

AWS C3.4M/C3.4:2007
An American National Standard



Specification for Torch Brazing



American Welding Society



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An American National Standard

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Specification for Torch 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, and process procedure requirements, as well as inspection requirements for the torch brazing of steels, stainless steels, copper, copper alloys, and heat- or corrosion-resistant alloys and other materials that can be adequately torch brazed (the torch brazing of aluminum alloys is addressed in AWS C3.7M/C3.7, *Specification for Aluminum Brazing*). This specification provides criteria for classifying torch brazed joints based on loading and the consequences of failure and quality assurance criteria defining the limits of acceptability in each class. The specification defines acceptable torch brazing equipment, materials, and procedures as well as the required inspection for each class of joint.



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Specification for Torch Brazing

1. Scope

This specification presents the minimum fabrication and quality requirements for the torch brazing of materials such as steels, stainless steels, copper, copper alloys, and heat- and corrosion-resistant alloys as well as other materials that can be adequately torch brazed. Note that the torch brazing of aluminum alloys is addressed in AWS C3.7M/C3.7, *Specification for Aluminum Brazing*.

The purpose of this specification is to standardize torch brazing process requirements and control brazed joint quality for all applications requiring brazed joints of assured quality. This document establishes 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 modifications.

Procedures for the protection of the safety and health of those performing torch brazing and related operations are of great importance. However, safety and health concerns are beyond the scope of this standard and therefore are not fully addressed herein. Safety and health information is available from other sources, including, but not limited to, ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*.

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

2. Normative References

The standards listed below contain provisions which, 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.

American Welding Society (AWS) standards:¹

AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*;

AWS A3.0, *Standard Welding Terms and Definitions, Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*;

AWS A5.8/A5.8M, *Specification for Filler Metals for Brazing and Braze Welding*;

AWS A5.31, *Specification for Fluxes for Brazing and Braze Welding*;

AWS B2.2, *Standard for Brazing Procedure and Performance Qualification*;

AWS C3.3, *Recommended Practices for the Design, Manufacture, and Examination of Critical Brazed Components*; and

AWS C3.8M/C3.8, *Specification for the Ultrasonic Examination of Brazed Joints*.

American Society for Quality (ASQ) standards:²

ASQ Z1.4, *Sampling Procedures and Tables for Inspection by Attributes*.

Society of Automotive Engineers (SAE) documents:³

SAE AMS 2403, *Plating, General Purpose*;

SAE AMS 2424, *Plating, Nickel, Low Stressed Deposit*; and

SAE AMS 2451/1, *Plating, Brush, Nickel General Purpose*.

¹ AWS standards are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

² ASQ standards are published by the American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203.

³ SAE standards are published by the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001.