

AWS C3.11M/C3.11:2011
An American National Standard



Specification for Torch Soldering



American Welding Society®



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An American National Standard**

**Approved by the
American National Standards Institute
July 14, 2011**

Specification for Torch Soldering

1st Edition

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 describes relevant equipment, fabrication procedures, and quality (inspection) requirements for the torch soldering of materials. This document includes criteria for classifying torch-soldered joints based on loading and the consequences of failure and quality assurance criteria defining the limits of acceptability in each class.



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Foreword

This foreword is not part of AWS C3.11M/C3.11:2011, *Specification for Torch Soldering*, but is included for informational purposes only.

This document is a response to the need within the structural soldering community to develop generalized specifications that are applicable to the making of solder filler metal joints. To this date, the only such related document is ASTM B 828-02, *Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings*. The ASTM specification is an adaptation of the Application Data Sheet entitled *Soldering and Brazing Copper Tube and Fittings* published by the Copper Development Association, Inc. Although technically sound, the document is restrictive in its scope of application. In other engineering applications, e.g., soldering with an iron, furnace soldering, infrared soldering, etc., there are no equivalent specifications; therefore, it is important to the joining community that appropriate specifications be developed and approved which address the technologies associated with structural soldering.

This document is the first in a future series of AWS specifications that addresses materials and process for soldering technology.

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, 550 N.W. LeJeune Road, Miami, FL 33126.

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Specification for Torch Soldering

1. General Requirements

1.1 Scope. This specification presents the minimum process and quality requirements for the torch soldering of ceramics, precious metals, and refractory metals, as well as the alloys of copper (Cu), iron (Fe), nickel (Ni), aluminum (Al), magnesium (Mg), tin (Sn), lead (Pb), and zinc (Zn).

The purpose of this specification is to standardize torch soldering process requirements that will ensure that soldered joints attain the quality level designated by the application. This document establishes the minimum requirements for processes using a minimum amount of explanatory information so as to limit any ambiguity. This document assigns responsibility for soldered joint quality to the Organization Having Quality Responsibility and permits that organization to modify requirements as necessary. However, this specification requires that proper documentation be developed and archived by that organization, which explains the basis and specific details of any such modifications.

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 in brackets ([]) or in appropriate columns in tables and figures. 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

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.