
**Anodizing of aluminium and its
alloys — Test method for chemical
resistance of anodic oxidation
coatings on aluminium and its alloys
using electromotive force apparatus**

*Anodisation de l'aluminium et de ses alliages — Méthode d'essai
pour la résistance chimique des couches d'oxydation anodique
sur l'aluminium et ses alliages à l'aide d'un appareil à force
électromotrice*



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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.

Introduction

Anodic oxidation coatings can be exposed to various chemicals and attacked by chemical means. The resistance of anodic oxidation coatings to chemicals can give important information about how the characteristics of the coatings are affected by anodizing conditions, especially sealing conditions.

The test given in this document evaluates resistance to alkali or acid by measuring the dissolving time of anodic oxidation coatings. This method can test the chemical resistance characteristics of the whole thickness of the coatings.

This test method for chemical resistance using electromotive force apparatus has positive characteristics, such as a simplified testing apparatus, the reduction of artificial errors and applicability to thick anodic oxidation coatings over 20 μm . This test method is characterized by its small test area, the small quantity of test liquid used and a short testing time. In addition, both the test solutions can be supported by the same apparatus.

This method specified in this document uses sodium hydroxide or phosphoric acid, but it is possible to use other chemicals in accordance with the use environment. Therefore, this method can be widely applicable to anodic oxidation coatings for industrial products, electrical appliances or kitchenware.

Anodizing of aluminium and its alloys — Test method for chemical resistance of anodic oxidation coatings on aluminium and its alloys using electromotive force apparatus

1 Scope

This document specifies a test method using electromotive force test apparatus for assessing the chemical resistance of anodic oxidation coatings on aluminium and its alloys.

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 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

chemical resistance

capability of a coating to resist chemical agents of alkali and acid

4 Principle

This test is a method assessing chemical resistance by measuring the dissolving time of an anodic oxidation coating by a test solution. The dissolving time is determined by measuring the time from the injection of a test solution into an electric potential cell to detection of an electromotive force, which occurs when the coating is dissolved and there is electrical continuity between the test specimen and the cell. This test is capable of assessing the total characteristics of anodic oxidation coatings on aluminium and its alloys. Therefore, among products of the same coating thickness, this test can be applied to assess the protective capacity of the whole coating against chemical attack and its relationship with certain sealing methods, see [Annex C](#).

5 Reagents

Use only reagents of a recognized analytical grade and distilled water or deionized water of preferably less than 2 $\mu\text{S}/\text{cm}$ in conductivity, unless otherwise agreed by the anodizer and the customer.

The test solution should be prepared each time prior to use.

NOTE Where solution concentrations other than those specified in [5.1](#) and [5.2](#) are used, see [Annex A](#).