International Standard 2106

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Anodizing of aluminium and its alloys — Determination of mass per unit area (surface density) of anodic oxide coatings — Gravimetric method

Anodisation de l'aluminium et de ses alliages — Détermination de la masse par unité de surface (masse surfacique) des couches anodiques — Méthode gravimétrique

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Foreword

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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 2106 was developed by Technical Committee ISO/TC 79, *Light metals and their alloys*.

This second edition was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 2106-1976), which had been approved by the member bodies of the following countries :

Austria
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The member body of the following country had expressed disapproval of the document on technical grounds :

Japan

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Anodizing of aluminium and its alloys — Determination of mass per unit area (surface density) of anodic oxide coatings — Gravimetric method

1 Scope

This International Standard specifies a gravimetric method of determining the mass per unit area (surface density) of anodic oxide coatings on aluminium and its alloys.

2 Field of application

The method is applicable to all oxide coatings formed by anodizing aluminium and its alloys, either cast or wrought. This method is suitable for most aluminium alloys except those in which the copper content is greater than 6 %.

If the thickness is known with sufficient precision (see, for example, ISO 2128), determination of the mass per unit area (surface density) of the coating enables its apparent density to be calculated.

Inversely, if the conditions of application of the coating, and its density, are known, the determination of its mass per unit area (surface density) can permit an approximate calculation of its thickness to be made.

3 Reference

ISO 2128, *Anodizing of aluminium and its alloys — Determination of thickness of anodic oxide coatings — Non-destructive measurement by split-beam microscope.*

4 Principle

Dissolution of the anodic oxide coating on a weighed sample of known surface area, without significantly attacking the basis metal, using a mixture of phosphoric acid and chromium trioxide of specified concentration.

Reweighing of the sample after dissolution of the coating, and calculation of the mass lost. This mass is related to the unit area covered by the coating and is generally expressed in milligrams per square decimetre.

This is a destructive test.

5 Reagent

Phospho-chromic acid, prepared as follows :

- **phosphoric acid,** ϱ_{20} 1,7 g/ml : 35 ml;
- **crystallized chromium trioxide** : 20 g;
- **distilled water** : to make up to 1 l.

6 Apparatus

6.1 Laboratory balance, accurate to 0,1 mg.

6.2 Beakers.

6.3 Heating device.

7 Procedure

7.1 Preliminary treatment

The surface to be examined shall have an area of between 0,08 and 1 dm^2 and the mass of the sample shall not exceed 100 g. If the surface is dirty or impregnated with oil, grease or similar material, the foreign matter must be removed with the aid of a suitable organic solvent, such as trichlorethylene.

In certain cases, it is preferable to measure the mass of the oxide coating on one face only of the sample. In this case, the oxide coating on the other face is removed by a mechanical or chemical process, leaving the relevant face intact.

Alternatively, a protective agent, resistant to attack by the acidic test solution, may be applied over the reverse face of the sample.