INTERNATIONAL STANDARD

ISO 2085

Third edition
2018-08

Anodizing of aluminium and its alloys — Check for continuity of thin anodic oxidation coatings — Copper sulfate test

Anodisation de l'aluminium et de ses alliages — Contrôle de la continuité des couches anodiques minces — Essai au sulfate de cuivre

Reference number
ISO 2085:2018(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 79, *Light metals and their alloys*, Subcommittee SC 2, *Organic and anodic oxidation coatings on aluminium*.

This third edition cancels and replaces the second edition (ISO 2085:2010), which has been technically revised. The main change compared to the previous edition is that a test area has been added in Clause 6.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Anodizing of aluminium and its alloys — Check for continuity of thin anodic oxidation coatings — Copper sulfate test

1 Scope

This document specifies a method for 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 thickness less than 5 µm or coatings that have been deformed, which includes those produced by coil anodizing techniques.

NOTE The method described enables a rapid check to be made for the continuity of a thin coating of aluminium oxidation 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 that exposes bare metal.

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.

ISO 7583, *Anodizing of aluminium and its alloys — Terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7583 apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

Drops of copper sulfate reagent are placed on surface areas of about 100 mm^2, chosen at will on the test specimens and 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, black and/or dark reddish spots can be seen where the coating is not continuous.

5 Reagents

5.1 Copper sulfate solution, prepared as follows:

— copper(II) sulfate pentahydrate, ($CuSO_4 \cdot 5H_2O$): 20 g;

— hydrochloric acid (ρ_{20} = 1,18 g/ml): 20 ml;

— distilled water or deionized water: make up to 1 000 ml.

6 Test area

6.1 Sampling

The test area shall be within a significant surface of the product and shall not include the edges.

The test area shall be selected so that it can be held horizontally during the test unless it is to be immersed in the test solution (in accordance with Clause 7, NOTE 2).

6.2 Size and shape

The standard size of the test area should be 100 mm^2. The test area should be flat.

6.3 Treatment before testing

The test area shall be clean, free from dirt, stains and other foreign matters. Any deposits or stains shall be removed with a clean, soft cloth or similar material which is wetted by water or an appropriate organic solvent such as ethanol. Organic solvents which can corrode the test area or generate a protective film on the test area shall not be used.

7 Procedure

Carry out the test at room temperature.

Mark out a test area of approximately 100 mm^2 on a horizontal part of the test specimen using a wax crayon or rapidly drying organic paint material to delineate the test area leaving the test area itself unmasked.

Cover the test area with the reagent (5.1) using approximately four drops. Leave the reagent in contact with the surface for 5 min, noting any release of gas, and then rinse the area with clean water. Examine the surface and count the number of black and/or dark reddish spots and/or lines per 100 mm^2.

NOTE 1 For a more quantitative measurement, the average diameter (mm) of the black and/or dark reddish spots or the average length (mm) of the black and/or dark reddish lines is also estimated.

NOTE 2 Where a flat test area is not obtained from the product, the test is carried out by immersing the product in the copper sulfate solution. In this case, the surface of the product other than the test area, such as the edges, back surface, etc. of the product, is masked before the test for the purpose of delineating the test area.

8 Expression of results

Record the number of black and/or dark reddish spots and/or lines per 100 mm^2 for each area examined and, if appropriate, their average diameter and/or the length.