

AWS D9.1M/D9.1:2012
An American National Standard



Sheet Metal Welding Code



American Welding Society®



**AWS D9.1M/D9.1:2012
An American National Standard**

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American National Standards Institute
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Sheet Metal Welding Code

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Prepared by the
American Welding Society (AWS) D9 Committee on Welding, Brazing, and Soldering of Sheet Metal

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This code covers the arc and braze welding requirements for nonstructural sheet metal fabrications using the commonly welded metals available in sheet form. Requirements and limitations governing procedure and performance qualification are presented, and workmanship and inspection standards are supplied. The informative annexes provide useful information on materials and processes.



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This standard is subject to revision at any time by the AWS D9 Committee on Welding, Brazing, and Soldering of Sheet Metal. It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn. Comments (recommendations, additions, or deletions) and any pertinent data that may be of use in improving this standard are required and should be addressed to AWS Headquarters. Such comments will receive careful consideration by the AWS D9 Committee on Welding, Brazing, and Soldering of Sheet Metal and the author of the comments will be informed of the Committee's response to the comments. Guests are invited to attend all meetings of the AWS D9 Committee on Welding, Brazing, and Soldering of Sheet Metal to express their comments verbally. Procedures for appeal of an adverse decision concerning all such comments are provided in the Rules of Operation of the Technical Activities Committee. A copy of these Rules can be obtained from the American Welding Society, 8669 Doral Blvd., Doral, FL 33166.

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Foreword

This foreword is not part of AWS D9.1M/D9.1:2012, *Sheet Metal Welding Code*, but is included for informational purposes only.

This code was developed to provide standardized requirements for the qualification, production, and acceptance of welding or braze welding of nonstructural sheet metal components. Preparation of this document is in response to the many requests received from the sheet metal and construction industries.

The AWS Committee on Welding, Brazing, and Soldering of Sheet Metal was organized in May 1978 and has published five previous versions of D9.1.

The first, D9.1-80, *Specification for Welding of Sheet Metal*, was limited to the more common welding processes. The second, D9.1-84, bore the same title, but was augmented to provide coverage of braze welding.

D9.1-90, *Sheet Metal Welding Code*, was written to refine and clarify several areas of the standard and to upgrade it to the status of a code in order to enhance its use and to promote a minimum quality level for those who invoke it.

The 2000 edition, D9.1M/D9.1:2000, *Sheet Metal Welding Code*, provides for maintenance of the document and updates to keep abreast of practices being encountered in sheet metal welding and joining processes since the last revision.

The 2006 edition D9.1M/D9.1:2006, *Sheet Metal Welding Code*, also provides for maintenance of the document and presents up to date practices in sheet metal welding and joining processes since the 2000 revision.

The 2012 edition D9.1M/D9.1:2012, *Sheet Metal Welding Code*, provides for maintenance of the document and incorporates many of the comments received during the balloting process for the 2006 edition.

Underlined text in clauses, tables, or figures indicates an editorial or technical change from the 2006 edition. A vertical line in the margin also indicates a revision from 2006 edition.

As new applications are developed and more experience is gathered, it is anticipated that changes in this standard will be required. Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS D9 Committee on the Welding, Brazing, and Soldering of Sheet Metal, American Welding Society, 8669 Doral Blvd., Doral, FL 33166.

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Sheet Metal Welding Code

1. General Requirements

1.1 Scope. This code provides qualification, workmanship, and inspection requirements for both arc welding (Part A) and braze welding (Part B), as they apply to the fabrication, manufacture, and erection of nonstructural sheet metal components and systems.

1.1.1 This code was developed to provide standardized requirements for the qualification, production, and acceptance of welding or braze welding of nonstructural sheet metal components.

1.1.2 General applications of this code are in the following industrial areas:

- (1) Heating, ventilating, and air conditioning systems
- (2) Food processing equipment
- (3) Architectural sheet metal and similar applications
- (4) Other nonstructural sheet metal applications

This code covers sheet metal thicknesses up to and including 6.07 mm [0.239 in]. Also covered are the attachment of accessories and components of the system, and joining or attachment of any member, regardless of thickness, whose sole purpose is stiffening, supporting, or reinforcing the sheet metal.

1.1.2.1 Limitations/Exceptions. This code does not apply:

(1) Where negative pressure or positive pressure exceeds 30 kPa [5 psi], which is approximately 3 m [120 in] of standing water

(2) Where structural requirements are concerned (including AWS D1.3/D1.3M, *Structural Welding Code—Sheet Steel*)

(3) Where sheet metal products related to automotive applications are concerned

1.1.3 This code requires values to be specified by the Engineer for subclauses 8.2, 8.4, 13.1, and 13.3.

1.1.4 Symbols used in this code shall be in accordance with the latest edition of AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*.

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 ([]) or in appropriate columns in tables and figures. The measurements are not 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 and therefore are not 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 materials manufacturers
- (2) Operating Manuals supplied by equipment manufacturers