
**Corrosion of metals and alloys —
Test method for measuring the
stress corrosion crack growth rate
of steels and alloys under static-load
conditions in high-temperature water**

*Corrosion des métaux et des alliages — Méthode d'essai pour le
mesurage de la vitesse de propagation des fissures de corrosion sous
contrainte des aciers et des alliages dans des conditions de charge
statique dans de l'eau à haute température*

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle of test	2
5 Specimen	3
5.1 Specimen orientation	3
5.2 Specimen geometry	3
5.3 Specimen finish	4
5.4 Specimen size requirement	4
5.5 Specimen dimensional measurement	5
5.6 Stress intensity factor, K_I	5
6 Test equipment	5
7 Crack length measurement by potential drop method	6
8 Corrosion potential measurement	7
8.1 General	7
8.2 Measurement method	7
9 Test procedure	7
9.1 General	7
9.2 Installation in autoclave	8
9.3 Adjustment of test environment	9
9.4 Loading	9
9.4.1 General	9
9.4.2 Fatigue pre-cracking	9
9.4.3 SCC transitioning	9
9.4.4 Static loading	11
10 Evaluation of test results	11
11 Test report	14
Annex A (informative) CDCB specimen geometry and stress intensity factor calculation	16
Annex B (informative) Equipment for SCC growth testing	19
Annex C (informative) Water chemistry and monitoring items in simulated BWR and PWR environments	22
Annex D (informative) Approach to determine crack growth rate	24
Bibliography	25

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Corrosion of metals and alloys — Test method for measuring the stress corrosion crack growth rate of steels and alloys under static-load conditions in high-temperature water

1 Scope

This document specifies a test method for determining the stress corrosion crack (SCC) growth rate of steels and alloys under static-load conditions in high-temperature water, such as the simulated water environment of light water reactors. The crack length of the specimen is monitored by a potential drop method (PDM) during the test in an autoclave.

The test method is applicable to stainless steels, nickel base alloys, low alloy steels, carbon steels and other alloys.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7539-6, *Corrosion of metals and alloys — Stress corrosion testing — Part 6: Preparation and use of precracked specimens for tests under constant load or constant displacement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7539-6 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

potential drop method

PDM

non-destructive method for measuring a crack length based on the change in the electric potential as a crack propagates in the presence of an applied DC or AC current

3.2

stress corrosion crack transitioning

SCC transitioning

use of cyclic loading at low frequency and with increasing hold time at maximum load in the test environment to promote a transition in the fracture surface morphology from a transgranular (TG) fatigue pre-crack to SCC, typically intergranular (IG) or interdendritic (ID) morphology for austenitic alloys

3.3

crack-tip re-activation loading

use of loading cycles to re-activate the tip of crack when crack retardation is observed under a static loading