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Brazing — Quality requirements for brazing of metallic materials

Brasage fort — Exigences de qualité en brasage fort des matériaux métalliques

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by IIW, the *International Institute of Welding*, jointly with Commission XVII, *Brazing, soldering and diffusion bonding,* and Commission XVIII, *Quality management in welding and allied processes*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Brazing processes are widely used to manufacture many products from simple to complex. In some companies, brazing is the key fabrication process. Examples include several industry fields, such as automotive, aerospace, heat exchangers, refrigeration, air-conditioning, turbomachinery 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.

This document is similar in scope and purpose to the ISO 3834 series and has been adapted for brazing quality management systems. This document can be a useful tool when a quality management system (e.g. ISO 9001) is applied by manufacturers.

Specification of quality requirements for brazing 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.

Quality cannot be inspected into a product, it needs to be built in. Even the most extensive and sophisticated non-destructive testing does not improve the as-produced quality of the product. The use of non-destructive testing processes such as radiography, fluorescent penetrants and ultrasonics helps in rendering a decision as to the quality of the brazed joint.

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 can create serious and costly difficulties in the workshop, on site, or in service. Incorrect material selection can result in problems, such as failure of brazed 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.

This document identifies measures that are applicable for different situations. Typically, they can be applied in the following circumstances:

— in contractual situations: specification of brazing quality requirements;

— by manufacturers: establishment and maintenance of brazing quality requirements;

— by committees drafting manufacturing codes or application standards: specification of brazing quality requirements;

— by organizations assessing brazing quality performance (e.g. third parties, customers or manufacturers).

This document may be adopted in full or partially by the manufacturer depending on the assembly concerned. This document provides a flexible framework for the control of brazing in the following applications.

— Case 1: To provide specific requirements for specifications which require the manufacturer to have a quality management system (e.g. ISO 9001).

— Case 2: To provide specific guidance for a manufacturer developing a quality management system for brazing.

— Case 3: To provide detailed requirements for specifications, regulations or product standards that require control of brazing activities.

This document 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.

A similar series of documents, the ISO 3834 series, was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 10, *Quality management in the field of welding*.