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Organic coatings on aluminium and its alloys — Methods for specifying decorative and protective organic coatings on aluminium —

Part 1: Powder coatings

Couches organiques sur l'aluminium et ses alliages — Méthodes de spécification des revêtements décoratifs et protecteurs sur aluminium —

Partie 1: Revêtements par poudre

Reference number
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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*.

A list of all parts in the ISO 18768 series can be found on the ISO website.

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.

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Introduction

There are three major surface treatments on aluminium and its alloys:

a) anodic oxidation coatings;

b) organic coatings;

c) combined coatings of anodic oxidation coatings and organic coatings.

This document and ISO 18768-2 provide the performance requirements and test methods for b) organic coatings.

Performance requirements and test methods for a) anodic oxidation coatings are given in ISO 7599 and for c) combined coatings of anodic oxidation coatings and organic coatings in ISO 28340.

It is assumed that users are familiar with other relevant international and regional standards. Those standards should be respected, and this document adopts optional systems in such cases.

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Organic coatings on aluminium and its alloys — Methods for specifying decorative and protective organic coatings on aluminium —

Part 1: Powder coatings

1 Scope

This document specifies methods for specifying decorative and protective powder coatings on aluminium and its alloys. It defines the characteristic properties of powder coatings and provides testing methods with minimum performance requirements, with reference to the application and the aggressiveness of the environment in which the coated aluminium exists.

This document does not apply to coil coatings on aluminium.

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 1463, *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method*

ISO 1519, *Paints and varnishes — Bend test (cylindrical mandrel)*

ISO 1520, *Paints and varnishes — Cupping test*

ISO 2360, *Non-conductive coatings on non-magnetic electrically conductive base metals — Measurement of coating thickness — Amplitude-sensitive eddy-current method*

ISO 2409, *Paints and varnishes — Cross-cut test*

ISO 2810, *Paints and varnishes — Natural weathering of coatings — Exposure and assessment*

ISO 2813, *Paints and varnishes — Determination of gloss value at 20°, 60° and 85°*

ISO 2815, *Paints and varnishes — Buchholz indentation test*

ISO 3892, *Conversion coatings on metallic materials — Determination of coating mass per unit area — Gravimetric methods*

ISO 4623-2, *Paints and varnishes — Determination of resistance to filiform corrosion — Part 2: Aluminium substrates*

ISO 4628-1, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 1: General introduction and designation system*

ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering*

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ISO 4628-10, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 10: Assessment of degree of filiform corrosion*

ISO 6270-1, *Paints and varnishes — Determination of resistance to humidity — Part 1: Condensation (single-sided exposure)*

ISO 6270-2, *Paints and varnishes — Determination of resistance to humidity — Part 2: Condensation (in-cabinet exposure with heated water reservoir)*

ISO 6270-3, *Paints and varnishes — Determination of resistance to humidity — Part 3: Condensation (in-cabinet exposure with heated, bubbling water reservoir)*

ISO 6272-1, *Paints and varnishes — Rapid-deformation (impact resistance) tests — Part 1: Falling-weight test, large-area indenter*

ISO 6272-2, *Paints and varnishes — Rapid-deformation (impact resistance) tests — Part 2: Falling-weight test, small-area indenter*

ISO 8251, *Anodizing of aluminium and its alloys — Measurement of abrasion resistance of anodic oxidation coatings*

ISO 8993, *Anodizing of aluminium and its alloys — Rating system for the evaluation of pitting corrosion — Chart method*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 15184, *Paints and varnishes — Determination of film hardness by pencil test*

ISO 16474-2, *Paints and varnishes — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 16474-3, *Paints and varnishes — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

ISO 22479, *Corrosion of metals and alloys — Sulfur dioxide test in a humid atmosphere (fixed gas method)*

ISO 28340:2013, *Combined coatings on aluminium — General specifications for combined coatings of electrophoretic organic coatings and anodic oxidation coatings on aluminium*

ASTM C207, *Standard Specification for Hydrated Lime for Masonry Purposes*

ASTM D2794, *Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)*

ASTM D7869, *Standard Practice for Xenon Arc Exposure Test with Enhanced Light and Water Exposure for Transportation Coatings*

ASTM G85-19, *Standard Practice for Modified Salt Splay (Fog) Testing*

GSB International, GSB QR AL 631-7 ST 663-7, *International Quality Regulations For the Coating of Building Components*

3 Terms and definitions

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

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

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

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

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3.1
powder coating
continuous layer of coating powder applied to the aluminium or aluminium alloy substrate, which is protective and/or decorative

3.2
reference sample
reference specimen
sample which defines the criteria for acceptable properties

Note 1 to entry: This may be agreed between the customer and the surface processor.

3.3
significant surface
part of the article covered or to be covered by the coatings, and for which the coatings are essential for service and/or appearance

3.4
test specimen
single sample of the final product to be used for testing

4 Information to be supplied by the customer to the surface processor

In order to coat the product correctly and depending on the application, the following information should be supplied by the customer to the surface processor, if necessary, in consultation with the aluminium supplier and/or the surface processor.

A summary of the references to this information is given in Annex A.

a) a reference to this document, i.e. ISO 18768-1;

b) the intended service use of the article to be coated;

c) the environmental categories of the intended service (see Clause 6);

d) the specification of the aluminium (chemical composition and temper designations) to be coated;

e) an indication of the significant surface(s) of the product to be coated;

f) the preferred position and maximum size of contact marks;

g) details of any formal sampling plans required;

h) the type of pretreatment;

i) mass loss by etching;

j) thickness of the anodic oxidation coating or mass of the chemical conversion coating used for pretreatment;

k) the type of coating process to be used;

l) the quality of appearance required;

m) the acceptable limits of colour variation by agreed reference samples;

n) the colour difference of the coating between the test specimen and the reference samples using a colour difference meter;

o) the acceptable limits of gloss variation by agreed reference samples;

p) the value range of the gloss measured by equipment;

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