

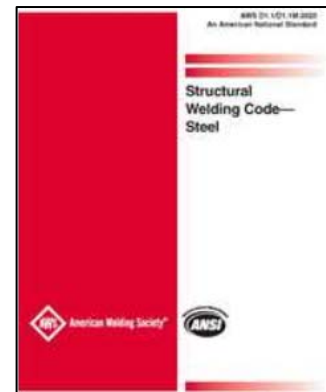
AWS D1.1-2020 – Updated Welding Code

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D1.1 from the American Welding Society (AWS) has been relied on for years as the Code for structural welding. AWS released D1.1-2020 this year superseding the previous 2015 edition.

History of the Code

Published in 1928, the first edition of the *Code for Fusion Welding and Gas Cutting in Building Construction* was called Code 1 Part A. The initial Code was revised in 1930 and 1937 and maintained the same title. The document was revised again in 1941 and given the designation D1.0. The D1.0 document was revised again in the years 1946, 1963, 1966, and 1969. The 1963 edition published an amended version in 1965, and the 1966 edition published an amended version in 1967. In 1972, the Code was combined with D2.0, *Specifications for Welding Highway and Railway Bridges*, designated D1.1, and retitled *AWS Structural Welding Code*. D1.1 was revised again in the years 1975, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010 (a 2nd printing of D1.1 2010 was published in 2011), and 2015. The 1st Spanish edition translation of the Code was published in 2010.



From 1972 to 1988, D1.1 covered welding applications for both buildings and bridges. In 1988, AWS published its 1st edition of *AASHTO/AWS D1.5, Bridge Welding Code*; coincident with this, the D1.1 Code changed references of buildings and bridges to statically loaded and dynamically loaded structures in order to make the document applicable to a broader range of structural applications. After the 2010 edition, the Society decided that the Code would be published on a five-year revision cycle instead of two-year. This decision was to align the publication cycle of the Code with the publication cycles of the AISC Steel Building Specification and the International Building Code.

Code Changes from 2015 to 2020

The 24th edition of the D1.1 Code was released earlier this year. A summary of the changes are as follows:

1. **Clause 2 Normative References** - This is a new Clause listing normative references which are documents referenced within the Code that are mandatory to the extent specified within the Code. This clause replaces subclause 1.9 and Annex S from the 2015 edition.
2. **Clause 3 Terms and Definitions** - This is a new Clause that provides terms and definitions specific to the Code. This Clause replaces subclause 1.3 and Annex J.

3. Clause 4 Design of Welded Connections - Clause 4 was presented as Clause 2 previously. Annex A figures in the previous edition were incorporated into Clause 4.

4. Clause 5 Prequalification of WPS - Clause 5 was presented as Clause 3 in the 2015 edition. The Clause has also been restructured to follow the normal progression of writing a prequalified WPS. Table 5.2 has been editorially renamed and reorganized to list WPS essential variables. Additional



requirements have been added when using shielding gases and a new Table 5.7 was added on shielding gases. New materials have been added to Tables 5.3 and 5.8.

5. Clause 6 Qualifications - Clause 6 was presented as Clause 4 previously. Revisions include the requirements for the qualification of WPS using waveform technology. All CVN testing requirements have been added to Table 6.7 contained in a single location. The WPS retest requirements have been clarified. The PJP groove weld clause has been reorganized to clarify the qualification of PJP groove welds using the joint details in Figure 5.2. Part D of the Clause has been reorganized to better align the testing procedures and qualification of CVNs with the order that they would be accomplished.

6. Clause 7 Fabrication - Clause 7 was presented as Clause 5 in 2015. Revisions were made to the weld restoration of base metal with mis-located holes.

7. Clause 8 Inspection - Clause 8 was presented as Clause 6 in 2015. Revisions were made to the qualification requirements for inspection personnel to ensure that all welding inspectors are qualified. The Engineer's responsibilities as it relates to inspection were also clarified. Digital radiography has been added to Radiographic Testing. The limitations for geometric un-sharpness have been added to the Code and the equation has been revised to match the equation in ASME *Boiler and Pressure Vessel Code*, Section V, Article 2. The methodology to determine ultrasound attenuation factor has been updated to reflect that UT instruments are now capable of reporting a fractional value for dB.

8. Clause 9 Stud Welding - Clause 9 was previously presented as Clause 7 in 2015. The Code was updated to require the manufacturer's permanent identification on headed studs and deformed anchor bars. Revisions were made to provide weld procedure requirements for fillet welding of studs.

9. Clause 10 Tubular Structures - Clause 10 was presented as Clause 9 in 2015. The calculations for static strength of welded tubular connections were removed in deference to AISC design provisions.

10. Clause 11 Strengthening and Repair of Existing Structures - Clause 11 was previously presented as Clause 8 in 2015.

Reference American Welding Society Structural Welding Code – Steel D1.1-2020