

AWS A5.29/A5.29M:2010
An American National Standard



Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding



American Welding Society



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An American National Standard**

**Approved by the
American National Standards Institute
September 18, 2009**

**Specification for
Low-Alloy Steel Electrodes
for Flux Cored Arc Welding**

4th Edition

Supersedes AWS A5.29/A5.29M:2005

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 low-alloy steel electrodes for flux cored arc welding. The requirements include chemical composition and mechanical properties of the weld metal and certain usability characteristics. Optional, supplemental designators are also included for improved toughness and diffusible hydrogen. Additional requirements are included for standard sizes, marking, manufacturing, and packaging. A guide is appended to the specification as a source of information concerning the classification system employed and the intended use of low-alloy steel flux cored electrodes.

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.



American Welding Society

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Foreword

This foreword is not part of AWS A5.29/A5.29M:2010, *Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding*, but is included for informational purposes only.

This document is the second of the A5.29 specifications which uses of both U.S. Customary Units and the International System of Units (SI) throughout. 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, AWS A1.1, *Metric Practice Guide for the Welding Industry*, and ISO 554, *Welding consumables—Technical delivery conditions for welding filler materials—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 the U.S. Customary and SI Units.

This is the third revision of A5.29 that was issued initially in 1980. In this revision, the quantity of “Mn + Ni” has been corrected from 1.5% to 1.50% in Note “d” of Table 7.

Historical Background

ANSI/AWS A5.29-80 *Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding*

ANSI/AWS A5.29:1998 *Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding*

AWS A5.29/A5.29M:2005 *Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding*

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, 550 N.W. LeJeune Road, Miami, FL 33126.

Table of Contents

	Page No.
<i>Personnel</i>	iii
<i>Foreword</i>	vii
<i>List of Tables</i>	x
<i>List of Figures</i>	x
1. Scope	1
2. Normative References	1
3. Classification	2
4. Acceptance	5
5. Certification	5
6. Rounding-Off Procedure	5
7. Summary of Tests	10
8. Retest	10
9. Test Assemblies	11
10. Chemical Analysis	17
11. Radiographic Test	17
12. Tension Test	20
13. Impact Test	20
14. Fillet Weld Test	21
15. Diffusible Hydrogen Test	21
16. Method of Manufacture	23
17. Standard Sizes	23
18. Finish and Uniformity	23
19. Standard Package Forms	26
20. Winding Requirements	26
21. Electrode Identification	27
22. Packaging	28
23. Marking of Packages	29
Annex A (Informative)—Guide to AWS Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding	31
Annex B (Informative)—Guidelines for Preparation of Technical Inquiries for AWS Technical Committees	45
AWS Filler Metal Specifications by Material and Welding Process	47
AWS Filler Metal Specifications and Related Documents	49

List of Tables

Table	Page No.
1U A5.29 Mechanical Property Requirements	3
1M A5.29M Mechanical Property Requirements.....	7
2 Electrode Usability Requirements	9
3 Tests Required for Classification	10
4 Base Metal for Test Assemblies.....	14
5 Heat Input Requirements and Suggested Pass and Layer Sequence for Multiple Pass Electrode Classifications	15
6 Preheat, Interpass, and PWHT Temperatures	16
7 Weld Metal Chemical Composition Requirements for Classification to A5.29/A5.29M.....	18
8 Dimensional Requirements for Fillet Weld Usability Test Specimens	22
9 Diffusible Hydrogen Limits for Weld Metal.....	25
10 Standard Sizes and Tolerances of Electrodes.....	25
11 Packaging Requirements.....	26
A.1 Comparison of Approximate Equivalent Classifications for ISO/DIS 17632	34
A.2 Comparison of Approximate Equivalent Classifications for ISO/DIS 17634	35
A.3 Comparison of Approximate Equivalent Classifications for ISO/DIS 18276	36

List of Figures

Figure	Page No.
1 A5.29/A5.29M Classification System.....	6
2 Pad for Chemical Analysis of Deposited Weld Metal.....	11
3 Test Assembly for Mechanical Properties and Soundness of Weld Metal.....	12
4 Fillet Weld Test Assembly	13
5 Dimensions of Fillet Welds	22
6 Alternate Methods for Facilitating Fillet Weld Fracture.....	23
7 Radiographic Standards for Test Assembly in Figure 3.....	24
8 Standard Spools—Dimensions of 4, 8, 12, and 14 in [100, 200, 300, and 350 mm] Spools.....	27
9 Standard Spools—Dimensions of 22, 24, and 30 in [560, 610, and 760 mm] Spools.....	28

Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding

1. Scope

1.1 This specification prescribes requirements for the classification of low-alloy steel electrodes for flux cored arc welding (FCAW) either with or without shielding gas. Iron is the only element whose content exceeds 10.5 percent in undiluted weld metal deposited by these electrodes. Metal cored low-alloy steel electrodes are not classified under this specification but are classified according to AWS A5.28/A5.28M.¹

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 the nonmandatory Annex Sections A5 and A9. Safety and health information is available from other sources, including, but not limited to, ANSI Z49.1² and applicable federal and state regulations.

1.3 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 weld metal properties. The specification with the designation A5.29 uses U.S. Customary Units. The specification A5.29M 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 the sizing of electrodes or packaging or both under the A5.29 and A5.29M specifications.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this AWS standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreement based on this AWS standard are encouraged to investigate the possibility of applying the most recent editions of the documents shown below. For undated references, the latest edition of the standard referred to applies.

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

- (1) AWS A4.3, *Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding*
- (2) AWS A5.01, *Filler Metal Procurement Guidelines*
- (3) AWS A5.32/A5.32M, *Specification for Welding Shielding Gases*
- (4) AWS B4.0 or B4.0M, *Standard Methods for Mechanical Testing of Welds.*

2.2 The following ANSI standard is referenced in the mandatory sections of this document:

- (1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes.*

¹ AWS standards are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

² This ANSI standard is published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.