AWS D9.1M/D9.1:2006
An American National Standard

Sheet Metal Welding Code

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American National Standards Institute
July 25, 2006

Sheet Metal Welding Code

5th Edition

Supersedes AWS D9.1M/D9.1:2000

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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Personnel

AWS D9 Committee on the Welding, Brazing, and Soldering of Sheet Metal

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Foreword

This foreword is not a part of AWS D9.1M/D9.1:2006, *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 four 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.

Underlined text indicates a revision from the 2000 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, 550 N.W. LeJeune Road, Miami, FL 33126.

Official interpretations of any of the technical requirements of this standard may be obtained by sending a request, in writing, to the Managing Director, Technical Services Division, American Welding Society. A formal reply will be issued after it has been reviewed by the appropriate personnel following established procedures.

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Dedication

The AWS D9 Committee on Welding, Brazing, and Soldering of Sheet Metal dedicates this edition of the D9.1M/D9.1, *Sheet Metal Welding Code*, to James E. Roth for his significant contribution to both sheet metal and welding, and to the memory of Paul B. Dickerson.

In 1978, Jim recognized the need for a standard for welding nonstructural sheet metal and spearheaded the effort soliciting support from SMACNA, the Sheet Metal National Training Fund, the American Welding Society, and the welding community at large in the development of D9.1. Under his leadership, D9.1 has become the internationally accepted "standard" for welding sheet metal.

Paul was an AWS Fellow and contributed unselfishly to several technical committees of the American Welding Society, including D9. He is missed by all for whom he so generously shared his prodigious knowledge and wisdom.

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Sheet Metal Welding Code

1. Scope, Purpose, and Applications

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.

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

1.3 Applications. 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 up to and including 6.4 mm [0.250 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.

Where negative pressure or positive pressure exceeds 30 kPa [5 psi] which is approximately 3 meters [120 in] of standing water or where structural requirements are concerned, other codes or standards shall be used.

1.4 Required Information. This code requires values to be specified by the Engineer for paragraphs 8.2, 8.3, 13.1, and 13.3.

1.5 Symbols. 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*.

1.6 Standard 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 of the other without combining in any way.

1.7 Safety and Health. Safety and health issues and 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* and applicable federal, state, and local regulations.

Additional information may be found in the *Safety and Health Fact Sheets*, a document of the AWS Safety and Health Committee.[1] The equipment manufacturer's operating manual and safety instructions should always be carefully studied and complied with when operating welding or related equipment. Material Safety Data Sheets (MSDSs) for materials used in these processes are available from the material supplier.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute 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.

ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*;[2] and

AWS documents:[3]

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

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

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[1] Safety and Health Fact Sheets are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.
[2] ANSI Z49.1 is published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.
[3] AWS standards are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.