

**AWS A5.14/A5.14M:2018**  
**An American National Standard**

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# **Specification for Nickel and Nickel- Alloy Bare Welding Electrodes and Rods**



**AWS A5.14/A5.14M:2018**  
**An American National Standard**

**Approved by the**  
**American National Standards Institute**  
**October 30, 2017**

**Specification for**  
**Nickel and Nickel-Alloy**  
**Bare Welding Electrodes and Rods**

**11th Edition**

**Supersedes AWS A5.14/A5.14M:2011**

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**

The chemical compositions of 57 nickel and nickel-alloy welding electrodes and rods are specified, including six compositions not previously classified. Major topics include general requirements, testing, packaging, and application guidelines.

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 document is the fifth of the A5.14 specifications, 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 the AWS A1.1, *Metric Practice Guide for the Welding Industry*, and International Standard ISO 544, *Welding Consumables — Technical Delivery Conditions for Filler Materials and Fluxes—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 document also relates its classifications to ISO 18274, *Welding Consumables — Solid Wire Electrodes, Solid Strip Electrodes, Solid Wires and Solid Rods for Fusion Welding of Nickel and Nickel Alloys — Classification*.

The first specification for bare nickel and nickel-alloy welding electrodes and rods was prepared by a joint committee of the American Society for Testing and Materials and the American Welding Society and was issued in 1956. Eight years later, the first revision was prepared by the joint committee. This is the eighth revision prepared exclusively by the AWS A5 Committee on Filler Metals and Allied Materials.

*Substantive changes are shown in Italic font in the body of this specification which includes new classifications ERNiCrCo-1, ERNiCrFe-15, ERNiFeCr-3, ERNiMoCr-1, ERNiCrCoMo-2, and ERNiCrMoWNb-1. Detailed packaging information has been replaced with the reference of AWS A5.02/A5.02M:2007. Chemical composition of ERNiCrMo-19 has been modified slightly.*

*The requester of the chemical composition change in ERNiCrMo-19 classification stated that this alloy is not patented in USA, but patented for VDM Metals in Germany (patent DE 59801333), France (patent FR 991788), and the UK (GB 991788). All of these were generated out of the European patent EP991788 and will expire on May 27, 2018.*

*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 or of any patent rights in connection therewith. If the patent holder has filed a statement of willingness to grant a license under these rights on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain such a license, then details may be obtained from the standard developer.*

### Document Development

ASTM B304-56T AWS A5.14-56T	<i>Tentative Specification for Nickel and Nickel-Base Alloy Bare Welding Filler Metals</i>
AWS A5.14-64T ASTM B304-64T	<i>Tentative Specification for Nickel and Nickel Alloy Bare Welding Rods and Electrodes</i>
AWS A5.14-69T ANSI W3.14-1973	<i>Specification for Nickel and Nickel-Alloy Bare Welding Rods and Electrodes</i>
ANSI/AWS A5.14-76	<i>Specification for Nickel and Nickel Alloy Bare Welding Rods and Electrodes</i>
ANSI/AWS A5.14-83	<i>Specification for Nickel and Nickel Alloy Bare Welding Rods and Electrodes</i>
ANSI/AWS A5.14-89	<i>Specification for Nickel and Nickel Alloy Bare Welding Electrodes and Rods</i>

**Document Development (Continued)**

ANSI/AWS A5.14/A5.14M-97	<i>Specification for Nickel and Nickel-Alloy Bare Welding Electrodes and Rods</i>
AWS A5.14/A5.14M:2005	<i>Specification for Nickel and Nickel-Alloy Bare Welding Electrodes and Rods</i>
AWS A5.14/A5.14M:2009	<i>Specification for Nickel and Nickel-Alloy Bare Welding Electrodes and Rods</i>
AWS A5.14/A5.14M:2011	<i>Specification for Nickel and Nickel-Alloy Bare Welding Electrodes and Rods</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.

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# Specification for Nickel and Nickel-Alloy Bare Welding Electrodes and Rods

## 1. Scope

**1.1** This specification prescribes requirements for the classification of bare nickel and nickel-alloy welding electrodes, strip electrodes, and welding rods. It includes those compositions where the nickel content exceeds that of any other element.

**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 material properties. The specification with the designation A5.14 uses U.S. Customary Units. The specification A5.14M 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 filler metal or packaging or both under A5.14 or A5.14M specifications.

**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 A5 and A10.

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 AWS website

Material or Equipment Manufacturers:

- (1) Safety Data Sheets supplied by materials manufacturers
- (2) Operating Manuals supplied by equipment manufacturers
- (3) Applicable federal and state regulations

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 to, or revisions of, any of these publications do not apply.

**2.1** The following AWS standards are referenced in the mandatory sections of this document:

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