AWS C2.25/C2.25M:2012 (R2026)
An American National Standard

Specification for Thermal Spray Feedstock—Wire and Rods

American Welding Society®

Approved American National Standard
ANSI

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An American National Standard

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Specification for Thermal Spray Feedstock—Wire and Rods

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Prepared by the
American Welding Society (AWS) C2 Committee on Thermal Spraying

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification provides the as-manufactured chemical composition classification requirements for solid and composite wires and ceramic rods for thermal spraying. Requirements for standard sizes, marking, manufacturing, and packaging are included.

American Welding Society®

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Foreword

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

This is a reaffirmation of the first revision of the specification, which was originally issued in 2002 and later revised in 2012. This document was developed by request of the U.S. Army Material Technology Center to supersede MIL-W-6712C, Metalizing Wire, with a U.S. National consensus standard. This revision describes a number of new feedstock materials.

The following editorial changes were included in the first reaffirmation:

The safety subclause was revised, notes a and b in Figure 2 and note a in Figure 3 were renumbered to 3 and 4, and 3, respectively; the references to notes a and b in Figure 2 and note a in Figure 3 were deleted from the figures; "ASTM" was changed to "ASTM International" in footnote 1; the title of ISO 544 was changed to "*Welding consumables—Technical delivery condition for filler materials and fluxes—Type of product, dimensions, tolerances and markings*"; the first "not" in 9 (2) was deleted; "the" was changed to "this" in 11.2.3, 12 (2), first sentence, third sentence, and last sentence.

The following editorial changes are included in this current reaffirmation:

The normative references clause was revised to reflect current boilerplate language. The clause now reads: "The documents listed below are referenced within this publication and are mandatory to the extent specified herein. For undated references, the latest edition of the referenced standard shall apply. For dated references, subsequent amendments or revisions of the publications may not apply since the relevant requirements may have changed."

The headings for the referenced documents were revised to read "American Welding Society (AWS) standards," "American Society of Testing and Materials (ASTM) standards," and "International Organization for Standardization (ISO) standard."

A reference to A3.0M/A3.0, *Standard Welding Terms and Definitions, Including Terms for Additive Manufacturing, Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying, and Nondestructive Examination* was added as a normative reference.

Footnotes 1, 2, and 3 were removed as it was part of the original boilerplate language.

The terms and definitions clause boilerplate was revised to remove "Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying."

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS C2 Committee on Thermal Spraying, American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Specification for Thermal Spray Feedstock—Wire and Rods

1. General Requirements

1.1 Scope. This specification prescribes requirements for the classification of thermal spray feedstock based on the as manufactured chemical composition. Thermal Spray Feedstock includes solid and composite wires and ceramic rods for thermal spraying. Requirements for standard sizes, marking, manufacturing, and packaging are included.

1.2 Units of Measurement. This standard 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 and figures. The measurements may not be exact equivalents: therefore, each system must be used independently.

1.3 Safety. Safety and health issues and concerns are beyond the scope of this standard and therefore are not addressed herein. 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 and 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. For undated references, the latest edition of the referenced standard shall apply. For dated references, subsequent amendments or revisions of the publications may not apply since the relevant requirements may have changed.
American Welding Society (AWS) standards:

A3.0M/A3.0, *Standard Welding Terms and Definitions, Including Terms for Additive Manufacturing, Adhesive Bonding, Brazing, Soldering, Thermal Cutting, Thermal Spraying, and Nondestructive Examination*
ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*

American Society of Testing and Materials (ASTM) standards:

ASTM E29, *Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications*

ASTM E34, *Test Method for Chemical Analysis of Aluminum and Aluminum Alloys (referee)*

ASTM E227, *Standard Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique*

ASTM E354, *Test Method for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys*

ASTM E363, *Methods for Chemical Analysis of Chromium and Ferrochromium*

ASTM E536, *Test Method for Chemical Analysis of Zinc and Zinc Alloys*

ASTM E926, *Test Method for Preparing Refuse-Derived Fuel (RDF) Samples for Analysis of Metals*

ASTM STP 747, *New Analytical Techniques for Trace Constituents of Metallic and Metal Bearing Ores*

ASTM STP 944, *Chemical Analysis of Metals*

ASTM DS-56/SAE HS-1086, *Metals and Alloys in the Unified Numbering System*

International Organization for Standardization (ISO) standard:

ISO 544, *Welding consumables—Technical delivery condition for filler materials and fluxes—Type of product, dimensions, tolerances and markings*

3. Terms and Definitions

AWS A3.0M/A3.0, *Standard Welding Terms and Definitions*, provides the basis for terms and definitions used herein.

4. Basis of Classification

4.1 The thermal spray feedstock solid and composite wires, and ceramic rods in this specification are classified using a system that is independent of U.S. Customary Units and the International System of Units (SI). The classification is according to chemical composition of the thermal spray material as specified in Tables 1 through 4. Table 1 lists the chemical composition of solid ferrous wires. Table 2 lists the chemical composition of solid nonferrous wires. Table 3 lists the chemical composition of the mixture of the sheath and core material of composite wires. Table 4 lists the chemical composition of ceramic rods.

4.2 The system for classifying the thermal spray feedstock under this AWS standard is using W, CW, and CR as the prefix designation for solid alloy and solid composite wires, cored composite wires, and ceramic rods, respectively, followed by the chemical composition in decreasing percentage order (see Figure 1).

4.3 Thermal spray solid and composite wires and ceramic rods classified under one classification shall not be classified under any other classification in this specification.

5. Certification

5.1 The act of placing the C2.25/C2.25M specification and classification designations on the packaging enclosing the product, or the classification on the product itself, constitutes the suppliers (manufacturers) certification that the product meets all the requirements of the specification.