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Structural Welding Code— Stainless Steel



American Welding Society



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Structural Welding Code— Stainless Steel

Prepared by
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Abstract

This code covers the requirements for welding stainless steel structural assemblies.



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Structural Welding Code—Stainless Steel

1. General Provisions

1.1 Scope

This code covers welding requirements applicable to stainless steel weldments subject to design stress. It shall be used in conjunction with any complementary code or specification for the design or construction of stainless steel weldments.

1.2 Base Metal

The base metals to be welded under this code are stainless steel with the following limits:

- I) Carbon (C) equal to or less than 0.5%
- II) Chromium (Cr) equal to or greater than 10.5%
- III) Iron (Fe) exceeds any other single element.

Stainless steel base metals may include any of the following types:

- (1) Austenitic
- (2) Ferritic
- (3) Martensitic
- (4) Precipitation Hardening (austenitic, semi-austenitic and martensitic)
- (5) Duplex
- (6) Dissimilar (any combinations of the types above or with weldable carbon steels or low alloy steels).

The stainless steel types may be in any of the following forms:

- A. Cold rolled—sheet
- B. Hot rolled—sheet, plate
- C. Shapes
- D. Structural
- E. Tubular
- F. Clad materials & combinations
- G. Castings
- H. Forgings

Stainless steel types are generally listed by American Iron and Steel Institute (AISI) Numbers, Unified Numbering System (UNS), or by American Society of Testing and Materials (ASTM) Specifications for product form.

Newer proprietary steels may not be numbered and must be identified by chemical composition or other suitable means which clearly define the steel.

1.2.1 Specified Base Metal. The contract documents shall designate the specification and classification of base metal to be used. Normally, they will be selected in accordance with the specifications. When welding to this code is involved, the base metals, as defined in 1.2, should be used wherever possible. The designer shall specify application limits for temperature in the contract documents. The provisions of this code are not intended to apply to welding base metals thinner than 1/16 in. (2 mm) or 16 gage.

1.2.2 Base Metal Prequalification. Austenitic stainless steels whose filler metals normally produce a small amount of ferrite (see Table 3.2 for prequalified limits) shall be considered prequalified, provided they are welded with filler metals in accordance with Table 3.3 and the WPSs used conform to all the applicable requirements of this code. All other stainless steels or combinations, and WPSs which are not prequalified, shall be qualified in conformance to this code.

1.2.3 Use of Unlisted Base Metals. When a stainless steel other than one of those listed in Table 3.2 is proposed for welded construction under this code, WPSs shall be established by qualification in accordance with the requirements of section 4, except as allowed in 1.2.3.1. The fabricator shall have the responsibility for establishing the WPS by qualification.

1.2.3.1 Unlisted base metals which have the same chemical composition and strength as a listed steel may be welded with a prequalified or qualified WPS for the listed steel.

1.2.4 Weldability. The Engineer may prescribe additional weldability testing of the unlisted steel. The responsibility for determining weldability is assigned to