
INTERNATIONAL STANDARD



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**Anodization (anodic oxidation) of aluminium and its alloys —
Insulation check by measurement of breakdown potential**

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2376 was drawn up by Technical Committee ISO/TC 79, *Light metals and their alloys*.

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It was approved in October 1971 by the Member Bodies of the following countries:

Austria
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Turkey

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The Member Body of the following country expressed disapproval of the document on technical grounds:

United Kingdom

Anodization (anodic oxidation) of aluminium and its alloys — Insulation check by measurement of breakdown potential

1 SCOPE

This International Standard specifies a method of checking the insulation of oxide coatings obtained by anodization (anodic oxidation) of aluminium and of its alloys, by determination of the breakdown potential.

2 FIELD OF APPLICATION

This International Standard is directly applicable in cases where the anodization is carried out for the purpose of electrical insulation and in cases where the specifications are based on the principle of breakdown potential.

3 PRINCIPLE

The measurement is normally carried out on pieces which have undergone sealing after anodization and drying, to the exclusion of all varnishing or other covering.

The measurement of the breakdown potential is based on the dielectric characteristics and the insulation properties of the oxide coating. The electric voltage at which current first passes through the coating is measured. This voltage depends on the thickness of the anodic film, as well as on many other factors, in particular : the surface condition, composition of the basis metal, effectiveness of the sealing and the dryness of the piece and its ageing.

4 APPARATUS

The output of the test apparatus shall be capable of supplying continuously variable alternating voltage with a reading sensitivity of 10 V. The frequency of supply shall be 50 or 60 Hz.

Two electrode systems are suitable, namely :

- the system with a metal ball of 3 to 8 mm in diameter applied on the surface, the other electrode consisting generally of a point in contact with the basis metal;

- the system with two metal balls of the same diameter separated by a distance of 25 mm.

In both cases, the balls shall be clean and applied with a force between 0.5 and 1 N.

The rate of increase of the voltage shall be 25 V/s.

5 PROCEDURE

Proceed in accordance with the directions given by the supplier of the apparatus.

In particular, the two electrodes shall be placed on the piece a few centimetres from each other on a flat, smooth or machined part, or on a curve of more than 5 mm radius and at least 5 mm from a sharp edge.

For narrow products, the test may be carried out on the long axis, provided, however, that the electrodes are at least 1 mm from a sharp edge.

Record the voltage corresponding to the electrical breakdown of the coating. Repeat the measurement at ten different points on the piece and calculate the arithmetical mean.

6 EXPRESSION OF RESULTS

Record the arithmetical mean of the results of ten measurements taken at different points of the piece as the breakdown potential.

If one ball is used (the other electrode being in contact with the basis metal) the reading represents the effective breakdown potential of the coating.

If two balls are used, the reading represents approximately double the breakdown potential.

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