


ANSI/AWS A5.17/A5.17M-97 (R2007)
An American National Standard



**Specification for
Carbon Steel
Electrodes and
Fluxes for
Submerged Arc
Welding**



American Welding Society



Key Words— Carbon steel electrodes, submerged arc flux crushed slag, welding electrodes, filler metal specification, mild steel, solid electrode, composite electrode

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Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding

Supersedes ANSI/AWS A5.17-89

Prepared by the
American Welding Society (AWS) A5 Committee on Filler Metals

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification provides requirements for the classification of solid and composite carbon steel electrodes and fluxes for submerged arc welding. Electrode classification is based on chemical composition of the electrode for solid electrodes, and chemical composition of the weld metal for composite electrodes. Flux classification is based on the mechanical properties of weld metal produced with the flux and an electrode classified herein. Other requirements include sizes, marking, manufacturing and packaging. The form and usability of the flux are also included.

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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Table of Contents

	Page No.
<i>Personnel (Reaffirmation)</i>	v
<i>Personnel (Original)</i>	vii
<i>Foreword</i>	ix
<i>List of Tables</i>	xii
<i>List of Figures</i>	xii
1. Scope	1
Part A—General Requirements	1
2. Normative References	1
3. Classification	2
4. Acceptance	2
5. Certification	2
6. Units of Measure and Rounding-Off Procedure	2
Part B—Tests, Procedures, and Requirements.....	6
7. Summary of Tests	6
8. Retest	6
9. Weld Test Assemblies	7
10. Chemical Analysis	11
11. Radiographic Test	11
12. Tension Test	11
13. Impact Test	13
14. Diffusible Hydrogen Test	13
Part C—Manufacture, Identification, and Packaging.....	14
15. Method of Manufacture	14
16. Electrode Requirements	14
17. Flux Requirements	17
Annex A (Informative)—Guide to AWS Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding	19
Annex B (Informative)—Guidelines for the Preparation of Technical Inquiries.....	29
AWS Filler Metal Specifications by Material and Welding Process	31
AWS Filler Metal Specifications and Related Documents	33

List of Tables

Table	Page No.
1	Chemical Composition Requirements for Solid Electrodes5
2	Chemical Composition Requirements for Composite Electrode Weld Metal5
3	Tests Required for Classification6
4	Base Metals for Test Assemblies 10
5U	A5.17 Tension Test Requirements 13
5M	A5.17M Tension Test Requirements 13
6U	A5.17 Impact Test Requirements 14
6M	A5.17M Impact Test Requirements 14
7	Diffusible Hydrogen Requirements 15
8U	A5.17 Standard Electrode Sizes and Tolerances 15
8M	A5.17M Standard Electrode Sizes and Tolerances 15
9	Standard Dimensions and Weights 16
A1	Comparison of Electrode Designations 21

List of Figures

Figure	Page No.
1U	A5.17 Classification System for U.S. Customary Units3
1M	A5.17M Classification System for the International System of Units (SI)4
2	Weld Pad for Chemical Analysis of Weld Metal7
3A	Groove Weld Test Assembly8
3B	Groove Weld Test Welding Parameters9
4	Radiographic Standards for Rounded Indications 12

Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding

1. Scope

This specification prescribes requirements for the classification of carbon steel electrodes (both solid and composite) and fluxes for submerged arc welding.

This document is the first of the A5.17 specifications which is a combined specification providing for classification utilizing a system based upon U.S. Customary Units, or utilizing a system based upon 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, ANSI/AWS A1.1, *Metric Practice Guide for the Welding Industry*, is used where suitable. Tables and Figures make use of both U.S. Customary Units and SI Units which, with the application of the specified tolerances, provides for interchangeability of products in both U.S. Customary and SI Units.

(1) Paragraphs, tables and figures which carry the suffix letter "U" are applicable only to those products classified to the system based upon U.S. Customary Units under the A5.17 specification.

(2) Paragraphs, tables and figures which carry the suffix letter "M" are applicable only to those products classified to the system based upon the International System of Units (SI), under the A5.17M specification.

(3) Paragraphs, tables and figures which do not have either the suffix letter "U" or the suffix letter "M" are applicable to those products classified under either the U.S. Customary Units System or the International System of Units (SI).

Part A **General Requirements**

2. Normative References

2.1 The following ANSI/AWS standards¹ are referenced in the mandatory sections of this document:

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

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

(2) ANSI/AWS A4.3, *Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding*.

(3) ANSI/AWS A5.01, *Filler Metal Procurement Guidelines*.

(4) ANSI/AWS A5.1, *Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding*.

(5) ANSI/AWS B4.0, *Standard Methods for Mechanical Testing of Welds*.

2.2 The following ASTM standards² are referenced in the mandatory sections of this document:

(1) ASTM A29/A29M, *Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished*.

(2) ASTM A36/A36M, *Specification for Carbon Structural Steel*.

(3) ASTM A285/A285M, *Specification for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength*.

(4) ASTM A515/A515M, *Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service*.

(5) ASTM A516/A516M, *Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service*.

(6) ASTM DS-56, SAE HS-1086, *Metals and Alloys in the Unified Numbering System*.

(7) ASTM E29, *Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications*.

(8) ASTM E142, *Method for Controlling Quality of Radiographic Testing*.

2. ASTM standards are published by the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.