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Third edition
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Anodizing of aluminium and its alloys — Specification for hard anodic oxidation coatings on aluminium and its alloys

Anodisation de l'aluminium et de ses alliages — Spécification pour l'anodisation dure de l'aluminium et des alliages d'aluminium



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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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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*.

This third edition cancels and replaces the second edition (ISO 10074:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the normative references have been updated;
- the recommended jet nozzle for abrasion testing has been revised.

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Introduction

Hard anodizing is an electrolytic treatment which results in the formation of a hard and usually thick coating of alumina used primarily for engineering purposes.

Hard anodizing can be applied to cast or wrought aluminium and aluminium alloys; however, alloys containing more than 5 % copper and/or 8 % silicon and die casting alloys require special anodizing procedures. To obtain optimum microhardness, wear resistance or low surface roughness characteristics, low contents of alloy are selected.

Unless otherwise specified, articles are anodized after all heat-treatment, machining, welding, forming and perforating operations. The best results are achieved on machined surfaces. Sharp edges are machined to a radius of at least 10 times the intended thickness to avoid "burning" and/or spalling.

Hard anodizing will usually result in a dimensional increase on each surface equal to about 50 % of the coating thickness. The dimensions of the component prior to anodizing will allow for this, if necessary.

The thickness is generally within the range of 25 μm to 150 μm . Low thickness (up to 25 μm) is sometimes used in a variety of applications, such as splines and threads. Normal thickness (50 μm to 80 μm) is used for wear or insulation requirements. High thickness (150 μm) is used for repairing purposes, but thick coatings tend to be softer in outer regions. Very hard coatings reduce the fatigue strength. This phenomenon can be minimized by applying shot peening before hard anodizing (see [H.6](#)), by reducing thickness and/or by sealing. Hard anodizing tends to increase surface roughness. This can be limited with low alloy contents and/or mechanical finishing.

Hard anodic oxidation coatings are mainly used to obtain the following:

- resistance to wear through abrasion or erosion;
- electrical insulation;
- thermal insulation;
- build-up (to repair parts out of tolerance on machining or worn parts);
- resistance to corrosion (when sealed).