

## **Corrosion of metals and alloys - Corrosion fatigue testing - Part 1: Cycles to failure testing**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 11782-1:2008 sisaldab Euroopa standardi EN ISO 11782-1:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 20.06.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 16.04.2008.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 11782-1:2008 consists of the English text of the European standard EN ISO 11782-1:2008.

This standard is ratified with the order of Estonian Centre for Standardisation dated 20.06.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

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ICS 77.060

Võtmesõnad:

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English Version

Corrosion of metals and alloys - Corrosion fatigue testing - Part  
1: Cycles to failure testing (ISO 11782-1:1998)

Corrosion des métaux et alliages - Essais de fatigue-  
corrosion - Partie 1: Essais cycliques à la rupture (ISO  
11782-1:1998)

Korrosion von Metallen und Legierungen - Prüfung der  
Schwingungskorrosion - Teil 1: Prüfung unter Anwendung  
von Bruch-Schwingspielen (ISO 11782-1:1998)

This European Standard was approved by CEN on 21 March 2008.

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## Foreword

The text of ISO 11782-1:1998 has been prepared by Technical Committee ISO/TC 156 "Corrosion of metals and alloys" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 11782-1:2008 by Technical Committee CEN/TC 262 "Metallic and other inorganic coatings" the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by October 2008, and conflicting national standards shall be withdrawn at the latest by October 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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### Endorsement notice

The text of ISO 11782-1:1998 has been approved by CEN as a EN ISO 11782-1:2008 without any modification.

## Introduction

The study of cycles to failure testing uses plain or notched specimens to provide data on the intrinsic corrosion fatigue crack like behaviour of a metal or alloy and can be used to develop criteria for engineering design to prevent fatigue failures.

The study of cycles to failure can be applied to a wide variety of product forms including plate, rod, wire, sheet and tubes as well as to parts joined by welding.

The results of corrosion fatigue testing are suitable for direct application only when the service conditions exactly parallel the test conditions especially with regard to material, environmental and stressing considerations. The combination of material/load/environmental may not be directly comparable to the application. For these cases engineering judgement must be applied.

# Corrosion of metals and alloys — Corrosion fatigue testing —

## Part 1: Cycles to failure testing

### 1 Scope

**1.1** This International Standard provides guidance and instruction on corrosion fatigue testing of metals and alloys in aqueous or gaseous environments and is concerned with cycles to failure testing. Crack propagation testing is considered in ISO 11782-2.

**1.2** Corrosive or otherwise chemically active environments can promote the initiation of fatigue cracks in metals and alloys and increase the rate of fatigue crack propagation. Corrosion fatigue processes are not limited to specific metal/environment systems and reliable estimates of fatigue life for all combinations of loading and environment cannot be made without data from laboratory tests.

**1.3** This International Standard is not intended for application to corrosion fatigue testing of components or parts; nevertheless many of the general principles will apply.

### 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 11782. 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 11782 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 metals and alloys — Stress corrosion testing — Part 1: General guidance on testing procedures*.

### 3 Definitions

For the purposes of this part of ISO 11782, the following definitions apply.

**3.1 corrosion fatigue:** Process involving conjoint corrosion and alternating straining of the metal, often leading to cracking.

NOTE — Corrosion fatigue may occur when a metal is subjected to cyclic straining in a corrosive environment.

**3.2 stress amplitude,  $S_a$ , in fatigue loading:** One half of the range of a cycle (also known as the alternating stress):

$$S_a = \frac{S_{\max} - S_{\min}}{2}$$