

AWS A5.15:1990 (R2016)
An American National Standard

Specification for Welding Electrodes and Rods for Cast Iron



AWS A5.15:1990 (R2016)
An American National Standard

Approved by
American National Standards Institute
May 5, 2016

Specification for Welding Electrodes and Rods for Cast Iron

Supersedes AWS A5.15-90 (2006)

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: 978-0-87171-886-0
© 2016 by American Welding Society
All rights reserved
Printed in the United States of America

Photocopy Rights. No portion of this standard may be reproduced, stored in a retrieval system, or transmitted in **any** form, including mechanical, photocopying, recording, or otherwise, without the prior written permission of the copyright owner.

Authorization to photocopy items for internal, personal, or educational classroom use only or the internal, personal, or educational classroom use only of specific clients is granted by the American Welding Society provided that the appropriate fee is paid to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, tel: (978) 750-8400; Internet: <www.copyright.com>.

Statement on the Use of American Welding Society Standards

All standards (codes, specifications, recommended practices, methods, classifications, and guides) of the American Welding Society (AWS) are voluntary consensus standards that have been developed in accordance with the rules of the American National Standards Institute (ANSI). When AWS American National Standards are either incorporated in, or made part of, documents that are included in federal or state laws and regulations, or the regulations of other governmental bodies, their provisions carry the full legal authority of the statute. In such cases, any changes in those AWS standards must be approved by the governmental body having statutory jurisdiction before they can become a part of those laws and regulations. In all cases, these standards carry the full legal authority of the contract or other document that invokes the AWS standards. Where this contractual relationship exists, changes in or deviations from requirements of an AWS standard must be by agreement between the contracting parties.

AWS American National Standards are developed through a consensus standards development process that brings together volunteers representing varied viewpoints and interests to achieve consensus. While AWS administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in its standards.

AWS disclaims liability for any injury to persons or to property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this standard. AWS also makes no guarantee or warranty as to the accuracy or completeness of any information published herein.

In issuing and making this standard available, AWS is neither undertaking to render professional or other services for or on behalf of any person or entity, nor is AWS undertaking to perform any duty owed by any person or entity to someone else. Anyone using these documents should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. It is assumed that the use of this standard and its provisions is entrusted to appropriately qualified and competent personnel.

This standard may be superseded by new editions. This standard may also be corrected through publication of amendments or errata, or supplemented by publication of addenda. Information on the latest editions of AWS standards including amendments, errata, and addenda is posted on the AWS web page (www.aws.org). Users should ensure that they have the latest edition, amendments, errata, and addenda.

Publication of this standard does not authorize infringement of any patent or trade name. Users of this standard accept any and all liabilities for infringement of any patent or trade name items. AWS disclaims liability for the infringement of any patent or product trade name resulting from the use of this standard.

AWS does not monitor, police, or enforce compliance with this standard, nor does it have the power to do so.

Official interpretations of any of the technical requirements of this standard may only be obtained by sending a request, in writing, to the appropriate technical committee. Such requests should be addressed to the American Welding Society, Attention: Managing Director, Technical Services Division, 8669 NW 36th St # 130, Miami, FL 33166 (see Annex B). With regard to technical inquiries made concerning AWS standards, oral opinions on AWS standards may be rendered. These opinions are offered solely as a convenience to users of this standard, and they do not constitute professional advice. Such opinions represent only the personal opinions of the particular individuals giving them. These individuals do not speak on behalf of AWS, nor do these oral opinions constitute official or unofficial opinions or interpretations of AWS. In addition, oral opinions are informal and should not be used as a substitute for an official interpretation.

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 36th St # 130, Miami, FL 33166.

This page is intentionally blank.

Foreword

This foreword is not part of AWS A5.15:1990 (R2016). *Specification for Welding Electrodes and Rods for Cast Iron*, but is included for informational purposes only.

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

Significant changes made in this reaffirmed edition are correction of “1/16 (.016) in 0.4 mm” to “1/16 (.062) in 1.6 mm” in the table of Figure 3, updating the addresses of various organizations, and updating the list of “AWS Filler Metal Related Documents.”

Evolution of the document is as shown below:

ASTM A398-56T AWS A5.15-56T	<i>Tentative Specification for Welding Rods and Covered Electrodes for Welding Cast Iron</i>
AWS A5.15-65T ASTM A398-65T	<i>Tentative Specification for Welding Rods and Covered Electrodes for Cast Iron</i>
AWS A5.15-69 ANSI W3.15-1973	<i>Specification for Welding Rods and Covered Electrodes for Welding Cast Iron</i>
ANSI/A WS A5. 15-82	<i>Specification for Welding Rods and Covered Electrodes for Cast Iron</i>
AWS A5.15-90 (R2006)	<i>Specification for Welding Rods and Covered Electrodes for Cast Iron</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 36th ST, Miami, FL 33166.

Table of Contents

	Page No.
<i>Personnel (Reaffirmation)</i>	<i>v</i>
<i>Personnel (Original)</i>	<i>vii</i>
<i>Foreword</i>	<i>ix</i>
<i>List of Tables</i>	<i>xii</i>
<i>List of Figures</i>	<i>xii</i>
1. Scope	1
2. Classification	1
3. Acceptance	1
4. Certification	1
5. Units of Measure and Rounding-Off Procedure	2
6. Summary of Tests	3
7. Retest	3
8. Weld Test Assembly	3
9. Chemical Analysis	4
10. Welding Rods	6
11. Shielded Metal Arc Welding Electrodes	7
12. Gas Metal Arc and Flux Cored Arc Welding Electrodes	10
Annex A	15
Annex B—Guidelines for Preparation of Technical Inquiries for AWS Technical Committees	23
AWS Filler Metal Specifications and Related Documents.....	27

List of Tables

Tables	Page No.
1A Chemical Composition Requirements for Undiluted Weld Metal for Shielded Metal Arc and Flux Cored Arc Welding Electrodes	2
1B Chemical Composition Requirements for Core Wire for Shielded Metal Arc Welding Electrodes.....	2
1C Chemical Composition Requirements for Rods and Bare Electrodes	3
2 Required Tests.....	4
3 Standard Sizes and Lengths of Welding Rods	6
4 Standard Sizes and Lengths for Shielded Metal Arc Welding Electrodes	8
5 Standard Sizes and Tolerances for Gas Metal Arc and Flux Cored Arc Welding Electrodes.....	10
6 Standard Dimensions for Coils With and Without Support and Drums.....	11
7 Standard Package Dimensions and Weights.....	11
A1 Typical Mechanical Properties of Undiluted Weld Metal.....	18
A2 Copper-Base Welding Electrodes and Rods from AWS Specifications Suitable for Welding Cast Irons	21

List of Figures

Figure	Page No.
1 Pad for Chemical Analysis of Undiluted Weld Metal.....	5
2 Dimensions of 12 and 14 in (300 and 360 mm) Spools	12
3 Dimensions of 30 in (760 mm) Spools	13

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 ANSI/AWS A5.01. *Filler Metal Procurement Guidelines*.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 ANSI/AWS A5.01. *Filler Metal Procurement Guidelines*.

³ AWS standards are published by the American Welding Society, 8669 NW 36th 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.