



# SLOVENSKI STANDARD SIST EN ISO 7539-7:1999

01-oktober-1999

Corrosion of metals and alloys - Stress corrosion testing - Part 7: Slow strain rate testing (ISO 7539-7:1989)

Korrosion der Metalle und Legierungen - Prüfung der Spannungsrißkorrosion - Teil 7: Prüfung mit langsamer Dehnrate (ISO 7539-7:1989)

Corrosion des métaux et alliages - Essais de corrosion sous contrainte - Partie 7: Essais a faible vitesse de déformation (ISO 7539-7:1989)

Ta slovenski standard je istoveten z: EN ISO 7539-7:1995

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**ICS:**

77.060            Korozija kovin            Corrosion of metals

**SIST EN ISO 7539-7:1999**            en

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EUROPEAN STANDARD

EN ISO 7539-7

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 1995

ICS 77.060

Descriptors: metals, alloys, tests, corrosion tests, stress corrosion tests

English version

**Corrosion of metals and alloys - Stress corrosion  
testing - Part 7: Slow strain rate testing  
(ISO 7539-7:1989)**

Corrosion des métaux et alliages - Essais de  
corrosion sous contrainte - Partie 7: Essais à  
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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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## CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

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Ref. No. EN ISO 7539-7:1995 E

Page 2  
EN ISO 7539-7:1995

## Foreword

The text of the International Standard has been taken as a European Standard by the Technical Committee CEN/TC 262 "Protection of metallic materials against corrosion" from ISO/TC 156 "Corrosion of metals and alloys" of the International Organization for Standardization (ISO).

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 1995, and conflicting national standards shall be withdrawn at the latest by December 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 7539-7:1989 has been approved by CEN as a European Standard without any modification.

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# INTERNATIONAL STANDARD

**ISO**  
**7539-7**

First edition  
1989-12-01

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## Corrosion of metals and alloys — Stress corrosion testing —

### Part 7: Slow strain rate testing

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*Corrosion des métaux et alliages — Essais de corrosion sous contrainte —*

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Reference number  
ISO 7539-7 : 1989 (E)

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7539-7 was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*.

ISO 7539 consists of the following parts, under the general title *Corrosion of metals and alloys — Stress corrosion testing*:

- *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-cracked specimens*
- *Part 7: Slow strain rate testing*
- *Part 8: Preparation and use of welded specimens*

Annex A of this part of ISO 7539 is for information only.

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## Introduction

This part of ISO 7539 is one of a series giving procedures for designing, preparing and using various forms of test specimen to carry out tests to establish a metals resistance to stress corrosion.

Each of the standards in the series needs to be read in association with ISO 7539-1. This helps in the choice of an appropriate test procedure to suit particular circumstances as well as giving guidance towards assessing the significance of the results of the tests.

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# Corrosion of metals and alloys — Stress corrosion testing —

## Part 7 : Slow strain rate testing

### 1 Scope

**1.1** This part of ISO 7539 covers procedures for conducting slow strain rate tests for investigating susceptibility of a metal to stress corrosion cracking, including hydrogen-induced failure.

The term "metal" as used in this part of ISO 7539 includes alloys.

**1.2** Slow strain rate tests are adaptable for testing a wide variety of product forms, including plate, rod, wire, sheet and tubes, as well as composites of these and parts joined by welding. Notched or pre-cracked specimens may be used, as well as initially plain specimens.

**1.3** The principal advantage of the test is the rapidity with which susceptibility to stress corrosion cracking of a particular metal/environment combination can be assessed.

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7539. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7539 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7539-1 : 1987, *Corrosion of metals and alloys — Stress corrosion testing — Part 1: General guidance on testing procedures*.

ISO 7539-4 : 1989, *Corrosion of metals and alloys — Stress corrosion testing — Part 4: Preparation and use of uniaxially loaded tension specimens*.

ISO 7539-6 : 1989, *Corrosion of metal and alloys — Stress corrosion testing — Part 6: Preparation and use of pre-cracked specimens*.

### 3 Definitions

For the purposes of this part of ISO 7539, the following definitions and those given in ISO 7539-1 apply.

**3.1 creep**: Time-dependent mechanical deformation of a specimen after application of the initial load.

**3.2 elongation to fracture**: The ratio, expressed as a percentage, of the increase in length of the gauge length which has occurred during a test, to the original gauge length.

**3.3 maximum load**: The maximum value of the load achieved during a test taken to total failure or, in the case of composite materials, the load corresponding to failure of one element.

**3.4 nominal stress — elongation curves**: A plot of the nominal stress calculated from the instantaneous applied load and the original cross-sectional area of a specimen, against the elongation of the gauge length at the time of the load measurement.

**3.5 reduction of area**: The ratio, expressed as a percentage, of the maximum decrease in cross-sectional area which has occurred during a test, to the original cross-sectional area.

**3.6 strain rate**: The initial rate of increase of the gauge length of an initially plain tensile specimen.

### 4 Principle

**4.1** The test consists in subjecting a specimen to an increasing strain whilst exposed to a specified environment with a view to determining stress corrosion susceptibility by reference to one or more of the parameters enumerated in clause 7.

**4.2** Corrosive environments may cause a deterioration of the properties of stressed materials beyond those observed with the same combination of environment and material when the latter is not subjected to slow dynamic strain. This enhanced