



Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding



American Welding Society®



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Specification for **Low-Alloy Steel Electrodes for** **Shielded Metal Arc Welding**

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Prepared by the
American Welding Society (AWS) A5 Committee on Filler Metals and Allied Materials

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification prescribes the requirements for classification of low-alloy steel covered electrodes used for shielded metal arc welding. The requirements include chemical composition and mechanical properties of weld metal, weld metal soundness, usability tests of electrodes, and moisture tests of the low-hydrogen electrode covering. Requirements for standard sizes and lengths, marking, manufacturing, and packaging are also included.

Optional supplemental requirements include tests for absorbed moisture in the electrode covering and for diffusible hydrogen in the weld metal.

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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Foreword

This foreword is not part of AWS A5.5 /A5.5M: 2014, *Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding*, but is included for informational purposes only.

This document is the second revision of the A5.5/A5.5M specification which 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 values in any way. In selecting rational metric units, AWS A1.1, *Metric Practice Guide for the Welding Industry*, and International Standard ISO 544, *Welding consumables — Technical delivery conditions for welding filler materials — Type of product, dimensions, tolerances and markings* are used where suitable. Tables and figures make use of both U.S. Customary and SI Units, which, with the application of the specified tolerances, provides for interchangeability of products in both U.S. Customary and SI Units.

This edition includes new filler metal classifications E8015-B2 (reinstated), E9018-B6, E90XX-B23, E90XX-B24, E90XX-B92; E9018-NM2; revised “Rounding Procedure;” references to AWS A5.02/A5.02M:2007 for covered electrode standard sizes, packaging, and physical attributes; the change of E90XX-B9 classifications to E90XX-B91; and changes in procedures for requests for filler metal classifications. Such significant changes are shown in italic font.

Document Development of A5.5/A5.5M

ASTM A316–48T AWS A5.5–48T	<i>Tentative Specifications for Low-Alloy Steel Arc-Welding Electrodes</i>
ASTM A316–54T AWS A5.5–54T	<i>Tentative Specifications for High Tensile and Low-Alloy Steel Covered Arc-Welding Electrodes</i>
AWS A5.5–58T ASTM A316–58T	<i>Tentative Specification for Low-Alloy Steel Covered Arc-Welding Electrodes</i>
AWS A5.5–64T ASTM A316–64T	<i>Tentative Specification for Low-Alloy Steel Covered Arc-Welding Electrodes</i>
AWS A5.5–69 ANSI W3.5–1973	<i>Specification for Low-Alloy Steel Covered Arc-Welding Electrodes</i>
AWS A5.5–69 Add. 1–77	<i>1977 Addenda to Specification for Low-Alloy Steel Covered Arc-Welding Electrodes</i>
ANSI/AWS A5.5–81	<i>Specification for Low-Alloy Steel Covered Arc-Welding Electrodes</i>
ANSI/AWS A5.5–96	<i>Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding</i>
AWS A5.5/A5.5M:2006	<i>Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding</i>

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, A5 Committee on Filler Metals and Allied Materials, American Welding Society, 8669 NW 36th St, # 130, Miami, FL 33166.

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Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding

1. Scope

1.1 This specification prescribes requirements for the classification of low-alloy steel electrodes for shielded metal arc welding of carbon and low-alloy steels. These electrodes include steel alloys in which no single alloying element exceeds 10.5%.

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 nonmandatory annex Clauses A5 and A10. Safety and health information is available from other sources, including, but not limited to, ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, 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 material properties. The specification designated A5.5 uses U.S. Customary Units; and the specification designated A5.5M uses SI Units. The latter units are shown within brackets [] or in appropriate columns in tables and figures. Standard dimensions based on either system may be used for sizing of filler metal or packaging or both under A5.5 or A5.5M specification.

2. Normative References

2.1 The following standards contain provisions that, 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 edition of the documents shown below. For undated references, the latest edition of the standard referred to applies.

2.2 AWS standards¹:

- (1) AWS A3.0M/A3.0, *Standard Welding Terms and Definitions*
- (2) AWS A4.3, *Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding*
- (3) AWS A4.4M, *Standard Procedure for Determination of Moisture Content of Welding Fluxes and Welding Electrode Flux Coverings*
- (4) AWS A5.01M/A5.01 (ISO 14344 MOD), *Welding Consumables — Procurement of Filler Metals and Fluxes*

¹ AWS standards are published by the American Welding Society, 8669 NW 36th St, # 130, Miami, FL 33166.