Metallic materials - Method of test for the determination of quasistatic fracture toughness of welds

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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 15653:2010 sisaldab Euroopa standardi EN ISO 15653:2010 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 15653:2010 consists of the English text of the European standard EN ISO 15653:2010.
Standard on kinnitatud Eesti Standardikeskuse 31.05.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.05.2010 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 01.05.2010.	Date of Availability of the European standard text 01.05.2010.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 25.160.40

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 15653

April 2010

ICS 25.160.40

English Version

Metallic materials - Method of test for the determination of quasistatic fracture toughness of welds (ISO 15653:2010)

Matériaux métalliques - Méthode d'essai pour la détermination de la ténacité quasi statique à la rupture des soudures (ISO 15653:2010)

Metallische Werkstoffe - Prüfverfahren zur Bestimmung der quasistatischen Bruchzähigkeit von Schweißverbindungen (ISO 15653:2010)

This European Standard was approved by CEN on 23 January 2010.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN ISO 15653:2010: E

Foreword

This document (EN ISO 15653:2010) has been prepared by Technical Committee ISO/TC 164 "Mechanical testing of metals" in collaboration with Technical Committee CEN/TC 121 “Welding” the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by October 2010, and conflicting national standards shall be withdrawn at the latest by October 2010.

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 15653:2010 has been approved by CEN as a EN ISO 15653:2010 without any modification.

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1 Scope

This International Standard specifies methods for determining fracture toughness in terms of K (stress intensity factor), δ (crack tip opening displacement, CTOD) and J (experimental equivalent of the J-integral) for welds in metallic materials.

This International Standard is complementary to ISO 12135, which covers all aspects of fracture toughness testing of parent metal and which needs to be used in conjunction with this document. This International Standard describes methods for determining point values of fracture toughness. It should not be considered a way of obtaining a valid R-curve (resistance-to-crack-extension curve). However, the specimen preparation methods described in this International Standard could be usefully employed when determining R-curves for welds. The methods use fatigue precracked specimens which have been notched, after welding, in a specific target area in the weld. Methods are described to evaluate the suitability of a weld for notch placement within the target area, which is either within the weld metal or within the weld heat-affected zone (HAZ), and then, where appropriate, to evaluate the effectiveness of the fatigue crack in sampling these areas.

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 3785, *Metallic materials — Designation of test specimen axes in relation to product texture*

ISO 12135, *Metallic materials — Unified method of test for the determination of quasistatic fracture toughness*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12135 and the following apply.

3.1
stretch zone width
SZW
increase in crack length associated with crack tip blunting — i.e. prior to the onset of unstable crack extension, pop-in (see 3.3) or slow stable crack extension — and occurring in the same plane as the fatigue precrack

3.2
target area
intended fatigue crack tip position within the weld metal or HAZ

NOTE See 3.7 and 3.9.