
**Zahteve po kakovosti pri varjenju - Uporovno varjenje kovinskih materialov - 1.
del: Splošne zahteve po kakovosti (ISO 14554-1:2000)**

Quality requirements for welding - Resistance welding of metallic materials - Part 1:
Comprehensive quality requirements (ISO 14544-1:2000)

Schweißtechnische Qualitätsanforderungen - Widerstandsschweißen metallischer
Werkstoffe - Teil 1: Umfassende Qualitätsanforderungen (ISO 14554-1:2000)

Exigences de qualité en soudage - Soudage par résistance des matériaux métalliques -
Partie 1: Exigences de qualité complete (ISO 14554-1:2000)

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SIST EN ISO 14554-1:2001**en**

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EUROPEAN STANDARD
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EN ISO 14554-1

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English version

Quality requirements for welding - Resistance welding of metallic materials - Part 1: Comprehensive quality requirements (ISO 14554-1:2000)

Exigences de qualité en soudage - Soudage par résistance des matériaux métalliques - Partie 1: Exigences de qualité complète (ISO 14554-1:2000)

Schweißtechnische Qualitätsanforderungen - Widerstandsschweißen metallischer Werkstoffe - Teil 1: Umfassende Qualitätsanforderungen (ISO 14554-1:2000)

This European Standard was approved by CEN on 3 January 2000.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

The text of EN ISO 14554-1:2000 has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS, 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 October 2000, and conflicting national standards shall be withdrawn at the latest by October 2000.

According to the CEN/CENELEC 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 European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

Annexe A is informative.

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1 Scope

This standard has been prepared such that:

- it is independent of the type of welded construction to be manufactured;
- it defines quality requirements for welding both in production plants and on site;
- it provides guidance for describing a manufacturer's capability to produce welded constructions to meet specified requirements;
- it can also be used as a basis for assessing the manufacturer in respect to his welding capability.

This standard is appropriate when demonstration of a manufacturer's or a sub-contractor's capability to produce welded constructions, fulfilling specified quality requirements, are specified in one or more of the following:

- a contract between involved parties;
- an application standard;
- a regulatory requirement.

The requirements contained within this standard can be adopted in full or can be selectively deleted by the manufacturer if not applicable to the construction concerned. They provide a flexible framework for the control of welding in the following cases:

- Case 1

To provide specific requirements for resistance welding in contracts which require the manufacturer or sub-contractor to have a quality system in accordance with EN ISO 9001 or EN ISO 9002.

- Case 2

To provide specific requirements for resistance welding in contracts which require the manufacturer or sub-contractor to have a quality system other than EN ISO 9001 or EN ISO 9002.

- Case 3

To provide specific requirements for resistance welding as guidance to a manufacturer or sub-contractor developing a quality system.

- Case 4

To provide specific requirements for references in application standards which uses resistance welding as part of its requirements or in a contract between relevant parties. It is however more appropriate for EN ISO 14554-2 to be used in such cases.

For general guidelines for selection and use see EN 729-1 with the exception of Annex B and under consideration that for resistance welding only comprehensive and elementary quality requirements are specified. Annex A in this standard applies for resistance welding.

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 719:1994

Welding coordination – Tasks and responsibilities

EN 729-1

Quality requirements for welding – Fusion welding of metallic materials – Part 1: Guidelines for selection and use

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 ISO 9001

Quality systems – Model for quality assurance in design, development, production, installation and servicing (ISO 9001 : 1994)

EN ISO 9002

Quality systems – Model for quality assurance in production, installation and servicing (ISO 9002:1994)

EN ISO 14554-2

Quality requirements for welding – Resistance welding of metallic materials – Part 2: Elementary quality requirements (ISO 14554-2:2000)

ISO 5182

Welding – Materials for resistance welding electrodes and ancillary equipment

ISO 5184

Straight resistance spot welding electrodes

3 Terms and definitions

For the purposes of this standard terms and definitions listed in EN 729-1 apply.

4 Contract and design review

4.1 General

The manufacturer shall review the contractual requirements and the design data provided by the purchaser or in-house data for construction designed by the manufacturer. This is to ensure that all information necessary to carry out the fabrication operations is available prior to the commencement of the work. The manufacturer shall affirm his capability to meet all welding contract requirements and ensure adequate planning of all quality related activities.

Contract review is carried out by the manufacturer to verify that the contract is within his capability to perform, that sufficient resources are available to achieve delivery schedules and that documentation is clear and unambiguous. The manufacturer should ensure any variations between the contract and previous tender documentation are identified and the purchaser notified of any programme, cost or engineering changes that may result.

The items in 4.2 are typically considered at or before the time of the contract review. The items in 4.3 usually form part of the design review and should be taken into account during the contract review if the design is not carried out by the manufacturer. It shall be ensured that all relevant information has been supplied by the purchaser.

When a contract does not exist, e.g. items made for stock, the manufacturer is required to take into consideration the requirements of 4.2 whilst carrying out his design review (see 4.3).

4.2 Application – Contract review

Contractual requirements to be considered should include:

- a) the application standard to be used, together with any supplementary requirements;
- b) inspection and testing;
- c) the specification of welding procedures, destructive and non-destructive examination procedures and heat treatment procedures;
- d) the approach to be used for welding procedure approval;
- e) the approval of personnel;
- f) heat treatment (details see item 12);
- g) selection, identification and/or traceability, e.g. for materials, welding equipment, welders and welds (see clause 16);
- h) quality control arrangements, including any involvement of an independent inspection body;
- i) other welding requirements, e.g. surface condition of the sheets, coatings, fit up of the parts;
- j) environmental conditions, e.g. main voltage conditions, very high/low ambient temperatures, high humidity (see ISO 669);
- k) sub-contracting;
- l) handling of non-conformances.

4.3 Application – Design review

Design requirements to be considered should include:

- a) welding process or welding process variable;
- b) welding equipment and welding electrodes;
- c) use of special methods, e.g. welding with backing electrode, welding with shielding gas or shielding fluids, welding with intermediate electrode;
- d) location, accessibility and sequence of all welds;
- e) surface finish and the geometry of the welded joint, e.g. excessive electrode indentation or in the case of mash welding excessive thickness of the weld;
- f) parent metal(s) specification and welded joint properties;
- g) welds which are to be made in production plants or on site;
- h) initial and final dimensions of the welded component, any special surface or edge preparation;
- i) quality and acceptance requirements;
- j) other special requirements, e.g. surface finishing, heat treatment, interweld adhesives, sealants, primer.

5 Sub-contracting

When a manufacturer intends to use sub-contracted services (e.g. welding, inspection, heat treatment) all relevant specifications and requirements shall be supplied by the manufacturer to the sub-contractor. The sub-contractor shall provide such records and documentation of his work as may be specified by the manufacturer.

Any sub-contractor shall work as instructed by, and be responsible to, the manufacturer and shall fully comply with all relevant requirements of this standard. The manufacturer shall ensure that the sub-contractor can comply with the quality requirements of the contract.

The information to be provided by the manufacturer to the sub-contractor shall include all relevant data from the contract review (see 4.2) and the design review (see 4.3). Additional requirements may need to be specified if the design of a structure is to be sub-contracted.

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6 Welding personnel

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6.1 General

The manufacturer shall have at his disposal sufficient and competent personnel for the planning, performing and supervising of the welding production according to specified requirements.

6.2 Operators

All operators of resistance welding equipment shall be given introduction courses and task-orientated training.

6.3 Resistance weld setter

The resistance weld setter is the person who is competent for setting up resistance welding equipment according to specified welding procedures. He has the required knowledge and skill for carrying out the work for quality assurance in the field of resistance welding.

The required competence may be proved by sufficient experience, in-house training record, or by a certificate according to EN 1418.

6.4 Welding coordinator

The manufacturer shall have available suitable welding coordinators in order to give the welding personnel the necessary instructions and to perform and supervise the work carefully. Suited in this sense is the person who has a qualification according to the general recommendations in EN 719 applicable to resistance welding (specialist for resistance welding). Annex A of EN 719:1994 is not applicable for resistance welding. The persons responsible for quality work shall be sufficiently authorized to take all the necessary steps. The duties, interrelations and limits of the spheres of responsibility of those persons should be settled beyond doubt.

7 Inspection, testing and examination personnel

The manufacturer shall have at his disposal sufficient and competent personnel for planning and performing, for supervising, inspection of the welds, testing and examination of the welding production to satisfy the specified requirements.

8 Equipment

8.1 Production and testing facilities

The following equipment shall be available, when applicable, in the appropriate version:

- spot, projection, roller seam welding equipment, butt welding equipment including welding tools;
- equipment for the preparation of the parts to be joined;
- equipment for heat treatment (possibilities see clause 12);
- welding fixtures for clamping and positioning;
- workpiece transfer systems, handling equipment (robots and others) and other transfer devices for welding production;
- personnel protective equipment and other safety equipment directly associated with welding;
- cleaning facilities, e.g. for spatter removal;
- equipment for electrode dressing;
- equipment for destructive and non-destructive testing;
- equipment for welding process monitoring and control.

8.2 Description of facilities

The manufacturer shall maintain a list of essential equipment used for welding production. This list shall identify items of major equipment essential for an evaluation of workshop capacity and capability. It includes for example:

- characteristics and capability of the welding equipment;
- characteristics and capability of the workpiece transfer systems, robots etc.;
- size of components the production plant is able to handle;
- dimensions and temperature range of furnaces for postweld heat treatment;
- characteristics of the equipment for forming, flanging, bending, and cutting;
- characteristics of system controllers.

8.3 Approval of facilities

The equipment shall be adequate for the application concerned. Approval of the equipment for welding is not required unless specified in the contract.

8.4 Installation of new or refurbished equipment

After installation of new or refurbished equipment (see 8.1) appropriate tests shall be performed. The tests shall ensure fitness-for-purpose of the equipment. The tests shall be carried out in accordance with appropriate standards, whenever relevant. Records shall be maintained of such tests.