

AWS A5.20/A5.20M:2005
An American National Standard



Specification for Carbon Steel Electrodes for Flux Cored Arc Welding



American Welding Society



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Specification for Carbon Steel Electrodes for Flux Cored Arc Welding

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Prepared by
AWS A5 Committee on Filler Metals and Allied Materials

Under the Direction of
AWS Technical Activities Committee

Approved by
AWS Board of Directors

Abstract

This specification prescribes the requirements for classification of carbon steel electrodes for flux cored arc welding. The requirements include chemical composition and mechanical properties of the weld metal and certain usability characteristics. The AWS A5.20/A5.20M specification also includes optional, supplemental designators for improved toughness and diffusible hydrogen and to indicate conformance to special mechanical property requirements when the weld metal is deposited using both low heat input, fast cooling rate and high heat input, slow cooling rate procedures. Additional requirements are included for standard sizes, marking, manufacturing and packaging. A guide is appended to the specification as a source of information concerning the classification system employed and the intended use of carbon steel flux cored electrodes.

This specification makes use of both U.S. Customary Units and the International System of Units (SI). Since these are not equivalent, each system must be used independently of the other.



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Specification for Carbon Steel Electrodes for Flux Cored Arc Welding

1. Scope

1.1 This specification prescribes requirements for the classification of carbon steel electrodes for flux cored arc welding (FCAW) either with or without shielding gas. (Metal cored carbon steel electrodes are classified according to AWS A5.18/A5.18M.)¹

1.2 Safety and health issues and concerns are beyond the scope of this standard and, therefore, are not fully addressed herein. Some safety and health information can be found in the nonmandatory Annex Sections A5 and A9. Safety and health information is available from other sources, including, but not limited to, ANSI Z49.1² and applicable federal and state regulations.

1.3 This specification makes use of both U.S. Customary Units and the International System of Units (SI). The measurements are not exact equivalents; therefore, each system must be used independently of the other without combining in any way when referring to weld metal properties. The specification with the designation A5.20 uses U.S. Customary Units. The specification A5.20M uses SI Units. The latter are shown within brackets [] or in appropriate columns in tables and figures. Standard dimensions based on either system may be used for the sizing of electrodes or packaging or both under the A5.20 and A5.20M specifications.

1. AWS standards can be obtained from Global Engineering Documents, an Information Handling Services (IHS) Group Company, 15 Inverness Way East, Englewood, CO 80112-5776; telephone (800) 854-7179, (303) 397-7956; fax (303) 397-2740; internet: www.global.ihs.com.

2. ANSI standards can be obtained from the American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036, and Global Engineering Documents, an Information Handling Services (IHS) Group Company, 15 Inverness Way East, Englewood, CO 80112-5776; telephone (800) 854-7179, (303) 397-7956; fax (303) 397-2740; internet: www.global.ihs.com.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this AWS standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreement based on this AWS standard are encouraged to investigate the possibility of applying the most recent editions of the documents shown below. For undated references, the latest edition of the standard referred to applies.

2.1 The following AWS standards are referenced in the mandatory sections of this document:

(1) AWS A4.3, *Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding*.

(2) AWS A5.01, *Filler Metal Procurement Guidelines*.

(3) AWS A5.32/A5.32M, *Specification for Welding Shielding Gases*.

(4) AWS B4.0 or B4.0M, *Standard Methods for Mechanical Testing of Welds*.

2.2 The following ANSI standard is referenced in the mandatory sections of this document:

(1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*.

2.3 The following ASTM standards³ are referenced in the mandatory sections of this document:

(1) ASTM A 36/A 36M, *Specification for Carbon Structural Steel*.

(2) ASTM A 285/A 285M, *Specification for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength*.

(3) ASTM A 515/A 515M, *Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service*.

3. ASTM standards can be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.