

**AWS A5.9/A5.9M:2022
(ISO 14343:2017 MOD)
An American National Standard**

Specification for Bare Stainless Steel Welding Electrodes and Rods



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(ISO 14343:2017 MOD)
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**Approved by the
American National Standards Institute
September 8, 2022**

Specification for Bare Stainless Steel Welding Electrodes and Rods

10th Edition

Revises AWS A5.9/A5.9M:2017

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 bare stainless steel electrodes (both as wire and strip) for gas metal arc welding, submerged arc welding, and other fusion welding processes. It also includes wire and rods for use in gas tungsten arc welding and plasma arc welding. Classification is based on chemical composition of the filler metal. A guide is appended to the specification as a source of information concerning the classification system employed and the intended use of the stainless steel filler 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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This standard is subject to revision at any time by the AWS A5 Committee on Filler Metals and Allied Materials. It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn. Comments (recommendations, additions, or deletions) and any pertinent data that may be of use in improving this standard are requested and should be addressed to AWS Headquarters. Such comments will receive careful consideration by the AWS A5 Committee on Filler Metals and Allied Materials and the author of the comments will be informed of the Committee's response to the comments. Guests are invited to attend all meetings of the AWS A5 Committee on Filler Metals and Allied Materials to express their comments verbally. Procedures for appeal of an adverse decision concerning all such comments are provided in the Rules of Operation of the Technical Activities Committee. A copy of these Rules can be obtained from the American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Foreword

This foreword is not part of this standard but is included for informational purposes only.

The first specification for bare stainless steel electrodes and rods was prepared in 1953 by a joint committee of the American Society for Testing and Materials and the American Welding Society. The joint committee also prepared the 1962 revision. The first revision prepared exclusively by the AWS A5 Committee on Filler Metal and Allied Materials was published in 1969. This is the second revision with modified adoption of ISO 14343.

Document Development

The current document is the tenth revision of the original 1953 document. The document evolution took place as follows:

ASTM A371-53T AWS A5.9-53T	<i>Tentative Specifications for Corrosion Resisting Chromium and Chromium-Nickel Steel Welding Rods and Bare Electrodes</i>
ASTM A371-62T AWS A5.9-62T	<i>Tentative Specifications for Corrosion Resisting Chromium and Chromium-Nickel Steel Welding Rods and Bare Electrodes</i>
AWS A5.9-69 ANSI W3.9-1973	<i>Specification for Corrosion-Resisting Chromium and Chromium-Nickel Steel Welding Rods and Bare Electrodes</i>
AWS A5.9-Add 1-75	<i>Addenda to Specification for Corrosion-Resisting Chromium and Chromium-Nickel Steel Welding Rods and Bare Electrodes</i>
AWS A5.9-77	<i>Specification for Corrosion Resisting Chromium and Chromium-Nickel Steel Bare and Composite Metal Cored and Stranded Arc Welding Electrodes and Welding Rods</i>
AWS A5.9-81	<i>Specification for Corrosion Resisting Chromium and Chromium-Nickel Steel Bare and Composite Metal Cored and Stranded Welding Electrodes and Welding Rods</i>
AWS A5.9-93	<i>Specification for Bare Stainless Steel Welding Electrodes and Rods</i>
AWS A5.9/A5.9M:2006	<i>Specification for Bare Stainless Steel Welding Electrodes and Rods</i>
AWS A5.9/A5.9M:2012	<i>Specification for Bare Stainless Steel Welding Electrodes and Rods</i>
AWS A5.9/A5.9M:2017 (ISO 14343:2009 MOD)	<i>Welding Consumables—Wire Electrodes, Strip Electrodes, Wires and Rods for Arc Welding of Stainless and Heat Resisting Steels—Classification</i>

Substantive changes in this edition consist of omitting some classifications which were included from ISO 14343 and “Z” classification, out of concern that they were not properly vetted according to the rules of the AWS A5 Committee such as reviewing test data from two heats/lots. Those classifications are listed in Table A.3.

Please note that ISO uses commas (,) and AWS uses periods (.) for decimals. The ISO decimal commas have been replaced by periods in this document for consistency.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO or AWS shall not be held responsible for identifying any or all such patent rights.

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.

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

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Introduction

It is recognized that there are two somewhat different approaches in the global market to classifying a given stainless steel welding consumable, and that either or both can be used to suit a particular market need. One is the *nominal composition* approach, which uses designators to indicate the principal alloying elements at their nominal levels, in a particular sequence, and which is sometimes followed by chemical element symbols to indicate compositional modifications to the original grade. The other is the *alloy type* approach, which uses tradition-based three- or four-digit designations for certain original grades, sometimes followed by one or more chemical element symbols indicating compositional modifications of the original. In both approaches, classification is based upon the chemical composition of the product. In many cases, a given product can be classified using both approaches, because the composition ranges, although slightly different, overlap to a considerable extent between the two.

Designation by either type of classification, or both where suitable, identifies a product as being classified according to this AWS standard. Many, but not all, commercial products addressed by this AWS standard can be classified using both approaches, and suitable products can be so marked.

For stainless steel welding consumables, there is no unique relationship between the product form (wire electrode, strip electrode, wire, or rod) and the welding process used (gas-shielded metal arc welding, gas tungsten arc welding, plasma arc welding, submerged arc welding, electroslag welding, and laser beam welding). For this reason, the wire electrodes, strip electrodes, wires, or rods can be classified on the basis of any of the above product forms and can be used, as appropriate, for more than one of the above processes.

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Specification for Bare Stainless Steel Welding Electrodes and Rods

1. Scope

1.1 This specification prescribes requirements for the classification of bare stainless steel wire electrodes (including stranded wire in which all wires in the strand are from one heat), strip electrodes, wires, and rods for gas metal arc welding, gas tungsten arc welding, plasma arc welding, submerged arc welding, electroslag welding, and laser beam welding of stainless and heat resisting steels. The classification of the wire electrodes, strip electrodes, wires, and rods is based upon their chemical composition. The chromium content of these filler metals is not less than 10.5% and the iron content exceeds that of any other element. For purposes of classification, the iron content shall be derived as the balance element when all other elements are considered to be at their minimum specified values.

1.2 This standard 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. The specification with the designation A5.9 uses U.S. Customary Units. The specification A5.9M 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 sizing of electrodes, rods, and strips or packaging or both under A5.9 or A5.9M specifications. This specification's Annex A makes use of both U.S. Customary Units and the International System of Units (SI). The measurements are not exact equivalents. The specification designated A5.9 uses U.S. customary units in its Annex A and the specification designated A5.9M uses SI units in its Annex A. The latter units are shown within brackets [] or in appropriate columns in tables and figures.

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 Clauses A6 and A12.

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.