

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**

ICS 25.160.01

National foreword

This British Standard is the UK implementation of EN ISO 3834-5:2005. It is identical with ISO 3834-5:2005, incorporating corrigendum August 2007.

The UK participation in its preparation was entrusted to Technical Committee WEE/-/1, Briefing committee for welding.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Amendments/corrigenda issued since publication

Date	Comments
30 June 2008	Implementation of ISO corrigendum August 2007. First paragraph of 2.1 replaced

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English Version

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conformity to the quality requirements of ISO 3834-2, ISO 3834-
3 or ISO 3834-4 (ISO 3834-5:2005)

Exigences de qualité en soudage par fusion des matériaux
métalliques - Partie 5: Documents auxquels il est
nécessaire de se conformer pour déclarer la conformité aux
exigences de qualité de l'ISO 3834-2, l'ISO 3834-3 ou l'ISO
3834-4 (ISO 3834-5:2005)

This European Standard was approved by CEN on 28 October 2005.

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Foreword

This document (EN ISO 3834-5:2005) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

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

Endorsement notice

The text of ISO 3834-5:2005 has been approved by CEN as EN ISO 3834-5:2005 without any modifications.

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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

1 Scope

This part of ISO 3834 specifies the 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. It can only be used in conjunction with ISO 3834-2, ISO 3834-3 or ISO 3834-4.

2 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

2.1 General

Conformity to the quality requirements of ISO 3834-2, ISO 3834-3 or ISO 3834-4 shall be claimed by a manufacturer in accordance with one or more of the following options:

- a) adopting the ISO documents listed in 2.2;
- b) adoption of other documents that provide technically equivalent conditions to the ISO documents listed in 2.2;
- c) adoption of different supporting standards, where these are required in application standards used by the manufacturers.

It is the responsibility of the manufacturer to demonstrate technically equivalent conditions when documents other than those specified in 2.2 are employed. Certificates issued following assessment by independent certification organizations, or claims of compliance by a manufacturer with any part of ISO 3834, shall clearly identify the documents used by the manufacturer.

2.2 ISO documents

The following ISO documents are indispensable for the application of ISO 3834-2, ISO 3834-3 or ISO 3834-4, as specified in 2.1. The latest edition of the referenced document (including any amendments) applies.

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

ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys*

ISO 9606-3, *Approval testing of welders — Fusion welding — Part 3: Copper and copper alloys*

ISO 9606-4, *Approval testing of welders — Fusion welding — Part 4: Nickel and nickel alloys*

ISO 9606-5, *Approval testing of welders — Fusion welding — Part 5: Titanium and titanium alloys, zirconium and zirconium alloys*

ISO 9712, *Non-destructive testing — Qualification and certification of personnel*

ISO 13916, *Welding — Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature*

ISO 14555, *Welding — Arc stud welding of metallic materials*

ISO 14731, *Welding coordination — Tasks and responsibilities*

ISO 14732, *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 15607, *Specification and qualification of welding procedures for metallic materials — General rules*

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*

ISO 15609-3, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 3: Electron beam welding*

ISO 15609-4, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 4: Laser beam welding*

ISO 15610, *Specification and qualification of welding procedures for metallic materials — Qualification based on tested welding consumables*

ISO 15611, *Specification and qualification of welding procedures for metallic materials — Qualification based on previous welding experience*

ISO 15612, *Specification and qualification of welding procedures for metallic materials — Qualification by adoption of a standard welding procedure*

ISO 15613, *Specification and qualification of welding procedures for metallic materials — Qualification based on pre-production welding test*

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 15614-2, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 2: Arc welding of aluminium and its alloys*

ISO 15614-3, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 3: Fusion and pressure welding of non-alloyed and low-alloyed cast irons*

ISO 15614-4, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 4: Finishing welding of aluminium castings*

ISO 15614-5, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 5: Arc welding of titanium, zirconium and their alloys*

ISO 15614-6, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 6: Arc welding of copper and copper alloys*

ISO 15614-7, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 7: Overlay welding*

ISO 15614-8, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 8: Welding of tubes to tube-plate joints*

ISO 15614-10, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 10: Hyperbaric dry welding*

ISO 15614-11, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 11: Electron and laser beam welding*

ISO 15618-1, *Qualification testing of welders for underwater welding — Part 1: Diver-welders for hyperbaric wet welding*

ISO 15618-2, *Qualification testing of welders for underwater welding — Part 2: Diver-welders and welding operators for hyperbaric dry welding*

ISO 17635, *Non-destructive testing of welds — General rules for fusion welds in metallic materials*

ISO 17636, *Non-destructive testing of welds — Radiographic testing of fusion-welded joints*

ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*

ISO 17638, *Non-destructive testing of welds — Magnetic particle testing*

ISO 17639, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds*

ISO 17640, *Non-destructive testing of welds — Ultrasonic testing of welded joints*

ISO 17662, *Welding — Calibration, verification and validation of equipment used for welding, including ancillary activities*

ISO/TR 17663, *Welding — Guidelines for quality requirements for heat treatment in connection with welding and allied processes*

ISO/TR 17671-2, *Welding — Recommendations for welding of metallic materials — Part 2: Arc welding of ferritic steels*

ISO/TR 17844, *Welding — Comparison of standardised methods for the avoidance of cold cracks*

2.3 Applicability

There are two different types of ISO documents for the quality requirements of fusion welding processes:

- Type A: ISO documents for welding processes for which the quality requirements are given in several documents, see Tables 1 to 9;
- Type B: ISO documents for specific welding processes for which the quality requirements are given in a single document, see Table 10.

NOTE 1 The quality requirements for fusion welding may also be used for friction welding, as appropriate (see ISO 15620^[1]).

NOTE 2 For guidelines on the education and qualification of personnel dealing with welding coordination and inspection, see Annex A.

Table 1 — Welders and welding operators

Welding process	ISO documents	ISO 3834-2:2005 subclause	ISO 3834-3:2005 subclause	ISO 3834-4:2005 subclause
Arc welding	ISO 9606-1, ISO 9606-2, ISO 9606-3, ISO 9606-4, ISO 9606-5, ISO 14732, ISO 15618-1, ISO 15618-2	7.2	7.2	7.2
Electron beam welding	ISO 14732			
Laser beam welding	ISO 14732			
Gas welding	ISO 9606-1			

Table 2 — Welding coordination personnel

Welding process	ISO documents	ISO 3834-2:2005 subclause	ISO 3834-3:2005 subclause	ISO 3834-4:2005 subclause
Arc welding	ISO 14731	7.3	7.3	none
Electron beam welding				
Laser beam welding				
Gas welding				

Table 3 — Non-destructive testing personnel

Welding process	ISO documents	ISO 3834-2:2005 subclause	ISO 3834-3:2005 subclause	ISO 3834-4:2005 subclause
Arc welding	ISO 9712	8.2	8.2	8.2
Electron beam welding				
Laser beam welding				
Gas welding				

Table 4 — Welding procedure specifications

Welding process	ISO documents	ISO 3834-2:2005 subclause	ISO 3834-3:2005 subclause	ISO 3834-4:2005 subclause
Arc welding	ISO 15609-1	10.2	10.2	none
Electron beam welding	ISO 15609-3			
Laser beam welding	ISO 15609-4			
Gas welding	ISO 15609-2			

Table 5 — Qualification of the welding procedures

Welding process	ISO documents	ISO 3834-2:2005 subclause	ISO 3834-3:2005 subclause	ISO 3834-4:2005 subclause
Arc welding	ISO 15607, ISO 15610, ISO 15611, ISO 15612, ISO 15613, ISO 15614-1, ISO 15614-2, ISO 15614-3, ISO 15614-4, ISO 15614-5 ISO 15614-6, ISO 15614-7, ISO 15614-8, ISO 15614-10	10.3	10.3	none
Electron beam welding	ISO 15607, ISO 15611, ISO 15612, ISO 15613, ISO 15614-11			
Laser beam welding	ISO 15607, ISO 15611, ISO 15612, ISO 15613, ISO 15614-11			
Gas welding	ISO 15607, ISO 15610, ISO 15611, ISO 15612, ISO 15613, ISO 15614-1			

Table 6 — Post-weld heat treatment

Welding process	ISO documents	ISO 3834-2:2005 Clause	ISO 3834-3:2005 Clause	ISO 3834-4:2005 Clause
Arc welding	ISO/TR 17663	13	13	none
Electron beam welding				
Laser beam welding				
Gas welding				

Table 7 — Inspection and testing during welding

Welding process	ISO documents	ISO 3834-2:2005 subclause	ISO 3834-3:2005 subclause	ISO 3834-4:2005 subclause
Arc welding	ISO 13916, ISO/TR 17671-2, ISO/TR 17844	14.3	14.3	none
Electron beam welding	none			
Laser beam welding	none			
Gas welding	none			

Table 8 — Inspection and testing after welding

Welding process	ISO documents	ISO 3834-2:2005 subclause	ISO 3834-3:2005 subclause	ISO 3834-4:2005 subclause
Arc welding	ISO 17635, ISO 17636, ISO 17637, ISO 17638, ISO 17639, ISO 17640	14.4	14.4	none
Electron beam welding				
Laser beam welding				
Gas welding				

Table 9 — Calibration and validation of measuring, inspection and testing equipment

Welding process	ISO documents	ISO 3834-2:2005 Clause	ISO 3834-3:2005 Clause	ISO 3834-4:2005 Clause
Arc welding	ISO 17662	16	16	none
Electron beam welding				
Laser beam welding				
Gas welding				

Table 10 — Other fusion welding processes

Welding process	ISO documents	ISO 3834-2:2005 clause	ISO 3834-3:2005 clause	ISO 3834-4:2005 clause
Stud welding	ISO 14555	all, if relevant	all, if relevant	all, if relevant
Aluminothermic welding/ thermite welding	Presently no ISO documents available	—	—	—

Annex A

(informative)

Guidelines on qualification/education scheme for personnel dealing with welding coordination and inspection

The International Institute of Welding (IIW) has, on a voluntary basis, prepared guidelines for minimum requirements for the education, training, examination and qualification of personnel dealing with welding coordination and inspection.

The minimum requirements for personnel dealing with welding coordination are stated in the following documents:

- International Welding Engineer (IWE)
Doc. IAB-002-2000/EFW-409;
- International Welding Technologist (IWT)
Doc. IAB-003-2000/EFW-410;
- International Welding Specialist (IWS)
Doc. IAB-004-2000/EFW-411.

The minimum requirements for inspection personnel are stated in the following document:

- International Welding Inspection Personnel (IWIP)
Doc. IAB-041-2001/EFW-450.

Personnel dealing with welding coordination and inspection fulfilling the requirements of these documents, or holding acceptable national qualifications, are considered to satisfy relevant requirements.

Bibliography

- [1] ISO 15620, *Welding — Friction welding of metallic materials*

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