Welding Consumables—Wire Electrodes, Strip Electrodes, Wires, and Rods for Arc Welding of Stainless and Heat Resisting Steels—Classification
Abstract

This specification prescribes the requirements for classification of bare solid 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 does not include any units other than weight percent. The specification’s Annex A 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 It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn.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 Society, 8669 NW 36 St, # 130, Miami, FL 33166.

AWS A5.9/A5.9M:2017 (ISO 14343:2009 MOD)
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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 first revision with modified adoption of ISO 14343.

Document Development

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

<table>
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<td>Tentative Specifications for Corrosion Resisting Chromium and Chromium-Nickel Steel Welding Rods and Bare Electrodes</td>
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| AWS A5.9-53T | Chrome-

This is the first revision of AWS A5.9/A5.9M that includes classifications from ISO 14343. Numerous classifications used in Europe or in countries around the Pacific Rim are added by this adoption of the ISO standard. 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.
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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. Classification according to system A, by nominal composition, is based mainly on the European standard EN 12072 Welding consumables—Wire electrodes, wires, and rods for arc welding of stainless and heat-resisting steels—Classification, while that of system B, by alloy type, is mainly based upon standards used around the Pacific Rim including AWS A5.9/A5.9M:2012 Specification for Bare Stainless Steel Welding Electrodes and Rods.

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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Welding Consumables—Wire Electrodes, Strip Electrodes, Wires, and Rods for Arc Welding of Stainless and Heat Resisting Steels—Classification

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 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 Informative Annex Clauses A6 and A12. 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’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.

2. Normative References

2.1 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.

2.2 The following AWS standards\(^1\) are referenced in the normative sections of this document.

1. AWS A3.0M/A3.0, Standard Welding Terms and Definitions
2. AWS A5.01M/A5.01 (ISO 14344 MOD), Welding Consumables—Procurement of Filler Metals and Fluxes
3. AWS A5.02/A5.02M, Specification for Filler Metal Standard Sizes, Packaging, and Physical Attributes
4. AWS F3.2, Ventilation Guide for Welding Fume

2.3 The following ANSI standard\(^2\) is referenced in the normative sections of this document.

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

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

\(^2\) ANSI Z49.1 is published by the American Welding Society, 8669 NW 36 St # 130, Miami, FL 33166.