

ICS 25.220.40
CCS A 29



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 19822-2024

Replacing GB/T 19822-2005

**Specification for hard anodic oxidation coatings on aluminium
and its alloys**

铝及铝合金硬质阳极氧化膜规范

(English Translation)

Issued on: June 29, 2024

Implemented on: January 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface
Introduction
1 Scope
2 Normative references
3 Terms and Definitions
4 Material classification
5 Appearance
6 Thickness
7 Surface density
8 Wear resistance
9 Vickers microhardness
10 Corrosion resistance
Appendix A (Normative) Information that the purchaser should provide to the supplier
Appendix B (Normative) Wear test
Appendix C (Normative) Preparation of standard samples
Appendix D (Informative) Sampling Procedure
Appendix E (Normative) Breakdown Voltage
Appendix F (Normative) Process Identification and Approval
Appendix G (Informative) Packaging, storage and transportation of anodized workpieces
Appendix H (Informative) Process Guide
References

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document replaces GB/T 19822-2005 "Specification for Hard Anodic Oxide Film on Aluminum and Aluminum Alloys" and is consistent with GB/T 19822-2005.

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

--- Deleted the definition of "effective surface" (see 3.3 of the 2005 edition);

- Modified the definition of hard oxide film 2 (a) and 2 (b) categories (see Chapter 4, Chapter 4 of the 2005 edition);
- Increased the number of pre-grinding reciprocating strokes in the grinding wheel wear test (see 8.2, 8.2 of the 2005 edition);
- Merged Appendix B and Appendix G (see Appendix B, Appendix B and Appendix G of the 2005 edition).

This document is modified to adopt ISO 10074:2021 "Aluminium and aluminium alloys - Anodised aluminium and aluminium alloy hard anodic oxide coatings - Specifications".

The technical differences between this document and ISO 19487:2016 and their reasons are as follows.

- ISO 7583 (see Chapter 3) has been replaced with the normative reference GB/T 8005.3 to adapt to my country's technical conditions and increase the Operability;
- ISO 4516 (see Chapter 9) has been replaced by the normative reference GB/T 9790 to adapt to my country's technical conditions and increase operability Sex;
- ISO 9227 (see Chapter 10 and 8.2) has been replaced by the normative reference GB/T 10125 to adapt to my country's technical conditions, and Increase operability;
- ISO 8251 (see Chapter 9) has been replaced with the normative reference GB/T 12967.2 to adapt to my country's technical conditions and increase the Operability;
- The normative reference GB/T 4957 replaces ISO 2360 (see Chapter 6); GB/T 6462 replaces ISO 1463 (see Chapter Chapter 6); GB/T 8754 replaces ISO 2376 (see Appendix E); GB/T 9258.1 replaces ISO 6344-1 (see 8.2 and B.1).

The following editorial changes were made to this document.

- Change the name of the document to "Specification for Hard Anodized Film of Aluminum and Aluminum Alloys";
- B.3.3 Procedure number.

Introduction

Hard anodizing is an electrolytic treatment that forms a hard and usually thick aluminum oxide film, which is mainly used for engineering purposes.

Hard anodizing can be used for cast or wrought aluminum and aluminum alloys. However, wrought aluminum alloys containing more than 5% copper and/or 8% silicon and Die-cast aluminum alloys require a special anodizing process. In order to obtain the best microhardness, wear resistance or low surface roughness characteristics Properties, choose low alloy content.

Unless otherwise specified, workpieces are anodized after all heat treatment, machining, welding, forming and punching operations.

The best results are obtained on the surface. Sharp contours should be processed into a radius of curvature not less than 10 times the predetermined thickness to avoid ablation or Peeling off.

Hard anodizing typically results in a dimensional increase of 50% of the film thickness on a single surface. If necessary, the assembly should be Allowance for size increase.

The film thickness is usually in the range of 25µm~150µm. Low thickness films (25µm) are sometimes used for various purposes, such as splines and threads; generally Thick films (50µm~80µm) are used for wear resistance or insulation; high-thickness films (150µm) are used for repair purposes, but the outer layer of the thick film tends to Very hard films reduce fatigue strength, a phenomenon that can be corrected by shot peening (see H.6) before hard anodizing.

Hard anodizing results in increased surface roughness, which can be reduced by reducing alloy content or mechanical finishing.

inhibition.

Hard anodized films are generally used for.

- Resistant to abrasive wear or corrosive wear;
- Electrical insulation;
- Thermal insulation;
- Repair workpieces (repair parts that are out of tolerance due to machining or wear);
- Corrosion resistance (sealed film).

Specification for hard anodized film on aluminium and aluminium alloys

1 Scope

This document specifies the requirements for hard anodic oxide films on aluminium and aluminium alloys and describes the test methods for hard anodic oxide films on aluminium and aluminium alloys.

This document also specifies the information that the purchaser should provide to the supplier (see Appendix A).

This document is applicable to aluminum and aluminum alloy hard anodized film. This document is not applicable to plasma electrolytic oxidation, micro-arc oxidation, plasma Coatings produced by processes such as chemical anodizing, anodic spark deposition or spark anodizing.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 4957 Measurement of coating thickness of non-conductive coatings on non-magnetic base metals - Eddy current method (GB/T 4957-2003, ISO 2360:1982, IDT) GB/T 6462 Measurement of metal and oxide coating thickness - Microscopic method (GB/T 6462-2005, ISO 1463.

2003, IDT)

GB/T 8005.3 Terminology of aluminium and aluminium alloys Part 3: Surface treatment (GB/T 8005.3-2008, ISO 7583:1986, MOD) GB/T 8754 Anodic oxidation of aluminum and aluminum alloys - Determination of insulation properties of anodic oxide films - Breakdown potential method (GB/T 8754-2006, ISO 2376:1972, IDT) GB/T 9258.1 Abrasive particle size analysis for coated abrasives Part 1: Particle size composition (GB/T 9258.1-2000, ISO 6344-1:1998, IDT) GB/T 9790 Vickers and Knoop microhardness test for metallic materials, metals and other inorganic coatings (GB/T 9790-2021, ISO 4516:2002, MOD) GB/T 10125 Artificial atmosphere corrosion test Salt spray test (GB/T 10125-2021, ISO 9227:2017, MOD) GB/T 12967.2 Test methods for anodic films on aluminium and aluminium alloys Part 2: Determination of the resistance of anodic oxide films by wheel wear tester Abrasiveness and wear resistance coefficient (GB/T 12967.2-2008, ISO 8251:1987, MOD) ISO 2106 Anodic oxidation of aluminium and aluminium alloys - Determination of mass per unit area (surface density) of anodic oxide coatings - Gravimetric method

3 Terms and definitions

The terms and definitions defined in GB/T 8005.3 and the following apply to this document.

Lot

Workpieces machined together having the same nominal alloy composition and heat treatment.

lot acceptance test lot acceptance test Test production batches (3.1) to determine whether they conform to the specified requirements.