

AWS A5.15:1990 (S2023)
An American National Standard

Specification for Welding Electrodes and Rods for Cast Iron



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Approved by the
American National Standards Institute
March 14, 1990
Stabilized Maintenance: August 3, 2023

Specification for Welding Electrodes and Rods for Cast Iron

5th Edition

Revises ANSI/AWS A5.15-82

Prepared by the
American Welding Society (AWS) A5 Committee on Filler Metal and Allied Materials

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

The chemical composition requirements for electrodes and rods for welding cast iron are specified. Copper-base rods used for braze welding of cast iron are not included. Major topics include general requirements, testing, packaging, and application guidelines.



ISBN Print: 978-1-64322-283-7

ISBN PDF: 978-1-64322-284-4

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Foreword

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

The first specification for electrodes and rods for welding cast iron was published in 1956 as a joint ASTM/AWS document. The first revision that was exclusively an AWS specification was published in 1969 and revised in 1982.

Evolution of the document is as shown below:

ASTM A398-56T *Tentative Specification for Welding Rods and Covered Electrodes for Welding Cast Iron*
AWS A5.15-56T

AWS A5.15-65T *Tentative Specification for Welding Rods and Covered Electrodes for Welding Cast Iron*
ASTM A398-65T

AWS A5.15-69 *Specification for Welding Rods and Covered Electrodes for Welding Cast Iron*
ANSI W3.15-1973

ANSI/AWS A5.15-82 *Specification for Welding Rods and Covered Electrodes for Cast Iron*

AWS A5.15-90 *Specification for Welding Electrodes and Rods for Cast Iron*

AWS A5.15-90 (R2006) *Specification for Welding Electrodes and Rods for Cast Iron*

AWS A5.15-90 (R2016) *Specification for Welding Electrodes and Rods for Cast Iron*

This standard has been approved for stabilized maintenance because it addresses mature technology or practices, and as a result, is not likely to require revision. A request for maintenance of this standard may be submitted at any time by following the maintenance request given in the Statement on the Use of American Welding Society Standards at the front of this document.

The A5E Subcommittee on Nickel and Nickel Alloy Filler Metals and the A5 Committee on Filler Metals and Allied Materials made editorial corrections to the document during the review process, and they are listed below:

Page xvii, last paragraph of the foreword, “loathe” changed to “for the”.

Page xviii, in the table of contents, a title was added to Annex A, which reads “Annex A (Informative)—Guide to AWS Specification for Welding Electrodes and Rods for Cast Iron.”

Page xviii, in the table of contents, the title for Annex B was changed to “Annex B (Informative)—Requesting an Official Interpretation on an AWS Standard”.

Page 1, in clause 3, the correct designation and title inserted to read, “AWS A5.01, *Welding and Brazing Consumables—Procurement of Filler Metals and Fluxes*”.

Page 1, in footnote 1, “east iron” changed to “cast iron”.

Page 1, in footnote 2, the correct designation and title inserted to read, “AWS A5.01, *Welding and Brazing Consumables—Procurement of Filler Metals and Fluxes*”.

Page 3, in Table 1C, the typo “ENNI-CI” was corrected to read “ERNI-CI”.

Page 3, in 8.2, “Figure I” replaced with “Figure 1”.

Page 4, in 8.3, “Figure I” replaced with “Figure 1”.

Page 4, in Table 2, the titled was changed from “Required Teats” to “Required Tests”.

Page 4, in 9.1, reference to Table 1A was corrected to read Table 1C.

For solid filler metal classified in Table 1C, and the core wire for electrodes classified in Table 1B, a sample of the filler metal, core wire, or the rod stock from which the filler metal or core wire is made, shall be prepared for chemical analysis.

Page 5, in footnote 5 of subclause 9.3, the “American Society for Testing and Materials” was changed to read “ASTM International”.

Page 5, in 9.3 (1), the title to ASTM E39 was corrected to read, “Standard Methods for Chemical Analysis of Nickel”.

Page 5, in 9.3 (2), the title to ASTM E76 was corrected to read, “Standard Test Methods for Chemical Analysis of Nickel-Copper Alloys”.

Page 5, in 9.3 (3), the title to ASTM E350 was corrected to read, “Standard Test Methods for Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron”.

Page 6, in 9.3 (4), the title to ASTM E351 was corrected to read, “Standard Test Methods for Chemical Analysis of Cast Iron—All types”.

Page 6, in 9.4 (5), the title to ASTM E353 was corrected to read, “Standard Test Methods for Chemical Analysis of Stainless, Heat Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys”.

Page 6, in 9.4 (6), the title to ASTM E354 was corrected to read, “Standard Test Methods for Chemical Analysis of High-Temperature Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys”.

Page 6, in 10.3, the article “a” was placed before “smooth” and not “have”.

All rods shall have a smooth finish that is free from slivers, depressions, scratches, scale, seams, laps, and foreign matter that would adversely affect the welding characteristics or the properties of the weld metal.

Page 6, in the title of subclause 10.4, the comma was removed.

Page 6, in 10.4, the typo “g” was corrected to read “kg”.

Welding rods shall be packed in containers of 5, 10, 25, 30, 50, 60, or 100 lb (2.3, 4.5, 11, 14, 23, 27, or 45 kg) net weight.

Page 6, in 10.5, “during” was added to the sentence.

Welding rods shall be suitably packaged to ensure against damage during shipment and storage under normal conditions.

Page 6, in the sample precautionary information mentioned in 10.6.3, the word “understand” was put in lowercase, and “Material Safety Data Sheets (MSDSs)” was changed to “Safety Data Sheets (SDSs)”.

Page 7, in the title of Table 3, the first letter in the word “Welding” was capitalized.

Page 8, in 11.3.3, the apostrophe in “ordinary’ handling” was removed.

Page 9, in the sample precautionary information mentioned in 11.7.2, “understand” was put in lower case; the word “bum” was replaced with “burn”; “Material Safety Data Sheets (MSDSs)” was changed to “Safety Data Sheets (SDSs)”; and the title to ANSI Z49.1 was corrected to read, “*Safety in Welding, Cutting, and Allied Processes*”.

Page 10, in the title of Table 5, the word “Qas” was changed to “Gas”, a comma was removed from the row titled “Coils Without Support, Coils With Support, Spools, Drums”, and “tolernaces” was corrected to read “tolerances” in the footnote.

Page 11, in Table 6, the comma after “Coil” was removed, and the first letter in the word “wound” was capitalized.

Page 12, in Figure 2, “SI” was capitalized.

Page 13, in Figure 3, “B1” was changed to “B”, the order of “C, maximum” and “D” was reversed, and “SI” was capitalized.

Page 14, in the sample precautionary information mentioned in 12.8.2, “Material Safety Data Sheets (MSDSs)” was changed to read “Safety Data Sheets (SDSs)”.

Page 15, a title was given for Annex A, which reads, “Annex A (Informative) Guide to AWS Specification for Welding Electrodes and Rods for Cast Iron”.

Page 15, in A3.1, the correct designation and title inserted to read, “AWS A5.01, Welding and Brazing Consumables—Procurement of Filler Metals and Fluxes” and “stales” was changed to “states”.

Page 15, in A3.1, the correct designation inserted to read “AWS A5.01” in two places, and “is” was added between “testing” and “normally”.

Page 15, in A4.2, the correct designation inserted to read “AWS A5.01”.

Page 16, in the title of A6.3, “RCi” was changed to “RCI”.

Page 18, in A6.2.2, “Include” was changed to “Included”.

Page 20, in the title of A7.2.6, “Classification” was changed to “Classifications”.

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 Welding Electrodes and Rods for Cast Iron

1. Scope

This specification prescribes requirements for the classification of the following:

- (1) Rods for oxyfuel gas welding
- (2) Electrodes for gas metal arc welding
- (3) Electrodes for flux cored arc welding
- (4) Electrodes for shielded metal arc welding

These filler metals are suitable for welding gray cast iron, malleable cast iron, nodular cast iron, compacted graphite cast iron, and certain alloy cast irons.¹

2. Classification

2.1 The electrodes and rods covered by this specification are classified according to chemical composition, as specified in Tables 1A, 1B, and 1C.

2.2 Electrodes and rods classified under one classification shall not be classified under any other classification in this specification.

2.3 The electrodes and rods classified under this specification are intended for oxyfuel gas welding, shielded metal arc welding, gas metal arc welding, or flux cored arc welding, as applicable, but that is not to prohibit their use with any other process for which they are found suitable.

3. Acceptance

Acceptance² of the welding electrodes shall be in accordance with the provisions of AWS A5.01, *Welding and Brazing Consumables—Procurement of Filler Metals and Fluxes*.³

4. Certification

By affixing the AWS specification and classification designations to the packaging, or the classification to the product, the manufacturer certifies that the product meets the requirements of this specification.⁴

¹ Copper-base filler metals frequently used in the braze welding of cast iron are no longer included in this specification. For more information pertaining to these materials see A7.6 in the Annex A.

² See section A3 (in the Annex A) for further information concerning acceptance, testing of the material shipped, and AWS A5.01, *Welding and Brazing Consumables—Procurement of Filler Metals and Fluxes*.

³ AWS standards are published by the American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

⁴ See section A4 (in the Annex A) for further information concerning certification and the testing called for to meet this requirement.