Welding - Recommendation for welding of metallic materials - Part 6: Laser beam welding

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 1011-6:2006 sisaldab Euroopa standardi EN 1011-6:2005 ingliskeelset teksti. Käesolev dokument on jõustatud 27.02.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 1011-6:2006 consists of the English text of the European standard EN 1011-6:2005. This document is endorsed on 27.02.2006 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This European Standard gives general guidance for laser beam welding and associated processes of metallic materials in all forms of product (e.g. cast, wrought, extruded, forged).	**Scope:** This European Standard gives general guidance for laser beam welding and associated processes of metallic materials in all forms of product (e.g. cast, wrought, extruded, forged).

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Welding - Recommendation for welding of metallic materials - Part 6: Laser beam welding

Soudage - Recommandations pour le soudage des matériaux métalliques - Partie 6: Soudage par faisceau laser

Schweißen - Empfehlungen zum Schweißen metallischer Werkstoffen - Teil 6: Laserstrahlschweißen

This European Standard was approved by CEN on 28 November 2005.

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

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Foreword

This European Standard (EN 1011-6:2005) has been prepared by 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of an identical text or by endorsement, at the latest by June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

This standard is composed of the following parts:

— Part 1: General guidance for arc welding;

— Part 2: Arc welding of ferritic steels;

— Part 3: Arc welding of stainless steels;

— Part 4: Arc welding of aluminium and aluminium alloys;

— Part 5: Welding of clad steel;

— Part 6: Laser beam welding;

— Part 7: Electron beam welding;

— Part 8: Welding of cast irons (prepared by CEN/TC 190).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This standard is being issued in several parts in order that it can be extended to cover the different types of metallic materials that will be produced to all European Standards for weldable metallic materials.

When this European Standard is referenced for contractual purposes the ordering authority or contracting parties should state the need for compliance with the relevant parts of this standard and such other annexes as are appropriate.

This European Standard gives general guidance for the satisfactory production and control of welding and associated processes and details of some of the possible detrimental phenomena that can occur, with advice on methods by which they can be avoided. It is generally applicable to laser beam processing of metallic materials and also to some extent for non-metallic materials. It is appropriate regardless of the type of fabrication involved, although the relevant product standard, structural code or the design specification can have additional requirements. Permissible design stresses, methods of testing and inspection levels are not included because they depend on the service conditions of the fabrication. These details should be obtained from the relevant application standard or by agreement between the contracting parties.

It has been assumed in the drafting of the standard that the execution of its provisions is entrusted to appropriately qualified, experienced and trained personnel.

1 Scope

This European Standard gives general guidance for laser beam welding and associated processes of metallic materials in all forms of product (e.g. cast, wrought, extruded, forged).

NOTE Some guidance on laser beam cutting, drilling, surface treatment and cladding is given in Annex F.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3834-2, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements (ISO 3834-2:2005)*

EN ISO 3834-5, *Quality requirements for fusion welding of metallic materials - Part 5: Documents with which it is necessary to confirm to claim conformity to the quality requirements of ISO 3834-2, ISO 3834-3 or ISO 3834-4 (ISO 3834-5:2005)*

EN ISO 11145:2001, *Optics and optical instruments — Lasers and laser-related equipment — Vocabulary and symbols (ISO 11145:2001)*

EN ISO 15609-4, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 4: Laser beam welding (ISO 15609-4:2004)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 11145:2001 apply.

4 Health and safety and protection of the environment

A general checklist on protection of the environment in welding and allied processes is in preparation by CEN/TC 121. It will cover laser applications.

Laser beam processing introduces additional hazards over and above those normally experienced in arc welding. Specialist advice should be sought, see e.g. EN 60825-1 and EN ISO 11553-1.

Guidance for safety aspects related to the application of industrial robots for manipulation of the focussing devices and/or the components to be welded can be found in EN 775.

5 Quality requirements

Laser beam welding is a complex process needing detailed process control. All processing is performed under numerical control necessitating programming of each single operation. The application has to be controlled at a level compatible with EN ISO 3834-2 and EN ISO 3834-5.

NOTE This does not entail a requirement for certification but the process control should operate in accordance with EN ISO 3834-2 and EN ISO 3834-5.