Metallic materials - Determination of plane-strain fracture toughness (ISO 12737:2010)

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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 12737:2010 sisaldab Euroopa standardi EN ISO 12737:2010 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 12737:2010 consists of the English text of the European standard EN ISO 12737:2010.
Standard on kinnitatud Eesti Standardikeskuse 31.12.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.12.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 15.12.2010.	Date of Availability of the European standard text 15.12.2010.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 77.040.10

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 12737

December 2010

ICS 77.040.10

Supersedes EN ISO 12737:2005

English Version

Metallic materials - Determination of plane-strain fracture toughness (ISO 12737:2010)

Matériaux métalliques - Détermination du facteur d'intensité de contrainte critique (ISO 12737:2010)

Metallische Werkstoffe - Bestimmung der Bruchzähigkeit (ebener Dehnungszustand) (ISO 12737:2010)

This European Standard was approved by CEN on 4 October 2010.

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Foreword

This document (EN ISO 12737:2010) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee ECISS/TC 101 “Test methods for steel (other than chemical analysis)” the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by June 2011, and conflicting national standards shall be withdrawn at the latest by June 2011.

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Endorsement notice

The text of ISO 12737:2010 has been approved by CEN as a EN ISO 12737:2010 without any modification.

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1 Scope

This International Standard specifies the ISO method for determining the plane-strain fracture toughness of homogeneous metallic materials using a specimen that is notched and precracked by fatigue, and subjected to slowly increasing crack displacement force.

2 Normative references

The following referenced documents are indispensable for the application 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 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

ISO 9513, *Metallic materials — Calibration of extensometers used in uniaxial testing*

ASTM E399-09, *Standard Test Method for Linear-Elastic Plane-Strain Fracture Toughness K_{Ic} of Metallic Materials*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
plane-strain stress intensity factor
K_I
magnitude of the elastic stress field at the tip of a crack subjected to opening mode displacement (mode I)

NOTE It is a function of applied force and test specimen size, geometry, and crack length, and has the dimensions of force times length$^{-3/2}$.

3.2
plane-strain fracture toughness
K_{Ic}
measure, by the operational procedure of this method, of a material's resistance to crack extension when the state of stress near the crack tip is predominantly plane strain and plastic deformation is limited

NOTE It is the critical value of K_I at which significant crack extension occurs on increasing load with high constraint to plastic deformation.