

An American National Standard



Specification for Fluxes for Brazing and Braze Welding



American Welding Society®



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An American National Standard

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Specification for Fluxes for Brazing and Braze Welding

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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

Eighteen fluxes for brazing and braze welding are classified according to the filler metal, form, and activity temperature range. Classification is in accordance with a classification system that employs the designator "FB" to indicate fluxes for brazing and braze welding applications. In addition to selected tests for each classification, major topics include general requirements, testing procedures, and packaging requirements. An annex listing general application guidelines is included.

This specification makes use of both the International System of Units (SI) and U.S. Customary Units. The measurements may not be exact equivalents; therefore, each system shall be used independently.



American Welding Society®

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Foreword

This foreword is not part of AWS A5.31M/A5.31:2012, *Specification for Fluxes for Brazing and Braze Welding*, but is included for informational purposes only.

This document is the first of the A5.31 specifications that makes use of both the International System of Units (SI) and U.S. Customary Units. 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 International Standard ISO 544, *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 SI Units and U.S. Customary Units, which with the application of the specified tolerances provides for interchangeability of products in both the SI Units and U.S. Customary Units.

This is the second revision of the original specification issued in 1992. The first edition of the *Brazing Manual*, published in 1955, included a numerical list of fluxes. The next two editions, published in 10-year intervals, made numerous changes to the initial listings, but lacked the inclusion of the testing and restrictions normally incorporated in a specification. The *Brazing Manual* was revised again in 1991 and published as the *AWS Brazing Handbook*. The fifth edition of the *Brazing Handbook* was published in 2007.

In 1978, the American Welding Society's Brazing and Soldering Committee recognized the need for a flux specification. About two years later, collaboration between the Committee on Filler Metals and Allied Materials and the Subcommittee on Filler Metals and Fluxes for Brazing led to the initial preparation of the specification. At that point, the magnitude of the challenge to prepare a specification in an industry built on a foundation of proprietary products became apparent. After over a decade of activity by a dedicated group of brazing specialists, the first National Specification, AWS/ANSI A5.31-92, was issued. AWS A5.31M/A5.31:2012 represents over two decades of activity by a dedicated group of brazing specialists.

The present edition, which supersedes ANSI/AWS A5.31-92 (R2003), includes the following updates:

The International System of Units (SI) is used as the primary unit of measurement

Three classes of dispensable fluxes: FB3-L, FB3-M, FB3-N

Sodium Glare Test was removed

Test base metal options added for select flux classifications

Revised shelf life requirements

Revised test specimen and preparation requirements

Test lot definition

Revised retest requirements

Revised particle size test requirements

Adherence Test title now reads as Adhesion Test

Revised fluidity test requirements

A flux viscosity test reference is included

Supplemental Annexes—Informative references and safety considerations

New substantive revisions are noted within the specification in italic font.

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.

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Specification for Fluxes for Brazing and Braze Welding

1. General Requirements

1.1 Scope. This specification prescribes the requirements for the classification of brazing fluxes used with brazing or braze welding filler metals such as those classified in AWS A5.8M/A5.8, *Specification for Filler Metals for Brazing and Braze Welding*.

1.2 Units of Measurement. This specification makes use of both the International System of Units (SI) and U.S. Customary Units. The measurements are not exact equivalents; therefore, each system must be used independently of the other without combining in any way when referring to material properties. The specification with the designation A5.31M uses SI Units. The specification A5.31 uses U.S. Customary 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 sizing of brazing fluxes or packaging or both under A5.31M or A5.31 specifications.

1.3 Safety. Safety issues and concerns are addressed in this standard, although health issues and concerns are beyond the scope of this standard. Some safety and health information can be found in non-mandatory Annex Clauses B5 and B8.

Safety and health information is available from the following sources:

American Welding Society:

- (1) ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes
- (2) AWS Safety and Health Fact Sheets (see Annex Clause B8)
- (3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

- (1) Material Safety Data Sheets supplied by the materials manufacturers
- (2) Operating manuals supplied by equipment manufacturers

Applicable Regulatory Agencies

Work performed in accordance with this standard may involve the use of materials that have been deemed hazardous, and may involve operations or equipment that may cause injury or death. This standard does not purport to address all safety and health risks that may be encountered. The user of this standard should establish an appropriate safety program to address such risks as well as to meet applicable regulatory requirements. ANSI Z49.1 should be considered when developing the safety program.