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

GB/T 22640-2023

Replacing GB/T 22640-2008

**Test method for determining susceptibility to stress corrosion
cracking of aluminum alloys**

铝合金应力腐蚀敏感性评价试验方法

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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: This document replaces GB/T 22640-2008 "Stress Corrosion Test Method for Ring Specimens of Aluminum Alloy Processed Products", and GB/T 22640- Compared with:2008, except for structural adjustment and editorial changes, the main technical changes are as follows:

- a) The preparation of corrosive medium has been changed (see Chapter 4, Chapter 4 of the:2008 edition);
- b) The slow strain rate corrosion test machine is added (see 5:1);
- c) Added loading bracket (see 5:9);
- d) The test device for boiling sodium chloride solution has been added (see 5:10);
- e) Changed the C-ring sample diagram and sample size (see 6:2:1, 6:2:2 of the:2008 edition);
- f) A tensile test sample has been added (see 6:2:2);
- g) A bending beam specimen is added (see 6:2:3);
- h) The U-shaped test piece is added (see 6:2:4);
- i) The requirements for the test temperature have been changed (see 7:2:2, 7:2 of the:2008 edition);
- j) Changed the sample cleaning method (see 7:2:8, 7:13 of the:2008 edition);
- k) Changed the expression method of the sample results (see 7:3, 8:1 of the:2008 edition);
- l) The constant strain test method for bending beam specimens has been added (see Chapter 8);
- m) Added the U-shaped sample constant strain test method (see Chapter 9);

1 Scope

GB/T 22640-2023 is the Chinese national standard on test method for determining susceptibility to stress corrosion cracking of aluminum alloys, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 23 May 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 December 2023. Classification: ICS 77.040.99, CCS H25. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document describes the test method for stress corrosion susceptibility evaluation of wrought aluminum alloy products: This document is applicable to constant strain tests of C-ring specimens, constant strain tests of bending beam specimens, constant strain tests of U-shaped specimens, and tensile tests: Sample constant load test, tensile sample constant strain test, tensile sample continuous increase strain test, boiling sodium chloride solution constant strain test price: Other grades of aluminum alloy products can also refer to this document:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document: GB/T 3246:

1 Deformed Aluminum and Aluminum Alloy Products Microstructure Test Method Part 1: Microstructure Test Method GB/T 3246:

2 Microstructural test methods for wrought aluminum and aluminum alloy products Part 2: Low magnification test methods

GB/T 6682 Analytical laboratory water specifications and test methods

GB/T 8170 Rounding off rules for numbers and expression and determination of limit values

GB/T 16865 Deformed aluminum, magnesium and its alloy processed products tensile test specimens and methods

JJF1914 Calibration specification for metallographic microscope

JJF1916 Scanning Electron Microscope Calibration Specification JJF (Nonferrous Metals)

0007 Calibration Specification for Slow Strain Rate Stress Corrosion Testing Machine JJF
(non-ferrous metals) 0009 Calibration specification for periodic immersion test chamber
JJG21 micrometer JJG

30 Universal Caliper JJG34 indicator (pointer type, digital display type)

3 Method overview

After applying stress to the sample according to the specified loading method, the sample is fully immersed or partially immersed in the corrosive medium, and placed in a test ring with a certain temperature and humidity: In the environment, cracks or fractures appear in the sample until the specified time: Observe the corrosion phenomenon of the sample visually or under a microscope, or calculate the stress corrosion sensitivity Sensitivity index to evaluate the stress corrosion susceptibility of aluminum alloy products: According to the sample loading method, the test methods are divided into the following types:

---Constant load test: The load of the sample is constant or the load is within the accuracy of control during the test: The sample type is a tensile sample, and the loading method Loading for the bracket and testing machine, the impregnation methods are full immersion infiltration and periodic infiltration: The test method is the constant load test of tensile specimens:

---Constant strain test: The deformation displacement of the sample during the test is constant or the displacement is within the control accuracy: The sample type is C-ring sample, For tensile specimens, bending beam specimens, and U-shaped specimens, the loading method is bracket loading, and the impregnation methods are full immersion infiltration and periodic infiltration: try The test methods are constant strain test of C-shaped ring specimen, constant strain test of bending beam specimen, constant strain test of U-shaped specimen, constant strain test of tensile specimen