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An American National Standard



Specification for Underwater Welding



American Welding Society



Key Words— Underwater welding, dry spot welding, habitat welding, one atmosphere welding, wet welding, hyperbaric welding

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Specification for Underwater Welding

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Subcommittee on Underwater Welding

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Approved by
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Abstract

This specification covers the requirements for welding structures or components under the surface of water. It includes welding in both dry and wet environments. Sections 1 through 6 constitute the general requirements for underwater welding while sections 7 through 10 contain the special requirements applicable to four individual classes of weld:

Class A—Comparable to above-water welding

Class B—For less critical applications

Class C—Where load bearing is not a primary consideration

Class O—To meet the requirements of another designated code or specification



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Specification for Underwater Welding

1. General Provisions

1.1 Scope

This specification covers underwater welding in both dry and wet environments. Operations required at the surface related to and in support of underwater welding are within the scope of this document, but welding above the surface is not. All provisions of this document apply equally to new construction and to modification and repair of existing structures underwater.

1.2 References

It shall be the responsibility of the Customer to specify the appropriate editions of the standards referenced in this specification. The following documents are incorporated by reference:

ANSI/AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Testing*
 ANSI/AWS A3.0, *Standard Method for Standard Welding Terms and Definitions*
 ANSI/AWS B4.0, *Mechanical Testing of Welds*
 ANSI/AWS D1.1, *Structural Welding Code—Steel*
 API RP2X, *Recommended Practice for Ultrasonic and Magnetic Examination of Offshore Structural Fabrication and Guidelines for Qualification of Technicians*
 ASTM A 370, *Standard Methods and Definitions for Mechanical Testing of Steel Products*
 ASTM E 92, *Test Method for Vickers Hardness of Metallic Materials*
 ASTM E 164, *Standard Practice for Ultrasonic Contact Examination of Weldments*
 ASTM E 165, *Standard Test Method for Liquid Penetrant Examination*
 ASTM E 309, *Standard Practice for Eddy-Current Examination of Steel Tubular Products using Magnetic Saturation*
 ASTM E 340, *Standard Test Method for Macroetching Metals and Alloys*

ASTM E 426, *Standard Practice for Electromagnetic (Eddy-Current) Examination of Seamless and Welded Tubular Products Austenitic Stainless Steel and Similar Alloys*

ASTM E 709, *Guide for Magnetic Particle Examination*

ASTM E 1219, *Standard Test Method for Fluorescent Liquid Penetrant Examination Using the Solvent-Removable Process*

ASTM E 1220, *Standard Test Method for Visible Liquid Penetrant Examination Using the Solvent-Removable Process*

ASTM E 1416, *Standard Test Method for Radioscopic Examination of Weldments*

ASTM E 1444, *Standard Practice for Magnetic Particle Examination*

ISO 148, *Steel—Charpy Impact Test (V-Notch)*

ISO 3452, *Non-destructive Testing—Penetrant Inspection—General Principles*

ISO 4136, *Fusion Welded Butt Joints in Steel—Transverse Tensile Test*

ISO 4969, *Steel—Macroscopic Examination by Etching with Strong Mineral Acids*

ISO 6892, *Metallic Materials—Tensile Testing at Ambient Temperature*

ISO 6947, *Welds—Working Positions—Definitions of Angles of Slope and Rotation*

ISO 9304, *Seamless and Welded (Except Submerged Arc Welded) Steel Tubes for Pressure Purposes—Eddy Current Testing for the Detection of Imperfections*

ISO/DIS 9015.2, *Welding—Welded Joints in Metallic Materials—Hardness Testing*

ISO/DIS 9016.2, *Welding—Welded Joints in Metallic Materials—Specimen Location and Notch Orientation for Impact Tests*

QW-470, *Etching Processes and Reagents (ASME B&PV Code Section IX)*

SNT-TC-1A, *American Society for Nondestructive Testing, Recommended Practice*