

**AWS A5.10/A5.10M:2017  
(ISO 18273:2004 MOD)  
An American National Standard**

**Welding  
Consumables—Wire  
Electrodes, Wires and  
Rods for Welding of  
Aluminum and  
Aluminum Alloys—  
Classification**



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(ISO 18273:2004 MOD)  
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**Approved by the  
American National Standards Institute  
November 22, 2016**

# **Welding Consumables—Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum Alloys—Classification**

**11th Edition**

**Supersedes AWS A5.10/A5.10M:2012 (ISO 18273:2004 MOD)**

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 second edition of this specification with modified adoption of ISO 18273:2004, *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 18273:2004. Therefore, classification in accordance with ISO 18273:2004 does not provide classification in accordance with this document unless this weld testing is successfully conducted.

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.

*ISO uses comma (,) for decimal, but AWS uses period (.) for decimal. Decimal commas have been changed to decimal periods.*

*Classifications ER4943 and R4943 are subject to a pending patent application.*

*NOTE: 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.*

*Changes in this edition include the following:*

*Added Clause A10, "Mechanical Properties of Weld Metal"*

*Added Table A.2—Typical Historical Properties of Aluminum Filler Metals (as-welded condition)*

*Added Table A.3—Weld Metal Test Results (All weld-metal—as welded)—developed by the methodology of Clause A10 herein*

*Added Table A.4—Weld Metal Test Results (All weld-metal—PWHT)—developed by the methodology of Clause A10 herein*

*Added Figure A.1, "Preparation of Test Piece"*

This specification developed as follows:

ASTM B285-54T      *Tentative Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*  
AWS A5.10-54T

ASTM B285-57T      *Tentative Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*  
AWS A5.10-57T

AWS A5.10-61T      *Tentative Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*  
ASTM B285-61T

AWS A5.10-69      *Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes*  
ANSI W5.10-1973

ANSI/AWS A5.10-80	<i>Specification for Aluminum and Aluminum-Alloy Bare Electrodes and Rods</i>
ANSI/AWS A5.10-88	<i>Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods</i>
ANSI/AWS A5.10-92	<i>Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods</i>
AWS A5.10/A5.10M:1999	<i>Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods</i>
AWS A5.10/A5.10M:1999 (R2007)	<i>Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods</i>
AWS A5.10/A5.10M:2012 (ISO 18273:2004 MOD)	<i>Welding Consumables—Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum-Alloys—Classification</i>

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 36 St, # 130, Miami, FL 33166.

# Table of Contents

	<b>Page No.</b>
<i>Personnel</i> .....	v
<i>Foreword</i> .....	vii
<i>List of Tables</i> .....	x
<i>List of Figures</i> .....	x
<b>1. Scope</b> .....	1
<b>2. Normative References</b> .....	1
<b>3. Classifications</b> .....	2
<b>4. Acceptance</b> .....	2
<b>5. Certification</b> .....	2
<b>6. Rounding Procedure</b> .....	2
<b>7. Summary of Tests</b> .....	6
<b>8. Retest</b> .....	6
<b>9. Weld Test Assemblies</b> .....	6
<b>10. Chemical Analysis</b> .....	10
<b>11. Radiographic Test</b> .....	10
<b>12. Bead-on-Plate Test</b> .....	12
<b>13. Method of Manufacture</b> .....	12
<b>14. Standard Sizes</b> .....	12
<b>15. Finish and Uniformity</b> .....	15
<b>16. Standard Package Forms</b> .....	15
<b>17. Winding Requirements</b> .....	15
<b>18. Filler Metal Identification</b> .....	15
<b>19. Packaging</b> .....	15
<b>20. Marking of Packages</b> .....	16
<b>21. Symbols and Requirements</b> .....	16
<b>22. Mechanical Properties of the Weld Metal</b> .....	16
Annex A (Informative)—Guide to Welding Consumables—Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum Alloy—Classification .....	17
Annex B (Informative)—Guidelines for Preparation of Technical Inquiries .....	31
Annex C (Informative)—List of Deviations from ISO 18273:2004 .....	33
AWS Filler Metal Specifications by Material and Welding Process .....	35
AWS Filler Metal Specifications and Related Documents .....	37

## List of Tables

<b>Table</b>	<b>Page No.</b>
1 Symbols and Chemical Composition Requirements of Solid Wires and Rods.....	3
2 Required Tests .....	7
3 Base Metal for Test Assemblies. ....	10
4 Standard Sizes .....	14
5 Typical Sizes of Flattened Rods .....	15
6 Standard Packages, Dimensions, and Weights .....	16
A.1 Guide to the Choice of Filler Metal for General Purpose Welding.....	23
A.2 Typical Historical Properties of Aluminum Filler Metals (as-welded condition).....	27
A.3 Weld Metal Test Results (All weld-metal—as welded)—developed by the methodology of Clause A10 herein .....	27
A.4 Weld Metal Test Results (All weld-metal—PWHT)—developed by the methodology of Clause A10 herein .....	27
A.5 Discontinued Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods.....	28

## List of Figures

<b>Figure</b>	<b>Page No.</b>
1 Groove Weld Test Assembly for Radiographic Test .....	9
2A Radiographic Acceptance Standards for 3/16 in [5 mm] and 1/4 in [6 mm] Thick Test Assemblies— Overhead Welding Position.....	11
2B Radiographic Acceptance Standards for 3/8 in [10 mm] Thick Test Assemblies—Overhead Welding Position.....	12
3 Radiographic Acceptance Standard for Test Assemblies—Flat Welding Position .....	13
A.1 <i>Preparation of Test Piece</i> .....	26

# Welding Consumables—Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum Alloys—Classification

## 1. Scope

**1.1** This standard specifies requirements for classification of solid wires and rods for fusion welding of aluminum and aluminum alloys. The classification of the solid wires and rods is based on their chemical composition.

**1.2** Safety and health issues and concerns are beyond the scope of this standard and are therefore not fully addressed herein. Some safety and health information can be found in the nonmandatory Annex A Clauses A6 and A13. 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 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.

## 2. Normative References

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

**2.1** The following AWS standards<sup>1</sup> are referenced in the mandatory clauses of this document:

AWS A1.1, *Metric Practice Guide for the Welding Industry*

AWS A3.0M/A3.0, *Standard Welding Terms and Definitions, Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*

AWS A5.01M/A5.01 (ISO 14344 MOD), *Welding Consumables—Procurement of Filler Metals and Fluxes*

AWS A5.02/A5.02M:2007, *Specification for Filler Metal Standard Sizes, Packaging, and Physical Attributes*

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

AWS F3.2M/F3.2, *Ventilation Guide for Weld Fume*

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

ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*<sup>2</sup>

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

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