AWS C3.7M/C3.7:2011 (R2022)
An American National Standard

Specification for Aluminum Brazing

American Welding Society®

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An American National Standard

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Specification for Aluminum Brazing

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Prepared by the
American Welding Society (AWS) C3 Committee on Brazing and Soldering

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification presents the minimum fabrication, equipment, material, process procedure, and inspection requirements for the brazing of aluminum by all of the processes commonly used—atmosphere furnace, vacuum furnace, and flux processes. Its purpose is to standardize aluminum brazing requirements for all applications in which brazed aluminum joints of assured quality are required. It provides criteria for classifying aluminum brazed joints based on loading and the consequences of failure and quality assurance criteria defining the limits of acceptability of each class.

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Foreword

This foreword is not part of this standard, but is included for informational purposes only.

This specification is one of a series prepared at the request of the Aerospace Materials Division (AMD) of SAE International and a number of other organizations to replace the military specification MIL-B-7883, *Brazing of Steels, Copper, Copper Alloys, Nickel Alloys, Aluminum, and Aluminum Alloys*, which addressed all brazing processes. It became both obsolete and very cumbersome as brazing technology proliferated and became more complex.

Addressing all of the diverse brazing processes in one concise, easily understood document was found to be impractical; therefore, a series of six independent specifications on brazing have been written, all in the same format. These are AWS C3.4M/C3.4, *Specification for Torch Brazing*; AWS C3.5M/C3.5, *Specification for Induction Brazing*; AWS C3.6M/C3.6, *Specification for Furnace Brazing*; the present document AWS C3.7M/C3.7, *Specification for Aluminum Brazing*; AWS C3.8M/C3.8, *Specification for the Ultrasonic Pulse-Echo Examination of Brazed Joints*; and AWS C3.9M/C3.9, *Specification for Resistance Brazing*.

After the completion of the fourth brazing specification, it was determined that a document providing specific criteria and requirements for the application of ultrasonic testing to brazed joints was needed. Therefore, AWS C3.8M/C3.8, *Specification for the Ultrasonic Pulse-Echo Examination of Brazed Joints*, was written to complement this series.

The decision to subdivide the technology in this way was based on a survey of production brazing applications conducted by the AWS C3 Committee on Brazing and Soldering. The survey demonstrated that these six specifications would cover the vast majority of brazing performed today.

This fourth edition supersedes AWS C3.7M/C3.7:2005, bearing the same title and includes changes to numerous clauses to provide clarification, correct inconsistencies, and updates representative of current industry practices.

In this reaffirmation, typographical errors were corrected in the Personnel, the current instructions on how to request an Official Interpretation on an AWS Standard in Annex B was added, and the List of AWS Documents in Brazing and Soldering was updated.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS C3 Committee on Brazing and Soldering, American Welding Society, 8669 NW 36th Street, #130, Miami, FL 33166.

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Specification for Aluminum Brazing

1. General Requirements

1.1 Scope. This specification presents the minimum fabrication and quality requirements for brazing of aluminum and aluminum alloys. Its purpose is to standardize brazing process requirements and control brazed joint quality for all applications for which brazed joints of assured quality are required. This document establishes the minimum requirements for processes and products with a minimum of explanatory information so that sources of ambiguity are minimized. It assigns responsibility for the ultimate quality of the brazed product to a single organization and permits that organization to modify requirements if appropriate to the application. It requires proper documentation of any such modification.

1.2 Units of Measurement. This standard makes use of both the International System of Units (SI) and U.S. Customary Units; the latter are shown within brackets ([ ]). The measurements may not be exact equivalents; therefore, each system must be used independently.

1.3 Safety. Safety and health issues and concerns are beyond the scope of this standard; some safety and health information is provided, but such issues are not fully addressed herein.

Safety and Health information is available from the following sources:

American Welding Society:

(1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*

(2) AWS Safety and Health Fact Sheets

(3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

(1) Material Safety Data Sheets supplied by the materials manufacturers

(2) Operating Manuals supplied by equipment manufacturers

Applicable Regulatory Agencies:

(1) United States Department of Labor, Occupational Safety & Health Administration (OSHA)

(2) Equivalent agencies of other countries and individual states

Work performed in accordance with this standard may involve the use of materials that have been deemed hazardous, and may involve operations or equipment that may cause injury or death. This standard does not purport to address all safety and health risks that may be encountered. The user of this standard should establish an appropriate safety program to address such risks as well as to meet applicable regulatory requirements. ANSI Z49.1 should be considered when developing the safety program.

2. Normative References

The standards listed below contain provisions that, through reference in this text, constitute mandatory provisions of this AWS standard. For undated references, the latest edition of the referenced standard shall apply. For dated references, subsequent amendments to or revisions of, any of these publications do not apply.