SLOVENSKI STANDARD
SIST EN ISO 7539-3:1999

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Korozija kovin in zlitin - Ugotavljanje pokanja zaradi napetostne korozije - 3. del: Priprava in uporaba preskuġancev v obliki ļ rke U (U-upognjenci) (ISO 7539-3:1989)

Corrosion of metals and alloys - Stress corrosion testing - Part 3: Preparation and use of U-bend specimens (ISO 7539-3:1989)

Korrosion der Metalle und Legierungen - Prüfung der Spannungsrißkorrosion - Teil 3: Vorbereitung und Anwendung von Bügelproben (ISO 7539-3:1989)

Corrosion des métaux et alliages - Essais de corrosion sous contrainte - Partie 3: Préparation et utilisation des éprouvettes cintrées en U (ISO 7539-3:1989)

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Corrosion of metals and alloys - Stress corrosion testing - Part 3: Preparation and use of U-bend specimens (ISO 7539-3:1989)

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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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Foreword

This European Standard has been taken over by the Technical Committee CEN/TC 262 "Protection of metallic materials against corrosion" from the work of 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of an identical text or by endorsement, at the latest by November 1995, and conflicting national standards shall be withdrawn at the latest by November 1995.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, United Kingdom.

Endorsement notice

The text of the International Standard ISO 7539-3:1989 was approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO 7539-3

First edition
1989-12-01

Corrosion of metals and alloys — Stress corrosion testing —

Part 3:
Preparation and use of U-bend specimens

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

Partie 3: Préparation et utilisation des éprouvettes cintrées en U

Reference number
ISO 7539-3 : 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 7539-3 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*

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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 3: Preparation and use of U-bend specimens

WARNING — U-bend specimens made from high strength materials may fracture rapidly; pieces may fly off at high velocity and can be dangerous. Personnel installing and examining specimens must be made aware of this possiblity and be protected against injury.

1 Scope

1.1 This part of ISO 7539 covers procedures for designing, preparing and using U-bend test specimens for investigating the susceptibility of a metal to stress corrosion.

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

1.2 U-bend specimens may be used to test a variety of product forms. They are used principally for sheet, plate or flat extruded material, which conveniently provides flat specimens of rectangular cross-section, but may also be employed for wire or rod, or for machined specimens of circular cross-section. They can also be used for parts joined by welding.

1.3 The U-bend test is frequently used to establish whether a metal is susceptible to stress corrosion cracking in a given environment. It is used in laboratories to screen materials for susceptibility for specific applications and in service environments to assess the risk of failure.

1.4 The principal advantages of the test are its simplicity and its consequent adaptability for use in plant. A disadvantage is that stresses cannot be quantified with accuracy and if this is desired an alternative method of stressing should be used.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 7539. At the time of publication, the edition indicated was 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 edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

3 Definitions

For the purposes of this part of ISO 7539, the definitions given in ISO 7539-1 are applicable.

4 Principle

4.1 The test consists in exposing to the corroding medium a piece of metal bent into a U-shape and held in a manner which ensures that there are initial tensile stresses ranging up to the yield point over a proportion of the surface. In the act of forming specimens, varying amounts of cold work may be introduced and this deformation may influence the stress corrosion cracking tendency as compared to that of the material in the original condition.

4.2 The test may be performed under laboratory conditions by exposing the specimens to simulated service conditions or it may be carried out in the actual service environment at the location of interest.

4.3 The objective of the test is either to establish whether a metal is suitable for a proposed application or to assess the risk of stress corrosion cracking of metals used in existing plant under service conditions.

4.4 Wide variations in test results may be obtained for a given metal and environment even when testing nominally identical specimens and the replication of tests is frequently necessary. If specimens are prepared to different sizes or orientations or are subjected to different stressing procedures, test results may be even more variable.