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

GB/T 15970.7-2017

**Corrosion of metals and alloys -- Stress corrosion testing --
Part 7: Slow strain rate testing
(English Translation)**

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Foreword

GB/T 15970 "Corrosion of metals and alloys - Stress corrosion test" is divided into the following parts.

- Part 1. General guidance on testing procedures;
- Part 2. Preparation and use of bent-beam specimens;
- Part 3. Preparation and use of U-bend specimens;
- Part 4. Preparation and use of uniaxially loaded tension specimens;
- Part 5. Preparation and use of C-ring specimens;
- Part 6. Preparation and use of pre-fractured specimens;
- Part 7. Slow strain rate testing;
- Part 8. Preparation and use of specimens to evaluate weldments;
- Part 9. Preparation and use of pre-fractured specimens for tests under rising load or rising displacement.

This part is the part 7 of GB/T 15970.

This part was drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 15970.7-2000 "Corrosion of metals and alloys - Stress corrosion testing - Part 7. Slow strain rate testing". As compared with GB/T 15970.7-2000, the main technical changes are as follows.

- MODIFY the normative references;
- ADD the definition of plastic strain to failure;
- MODIFY the definition of elongation to fracture, reduction of area, strain rate;
- ADD the descriptions for the number of specimens in each group;
- ADD the requirements for reagents;
- DELETE the description that "If the total test time of the test at a very slow strain rate is required, it is needed to preload the specimen";
- ADD the description of important parameters of environmental factors;
- ADD the descriptions for the factors which affect the potential of the metal electrode;
- ADD the provisions for the auxiliary electrodes that generate external currents;
- ADD the requirements for the ratio of solution volume to specimen's surface area;
- ADD the sensibility of the use of plastic strain to failure to assess the stress-corrosion-fracturing;
- ADD the descriptions for testing the plastic strain to failure;
- ADD the expression formula of the plastic strain to failure and the limitations of the use of the formula;
- MODIFY the method of determining the critical stress or strain value;
- ADD the description of the test results;
- DELETE the contents of the original Appendix A;
- CHANGE the original Appendix B into Appendix A.

This part uses the redrafting methods to modify and adopt the ISO 7539-7.2005

Corrosion of metals and alloys - Stress corrosion testing - Part 7. Method for slow strain rate testing.

As compared with ISO 7539-7.2005, this part has structural changes and adds the clause 6.

The technical differences between this part and ISO 7539-7.2005 and their reasons are as follows.

- ADJUST the relevant standards in the normative references, to adapt to Chinese technical documents (see clause 2);
- MODIFY the definition of elongation to fracture, reduction of area, strain rate, post-break elongation, part shrinkage and strain rate, to be consistent with the definition given in GB/T 228.1-2010 (see clause 3);
- ADD the descriptions for the number of specimens per group, to clarify the number of specimens and reduce the risk of use (see clause 5);
- ADD the requirements for the reagents, to provide a reproducible chemical environment, thereby ensuring the consistent test results (see clause 6);
- ADD the requirements for the ratio of solution volume to specimen's surface area, to ensure that the specimen is exposed to sufficient corrosive solution

Corrosion of metals and alloys - Stress corrosion testing - Part 7. Slow strain rate testing

1 Scope

This part of GB/T 15970 specifies a slow strain rate test procedure, for studying the susceptibility of metals and alloys to stress-corrosion-fracturing, including hydrogen-induced failure.

The term "metal" as used in this part also includes alloys.

This part applies to boards, rods, wires, belts, tubes and their welded assemblies.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 6682 Water for analytical laboratory use - Specification and test methods

GB/T 15970.1 Corrosion of metals and alloys - Stress corrosion testing - Part

1 General guidance on testing procedures (GB/T 15970.1-1995, idt ISO

7539-1.1987)

GB/T 15970.4 Corrosion of metals and alloys - Stress corrosion testing - Part

4 Preparation and use of uniaxially loaded tension specimens (GB/T

15970.4-2000, idt ISO 7539-4.1989)

GB/T 15970.6 Corrosion of metals and alloys - Stress corrosion testing - Part

6 Preparation and use of pre-fractured specimens for tests under constant

load or constant displacement (GB/T 15970.6-2007, ISO 7539-6.2003, IDT)

3 Terms and definitions

The terms and definitions as defined in GB/T 15970.1 as well as the following terms and definitions apply to this document.

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