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

GB/T 15970.11-2022

**Corrosion of metals and alloys - Stress corrosion cracking - Part 11:
Guidelines for testing the resistance of metals and alloys to hydrogen
embrittlement and hydrogen-assisted cracking**

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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 is part 11 of GB/T 15970 "Stress Corrosion Tests for Corrosion of Metals and Alloys". GB/T 15970 has been issued

the following sections.

- Part 1. General principles of test methods;
- Part 2. Preparation and application of curved beam specimens;
- Part 3. Preparation and application of U-shaped bending specimens;
- Part 4. Preparation and application of uniaxially loaded tensile specimens;
- Part 5. Preparation and application of C-ring specimens;
- Part 6. Preparation and application of pre-cracked specimens under constant load or constant displacement;
- Part 7. Slow strain rate test;
- Part 8. Preparation and application of welding samples;
- Part 9. Preparation and application of pre-cracked specimens under increasing load or increasing displacement;
- Part 10. Reverse U-bend test method;
- Part 11. Metals and alloys hydrogen embrittlement and hydrogen-induced cracking test

guidelines.

This document is identical to ISO 7539-11:2013 "Stress corrosion tests for corrosion of metals and alloys - Part 11: Metals and alloys

Guidelines for Hydrogen Embrittlement and Hydrogen-Induced Cracking Tests.

A chapter "Terms and Definitions" has been added to this document.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

GB/T 15970 "Stress Corrosion Tests for Corrosion of Metals and Alloys" is a national steel standardization technical committee

The sub-technical committee (hereinafter referred to as the "committee") is responsible for formulating and revising one of the stress corrosion test method standards. GB/T 15970 aims to assess

Stress corrosion resistance of metals and alloys, etc.

GB/T 15970 consists of twelve parts.

--- Part 1: General principles of test methods. The purpose is to evaluate the stress corrosion resistance of metals and alloys, and various test methods are given.

general guidelines for the selection, use, and interpretation of meaning of.

--- Part 2: Preparation and application of bent beam specimens. The purpose is to study the susceptibility of metals and alloys to stress corrosion.

Procedures for the design, preparation and use of beam specimens.

--- Part 3: Preparation and application of U-bending specimens. The purpose is to study the susceptibility of metals and alloys to stress corrosion, giving

The design, preparation and use procedures of U-shaped specimens are described.

--- Part 4: Preparation and application of uniaxially loaded tensile specimens. The purpose is to study the susceptibility of metals and alloys to stress corrosion

The design, preparation and application procedures of uniaxially loaded tensile specimens are given.

--- Part 5: Preparation and application of C-ring specimens. The purpose is to study the susceptibility of metals and alloys to stress corrosion, given

The methods of design, preparation, loading, exposure and inspection of C-ring specimens provide information on the stress state and distribution of C-ring specimens.

analyze.

--- Part 6.Preparation and application of pre-cracked specimens under constant load or constant displacement. The purpose is to study the response of metals and alloys to stress

Corrosion susceptibility, with recommendations for the design, preparation and use of pre-cracked test specimens.

--- Part 7.Slow strain rate test. The purpose is to study the susceptibility of metals and alloys to stress corrosion cracking and hydrogen induced cracking

The slow strain rate test procedure is given.

--- Part 8.Preparation and application of welding specimens. The purpose is to study the susceptibility of metals and alloys to stress corrosion, and further

Preparation of welded specimens for stress corrosion testing and additional factors to be considered, especially for the selection of specimens and test methods

It is recommended to determine the stress corrosion resistance of metals in the welded state.

--- Part 9.Preparation and application of pre-cracked specimens under increasing load or increasing displacement. The purpose is to study metal and alloy

The susceptibility of gold to stress corrosion, gives the prediction of the susceptibility of metal to stress corrosion cracking under increasing load or increasing displacement.

Design, preparation and application of cracked specimens, etc.

--- Part 10.Reverse U-bend test method. The purpose is to study the susceptibility of metals and alloys to stress corrosion, given

The principle of the reverse U-bend test method, specimens, test procedures, result evaluation and test reports, etc.

--- Part 11.Metals and alloys hydrogen embrittlement and hydrogen-induced cracking test guidelines. The purpose is to study the resistance of metals and alloys to stress corrosion cracking

and susceptibility to hydrogen-induced cracking, giving the key points to be considered when designing and conducting tests on the resistance to hydrogen embrittlement and hydrogen-induced cracking of metals or their alloys

key properties.

--- Part 12.Guidelines for atmospheric stress corrosion cracking. The purpose is to study the resistance of metals and alloys to stress corrosion cracking and hydrogen induced cracking

Susceptibility, gives the design and conduct of tests to evaluate the susceptibility of metals

and alloys to stress corrosion cracking under conditions of atmospheric exposure

General matters to be considered.

Corrosion Stress Corrosion Testing of Metals and Alloys

Part 11. Hydrogen embrittlement of metals and alloys

and hydrogen induced cracking test guide

1 Scope

This document provides guidance on the key properties to consider when designing and conducting tests on metals or their alloys for resistance to hydrogen embrittlement and hydrogen-induced cracking.

Note. This document does not involve specific test methods, specific test methods can refer to other documents given in the references.

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.

ISO 7539-7 Stress corrosion tests for corrosion of metals and alloys - Part 7. Slow strain rate test (Corrosion of

Note. GB/T 15970.7-2000 Stress corrosion test for corrosion of metals and alloys Part 7. Slow strain rate test (ISO 7539-7:1989,

IDT).

ISO 17081 Methods for the measurement of hydrogen permeation and the electrochemical method for the determination of hydrogen absorption and migration in metals (Method of

Note. GB/T 30074-2013 Method for measuring hydrogen permeation (absorption and migration) in metals by electrochemical techniques (ISO 17081:2004, MOD).

3 Terms and Definitions

This document does not have terms and definitions that need to be defined.