AWS A5.30/A5.30M:2022
An American National Standard

Specification for Consumable Inserts

American Welding Society®

AWS A5.30/A5.30M:2022
An American National Standard

Approved by the
American National Standards Institute
September 8, 2022

Specification for Consumable Inserts

4th Edition

Revises AWS A5.30/A5.30M:2007

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

Five classes (cross-sectional designs) of consumable inserts of various chemical compositions are described. Each class is subdivided into two or three styles based on the shape of the insert. The chemical composition of the consumable insert is specified herein, or by the composition limits shown in another AWS A5 solid wire specification. Packaging and marking requirements are specified. Application guidelines are provided in an informational annex.

American Welding Society®

ISBN Print: 978-1-64322-251-6
ISBN PDF: 978-1-64322-252-3

Statement on the Use of American Welding Society Standards

All standards (codes, specifications, recommended practices, methods, classifications, and guides) of the American Welding Society (AWS) are voluntary consensus standards that have been developed in accordance with the rules of the American National Standards Institute (ANSI). When AWS American National Standards are either incorporated in, or made part of, documents that are included in federal or state laws and regulations, or the regulations of other governmental bodies, their provisions carry the full legal authority of the statute. In such cases, any changes in those AWS standards must be approved by the governmental body having statutory jurisdiction before they can become a part of those laws and regulations. In all cases, these standards carry the full legal authority of the contract or other document that invokes the AWS standards. Where this contractual relationship exists, changes in or deviations from requirements of an AWS standard must be by agreement between the contracting parties.

AWS American National Standards are developed through a consensus standards development process that brings together volunteers representing varied viewpoints and interests to achieve consensus. While AWS administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in its standards.

AWS disclaims liability for any injury to persons or to property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this standard. AWS also makes no guarantee or warranty as to the accuracy or completeness of any information published herein.

In issuing and making this standard available, AWS is neither undertaking to render professional or other services for or on behalf of any person or entity, nor is AWS undertaking to perform any duty owed by any person or entity to someone else. Anyone using these documents should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. It is assumed that the use of this standard and its provisions is entrusted to appropriately qualified and competent personnel.

This standard may be revised, corrected through publication of amendments or errata, or supplemented by publication of addenda. Information on the latest editions of AWS standards including amendments, errata, and addenda is posted on the AWS web page (www.aws.org). Users should ensure that they have the latest edition, amendments, errata, and addenda.

Publication of this standard does not authorize infringement of any patent or trade name. Users of this standard accept any and all liabilities for infringement of any patent or trade name items. AWS disclaims liability for the infringement of any patent or product trade name resulting from the use of this standard.

AWS does not monitor, police, or enforce compliance with this standard, nor does it have the power to do so.

Official interpretations of any of the technical requirements of this standard may only be obtained by sending a request, in writing, to the appropriate technical committee. Such requests should be addressed to the American Welding Society, Attention: Managing Director, Standards Development, 8669 NW 36 St, # 130, Miami, FL 33166 (see Annex B). With regard to technical inquiries made concerning AWS standards, oral opinions on AWS standards may be rendered. These opinions are offered solely as a convenience to users of this standard, and they do not constitute professional advice. Such opinions represent only the personal opinions of the particular individuals giving them. These individuals do not speak on behalf of AWS, nor do these oral opinions constitute official or unofficial opinions or interpretations of AWS. In addition, oral opinions are informal and should not be used as a substitute for an official interpretation.

This standard is subject to revision at any time by the AWS A5 Committee on Filler Metals and Allied Materials. It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn. Comments (recommendations, additions, or deletions) and any pertinent data that may be of use in improving this standard are requested and should be addressed to AWS Headquarters. Such comments will receive careful consideration by the AWS A5 Committee on Filler Metals and Allied Materials and the author of the comments will be informed of the Committee's response to the comments. Guests are invited to attend all meetings of the AWS A5 Committee on Filler Metals and Allied Materials to express their comments verbally. Procedures for appeal of an adverse decision concerning all such comments are provided in the Rules of Operation of the Technical Activities Committee. A copy of these Rules can be obtained from the American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

This page is intentionally blank.

Personnel

AWS A5 Committee on Filler Metals and Allied Materials

T. Melfi, Chair	*The Lincoln Electric Company*
R. V. Decker, Vice Chair	*Weldstar*
M. F. Sinfield, 2nd Vice Chair	*Naval Surface Warfare Center*
K. R. Bulger, Secretary	*American Welding Society*
T. Anderson	*ITW–Miller Electric Manufacturing Company.*
A. Boulianne	*CWB Group*
J. C. Bundy	*Hobart Brothers Company*
J. L. Caron	*Haynes International, Incorporated*
G. L. Chouinard	*Stoody Company (a division of ESAB)*
T. J. Eckardt	*Kiefner and Associates*
D. A. Fink	*The Lincoln Electric Company*
R. J. Fox	*Hobart Brothers LLC*
R. D. Fuchs	*Voestalpine Bohler Welding USA, Inc.*
M. James	*The Lincoln Electric Company*
S. D. Kiser	*Consultant*
P. J. Konkol	*Concurrent Technologies Corporation*
D. J. Kotecki	*Damian Kotecki Welding Consultants*
L. G. Kvidahl	*Consultant*
J. S. Lee	*Chevron*
C. McEvoy	*Consultant*
W. C. Mosier	*Polymet Corporation*
T. C. Myers	*Westec*
B. A. Pletcher	*Bechtel Global Corporation*
K. J. Roossinck	*Ingalls Shipbuilding*
K. Sampath	*Consultant*
J. D. Schaefer	*Aqua-Chem*
J. B. Schaeffer	*The Lincoln Electric Company*
F. A. Schweighardt	*Airgas*
W. S. Severance	*The Lincoln Electric Company*
D. Singh	*Baker Hughes*
R. C. Sutherlin	*Richard Sutherlin PE Consulting LLC*
H. D. Wehr	*Arcos Industries*
J. Zhang	*Ohmstede, Limited*

Advisors to the AWS A5 Committee on Filler Metals and Allied Materials

S. E. Ferree	*Consultant*
S. Imaoka	*Kobe Steel, Limited*
S. J. Knostman	*Hobart Brothers Company*
M. T. Merlo	*Consultant*

AWS A5N Subcommittee on Consumable Inserts

H. D. Wehr, Chair	*Arcos Industries LLC*
W. J. Sperko, Vice Chair	*Sperko Engineering Services*
K. R. Bulger, Secretary	*American Welding Society*
R. V. Decker	*Weldstar*
W. F. Newell Jr	*W. F. Newell & Associates, Incorporated*
S. Williams	*Arcos Industries*

Advisors to the AWS A5N Subcommittee on Consumable Inserts

C. D. Sierra	*Imperial Weld Ring Company*

Foreword

This foreword is not part of this standard but is included for informational purposes only.

This document makes use of both U.S. Customary Units and the International System of Units (SI). In selecting rational metric units, the *Metric Practice Guide for the Welding Industry* (AWS A1.1) is 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 AWS document first issued in 1979. The document evolution took place as follows:

A5.30-79	*Specification for Consumable Inserts*
A5.30-97	*Specification for Consumable Inserts*
A5.30/A5.30M:2007	*Specification for Consumable Inserts*
A5.30/A5.30M:2022	*Specification for Consumable Inserts*

Substantive changes in this edition include a method to reference a solid wire specification for chemical composition requirements and the addition of a general classification, "G." Where possible, these changes are indicated by italicized text.

The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details may be obtained from the standards developer.

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 36th St., # 130, Miami, FL 33166.

All errata to a standard shall be published in the *Welding Journal* and posted on the AWS website.

This page is intentionally blank.

Table of Contents

Page No.

Personnel v
Foreword vii
List of Tables x
List of Figures x

1. Scope 1
2. Normative References 1
3. Classification 2
4. Acceptance 2
5. Certification 2
6. Rounding Procedure 2
7. Summary of Tests 3
8. Retest 3
9. Chemical Analysis 3
10. Method of Manufacture 3
11. Standard Shapes, Styles, and Sizes 3
12. Finish and Uniformity 4
13. Standard Package Forms 4
14. Insert Identification 4
15. Packaging 4
16. Marking of Packages 4

Annex A (Informative)—Guide to AWS Specification for Consumable Inserts 17
Annex B (Informative)—Requesting an Official Interpretation on an AWS Standard 25

AWS Filler Metal Specifications by Material and Welding Process 27
AWS Filler Metal Specifications and Related Documents 29

List of Tables

Table		Page No.
1	Carbon Steel Compositions	5
2	Chromium-Molybdenum Steel Compositions	6
3	Chromium-Nickel Stainless Steel Compositions	7
4	Copper-Nickel and Nickel Alloy Compositions	8
5	Minimum Overlap for Classes 1, 2, and 5 Style B Inserts	9
6	Dimensions of Class 3, Style D Inserts	10
7	Dimensions of Class 3, Style E Inserts	11
8	Cross-Sectional Dimensions and Tolerances for Classes 1, 2, 4, and 5 Inserts	12
A1	Comparison of Classifications	21

List of Figures

Figures		Page No.
1	AWS A5.30/A5.30M Classification System	13
2	Standard Sizes and Shapes of Consumable Inserts	14
A1	Fusibility Test Joint	22
A2	WRC-1992 (FN) Diagram for Stainless Steel Weld Metal	23
A3	Effect of Base Metal Dilution on Ferrite Content in Stainless Steel Welds with Consumable Inserts	24

Specification for Consumable Inserts

1. Scope

1.1 This specification prescribes requirements for the classification of consumable inserts. Several historical chemical compositions are included in this specification*, and other chemical compositions are by reference to corresponding AWS A5 solid wire specifications*. Consumable inserts are most often used for gas tungsten arc welding (GTAW), but also may be used with any other welding process for which they are found suitable. Shapes and dimensional requirements are included in this specification, as well as packaging and testing requirements.

1.2 This specification makes use of both U.S. Customary Units and the International System of Units (SI). The latter are shown within brackets [ ] or in appropriate columns in tables.

1.3 Safety and health issues and concerns are beyond the scope of this standard; some safety and health information is provided, but such issues are not fully addressed herein. Some safety and health information can be found in Annex A Clauses A5 and A10. 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

(3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

(1) Safety Data Sheets supplied by 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.

2. Normative References

The documents listed below are referenced within this publication and are mandatory to the extent specified herein. Unless otherwise defined in this document, welding terms are as defined in AWS A3.0M/A3.0. For undated references, the latest edition of the referenced standard shall apply. For dated references, subsequent amendments to or revisions of any of these publications do not apply.

American Welding Society (AWS) documents:

AWS A3.0M/A3.0, *Standard Welding Terms and Definitions including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*

AWS A5.01M/A5.01 (ISO 14344 MOD), *Welding Consumables – Procurement of Filler Metals and Fluxes*