SLOVENSKI STANDARD
oSIST prEN 1011-8:2016

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Varjenje - Priporočila za varjenje kovinskih materialov - 8. del: Varjenje železove litine

Welding - Recommendations for welding of metallic materials - Part 8: Welding of cast irons

Schweißen - Empfehlungen zum Schweißen metallischer Werkstoffe - Teil 8: Schweißen von Gusseisen

Soudage - Recommandations pour le soudage des matériaux métalliques - Partie 8 : Soudage des fontes

Ta slovenski standard je istoveten z: **prEN 1011-8**

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25.160.10	Varilni postopki in varjenje	Welding processes
77.140.80	Železni in jekleni ulitki	Iron and steel castings

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Will supersede EN 1011-8:2004

English Version

Welding - Recommendations for welding of metallic materials - Part 8: Welding of cast irons

Soudage - Recommandations pour le soudage des matériaux métalliques - Partie 8 : Soudage des fontes

Schweißen - Empfehlungen zum Schweißen metallischer Werkstoffe - Teil 8: Schweißen von Gusseisen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 190.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 1011-8:2016) has been prepared by Technical Committee CEN/TC 190 “Foundry Technology”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1011-8:2004.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 13 “Welding of cast iron” to prepare the following revision of the standard:

EN 1011-8:2004, *Welding — Recommendations for welding of metallic materials — Part 8: Welding of cast irons.*

The following modifications were made:

— “Normative references”: revised;

— Clause 7: Process designations brought in accordance with EN ISO 4063;

— Clause 8.2: Title modified in “Storage and handling”;

— Title of Clause 10.1 removed;

— Clauses 10.2 and 10.3 removed;

— Title of Clause 11.1 changed in “Assembly for welding” and clause revised;

— Title of Clause 12 changed in “Fabrication and inspection feasibility”;

— Title of Clause 17 changed in “Arc strikes” and clause revised;

— Title of Clause 18 changed in “Weld run sequence”;

— Title of Clause 22 changed in “Elimination of distortion or inherent stresses” and clause revised;

— Title of Clause 25 changed in “Non-conformance and corrective actions”;

— Clause 27 revised;

— Title of Clause 28 changed in “Surface cleaning and treatment” and clause revised;

— Table B.1, “Column: Method”, “row: Oxy acetylene welding (311)”, last cell, Entry changed in “Welding rods OII EN 12536”;

— Bibliography revised.

This is one of a series of European Standards for requirements for fusion welding of metallic materials with the general title:

Welding — Recommendations for welding of metallic materials.

This series of European Standards 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.*

1 Scope

This document specifies the requirements for fusion welding of unalloyed and low-alloy cast iron castings produced in accordance with:

— EN 1561, *Founding — Grey cast irons;*

— EN 1562, *Founding — Malleable cast irons;*

— EN 1563, *Founding — Spheroidal graphite cast irons.*

This document does not apply to the joint welding of cast iron castings to other materials.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1011-1:2009, *Welding - Recommendations for welding of metallic materials - Part 1: General guidance for arc welding*

EN ISO 4063, *Welding and allied processes - Nomenclature of processes and reference numbers (ISO 4063)*

EN ISO 15609-1, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1)*

3 Terms and definitions

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

3.1
production welding
welding carried out during manufacturing before final delivery to the end user

Note 1 to entry: It includes joint welding and finishing welding (see 3.2 and 3.3).

3.2
joint welding
production welding used to assemble components together to obtain an integral unit

3.3
finishing welding
production welding carried out in order to ensure the agreed quality of the casting

3.4
repair welding
welding carried out after final delivery of the casting to the end user

3.5
homogeneous filler metal
filler metal which results in a deposited metal with the same type of microstructure as the parent metal

3.6
semi-homogeneous filler metal
filler metal which results in a deposited metal with a steel-type microstructure

3.7
non-homogeneous filler metal
filler metal which results in a deposited metal with a microstructure that differs from the parent metal

3.8
cast welding
welding by pouring liquid metal into a specially prepared groove in a casting

3.9
liquid metal welding
cast welding with additional use of a metal arc welding process

4 Abbreviations and symbols

For the purposes of this document, the abbreviations and symbols given in EN 1011-1:2009 shall apply.

5 Provision for quality assurance requirements

For the purposes of this document, the provisions for quality assurance requirements given in Annex A shall apply.

6 Storage, handling and identification of parent metal

Storage and handling shall be carried out in such a manner that the parent metal is not adversely affected. Provision shall be made for correct identification, e.g. grade and storage.

7 Fusion welding processes

Fusion welding processes shall be either one or a combination of the following welding processes with their reference number in accordance with EN ISO 4063:

111 Manual metal arc welding (metal arc welding with covered electrode);

114 Self-shielded tubular cored arc welding;

12 Submerged arc welding;

13 Gas-shielded metal arc welding;

141 TIG welding with solid filler material (wire/rod);

15 Plasma arc welding;

185 Magnetically impelled arc welding;

24 Flash welding;

311 Oxy acetylene welding;

42 Friction welding;

71 Aluminothermic welding;

and additionally:

— cast welding;

— liquid metal welding.

Other fusion welding processes shall be agreed between the manufacturer and the purchaser by the time of acceptance of the order.

8 Welding consumables

8.1 General

An appropriate filler metal (see 3.5, 3.6 and 3.7) shall be selected in accordance with the requirements of the weld and the welding process.

Any special recommendations given by the manufacturer and/or supplier of the welding consumables shall be taken into account.

Welding consumables (e.g. filler metals, gases and fluxes) shall conform to the appropriate European and/or International Standards, as applicable, (see Annex B, Tables B.1 and B.2).

It can be necessary to manufacture appropriate filler metals, especially for oxy acetylene and liquid metal welding. To avoid confusion, such products shall be identified.

8.2 Storage and handling

For the purposes of this document the storage and handling requirements given in EN 1011-1:2009 shall apply.

9 Equipment

9.1 General

For the purposes of this document, the equipment requirements given in EN 1011-1:2009 shall apply.

9.2 Ancillary equipment

If applicable, the ancillary equipment shall include:

a) power source for welding equipment and additional machinery;

b) facilities for joint preparation;

c) facilities for preheating and post-weld heat treatment including temperature measurement equipment;

d) cranes and other handling equipment;

e) peening equipment;

f) electrode baking ovens, electrode bags etc. for handling filler metals;

g) cleaning equipment;

h) equipment for destructive and non-destructive testing;

i) fixtures and welding jigs;

j) personal protection equipment directly connected with welding.

10 Fabrication

When welding cast iron castings, consideration shall be given to the:

— need for trained and approved welders;

— need for a responsible welding co-ordinator;

— casting geometry;

— temperature control;

— stress conditions caused by welding;

— material behaviour;

— working conditions;

— inspection requirements.

Selection of the requirement category (see EN ISO 3834-1) is recommended and should be carried out with due consideration of any special operating conditions and joint strains together with any economic factors.

Prior to welding, there shall be an agreement made between the parties concerned which includes the requirements for finishing welding, joint welding and repair welding, as applicable.

If applicable, finishing and/or repair welding methods to correct casting non-conformities shall be carefully planned and prepared.

The casting surface to be welded shall be checked by a suitable non-destructive test method, in order to ensure sound material after complete removal of any casting non-conformity.

11 Weld preparation

11.1 Assembly for welding

Assembly shall be carried out in accordance with EN 1011-1:2009.

NOTE In addition, weld preparation should meet the recommendations given in Table B.1 and Table B.2.

11.2 Finishing welds and repair welds

Preparation shall remove any crack, pore, notch and contamination. The area to be welded shall be suitable for the welding process (see B.1 and B.2).

NOTE Recommendations on weld preparation are given in B.2.

If contamination cannot be removed (e.g. during repair welding), other measures shall be used, such as the selection of special filler metals.

12 Fabrication and inspection feasibility

Positioning of parts to be welded shall be carried out in accordance with EN 1011-1:2009.