

AWS A5.8/A5.8M:2004
An American National Standard



Specification for Filler Metals for Brazing and Braze Welding



American Welding Society



Key Words—Brazing, brazing filler metals, braze welding filler metals, aluminum filler metals, cobalt filler metals, copper filler metals, gold filler metals, magnesium filler metals, nickel filler metals, silver filler metals

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Specification for Filler Metals for Brazing and Braze Welding

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Prepared by
AWS A5 Committee on Filler Metals and Allied Materials

Under the Direction of
AWS Technical Activities Committee

Approved by
AWS Board of Directors

Abstract

This specification prescribes the requirements for the classification of filler metals for brazing and braze welding. The chemical composition, physical form, and packaging of more than 75 brazing filler metals are specified. The filler metal groups described include aluminum, cobalt, copper, gold, magnesium, nickel, silver, and brazing filler metals for vacuum service. Information is provided concerning the liquidus, the solidus, the brazing temperature range, and general areas of application recommended for each filler metal. Additional requirements are included for manufacture, sizes, lengths, and packaging. A guide is appended to the specification as a source of information concerning the classification system employed and the intended use of the filler metals for brazing and braze welding.

This specification makes use of both U.S. Customary Units and the International System of Units (SI). Since these are not equivalent, each must be used independently of the other.



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Foreword

(This Foreword is not a part of AWS A5.8/A5.8M:2004, *Specification for Filler Metals for Brazing and Braze Welding*, but is included for informational purposes only.)

This document is the first of the AWS A5.8 specification revisions that makes use of both the 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 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 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 Units and SI units.

The current document is the ninth revision of the initial joint filler metal specification for brazing issued by the American Welding Society (AWS). The original specification was prepared by a joint committee of the American Welding Society and the American Society for Testing and Materials (ASTM). This joint activity continued for 17 years until 1969, when AWS became solely responsible for the development and publishing of the specification

The evolution of AWS A5.8/A5.8M, *Specification for Filler Metals for Brazing and Braze Welding*, is shown below:

ASTM B260-52T, AWS A5.8-52T	<i>Tentative Specification for Brazing Filler Metal</i>
ASTM B260-56T, AWS A5.8-56T	<i>Tentative Specification for Brazing Filler Metal</i>
AWS A5.8-62T, ASTM B260-62T	<i>Tentative Specification for Brazing Filler Metal</i>
AWS A5.8-69	<i>Specification for Brazing Filler Metal</i>
ANSI/AWS A5.8-76	<i>Specification for Brazing Filler Metal</i>
ANSI/AWS A5.8-81	<i>Specification for Brazing Filler Metal</i>
ANSI/AWS A5.8-89	<i>Specification for Filler Metals for Brazing</i>
ANSI/AWS A5.8-92	<i>Specification for Filler Metals for Brazing and Braze Welding</i>

The present edition, which supercedes ANSI/AWS A5.8-92, includes new filler metals. These are AWS BCu-1b; AWS BCu-3; AWS BCuP-8; AWS BCuP-9; AWS BNi-5b; AWS BNi-12; AWS BNi-13; AWS BVAu-3, Grades 1 and 2; BVAu-9, Grades 1 and 2; and BVAu-10, Grades 1 and 2.

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.

Official interpretations of any of the technical requirements of this standard may only be obtained by sending a request, in writing, to the Managing Director, Technical Services Division, American Welding Society. A formal reply will be issued after it has been reviewed by the appropriate personnel, following established procedures (see Annex C).

Errata

(The following Errata have been identified and incorporated into the current reprint of this document.)

Page 6, in Table 4, Titled “Chemical Composition Requirements for Copper, Copper-Zinc, and Copper-Phosphorous Filler Metals,” change the UNS number for BCuP-9 to C55385.

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Specification for Filler Metals for Brazing and Braze Welding

1. Scope

1.1 This specification prescribes requirements for the classification of filler metals for brazing and braze welding. It includes filler metals for brazing with or without a flux and in all protective atmospheres for various applications, including those for vacuum service.¹ The prefix “RB” indicates that the filler metal is suitable for use both as brazing rod for braze welding and as a brazing filler metal.

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 A10. Safety and health information is available from other sources, including, but not limited to, ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, 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 material properties. The specification with the designation A5.8 uses U.S. Customary Units. The specification A5.8M 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 sizing of filler metal or packaging or both under A5.8 or A5.8M specifications.

Part A *General Requirements*

2. Normative References

2.1 The following standards contain provisions which, through reference in this text, constitute provisions of

¹ Filler metals for vacuum service are for devices operating in vacuum service, regardless of the atmosphere used in making the joint.

this AWS standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements 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.

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

- (1) AWS A5.01, *Filler Metal Procurement Guidelines*.

2.3 The following ANSI standards³ are referenced in the mandatory sections of this document:

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

2.4 The following ASTM standards⁴ are referenced in the mandatory sections of this document:

- (1) *Analytical Chemistry for Metals, Ores, and Related Materials (I): C 571–E 354, Annual Book of ASTM Standards, Analytical Chemistry of Metals, Ores, and Related Materials*;

- (2) *Analytical Chemistry for Metals, Ores, and Related Materials (II): E 356 to last; Molecular Spectroscopy; Surface Analysis, Annual Book of ASTM Standards, Analytical Chemistry of Metals, Ores, and Related Materials*;

² AWS standards can be obtained from Global Engineering Documents, an Information Handling Services Group company, 15 Inverness Way East, Englewood, Colorado 80112-5776; telephones: (800) 854-7179, (303) 397-7956; fax (303) 397-2740; Internet: www.global.ihs.com.

³ ANSI standards can be obtained from American National Standards Institute, 25 West 43 Street, Fourth Floor, New York, New York 10036 and Global Engineering Documents, an Information Handling Services Group company, 15 Inverness Way East, Englewood, Colorado 80112-5776; telephones: (800) 854-7179, (303) 397-7956; fax (303) 397-2740; Internet: www.global.ihs.com.

⁴ ASTM standards can be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.