings which may be subjected to weathering or aggressive environments or where resistance to staining is important.

The method is not applicable to those coatings:

- a) formed on alloys containing more than 2% copper or 4% silicon;
- b) sealed by the dichromate process;
- c) that have been given supplementary processing, for example oiling, waxing or lacquering;
- d) that are coloured in deep shades;
- e) that are less than 3 μm thick.

The method is less appropriate where nickel or cobalt salts, or organic additives, have been added to the sealing bath.

2 Principle

A degreased area of sample is subjected to the action of an acid and the colouration obtained after the subsequent application of a dyestuff is observed.

¹⁾ See foreword.

3 Reagents

3.1 General

Use only reagents of recognized analytical grade and distilled water, or water of equivalent purity. The acid solutions specified in 3.2.1 and 3.2.2 may be used equally for either dye spot test, but the acid solution specified in 3.2.2 is preferred for safety reasons.

3.2 Acid solutions

WARNING NOTE: These acid solutions contain hydrofluoric acid and should be stored in appropriate containers and handled with care.

3.2.1 Acid solution A. Solution containing 25 ml of sulfuric acid ($\rho_{20} = 1,84$ g/ml) and 10 g of potassium fluoride per litre.

3.2.2 Acid solution B. Solution containing 25 ml of fluorosilicic acid (H_2SiF_6) ($\rho_{20} = 1,29$ g/ml) per litre.

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3.3 Dye solutions

3.3.1 Dye solution A. Aqueous solution containing 5 g of Sanodal Blue 2LW (Colour Index Mordant Blue 69) per litre, adjusted, at approximately 23 °C, to a pH of $5,0 \pm 0,5$ with dilute sulfuric acid solution or with dilute sodium hydroxide solution.

3.3.2 Dye solution B. Aqueous solution containing 10 g of Sanodal Red B3LW (Colour Index Acid Red 331) per litre, adjusted, at approximately 23 °C, to a pH of $5,7 \pm 0,5$ with dilute sulfuric acid solution or with dilute sodium hydroxide solution.

4 Test specimens

The test shall normally be carried out using production articles.

NOTE: The use of specially prepared test specimens, processed at the same time and in the same manner as production articles, can lead to erroneous results.

5 Procedure

Clean the surface to be tested removing any grease with a piece of cotton wool soaked in e.g. acetone or ethanol 96 % (v/v).

Apply one drop of acid solution A (3.2.1) or acid solution B (3.2.2), at approximately 23 °C, to the horizontal, clean, dry surface and allow to remain for 60 s.

Remove the drop of acid solution and wash and dry the test surface.

Apply one drop of dye solution A (3.3.1) or dye solution B (3.3.2) to the spot treated previously with acid solution and allow to remain for 1 min.

Wash off the drop of dye and clean the surface of the test area thoroughly by rubbing with a clean cloth soaked in water and a light abrasive, such as magnesia, whiting or an equivalent abrasive, for 20 s. Rinse thoroughly and dry.

Examine the test area and assess the intensity of the stain by comparison with the examples illustrated in annex A.

6 Expression of results

Express the loss of absorptive power in accordance with the classification given in annex A or as the intensity of the stain, as a numerical value, in accordance with annex A.

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7 Test report

The test report shall include at least the following information:

- a) the type and identification of the specimen tested;
- b) a reference to this European Standard;
- c) the anodizing specification (where known);
- d) the acid treatment used in the test (3.2.1 or 3.2.2);
- e) the colour of the dye solution used in the test (3.3.1 or 3.3.2);
- f) the loss of absorptive power or the intensity of the stain as a numerical value (see clause 6);

NOTE: Acceptance levels are normally specified in the relevant product specification.

- g) any observations concerning the conduct of the test or the nature of the stained area (for example, uneven density of staining);
- h) the date of the test.