AWS D17.2/D17.2M:2026
An American National Standard

Specification for Resistance Welding for Aerospace Applications



American Welding Society®



AWS D17.2/D17.2M:2026
An American National Standard

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Specification for Resistance Welding for Aerospace Applications

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Prepared by the
American Welding Society (AWS) D17 Committee on Welding in the Aircraft and Aerospace Industry

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification provides the general resistance welding requirements for aerospace hardware. It includes, but is not limited to, resistance spot and resistance seam welding of aluminum, magnesium, iron, nickel, cobalt, and titanium based alloys. There are requirements for machine qualification, welding schedule certification, production witness testing, and includes inspection and acceptance criteria for aerospace hardware.



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This standard is subject to revision at any time by the AWS D17 Committee on Welding in the Aircraft and Aerospace Industry. It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn.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 required and should be addressed to AWS Headquarters. Such comments will receive careful consideration by the AWS D17 Committee on Welding in the Aircraft and Aerospace Industry 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 D17 Committee on Welding in the Aircraft and Aerospace Industry 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 36th Street, Suite 130, Miami, FL 33166.

The AWS D17D Subcommittee on Resistance Welding dedicates this edition of **AWS D17.2/D17.2M:2026, Specification for Resistance Welding for Aerospace Applications**, to **Mario Diaz** in recognition of his dedication and contributions to the welding community at large. Mario served as a Secretary for the AWS D17 Committee and played a pivotal role in the development of this specification. His knowledge, work ethic, and unwavering commitment were instrumental in shaping the AWS D17.2/D17.2M standard and bringing it to completion.

In addition to his work on this committee, Mario contributed significantly through his involvement in other welding standards development efforts, through his dedication to supporting volunteers. His efforts have left a lasting impact, and his contributions are remembered with great respect and gratitude. The committee is deeply appreciative of the legacy he leaves behind.

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Foreword

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

In the mid-1990s, the AWS D17 Committee on Welding in the Aircraft and Aerospace Industries decided it was necessary to form a subcommittee to write a resistance spot and seam welding specification.

This is the fourth edition of the D17.2/D17.2M specification. This specification is intended to replace the following documents:

MIL-W-6858D, *Welding, Resistance: Spot and Seam*, March 28, 1978

AMS-W-6858A, *Welding, Resistance Spot and Seam*, April 1, 2000

MIL-W-6858D or AMS-W-6858A, or both, take precedence over this specification only when they are cited by the contract documents.

A vertical line in the margin and underlined text in clauses, tables, or figures indicates an editorial or technical change from the 2019 edition. If a clause referenced in a Table is underlined, it indicates the number of the clause, figure or table changed and the content remained the same. If a clause number is underlined in the Table of Contents it means updates were made to that clause; if only the word in the title is underlined it indicates only a title change.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS D17 Committee on Welding in the Aircraft and Aerospace Industries, American Welding Society, 8669 NW 36th Street, Suite 130, Miami, FL 33166.

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Specification for Resistance Welding for Aerospace Applications

1. General Requirements

1.1 Scope. This specification covers requirements for resistance spot and seam welding of the following metals and their alloys.

1.1.1 Material Groups

Group 1—Aluminum and magnesium

Group 2—Steel, nickel, and cobalt

Group 3—Titanium

1.1.2 Classification. All welds produced in accordance with this specification shall be classified on the engineering drawing or contract. Weld classifications shall be as follows: Class A, Class B, or Class C. These classifications refer to the qualification test requirements, level of inspection required, and to the applicable acceptance criteria. When specified on the engineering drawing, alternate testing requirements, acceptance criteria, and inspection methods take precedence. A part may contain weld joints with multiple classifications.

1.2 Units of Measure. 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 shall 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 as well as to meet applicable regulatory requirements. ANSI Z49.1 should be considered when developing the safety program.

1.4 Mandatory Provisions and Authority. Nothing in this specification supersedes applicable laws and regulations unless a specific exemption has been obtained prior to the contract date or as a contract amendment.

1.4.1 Mandatory Provisions. Most provisions of this specification are mandatory when the use of this specification is invoked. Certain provisions are optional and apply only when specified in contractual documents for a specific project. Guidance information is indicated by the words "should" or "may."

1.4.2 Drawing Authority. When requirements in this specification conflict with those on the engineering drawing, the requirements on the engineering drawing shall take precedence.

1.4.3 Specification Authority. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification takes precedence.

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.

AWS A3.0M/A3.0, *Standard Welding Terms and Definitions.*

AWS C1.1M/ C1.1, *Recommended Practices for Resistance Welding.*

AWS J1.2M/J1.2, *Guide to Installation and Maintenance of Resistance Welding Machines*.

ASTM E1742/E1742M, *Standard Practice for Radiographic Examination.*

3. Terms and Definitions

AWS A3.0M/A3.0, *Standard Welding Terms and Definitions*, provides the basis for terms and definitions used herein. However, the following terms and definitions are included below to accommodate usage specific to this specification.

clear annulus zone. The zone around the diameter of the nugget is termed the clear annulus zone and is shown at the sides of the nugget, Figure 10.4 (A) & (B).

clear penetration zone. The zones at the top and bottom of the nugget are termed clear penetration zones, see Figure 10.3(A), Figure 10.3 (B), Figure 10.3(C), and Figure 10.3(D).

close-spaced spot welds. Spot welds on sheet placed less than two diameters apart (D_S, as defined in Table 10.2), center to center.

customer. An individual or organization responsible for establishing the mission or design requirements of a product and provides some form of compensation for the delivery of the product. The product could be an engineering design, a structure, a system, or a weldment.

edge bulge crack. A split in the base metal between the edge of a sheet and a spot weld that occurs due to local deformation of the base metal when a spot weld is placed close to that edge, Figure 3.1.

Engineering Authority. The Engineering Authority is the organization that acts for and on behalf of the customer on all matters within the scope of this specification. The Engineering Authority is responsible for the integrity and airworthiness (when applicable) of the hardware and compliance with all contract documents.

fabricator. An organization responsible for producing weldments satisfying the design and contract requirements.

flash. Metal displaced from the joint by expulsion at the faying surface or electrode contact surfaces.

foil. A material with a thickness of 0.008 in [0.2 mm] or less.

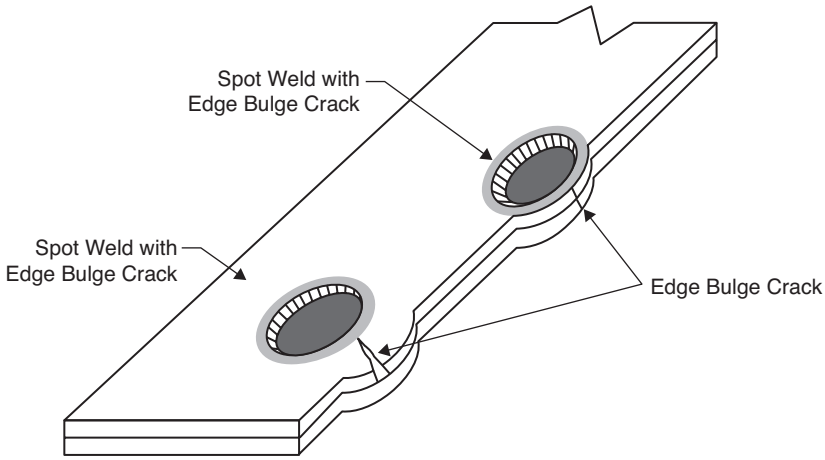


Figure 3.1—Edge Bulge Crack

incipient melting (coring). Localized melting and resolidification of material in the weld nugget or the heat affected zone. Incipient melting areas appear to be cracks when examined at low magnification, but when examined carefully or at higher magnifications, are seen to be completely filled.

metallographic section. A test specimen removed from a welded coupon that is cut across the diameter of a spot weld or across a seam weld, or a longitudinal cut along the center of a seam weld. The test specimen is then polished to the center of the weld and etched to accentuate the metallographic structure.

nugget. The weld (fused) metal joining the parts in spot or seam welds.

penetration. The distance a nugget extends into the thickness of a joined member.

production lot. Parts of the same configuration welded consecutively with the same welding schedule and machine setup.

production witness specimen. Test coupon welded using production setup and destructively tested to provide data on the quality of production welds.

resistance weld size. The diameter of a spot weld nugget or the width of a seam weld nugget measured at the plane of the faying surfaces.

sheet. A material with a thickness of more than 0.008 in through 0.250 in [0.20 mm through 6.35mm].

welding conditions. Variables and factors that may impact the weld quality including: material conditions, configuration, material preparation, electrode shape, machine number, and all weld parameters. Suggested forms for documentation are found in Annex A and Annex B.

welding parameters. Machine settings or adjustments, such as, but not limited to, weld current, weld time, and electrode force.

wire mesh. A metallic woven fabric or cloth.

wire mesh aperture. The open space between wires of a woven mesh.