AWS A5.20/A5.20M:2005 (R2015)
An American National Standard

# Specification for Carbon Steel Electrodes for Flux Cored Arc Welding


American Welding Society®

**AWS A5.20/A5.20M:2005 (R2015)**
**An American National Standard**

**Approved by the**
**American National Standards Institute**
**July 28, 2015**

# Specification for Carbon Steel Electrodes for Flux Cored Arc Welding

**Supersedes ANSI/AWS A5.20-95**

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 carbon steel electrodes for flux cored arc welding. The requirements include chemical composition and mechanical properties of the weld metal and certain usability characteristics. The AWS A5.20/A5.20M specification also includes optional, supplemental designators for improved toughness and diffusible hydrogen and to indicate conformance to special mechanical property requirements when the weld metal is deposited using both low heat input, fast cooling rate and high heat input, slow cooling rate procedures. 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 carbon 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.


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# Foreword

This foreword is not part of AWS A5.20/A5.20M:2005 (R2015), *Specification for Carbon Steel Electrodes for Flux Cored Arc Welding,* but is intended for informational purposes only.)

This document is the first of the A5.20 specifications which uses 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 metals—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.

The current document is the third revision of the initial joint ASTM/AWS document issued in 1969. Since it was developed by a subcommittee of the AWS Committee on Filler Metals and Allied Materials, the use of flux cored electrodes has been stimulated by developments in electrode manufacturing technology that have permitted the production of smaller diameter electrodes and by improvements in formulation of the core ingredients. This 2005 revision includes the following significant changes:

(1) Heat input limits are now applied to the preparation of mechanical property test assemblies.

(2) Maximum tensile strength limits have been added for all multiple pass classifications.

(3) Mechanical property tests are required on additional electrode sizes.

(4) Chemical composition limits have been modified.

(5) Welding parameters are specified for diffusible hydrogen testing.

(6) Optional supplemental designators (D and Q) have been added to identify high and low cooling rate mechanical property testing for FEMA and Navy applications.

The evolution took place as follows:

**Historical Background**

| | |
|---|---|
| AWS A5.20-69 | *Specifications for Mild Steel Electrodes for Flux Cored Arc Welding* |
| ANSI W3.20-1973 | |
| ANSI/AWS A5.20-79 | *Specification for Carbon Steel Electrodes for Flux Cored Arc Welding* |
| ANSI/AWS A5.20-95 | *Specification for Carbon Steel Electrodes for Flux Cored Arc Welding* |
| AWS A5.20/A5.20M:2005 | *Specification for Carbon 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, 8669 NW 36 St, # 130, Miami, FL 33166.

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