



SLOVENSKI STANDARD
SIST EN ISO 17660-1:2007

01-marec-2007

Varjenje - Varjenje betonskega jekla - 1. del: Obremenjeni zvarni spoji (ISO 17660-1:2006)

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

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

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

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Ta slovenski standard je istoveten z: EN ISO 17660-1:2006

ICS:

25.160.10 Varilni postopki in varjenje Welding processes

SIST EN ISO 17660-1:2007

en

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ICS 25.160.10

English Version

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

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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.

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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.

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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of an identical text or by endorsement, at the latest by March 2007, and conflicting national standards shall be withdrawn at the latest by March 2007.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.

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

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

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Case postale 56 • CH-1211 Geneva 20
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Fax + 41 22 749 09 47
E-mail copyright@iso.org
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Published in Switzerland

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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* [SIST EN ISO 17660-1:2007](https://standards.iteh.ai/catalog/standards/sist/814f9e60-2ec8-4ed4-8256-e32b6469c863/sist-en-iso-17660-1-2007)
- *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.

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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.

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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.

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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*

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3 Terms and definitions

SIST EN ISO 17660-1:2007

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

4 Symbols and abbreviated terms

a	throat thickness
A_{gt}	percentage total elongation at maximum force
A_n	nominal cross-sectional area of the bar
A_s	nominal cross-sectional area of the bar to be anchored
b	excess of the bar
d	nominal diameter of the welded bar
d_{max}	maximum nominal diameter of the welded bar
d_{min}	minimum nominal diameter of the welded bar
e	distance between the bars
F	force to be anchored by transverse bar
F_{max}	maximum tensile force
F_s	shear force
l	length of the weld (cross joint)
l_o	overall lap length
L_{min}	minimum length of the test specimen
r	radius of bent reinforcing steel bar
R_e	specified characteristic yield strength of the reinforcing steel
R_m	nominal tensile strength of the reinforcing steel
S_f	shear factor
t	thickness of the web of a section or of a plate to be welded
t_{min}	minimum thickness of the web of a section or of a plate to be welded
w	weld width
x	root gap
y	depth of root face
α	included angle
BW	butt weld
CEV	carbon equivalent value
FW	fillet weld
SF	Shear factor class
WPQR	welding procedure qualification record
WPS	welding procedure specification