AWS A5.10/A5.10M:2021
An American National Standard

Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods

American Welding Society®

Approved American National Standard
ANSI

AWS A5.10/A5.10M:2021
(ISO 18273:2015 MOD)
An American National Standard

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Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods

12th Edition

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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 requirements for the classification of bare wrought, and cast aluminum-alloy electrodes and rods for use with the gas metal arc, gas tungsten arc, oxyfuel gas, and plasma arc welding processes.

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 this standard but is included for informational purposes only.

This is the third edition of this specification with modified adoption of ISO 18273, *Welding Consumables – Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum-Alloys – Classification.* Classification in accordance with this document requires prescribed weld testing which is not a requirement of ISO 18273. Therefore, classification to ISO 18273, without additional testing specified herein, does not provide classification to this document. Annex C provides more information on the differences in the two documents.

This document 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. For selecting rational metric units, AWS A1.1, *Metric Practice Guide for the Welding Industry,* is used where suitable. Tables and figures make use of both U.S. Customary and SI units, which, with the application of the specified tolerances, provide for interchangeability of products in both U.S. Customary and SI Units.

The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details may be obtained from the standards developer.

Substantive changes included in this revision include the addition of weld metal strength requirements, the addition of a "G" classification option and rules for the use of computed and digital radiography. These substantive changes are shown in *italic font* where possible.

This specification developed as follows:

ASTM B285-54T AWS A5.10-54T	*Tentative Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*
ASTM B285-57T AWS A5.10-57T	*Tentative Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*
AWS A5.10-61T ASTM B285-61T	*Tentative Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*
AWS A5.10-69 ANSI W5.10-1973	*Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*
ANSI/AWS A5.10-80	*Specification for Aluminum and Aluminum-Alloy Bare Electrodes and Rods*
ANSI/AWS A5.10-88	*Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods*
ANSI/AWS A5.10-92	*Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods*
AWS A5.10/A5.10M:1999	*Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods*
AWS A5.10/A5.10M: 1999 (R2007)	*Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods*
AWS A5.10/A5.10M:2012 (ISO 18273:2004 MOD)	*Welding Consumables—Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum-Alloys – Classification*

AWS A5.10/A5.10M:2017 (ISO 18273:2004 MOD)	*Welding Consumables—Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum-Alloys – Classification*

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

All errata to a standard shall be published in the Welding Journal and posted on the AWS website.

Table of Contents

Page No.

List of Tables

List of Figures

Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods

1. Scope

1.1 This standard specifies requirements for classification of solid electrodes and rods for fusion welding of aluminum and aluminum alloys. The classification of the solid electrodes and rods is based on their chemical composition, operability testing and mechanical testing, when required.

1.2 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 A5.10 uses U.S. Customary Units. The specification with the designation A5.10M 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 specification A5.10 or A5.10M.

1.3 Safety and health issues and concerns are beyond the scope of this standard; some safety and health information is provided, but such issues are not fully addressed herein. Some safety and health information can be found in Annex A Clauses A5 and A11.

Safety and health information is available from the following sources:

American Welding Society:

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

(2) AWS Safety and Health Fact Sheets

(3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

(1) Safety Data Sheets supplied by materials manufacturers

(2) Operating Manuals supplied by equipment manufacturers

Applicable Regulatory Agencies

Work performed in accordance with this standard may involve the use of materials that have been deemed hazardous and may involve operations or equipment that may cause injury or death. This standard does not purport to address all safety and health risks that may be encountered. The user of this standard should establish an appropriate safety program to address such risks as well as to meet applicable regulatory requirements. ANSI Z49.1 should be considered when developing the safety program.

2. Normative References

The documents listed below are referenced within this publication and are mandatory to the extent specified herein. For undated references, the latest edition of the referenced standard shall apply. For dated references, subsequent amendments or revisions of the publications may not apply since the relevant requirements may have changed.