INTERNATIONAL STANDARD

ISO 18771

First edition
2019-02

Anodizing of aluminium and its alloys — Method to test the surface abrasion resistance using glass-coated abrasive paper

Reference number
ISO 18771:2019(E)

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Published in Switzerland

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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).

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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*.

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

Surface abrasion resistance is a valid method of assessing the weathering resistance of an anodic oxidation coating. The higher the anodizing electrolyte concentration and temperature and the longer the immersion time in the electrolyte, the lower will be the abrasion resistance of the coating. In general, the lower the abrasion resistance the more likely the coating is to develop chalking in service.

Whole articles can be used for this test and, for those passing the test, it is non-destructive.

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Anodizing of aluminium and its alloys — Method to test the surface abrasion resistance using glass-coated abrasive paper

1 Scope

This document specifies a method for the determination of the surface abrasion resistance of anodic oxidation coatings produced by sulfuric acid anodizing of aluminium and its alloys. It is mainly intended for the evaluation of external architectural coatings. It is a production control method that relies to a large extent on operator experience and instruction.

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 48-2, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD*

ISO 2143, *Anodizing of aluminium and its alloys — Estimation of loss of absorptive power of anodic oxidation coatings after sealing — Dye-spot test with prior acid treatment*

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

ISO 3210, *Anodizing of aluminium and its alloys — Assessment of quality of sealed anodic oxidation coatings by measurement of the loss of mass after immersion in acid solution(s)*

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 and the following 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/

3.1
block
resilient support for the abrasive paper during the test

3.2
double stroke
one complete reciprocal movement across the measuring area on the test specimen

3.3
glass-coated abrasive paper
abrasive paper used for the surface abrasion-resistance test

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3.4
lot
customer's complete order of one product

4 Principle

The surface abrasion resistance is evaluated by using an abrasive paper to determine whether or not the coating is more wear resistant than the glass-coated abrasive paper.

5 Apparatus

5.1 Glass-coated abrasive paper.

The backing paper shall be of such quality that the paper does not break during the performance of the test.

The glass-coated abrasive paper shall have been validated using the method described in Annex A.

NOTE Glass-coated abrasive paper with a very fine glass grit size equivalent to P240, as defined in ISO 6344-1, can be suitable to carry out this test.

5.2 Resilient support for the paper during the test.

It is recommended that the block is 6 mm to 8 mm thick and approximately 30 mm wide and 40 mm long. Its hardness shall be 30 IRHD to 70 IRHD (international rubber hardness degrees) as measured using an appropriate method described in ISO 48-2.

NOTE It is possible that a large rectangular rubber or soft-plastic pencil eraser is suitable.

6 Procedure

6.1 Test specimen

The test specimen shall normally consist of a production article (or part thereof). It shall be sealed, dry and clean and, if requested, shaped to correspond to its ultimate use in service.

6.2 Method 1

Wrap a strip of glass-coated abrasive paper round the block so that the abrasive side lies outwards. Position the strip across the 6 mm to 8 mm thickness of the block so that the ends of the strip can be held firmly in place by the thumb and forefinger on either side of the block and position the strip so that it lies across the leading end of the block as it is held (see Figure 1).

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