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Welding coordination — Tasks and responsibilities

Coordination en soudage — Tâches et responsabilités

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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
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Foreword

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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 14731 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 11, *Qualification requirements for welding and allied processes personnel*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14731:1997), which has been technically revised.

Requests for official interpretations of any aspect of this International Standard should be directed to the Secretariat of ISO/TC 44/SC 11 via your national standards body. A complete listing of these bodies can be found at http://www.iso.org.

Introduction

Welding is a special process, which requires the coordination of welding operations in order to establish confidence in welding fabrication and reliable performance in service. The tasks and responsibilities of personnel involved in welding-related activities (e. g. planning, executing, supervising and inspection) should be clearly defined.

Welding coordination — Tasks and responsibilities

1 Scope

This International Standard identifies the quality-related responsibilities and tasks included in the coordination of welding-related activities.

In any manufacturing organization, welding coordination can be undertaken by one or a number of persons.

Welding coordination requirements can be specified by a manufacturer, a contract or an application standard.

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 3834-1, *Quality requirements for fusion welding of metallic materials — Part 1: Criteria for the selection of the appropriate level of quality requirements*

3 Terms and definitions

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

3.1
manufacturer
person or organization responsible for the welding production

3.2
welding coordination
coordination of manufacturing operations for all welding and welding-related activities

3.3
welding coordinator
person responsible and competent to perform welding coordination

NOTE There might be a need for nominating different welding coordinators for different tasks.

3.4
welding inspection
conformity evaluation of welding-related matters by observation and judgement accompanied as appropriate by measurement or testing

NOTE Welding inspection is a part of welding coordination.

4 Tasks and responsibilities

4.1 Quality-related tasks

Annex B shall be used as a guide to allocate quality-related tasks and responsibilities to welding coordination personnel. It may be supplemented for special application. Not all the items shall necessarily apply to all manufacturing organizations or quality system requirements, and a selection should be made as appropriate. For example, where there is no destructive testing or non-destructive testing, B.14 b) and c) do not apply.

4.2 Specification of tasks and responsibilities

The tasks of the welding coordinator shall be selected from the applicable part of ISO 3834, in accordance with the criteria defined in ISO 3834-1 (see Annex B).

Each single activity in Annex B may be associated with a number of tasks and responsibilities, such as:

— specification and preparation,

— control,

— inspection, check or witnessing.

Where welding coordination is carried out by more than one person, the tasks and responsibilities shall be clearly allocated, such that responsibility is clearly defined and the persons are qualified for each specific welding coordination task.

Welding coordination is the sole responsibility of the manufacturer.

The manufacturer shall appoint at least one responsible welding coordinator.

Welding coordination may be subcontracted. However, compliance to this International Standard remains the responsibility of the manufacturer.

5 Job description

5.1 General

A job description is required for the welding coordination personnel, which shall include their tasks and responsibilities.

5.2 Tasks

For identification of the tasks assigned to the welding coordination personnel, see 4.2 and Annex B.

5.3 Responsibilities

The responsibilities assigned to the welding coordination personnel are identified as follows:

— their position in the manufacturing organization and their responsibilities;

— the extent of authorization accorded to them to accept by signature on behalf of the manufacturing organization, as needed in order to fulfil the assigned tasks, e.g. for procedure specification and supervision reports;

— the extent of authorization accorded to them to carry out the assigned tasks.

6 Technical knowledge

6.1 General knowledge requirements of all welding coordination personnel

For all tasks assigned, welding coordinators shall be able to demonstrate adequate technical knowledge to ensure satisfactory performance of these tasks.

The following factors shall be considered:

— general technical knowledge;

— specialized technical knowledge in welding and allied processes relevant to the assigned tasks, which shall be attained by a combination of theoretical knowledge, training and/or experience.

The extent of required manufacturing experience, education and technical knowledge shall be decided by the manufacturing organization, and shall depend on the assigned tasks and responsibilities.

6.2 Specific knowledge requirements of responsible welding coordination personnel

Responsible welding coordination personnel (see 4.2) shall be allocated from one of the following groups, depending on the nature and/or complexity of the production:

a) personnel with comprehensive technical knowledge, where full technical knowledge is required, in accordance with 6.1, for the planning, executing, supervising and testing of all tasks and responsibilities in welding fabrication (see Annex A);

b) personnel with specific technical knowledge, where the level of technical knowledge needs to be sufficient for the planning, executing, supervising and testing of the tasks and responsibilities in welding fabrication within a selective or limited technical field (see Annex A);

c) personnel with basic technical knowledge, where the level of technical knowledge needs to be sufficient for the planning, executing, supervising and testing of the tasks and responsibilities within a limited technical field, involving only simple welded constructions (see Annex A).

Annex A
(informative)

Recommendations for technical knowledge in welding

The International Institute of Welding (IIW) has, on a voluntary basis, prepared recommendations for minimum requirements for education, examination and qualification of welding coordination personnel.

The recommendations are stated in the following documents:

— International Welding Engineer (IWE), Doc. IAB-002-2000/EWF-409;

— International Welding Technologist (IWT), Doc. IAB-003-2000/EWF-410;

— International Welding Specialist (IWS), Doc. IAB-004-2000/EWF-411.

Welding coordination personnel fulfilling the requirements of these documents, or holding acceptable national qualifications, may be considered to satisfy the relevant requirements of 6.2.

Annex B
(normative)

Essential welding-related tasks in accordance with ISO 3834 to be considered when appropriate

B.1 Review of requirements

The following elements shall be considered in a review of requirements:

a) the product standard to be used, together with any supplementary requirements;

b) the capability of the manufacturer to meet the prescribed requirements.

B.2 Technical review

The following elements shall be considered in a technical review:

a) the parent material(s) specification and welded joint properties;

b) the joint location with relation to the design requirements;

c) quality and acceptance requirements for welds;

d) the location, accessibility and sequence of welds, including accessibility for inspection and non-destructive testing;

e) other welding requirements, e.g. batch testing of consumables, ferrite content of weld metal, ageing, hydrogen content, permanent backing, use of peening, surface finish, weld profile;

f) the dimensions and details of joint preparation and completed weld.

B.3 Sub-contracting

With regard to sub-contracting, the suitability of any sub-contractor for welding fabrication shall be considered.

B.4 Welding personnel

With regard to welding personnel, the qualification of welders and welding operators, brazers and brazing operators shall be considered.

B.5 Equipment

The following elements shall be considered with regard to equipment:

a) the suitability of welding and associated equipment;

b) auxiliaries and equipment supply, identification and handling;

c) personal protective equipment and other safety equipment, directly associated with the applicable manufacturing process;

d) equipment maintenance;

e) equipment verification and validation.

B.6 Production planning

The following elements shall be considered with regard to production planning:

a) reference to the appropriate procedure specifications for welding and allied processes;

b) the sequence in which the welds are to be made;

c) environmental conditions (e.g. protection from wind, temperature and rain);

d) the allocation of qualified personnel;

e) equipment for preheating and post-heat treatment, including temperature indicators;

f) the arrangement for any production test.

B.7 Qualification of the welding procedures

With regard to the qualification of the welding procedures, the method and range of qualification shall be considered.

B.8 Welding procedure specifications

With regard to welding procedure specifications, the range of qualification shall be considered.

B.9 Work instructions

With regard to work instructions, the issuing and use of work instructions shall be considered.

B.10 Welding consumables

The following elements shall be considered with regard to welding consumables:

a) compatibility;

b) delivery conditions;

c) any supplementary requirements in the welding consumable purchasing specifications, including the type of welding consumable inspection document;

d) the storage and handling of welding consumables.

B.11 Materials

The following elements shall be considered with regard to materials:

a) any supplementary requirements in the material purchasing specifications, including the type of inspection document for the material;

b) the storage and handling of parent material;

c) traceability.

B.12 Inspection and testing before welding

The following elements shall be considered with regard to inspection and testing before welding:

a) the suitability and validity of welders' and welding operators' qualification certificates;

b) the suitability of the welding procedure specification;

c) the identity of the parent material;

d) the identity of welding consumables;

e) joint preparation (e.g. shape and dimensions);

f) fit-up, jigging and tacking;

g) any special requirements in the welding procedure specification (e.g. prevention of distortion);

h) the suitability of working conditions for welding, including the environment.

B.13 Inspection and testing during welding

The following elements shall be considered with regard to inspection and testing during welding:

a) essential welding parameters (e.g. welding current, arc voltage and travel speed);

b) the preheating/interpass temperature;

c) the cleaning and shape of runs and layers of weld metal;

d) back gouging;

e) the welding sequence;

f) the correct use and handling of welding consumables;

g) control of distortion;

h) any intermediate examination (e.g. checking dimensions).

B.14 Inspection and testing after welding

The following elements shall be considered with regard to inspection and testing after welding:

a) the use of visual inspection (for completeness of welding, weld dimensions, shape);

b) the use of non-destructive testing;

c) the use of destructive testing;

d) the form, shape, tolerance and dimensions of the construction;

e) the results and records of post-operations (e.g. post-weld heat treatment, ageing).

B.15 Post-weld heat treatment

With regard to post-weld heat treatment, performance in accordance with the specification shall be considered.

B.16 Non-conformance and corrective actions

With regard to non-conformance and corrective actions, the necessary measures and actions (e.g. weld repairs, re-assessment of repaired welds, corrective actions) shall be considered.

B.17 Calibration and validation of measuring, inspection and testing equipment

With regard to the calibration and validation of measuring, inspection and testing equipment, the necessary methods and actions shall be considered.

B.18 Identification and traceability

The following elements shall be considered with regard to identification and traceability:

a) the identification of production plans;

b) the identification of routing cards;

c) the identification of weld locations in construction;

d) the identification of non-destructive testing procedures and personnel;

e) the identification of the welding consumable (e.g. designation, trade name, manufacturer of consumables and batch or cast numbers);

f) the identification and/or traceability of parent material (e.g. type, cast number);

g) the identification of the location of repairs;

h) the identification of the location of temporary attachments;

i) traceability for fully mechanized and automatic welding units to specific welds;

j) traceability of welder and welding operators to specific welds;

k) traceability of welding procedure specifications to specific welds.

B.19 Quality records

With regard to quality records, the preparation and maintenance of the necessary records (including subcontracted activities) shall be considered.

Bibliography

[1] ISO 3834-2, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

[2] ISO 3834-3, *Quality requirements for fusion welding of metallic materials — Part 3: Standard quality requirements*

[3] ISO 3834-4, *Quality requirements for fusion welding of metallic materials — Part 4: Elementary quality requirements*

[4] ISO 3834-5, *Quality requirements for fusion welding of metallic materials — Part 5: Documents with which it is necessary to conform to claim conformity to the quality requirements of ISO 3834-2, ISO 3834-3 or ISO 3834-4*

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