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Standards

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I.S. EN 1011-1:2009

Welding - Recommendations for welding of metallic materials - Part 1: General guidance for arc welding

I.S. EN 1011-1:2009

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English Version

Welding - Recommendations for welding of metallic materials - Part 1: General guidance for arc welding

Soudage - Recommendations pour le soudage des
matériaux métalliques - Partie 1 : Lignes directrices
générales pour le soudage à l'arc

Schweißen - Empfehlungen zum Schweißen metallischer
Werkstoffe - Teil 1: Allgemeine Anleitungen für das
Lichtbogenschweißen

This European Standard was approved by CEN on 10 January 2009.

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Foreword

This document (EN 1011-1:2009) 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of an identical text or by endorsement, at the latest by September 2009, and conflicting national standards shall be withdrawn at the latest by September 2009.

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.

This document supersedes EN 1011-1:1998

EN 1011 consists of the following parts, under the general title *Welding — Recommendations for welding of metallic materials*:

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

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Introduction

EN 1011 is issued in several parts in order that it may cover the different types of weldable metallic materials and specific welding processes.

This part of EN 1011 deals with the production and control of arc welding of metallic materials and is appropriate for all types of fabrication.

Specific materials advice is covered by parts 2, 3, 4, 5 and 8. Parts 6 and 7 refer to laser and electron beam welding and each cover a range of materials.

Permissible design stresses in welds, methods of testing and acceptance levels are not included because they depend on the service conditions of the fabrication. These details may be obtained from the relevant application standard or design specification.

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

1 Scope

This European Standard contains general guidance for the arc welding of metallic materials in all forms of product (e.g. cast, wrought, extruded, forged).

The processes and techniques referred to in this Part of EN 1011 may not all be relevant to all materials. Additional information relevant to specific materials is given in the relevant Parts of the Standard.

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.

EN 287-1, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 473, *Non destructive testing — Qualification and certification of NDT personnel — General principles*

EN 1011-2, *Welding — Recommendations for welding of metallic materials — Part 2: Arc welding of ferritic steels*

EN 1011-3, *Welding — Recommendations for welding of metallic materials — Part 3: Arc welding of stainless steels*

EN 1011-4, *Welding — Recommendations for welding of metallic materials — Part 4: Arc welding of aluminium and aluminium alloys*

EN 1011-5, *Welding — Recommendations for welding of metallic materials — Part 5: Welding of clad steel*

EN 1011-6, *Welding — Recommendations for welding of metallic materials — Part 6: Laser beam welding*

EN 1011-7, *Welding — Recommendations for welding of metallic materials — Part 7: Electron beam welding*

- EN 1011-8, *Welding — Recommendations for welding of metallic materials — Part 8: Welding of cast irons*
- EN 1418, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*
- EN 22553, *Welded, brazed and soldered joints — Symbolic representation on drawings (ISO 2553:1992)*
- EN ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers (ISO 4063:1998)*
- EN ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (ISO 9606-2:2004)*
- EN ISO 9606-3, *Approval testing of welders — Fusion welding — Part 3: Copper and copper alloys (ISO 9606-3:1999)*
- EN ISO 9606-4, *Approval testing of welders — Fusion welding — Part 4: Nickel and nickel alloys (ISO 9606-4:1999)*
- EN ISO 9606-5, *Approval testing of welders — Fusion welding — Part 5: Titanium and titanium alloys, zirconium and zirconium alloys (ISO 9606-5:2000)*
- EN ISO 9692 (all parts), *Welding and allied processes — Recommendations for joint preparation*
- EN ISO 14175, *Welding consumables — Gases and gas mixtures for fusion welding and allied processes (ISO 14175:2008)*
- EN ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules (ISO 15607:2003)*
- EN ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding (ISO 15609-1:2004)*
- EN ISO 15609-3, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 3: Electron beam welding (ISO 15609-3:2004)*
- 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)*
- EN ISO 17662, *Welding — Calibration, verification and validation of equipment used for welding, including ancillary activities (ISO 17662:2005)*
- CEN/TR 14599:2005, *Terms and definitions for welding purposes in relation with EN 1792*
- IEC/TS 62081, *Arc welding equipment — Installation and use*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TR 14599:2005 and the following apply.

3.1

thermal efficiency

k

ratio of heat energy introduced into the weld to the electrical energy consumed by the arc

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