AWS D1.6/D1.6M:2017
An American National Standard

Structural Welding Code—Stainless Steel

American Welding Society®

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An American National Standard

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Structural Welding Code—
Stainless 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 for welding stainless steel structural assemblies.

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Foreword

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

This is the third edition of the AWS D1.6, *Structural Welding Code—Stainless Steel*; the first edition was published in 1999. This code is the product of a pool of experts arriving at a consensus position, in keeping with the American National Standard Institute's requirements.

This code covers the requirements for welding stainless steel components other than pressure vessels or pressure piping. For many years, fabrications involving structural stainless steel welding used AWS D1.1/D1.1M, *Structural Welding Code—Steel*, to provide the requirements for quality construction. However, as the AWS D1.1 document is written for the carbon and low-alloy steels commonly encountered in structural fabrication, it does not explicitly address the unique requirements of stainless steels. The AWS Structural Welding Committee thus recognized the industry need for an AWS D1.1 analogue designed for the welding of stainless steel wrought and cast shapes and plates.

Changes in Code Requirements. Underlined text in the clauses, subclauses, tables, figures, or forms indicates a change from the 2007 edition. A vertical line in the margin of a table or figure also indicates a change from the 2007 edition.

The following is a list of the most significant revisions in the 2017 edition:

Summary of Changes

Clause/Table/Figure/Annex	Modification
Clause 1	Restructured to identify a summary of the code clauses, new safety and health information, and code limitations.
Clause 2	This is a new clause listing normative references. It replaces subclause 1.9 and Annex G from the previous edition.
Clause 3	This is a new clause that provides terms and definitions specific to this standard. It replaces subclause 1.3 and Annex G from the previous edition.
Clause 4	Clause 4 was presented as Clause 2 in the previous edition. Reorganized and updated to better parallel AWS D1.1/D1.1M, *Structural Welding Code—Steel*, where appropriate, and now also references AISC/SCI *Design Guide 27: Structural Stainless Steel*.
Clauses 5 and 7	Clause 5 was presented as Clause 3 in the previous edition. Clause 7 was presented as Clause 5 in the previous edition. Both clauses had many misplaced subclauses and requirements (some fabrication requirements were in the prequalification clause and vice versa); content has been placed in the appropriate clause. Flare-V and flare-bevel-groove welded prequalified joint details have been included to address a need for these and some interpretations, and to parallel AWS D1.1/D1.1M, *Structural Welding Code—Steel*. These clauses are now restructured to follow the standard D1 code format and provide a more logical flow.
Clause 6	Clause 6 was presented as Clause 4 in the previous edition. This clause has been rewritten and now allows qualification directly to AWS B2.1/B2.1M, *Specification for Welding Procedure and Performance Qualification*, without approval from the Engineer, all while retaining D1.6 code qualification requirements if the Contractor decides to utlize these.
Clause 8	Clause 8 was presented as Clause 6 in the previous edition. Revisions include placing all visual Inspector and NDE personnel qualification requirements together for ease of use. Visual inspection acceptance criteria were removed from the text and placed in a new Table 8.1, similar to AWS D1.1/D1.1M, *Structural Welding Code—Steel*. Several errata items were incorporated and new commentary words were inserted that were taken directly from D1.1.

(Continued)

Summary of Changes (Continued)

Clause/Table/Figure/Annex	Modification
	Annex E from the previous edition was deleted as most of its content was moved to Clause 8. Some content from Annexes H and O of the previous edition was moved into Clause 8.
Clause 9	Clause 9 was presented as Clause 7 in the previous edition. Revised to identify numerous improvements already addressed by AWS D1.1/D1.1M, *Structural Welding Code—Steel* and AASHTO/AWS D1.5M/D1.5, *Bridge Welding Code*. The manufacturers' stud base qualification testing in Annex D from the previous edition was moved into Clause 9, similar to D1.1.
Annexes A and B	Revised to parallel AWS D1.1/D1.1M, *Structural Welding Code—Steel*, and to correct terms of fillet weld size to align with the correct usage in AWS A3.0M/A3.0, *Standard Terms and Definitions*, and A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*.
Annex E	This is a new annex listing informative references.

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, Doral, FL 33166.

Table of Contents

Page No.

List of Tables

List of Figures

List of Forms

List of Prequalified Partial Joint Penetration (PJP) Groove Weld Joint Details—Nontubular for Figure 5.3

List of Prequalified Complete Joint Penetration (CJP) Groove Weld Joint Details—Nontubular for Figure 5.4

List of Prequalified Complete Joint Penetration (CJP) Groove Weld Joint Details—Nontubular for Figure 5.4

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Structural Welding Code—Stainless Steel

1. General Requirements

1.1 Scope

This code contains welding requirements for the fabrication, assembly, and erection of welded structures and weldments subject to design stress where at least one of the materials being joined is stainless steel. The code is intended to be used for base metals with a minimum thickness of 1/16 in [1.5 mm] or 16 gage. It shall be used in conjunction with any complementary code or specification for the design or construction of stainless steel structures and weldments. When this code is stipulated in contract documents, conformance with all provisions of the code shall be required, except for those provisions that the Engineer (see 1.5.1) or contract documents specifically modify or exempt.

The following is a summary of the code clauses:

(1) **General Requirements.** This clause contains basic information on the scope and limitations of the code, key definitions, and the major responsibilities of the parties involved with stainless steel fabrication.

(2) **Normative References.** This clause contains a list of reference documents that assist the user in implementation of this code or are required for implementation.

(3) **Terms and Definitions.** This clause contains terms and definitions as they relate to this code.

(4) **Design of Welded Connections.** This clause contains requirements for the design of welded connections.

(5) **Prequalification.** This clause contains the requirements for exempting a Welding Procedure Specification (WPS) from qualification by testing.

(6) **Qualification.** This clause contains the requirements for qualification of WPSs and welding personnel (welders and welding operators) by testing, including the tests required and the ranges qualified.

(7) **Fabrication.** This clause contains welding requirements for fabrication, assembly, and erection of welded stainless steel structures governed by this code, including the requirements for base metals, welding consumables, welding technique, weld details, material preparation and assembly, workmanship, weld repair, and other requirements.

(8) **Inspection.** This clause contains the requirements for the Inspector's qualifications and responsibilities, acceptance criteria for discontinuities, and procedures for nondestructive testing (NDT).

(9) **Stud Welding.** This clause contains the requirements for welding of studs to structures where at least one of the materials being joined is stainless steel.

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.