

AWS D1.3/D1.3M:2025
An American National Standard



Structural Welding Code— Sheet Steel



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An American National Standard

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American National Standards Institute
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Structural Welding Code— Sheet Steel

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Prepared by the
American Welding Society (AWS) D1 Committee on Structural Welding

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This code covers the requirements associated with welding sheet steel having a minimum specified yield point no greater than 80 ksi [550 MPa]. The code requirements cover any welded joint made from the commonly used structural quality low-carbon hot rolled and cold rolled sheet and strip steel with or without zinc coating (galvanized). Clause 1 includes general provisions, Clause 4 design, Clause 5 prequalification, Clause 6 qualification, Clause 7 fabrication, and Clause 8 inspection.



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Dedication

The D1 Committee on Structural Welding dedicates this edition of AWS D1.3/D1.3M, *Structural Welding Code—Sheet Steel*, in honor of Philip “Phil” Torchio, III. The D1H Subcommittee is gratefully indebted to Phil’s tireless efforts, devotion, and enthusiasm in making this revision of D1.3 possible. The members of D1 and D1H are forever thankful for his devotion to improving the AWS D1 Codes.

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Foreword

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

When the first edition of AWS D1.3/D1.3M, *Specification for Welding Sheet Steel in Structures*, was developed and issued in 1978, it was anticipated that changes would be needed in the specification as further research was conducted on sheet steel welded joints. After users' experience with the specification and development of new sheet steel applications, it was revised in 1981, 1989, 1998, 2008, 2018, and now in 2025. Also, in the 1981 edition, the title of the standard was changed to AWS D1.3/D1.3M, *Structural Welding Code—Sheet Steel*, to conform with the uniform titles now being given to standards developed by the AWS D1 Committee on Structural Welding. The many changes in this document reflect both experience in using the code and the results of research, principally by the American Iron and Steel Institute's Subcommittee on Sheet Steel.

One of the primary objectives of this code is to define the allowable capacities used in sheet steel applications in which transfer of calculated load occurs. The foremost examples of such applications are steel decks, panels, storage racks, and stud and joist framing members. It is a concurrent objective of this code to impose workmanship, technique, and qualification requirements to effect consistently sound execution of welding of joints in these categories.

Certain shielded metal arc, gas metal arc, gas tungsten, gas metal arc, and flux cored arc welding procedure specifications (WPSs), when used with certain types of joints, have been tested by users and have a history of satisfactory performance. These WPSs are designated as prequalified, may be employed without further evidence, and include most of those that are commonly used. However, the purpose of defining prequalified WPSs is not to preclude the use of other WPSs that are qualified.

Although this code is essentially directed at those joints that are used to transfer loads, the quality of welds where strength is not a governing consideration should meet quality standards that will maintain the integrity of the supporting structure.

The following is a summary of the most significant technical revisions contained in D1.3/D1.3M:2025:

Summary of Changes	
Clause/Table/Figure/Annex	Modification
Clause 1	Added a new clause and commentary on restricting filler metals when used in the “as-welded” condition. Added new commentary when using filler metals with the Submerged Arc Welding process.
	Revised the Code to allow for welding through multiple sheets as an accepted practice in the installation of steel deck at corner laps where 4 thicknesses of sheet are welded to the structural support.
Clause 3	Added two new definitions, procedure qualification records and qualifier.
Clause 4	The strength provisions in Clause 4.3 were deleted and the user is now referred to AISI S100 which reflects the most current research on strength of welded joints in sheet steel. Revised Arc Spot Welds to permit multiple thicknesses instead of double thicknesses.
Clause 6	Clause 6 was completely revised to provide clarity and better organization of the Clause. Added a new clause to account for retests. Placed all Welding Performance Qualification Essential Variables in a new Table. A Figure in Tables 6.2 and 6.4 was updated to better depict the joint detail. Revised Figures to clarify code requirements.
Clause 7	A new clause was added, Base Metal Preheat and Interpass Requirements for Welding Sheet Steel to Structural Steel, to codify the base metal preheat and interpass temperature requirements for welding sheet steel to structural steel. In addition, the requirements for groove and fillet welding sheet steel to structural steel have been differentiated from spot, seam, and plug welds.
Annex A	The Annex A was revised with the clause numbers for this edition of D1.3/D1.3M and D1.1/D1.1M, <i>Structural Welding Code—Steel</i> .

Errata: All errata to a standard shall be published in the *Welding Journal* and posted on the AWS website.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS D1 Committee on Structural Welding, American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Structural Welding Code—Sheet Steel

1. General Requirements

1.1 Scope

This code contains the requirements for arc welding of structural sheet/strip steels, including cold formed members, hereafter collectively referred to as “sheet steel,” which are equal to or less than 3/16 in [5 mm] in nominal thickness. In addition, welding hollow structural sections (HSS), also called tubular members, with wall thickness less than 1/8 in [3 mm] are included in the scope of this code. Design requirements for HSS member connections are not in the scope of this code. When this code is stipulated in contract documents, conformance with all its provisions shall be required, except for those provisions that the Engineer or contract documents specifically modifies or exempts.

When used in conjunction with AWS D1.1/D1.1M, conformance with the applicable provisions of Annex A of AWS D1.3/D1.3M shall apply (see also Table 1.1). Two weld types unique to sheet steel, arc spot and arc seam, are included in this code.

1.1.1 Applicable Materials. This code is applicable to the welding of structural sheet steels to other structural sheet steels or to supporting structural steel members.

1.1.2 General Requirements. The fundamental premise of the code is to provide general requirements applicable to any situation. Acceptance criteria for production welds different from those specified in the code shall be permitted for a particular application, provided they are suitably documented by the proposer and approved by the Engineer. These alternate acceptance criteria shall be based upon evaluation of suitability for service using past experience, experimental evidence, or engineering analysis considering material type, service load effects, and environmental factors.

1.1.3 Approval. All references to the need for approval shall be interpreted to mean approval by the Engineer, defined as the duly designated person who acts for and on behalf of the owner on all matters within the scope of this code. Deviations from code requirements shall require the Engineer’s approval.

1.1.4 Coatings. Applications may be used without removal of coating or galvanizing, provided the application meets the requirements of Annex A

1.2 Units of Measurement

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

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