

ICS 49.040
CCS V 16



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

GB/T 47040-2026

**Aerospace - Sulfuric acid anodizing of titanium and titanium
alloys - Treatment process**

航空航天 钛及钛合金硫酸阳极氧化 处理工艺

(English Translation)

Issued on: January 28, 2026

Implemented on: May 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Foreword
1 Scope
2 Normative references
3 Terms and Definitions
4 Technical Requirements
4.1 Process Requirements
4.2 Preparations before anodizing

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document adopts ISO 8080:2021 "Aerospace titanium and titanium alloys anodizing sulfuric acid process".

The following minimal editorial changes have been made to this document.

---To align with existing standards, the standard name has been changed to "Aerospace Titanium and Titanium Alloy Sulfuric Anodic Oxidation Process".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Aircraft Standardization Technical Committee (SAC/TC435).

1 Scope

This document specifies the technical requirements, quality assurance provisions, packaging and delivery of sulfuric acid anolyte films for aerospace titanium and titanium alloys.

This document applies to sulfuric acid anodizing treatment films on aerospace titanium and titanium alloys. These films are used in conjunction with solid thin-film lubricants to ensure...

The titanium fastener is protected from wear and provides some protection against galvanic corrosion of the less precious metals it comes into contact with. Refer to this guideline for other approved applications.

2 Normative references

This document has no normative references.

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4.1 Process Requirements

4.1.1

The anodizing solution should consist of an aqueous solution of industrial sulfuric acid, with a nominal concentration of 200 g/L to 400 g/L of H₂SO₄. The solution composition...

The concentration should be maintained within $\pm 10\%$ of the selected nominal components. The chloride content, calculated as NaCl, should not exceed 0.2 g/L. If procurement is approved...

If the parties agree and the obtained membrane meets all other requirements of this document, the chemical composition of the solution may be altered.

4.1.2

The content of dissolved metals in the solution, calculated as titanium ions, should not exceed 20 g/L.

4.1.3

The solution should be used at a temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$. The temperature control equipment should be able to maintain the solution temperature at the control setpoint.

Within $\pm 5^{\circ}\text{C}$ range.

4.1.4

The solution should be stored in a corrosion-resistant steel tank or a steel tank lined with acid-resistant material. Except in cases where the storage tank is lined with lead, the storage tank lining should be...

An auxiliary cathode plate made of a material that will not contaminate the solution.

4.1.5

A DC (VDC) power supply and related control equipment and instruments for reading voltage and current are required.

4.1.6

All fastening devices for parts shall be made of titanium or titanium alloy, such as wire, hooks, clamps and hangers.

4.1.7

Pickling solutions containing the following concentrations of a mixture of nitric acid and hydrofluoric acid can be used as a reference.

---280g/L~560g/L of HNO₃ (69%);

---15g/L~25g/L HF (70%).

When the anodic oxide film meets all the requirements of this document, and the original equipment manufacturer (OEM) and processor agree, it is possible to modify the nitrification process.

The concentration of acids and hydrofluoric acid, or the availability of alternative chemical products.

4.2 Preparations before anodizing

4.2.1

Parts shall be thoroughly alkaline cleaned to ensure that all surfaces are free of contaminants such as grease, oil and factory markings.

4.2.2

Degreasing should not be performed using chlorinated solvents or methanol.