

**Keevitamine. Soovitused metallmaterjalide
keevitamiseks. Osa 2: Ferriitteraste
kaarkeevitus**

Welding - Recommendations for welding of metallic
materials - Part 2: Arc welding of ferritic steels

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1011-2:2001 sisaldb Euroopa standardi EN 1011-2:2001 ingliskeelset teksti. Standard on kinnitatud Eesti Standardikeskuse 18.06.2001 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas. Standard on kätesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 1011-2:2001 consists of the English text of the European standard EN 1011-2:2001. This standard is ratified with the order of Estonian Centre for Standardisation dated 18.06.2001 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.
--	--

ICS 25.160.10

Standardite reproduutseerimis- ja levitamisõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute Estonian Standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: +372 605 5050; E-mail: info@evs.ee

English version

Welding

Recommendations for welding of metallic materials
Part 2: Arc welding of ferritic steels

Soudage – Recommandations pour le soudage des matériaux métalliques – Partie 2: Soudage à l'arc des aciers ferritiques

Schweißen – Empfehlungen zum Schweißen metallischer Werkstoffe – Teil 2: Lichtbogenschweißen von ferritischen Stählen

This European Standard was approved by CEN on 2000-07-06.

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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Management Centre: rue de Stassart 36, B-1050 Brussels

Contents

	Page
Foreword.....	3
Introduction	4
1 Scope	4
2 Normative references	4
3 Terms and definitions.....	4
4 Symbols and abbreviations	5
5 Parent metal.....	6
6 Weldability factors.....	6
7 Handling of welding consumables.....	6
8 Weld details	6
9 Welds in holes or slots.....	7
10 Preparation of joint face.....	7
11 Alignment of butt welds before welding.....	8
12 Preheating.....	8
13 Tack welds	8
14 Temporary attachments	8
15 Heat input.....	8
16 Welding procedure specification	9
17 Identification.....	9
18 Inspection and testing.....	9
19 Correction of non-conforming welds.....	9
20 Correction of distortion.....	9
21 Post weld heat treatment	9
Annex A (informative) Possible detrimental phenomena resulting from welding of steels, not covered by other annexes.....	10
Annex B (informative) Guidance on joint detail design (when there is no application standard)	11
Annex C (informative) Avoidance of hydrogen cracking (also known as cold cracking).....	13
Annex D (informative) Heat affected zone toughness and hardness.....	40
Annex E (informative) Avoidance of solidification cracking.....	47
Annex F (informative) Avoidance of lamellar tearing	49
Annex G (informative) References in the annexes.....	55
Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives.	56
Bibliography	56

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

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 July 2001, and conflicting national standards shall be withdrawn at the latest by July 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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

This Document is a preview generated by EVS

Introduction

This European Standard supplements Part 1. It is issued with several annexes in order that it can be extended to cover the different types of steel which are produced to all the European steel standards for ferritic steels (see clause 5).

This standard gives general guidance for the satisfactory production and control of welds in ferritic steels. Details concerning the possible detrimental phenomena which can occur are given with advice on methods by which they can be avoided. This standard is generally applicable to all ferritic steels and is appropriate regardless of the type of fabrication involved, although the application standard can have additional requirements.

1 Scope

This European Standard gives guidance for manual, semi-mechanised, mechanised and automatic arc welding of ferritic steels (see clause 5), excluding ferritic stainless steels, in all product forms.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 288-2:1997, *Specification and approval of welding procedures for metallic materials — Part 2: Welding procedure specification for arc welding*

EN 1011-1:1998, *Welding — Recommendations for welding of metallic materials — Part 1: General guidance for arc welding*

EN 29692, *Metal-arc welding with covered electrode, gas-shielded metal-arc — welding and gas welding — Joint preparations for steel (ISO 9692:1992)*

EN ISO 13916, *Welding — Guidance for the measurement of preheating temperature, interpass temperature and preheat maintenance temperature (ISO 13916:1996)*

CR ISO 15608, *Welding — Guidelines for a metallic material grouping system (ISO/TR 15608:2000)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions listed in EN 1011-1:1998 and the following apply:

3.1

cooling time $t_{8/5}$

the time taken, during cooling, for a weld run and its heat affected zone to pass through the temperature range from 800 °C to 500 °C

3.2

run out length

the length of a run produced by the melting of a covered electrode