

DIN EN ISO 3834-1

ICS 25.160.10

Supersedes
DIN EN 729-1:1994-11

**Quality requirements for fusion welding of metallic materials –
Part 1: Criteria for the selection of the appropriate level of quality
requirements (ISO 3834-1:2005)
English version of DIN EN ISO 3834-1:2006-03**

Qualitätsanforderungen für das Schmelzschweißen von metallischen Werkstoffen –
Teil 1: Kriterien für die Auswahl der geeigneten Stufe der Qualitätsanforderungen
(ISO 3834-1:2005)
Englische Fassung DIN EN ISO 3834-1:2006-03

Document comprises 13 pages

National foreword

This standard has been prepared by ISO/TC 44 'Welding and allied processes' in collaboration with Technical Committee CEN/TC 121 'Welding'.

The responsible German body involved in its preparation was the *Normenausschuss Schweißtechnik* (Welding Standards Committee), Joint Committee 092-00-04 AA *Qualitätssicherung beim Schweißen* (DVS AG Q 2).

The International Standards referred to in clause 2 of the EN and in the Bibliography have been published as the corresponding DIN EN ISO Standards with the same number.

ISO 3834 consists of the following parts, under the general title 'Quality requirements for fusion welding of metallic materials':

- Part 1: Criteria for the selection of the appropriate level of quality requirements
- Part 2: Comprehensive quality requirements
- Part 3: Standard quality requirements
- Part 4: Elementary quality requirements
- 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

NOTE A Technical Report ISO/TR 3834-6 'Quality requirements for fusion welding of metallic materials – Part 6: Guidance on implementing ISO 3834' is being prepared.

Requests for official interpretations of any aspect of this part of ISO 3834 should be directed to the Secretariat of ISO/TC 44/SC 10 via the corresponding national standards body, a complete listing of which can be found at www.iso.org.

Amendments

This standard differs from DIN EN 729-1:1994-11 as follows:

- a) Clause 1: As is the case with Part 2, Part 3 and Part 4 of DIN EN ISO 3834, the requirements of a quality management system as in DIN EN ISO 9001:2000 can be fulfilled. The four applications previously covered in Parts 2, 3 and 4 of DIN EN 729 have been revised for inclusion in this standard.
- b) Clause 2: Normative references are included in Part 5 of DIN EN ISO 3834.
- c) Clause 3: New terms and definitions have been included.
- d) Clause 5: This clause is a new addition and provides the user of the standard with recommendations on selecting the appropriate level of quality requirements.
- e) Clause 6: This clause is a new addition and references the individual clauses of DIN EN ISO 9001:2000 which are to be observed in addition to the standards series DIN EN ISO 3834 if a complete quality management system is to be achieved.
- f) Annex A: Table B.1 from DIN EN 729-1 has been revised and included in Annex A, while the previous Annex A has been omitted.

Previous editions

DIN 8563-1: 1964-06, 1973-03, 1978-10

DIN EN 729-1: 1994-11

EUROPEAN STANDARD

EN ISO 3834-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2005

ICS 25.160.01

Supersedes EN 729-1:1994, EN ISO 14554-1:2000, EN
ISO 14554-2:2000

English Version

Quality requirements for fusion welding of metallic materials -
Part 1: Criteria for the selection of the appropriate level of quality
requirements (ISO 3834-1:2005)

Exigences de qualité en soudage par fusion des matériaux
métalliques - Partie 1: Critères pour la sélection du niveau
approprié d'exigences de qualité (ISO 3834-1:2005)

Qualitätsanforderungen für das Schmelzschweißen von
metallischen Werkstoffen - Teil 1: Kriterien für die Auswahl
der geeigneten Stufe der Qualitätsanforderungen
(ISO 3834-1:2005)

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

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.

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Ref. No. EN ISO 3834-1:2005: E

Foreword

This document (EN ISO 3834-1:2005) 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.

This document supersedes EN 729-1:1994, EN ISO 14554-1:2000 and EN ISO 14554-2:2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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 3834-1:2005 has been approved by CEN as EN ISO 3834-1:2005 without any modifications.

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Introduction

Processes such as fusion welding are widely used to manufacture many products. In some companies, they are the key feature of production. Products may range from simple to complex. Examples include pressure vessels, domestic and agricultural equipment, cranes, bridges, transport vehicles and other items.

These processes exert a profound influence on the cost of manufacture and quality of the product. It is important, therefore, to ensure that these processes are carried out in the most effective way and that appropriate control is exercised over all aspects of the operation.

It is emphasised that ISO 3834 is not a quality management system standard replacing ISO 9001:2000. However, it can be a useful tool when ISO 9001:2000 is applied by manufacturers.

Specification of quality requirements for welding processes is important because the quality of these processes cannot be readily verified. Therefore, they are considered to be special processes as noted by ISO 9000:2000.

Quality cannot be inspected into a product, it has to be built in. Even the most extensive and sophisticated non-destructive testing does not improve the quality of the product.

For products to be free from serious problems in production and in service, it is necessary to provide controls, from the design phase, through material selection, into manufacture and subsequent inspection. For example, poor design may create serious and costly difficulties in the workshop, on site, or in service. Incorrect material selection may result in problems, such as cracking in welded joints.

To ensure sound and effective manufacturing, management needs to understand and appreciate the sources of potential trouble and to implement appropriate procedures for their control.

ISO 3834 identifies measures that are applicable for different situations. Typically, they may be applied in the following circumstances:

- in contractual situations: specification of welding quality requirements;
- by manufacturers: establishment and maintenance of welding quality requirements;
- by committees drafting manufacturing codes or application standards: specification of welding quality requirements;
- by organizations assessing welding quality performance, e.g. third parties, customers, or manufacturers.

ISO 3834 can be used by internal and external organizations, including certification bodies, to assess the manufacturer's ability to meet customer, regulatory or the manufacturer's own requirements.

1 Scope

This part of ISO 3834 provides a general outline of ISO 3834 and criteria to be taken into account for the selection of the appropriate level of quality requirements for fusion welding of metallic materials, among the three levels specified in ISO 3834-2 ^[3], ISO 3834-3 ^[4] and ISO 3834-4 ^[5]. It applies to manufacturing, both in workshops and at field installation sites.

NOTE 1 ISO 3834-2, ISO 3834-3 and ISO 3834-4 provide complete sets of quality requirements for process control related to all fusion welding processes (for each process separately or in combination as specified). ISO 3834-5 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.

This part of ISO 3834 does not specify requirements for a total quality management system. However, Clause 6 identifies quality management system elements where their inclusion will complement ISO 3834.

NOTE 2 ISO 3834-2, ISO 3834-3 and ISO 3834-4 may be used on their own by a manufacturer or in conjunction with ISO 9001:2000.

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 9000:2000, *Quality management systems — Fundamentals and vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000:2000 and the following apply.

3.1

design specification

requirements for products specified by customers or by the organization in anticipation of customer requirements, or by regulation

NOTE The requirements for products and in some cases associated processes can be contained in, for example, technical specifications, product standards, process standards, contractual agreements and regulatory requirements.

3.2

qualified person

person whose competence and knowledge have been obtained by education, training and/or relevant practical experience

NOTE In order to demonstrate the level of competence and knowledge, a qualification test may be required.

3.3

construction

product, structure or any other welded item

3.4

manufacturer fabricator

person or organization responsible for the welding production

3.5

sub-contractor

supplier of products, services and/or activities to the manufacturer in a contractual situation

3.6

welding operator

person who performs fully mechanised or automatic fusion welding processes

4 General outline of ISO 3834

ISO 3834 specifies quality requirements suitable for fusion welding processes of metallic materials. The requirements contained within this International Standard may be adopted for other welding processes. These requirements relate only to those aspects of the quality of the products, which may be influenced by fusion welding, without being assigned to any specific product group.

ISO 3834 therefore provides a method to demonstrate the capability of a manufacturer to produce products of the specified quality.

It was prepared such that:

- a) it is independent of the type of construction manufactured;
- b) it defines quality requirements for welding in workshops and/or on site;
- c) it provides guidance for describing a manufacturer's capability to produce constructions to meet specified requirements;
- d) it provides a basis for assessing a manufacturer's welding capability.

ISO 3834 is appropriate when demonstration of a manufacturer's capability to produce welded constructions, fulfilling specified quality requirements, is specified in one or more of the following:

- a specification;
- a product standard;
- a regulatory requirement.

The requirements contained within this document may be adopted in full or may 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 applications.

- Case 1: To provide specific requirements in specifications which require the manufacturer to have a quality management system in accordance with ISO 9001:2000 [1].
- Case 2: To provide specific requirements in specifications which require the manufacturer to have a quality management system other than ISO 9001:2000.
- Case 3: To provide specific guidance for a manufacturer developing a quality management system for fusion welding.
- Case 4: To provide detailed requirements for specifications, regulations or product standards that require control of fusion welding activities.

5 Selection of the appropriate level of quality requirements

The selection of the appropriate part of ISO 3834, specifying the required level of quality requirements, should be in accordance with the product standard, specification, regulation or contract. Because ISO 3834 may be used in a variety of situations and for different applications, definitive rules on the level of quality requirements to be adopted in individual circumstances cannot be given in this clause.

ISO 3834 may be applied in a variety of situations. The manufacturer should select one of the three parts specifying different levels of quality requirements, based on the following criteria related to products:

- the extent and significance of safety-critical products;
- the complexity of manufacture;
- the range of products manufactured;
- the range of different materials used;
- the extent to which metallurgical problems may occur;
- the extent to which manufacturing imperfections, e.g. misalignment, distortion or weld imperfection, affect product performance.

A manufacturer that demonstrates compliance to a particular quality level is considered to have established compliance to all lower levels without further demonstration [e.g. a manufacturer compliant to comprehensive quality requirements (i.e. ISO 3834-2) demonstrates compliance with standard quality requirements (i.e. ISO 3834-3) and elementary quality requirements (i.e. ISO 3834-4)].

Annex A lists criteria which assist in the selection of the appropriate part of ISO 3834.

6 Elements to be considered for a quality management system to complement ISO 3834

ISO 3834 contains many attributes that contribute to a quality management system (QMS). This clause identifies those QMS elements that the manufacturer should consider implementing to support the ISO 3834 quality requirements:

- a) control of documents and records (see ISO 9001:2000, 4.2.3, 4.2.4);
- b) management responsibilities (see ISO 9001:2000, Clause 5);
- c) provision of resources (see ISO 9001:2000, 6.1);
- d) competence, awareness and training of operational personnel [see ISO 9001:2000, 6.2.2, 7.5.2 b)];
- e) planning of product realization (see ISO 9001:2000, 7.1);
- f) determination of requirements related to the product (see ISO 9001:2000, 7.2.1);
- g) review of requirements related to the product (see ISO 9001:2000, 7.2.2);
- h) purchasing (see ISO 9001:2000, 7.4);
- i) validation of processes (see ISO 9001:2000, 7.5.2);
- j) customer property (see ISO 9001:2000, 7.5.4);
- k) internal audit (see ISO 9001:2000, 8.2.2);
- l) monitoring and measurement of product (see ISO 9001:2000, 8.2.4).

ISO 9004:2000^[2] provides guidance on the development and implementation of a quality management system.

Annex A (informative)

Criteria which assist in the selection of ISO 3834-2, ISO 3834-3 or ISO 3834-4

No.	Element	ISO 3834-2	ISO 3834-3	ISO 3834-4
1	Review of requirements	review required		
		record is required	record may be required	record is not required
2	Technical review	review required		
		record is required	record may be required	record is not required
3	Sub-contracting	treat like a manufacturer for the specific subcontracted product, services and/or activities, however final responsibility for quality remains with the manufacturer		
4	Welders and welding operators	qualification is required		
5	Welding co-ordination personnel	required		no specific requirement
6	Inspection and testing personnel	qualification is required		
7	Production and testing equipment	suitable and available as required for preparation, process execution, testing, transport, lifting in combination with safety equipment and protective clothes		
8	Equipment maintenance	required to provide, maintain and achieve product conformity		no specific requirement
		documented plans and records are required	records are recommended	
9	Description of equipment	list is required		no specific requirement
10	Production planning	required		no specific requirement
		documented plans and records are required	documented plans and records are recommended	
11	Welding procedure specifications	required		no specific requirement
12	Qualification of the welding procedures	required		no specific requirement
13	Batch testing of consumables	if required	no specific requirement	
14	Storage and handling of welding consumables	a procedure is required in accordance with supplier recommendations		in accordance with supplier recommendations
15	Storage of parent material	protection required from influence by environment; identification shall be maintained through storage		no specific requirement

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No.	Element	ISO 3834-2	ISO 3834-3	ISO 3834-4
16	Post-weld heat treatment	confirmation that the requirements according to product standard or specifications are fulfilled		no specific requirement
		procedure, record and traceability of the record to the product are required	procedure and record are required	
17	Inspection and testing before, during and after welding	required		if required
18	Non-conformance and corrective actions	measures of control are implemented procedures for repair and/or rectification are required		measures of control are implemented
19	Calibration or validation of measuring, inspection and testing equipment	required	if required	no specific requirement
20	Identification during process	if required		no specific requirement
21	Traceability	if required		no specific requirement
22	Quality records	if required		

Bibliography

- [1] ISO 9001:2000, *Quality management systems — Requirements*
- [2] ISO 9004:2000, *Quality management systems — Guidelines for performance improvements*
- [3] ISO 3834-2, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements*
- [4] ISO 3438-3, *Quality requirements for fusion welding of metallic materials — Part 3: Standard quality requirements*
- [5] ISO 3834-4, *Quality requirements for fusion welding of metallic materials — Part 4: Elementary quality requirements*