



SLOVENSKI STANDARD

SIST EN 12373-18:2002

01-februar-2002

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Aluminium and aluminium alloys - Anodizing - Part 18: Rating system for the evaluation of pitting corrosion - Chart method

Aluminium und Aluminiumlegierungen - Anodisieren - Teil 18: Bewertungssystem für Lochkorrosion - Richtreihenmethode

Aluminium et alliages d'aluminium - Anodisation - Partie 18: Systeme de cotation de la corrosion par piqures - Méthodes reposant sur des images-types

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Ta slovenski standard je istoveten z: EN 12373-18:2001

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 12373-18

May 2001

ICS 25.220.20; 77.120.10

English version

Aluminium and aluminium alloys - Anodizing - Part 18: Rating system for the evaluation of pitting corrosion - Chart method

Aluminium et alliages d'aluminium - Anodisation - Partie 18:
Système de cotation de la corrosion par piqûres -
Méthodes reposant sur des images-types

Aluminium und Aluminiumlegierungen - Anodisieren - Teil
18: Bewertungssystem für Lochkorrosion -
Richtreihenmethode

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

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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 8993 : 1989.

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 chart rating system based on standard charts that provides a means of defining levels of performance of anodic oxidation coatings on aluminium and its alloys that have been subjected to corrosion tests.

This rating system is applicable to pitting corrosion resulting from

- accelerated tests;
- exposure to corrosive environments;
- practical service tests.

It takes into account only pitting corrosion resulting from penetration of the protective anodic oxidation coating.

NOTE A related standard, EN 12373-19:2001, describes a similar rating system based on defined grids.

2 Terms and definitions

For the purposes of this standard the following terms and definitions apply.

2.1

significant surface part of the surface of an article that is essential to its appearance or serviceability and which is covered by the anodic oxidation coating

NOTE The edges of an article are not normally included in the significant surface.

2.2.

corrosion pit

surface corrosion defect at which the anodic oxidation coating is penetrated

NOTE Discoloration or other surface defects which do not penetrate the coating do not count as corrosion pits.

3 Procedure for rating

3.1 Sample preparation

A sample of at least 5000 mm² is necessary.

Use one of the following methods to remove corrosion products or deposits on the surface so that corrosion pits may be clearly discerned:

a) wipe with a slurry of fine pumice to abrade away corrosion products and dirt, then rinse in clean water and air dry;

or

b) dip for 5 min to 10 min in 30 % (*m/m*) nitric acid, prepared by diluting 1 volume of concentrated nitric acid ($\rho_{20} = 1,40$ g/ml) with 1 volume of water at 20 °C to 25 °C; rinse and dry as indicated in a);

or

c) dissolve the anodic oxidation coating in a hot phosphoric acid/chromic acid mixture; rinse and dry as indicated in a) so that pitting in the aluminium substrate may be discerned.

NOTE 1 EN 12373-2 describes the preparation and use of this reagent for the purposes of dissolution of the anodic oxidation coating.

NOTE 2 This method is particularly useful for dark-coloured anodic oxidation coatings.

3.2 Determination of chart rating

Select an area of at least 5 000 mm² on the significant surface of the sample.

NOTE A mask with an opening of 50 mm × 100 mm can be used to define the area to be evaluated.

Compare the size and frequency of corrosion pits on the cleaned significant surface with the rating charts given in figures 1 to 7. The rating will be the chart designation which most closely resembles the corroded specimen, for example, B2 or C5. Disregard effects on the edges of samples. A rating of A indicates no visible corrosion and a rating of H indicates the greatest degree of corrosion covered by this European Standard.

A conversion of chart rating to percentage area of the significant surface covered by corrosion pits is indicated in table 1.

Table 1 - Conversion of chart rating to percentage area covered by corrosion pits

Chart rating	Percentage area of corrosion pits
A	None
B1 B2 B3 B4 B5 B6	≤ 0,02
C1 C2 C3 C4 C5 C6	> 0,02 and ≤ 0,05
D1 D2 D3 D4 D5 D6	> 0,05 and ≤ 0,07
E1 E2 E3 E4 E5 E6	> 0,07 and ≤ 0,10
F1 F2 F3 F4 F5 F6	> 0,10 and ≤ 0,25
G1 G2 G3 G4 G5 G6	> 0,25 and ≤ 0,5
H1 H2 H3 H4 H5 H6	> 0,5

4 Expression of results

Express the result of the examination as the chart rating and/or the percentage area covered by corrosion pits, as appropriate.

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5 Test report

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The test report shall include at least the following information:

- a) the type and identification of the product tested and, where appropriate, the anodizing, exposure and corrosion test procedures;
- b) a reference to this European Standard;
- c) the method of sample preparation used (see 3.1);
- d) the comparison method used e.g. whether the comparison was done visually or electronically. In the case of comparison by an electronic method, the specification of the test apparatus shall also be given;
- e) the chart rating and/or the percentage area covered by corrosion pits (see clause 4);

NOTE The acceptable chart rating will normally be specified in the relevant corrosion test or product specification.

- f) the date of the test.