

Welding - Welding of reinforcing steel - Part 1: Load bearing welded joints

Welding - Welding of reinforcing steel - Part 1: Load bearing welded joints

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 17660-1:2006 sisaldab Euroopa standardi EN ISO 17660-1:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 27.10.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 17660-1:2006 consists of the English text of the European standard EN ISO 17660-1:2006.</p> <p>This document is endorsed on 27.10.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p>Käsitlusala:</p> <p>This part of ISO 17660 is applicable to the welding of weldable reinforcing steel and stainless reinforcing steel of load-bearing joints, in workshops or on site. It specifies requirements for materials, design and execution of welded joints, welding personnel, quality requirements, examination and testing.</p>	<p>Scope:</p> <p>This part of ISO 17660 is applicable to the welding of weldable reinforcing steel and stainless reinforcing steel of load-bearing joints, in workshops or on site. It specifies requirements for materials, design and execution of welded joints, welding personnel, quality requirements, examination and testing.</p>
--	--

ICS 25.160.10

Võtmesõnad:

ICS 25.160.10

English Version

**Welding - Welding of reinforcing steel - Part 1: Load-bearing
welded joints (ISO 17660-1:2006)**

Soudage - Soudage des aciers d'armatures - Partie 1:
Assemblages transmettant des efforts (ISO 17660-1:2006)

Schweißen - Schweißen von Betonstahl - Teil 1: Tragende
Schweißverbindungen (ISO 17660-1:2006)

This European Standard was approved by CEN on 2 August 2006.

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 Central Secretariat or to any CEN member.

This European Standard exists 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

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

Foreword

This document (EN ISO 17660-1:2006) has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DIN, in collaboration with Technical Committee ISO/TC 44 "Welding and allied processes".

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 March 2007, and conflicting national standards shall be withdrawn at the latest by March 2007.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Welding — Welding of reinforcing steel —
Part 1:
Load-bearing welded joints

Soudage — Soudage des aciers d'armatures —
Partie 1: Assemblages transmettant des efforts



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2006

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols and abbreviated terms	3
5 Welding processes	4
6 Load-bearing welded joints	4
7 Materials	14
8 Quality requirements	14
9 Welding personnel	15
10 Welding procedure specification (WPS)	16
11 Welding procedures	16
12 Production weld test	18
13 Execution and inspection of production welding of reinforcing steel	19
14 Examination and testing of test specimens	21
15 Production log	24
Annex A (informative) Welding procedure specification (WPS) for welding processes 111, 114, 135 and 136	25
Annex B (informative) Technical knowledge of welding coordinator for welding reinforcing steel	27
Annex C (informative) Test specimens	28
Annex D (informative) Assessment of the manufacturer performing welding	32
Annex E (informative) Evaluation of testing of welded joints	33
Annex F (informative) Example for production log	34
Annex G (informative) Classification of shear strength of load-bearing cross joints	35
Annex H (informative) Examples of diameter combinations for welding cross joints using welding processes 21 and 23	36
Bibliography	37

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 17660-1 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding*, in collaboration with Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Unification of requirements in the field of metal welding*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 17660 consists of the following parts, under the general title *Welding — Welding of reinforcing steel*:

- *Part 1: Load-bearing welded joints*
- *Part 2: Non load-bearing welded joints*

Requests for official interpretations of any aspect of this part of ISO 17660 should be directed to the Secretariat of ISO/TC 44/SC 10 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Introduction

Reinforcing steel bars are produced by a number of process routes and usually have a ribbed profile. Taking these issues into account, it is apparent that both the welder and the welding coordinator require a specific level of skill and job knowledge and that special procedures for quality assurance need to be adopted.

Welding — Welding of reinforcing steel —

Part 1: Load-bearing welded joints

1 Scope

This part of ISO 17660 is applicable to the welding of weldable reinforcing steel and stainless reinforcing steel of load-bearing joints, in workshops or on site. It specifies requirements for materials, design and execution of welded joints, welding personnel, quality requirements, examination and testing.

This part of ISO 17660 also covers welded joints between reinforcing steel bars and other steel components, such as connection devices and insert anchors, including prefabricated assemblies. Non load-bearing joints are covered by ISO 17660-2.

This part of ISO 17660 is not applicable to factory production of welding fabric and lattice girders using multiple spot welding machines or multiple projection welding machines.

The requirements of this part of ISO 17660 are only applicable to static loaded structures.

NOTE For fatigue-loaded structures, depending on type of joint and welding process, it is recommended that an appropriate reduction be taken into account on the fatigue strength of the reinforcing steel.

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 3834-3 *Quality requirements for fusion welding of metallic materials — Part 3: Standard quality requirements*

ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 9606-1, *Approval testing of welders — Fusion welding — Part 1: Steels*

ISO 14731:—¹⁾, *Welding coordination — Tasks and responsibilities*

ISO 14732²⁾, *Welding personnel — Approval testing of welding operators for fusion welding and of resistance weld setters for fully mechanized and automatic welding of metallic materials*

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

ISO 15609-2, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 2: Gas welding*

1) To be published (revision of ISO 14731:1997, EN 719:1994).

2) Equivalent to EN 1418.

ISO 15609-5, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 5: Resistance welding*

ISO 15614-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*

ISO 15614-12, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 12: Spot, seam and projection welding*

ISO 15614-13, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 13: Resistance butt and flash welding*

ISO 15620, *Welding — Friction welding of metallic materials*

ISO 15630-1, *Steel for the reinforcement and prestressing of concrete — Test methods — Part 1: Reinforcing bars, wire rod and wire*

ISO 15630-2, *Steel for the reinforcement and prestressing of concrete — Test methods — Part 2: Welded fabric*

ISO 16020, *Steel for the reinforcement and prestressing of concrete — Vocabulary*

EN 10079, *Definition of steel products*

EN 10080, *Steel for the reinforcement of concrete — Weldable reinforcing steel — General*

EN 10164, *Steel products with improved deformation properties perpendicular to the surface of the product — Technical delivery conditions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10079, EN 10080 and ISO 16020 and the following apply.

3.1
load-bearing welded joint
welded joint used for transmission of specified loads between reinforcing steel bars or between reinforcing steel bars and other steel products

3.2
non load-bearing welded joint
welded joint whose strength is not taken into account in the design of the reinforced concrete structure

NOTE The purpose of a non load-bearing welded joint is usually only to keep the reinforcing components in their correct places during fabrication, transport and concreting. The weld is often called tack weld.

3.3
shear factor
 S_f
relation between the shear force of a cross joint and the nominal yield strength R_e , multiplied by the nominal cross section area A_s of the loaded bar

3.4
manufacturer
enterprise carrying out the welding works within workshops or on site