D8.14M:2026
An American National Standard

Specification for Automotive Weld Quality—Arc Welding of Aluminum

American Welding Society®

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D8.14M:2026
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Approved by the
American National Standards Institute
March 23, 2026

Specification for Automotive Weld Quality—Arc Welding of Aluminum

4th Edition

Revises AWS D8.14M:2017

Prepared by the
American Welding Society (AWS) D8 Committee on Automotive Welding

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification covers the arc welding of automotive components that are manufactured from aluminum alloys.

American Welding Society®

ISBN Print: 978-1-64322-459-6
ISBN PDF: 978-1-64322-460-2
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Foreword

TThis foreword is not part of this standard but is included for information purposes only.

This specification revises D8.14M:2008, *Specification for Automotive Weld Quality—Arc Welding of Aluminum*, and was revised and enhanced by the D8C Subcommittee on Automotive Arc Welding of the AWS D8 Committee on Automotive Welding. This edition makes sole use of the International System of Units (SI).

Recent changes in automotive design caused by the desire to reduce fuel consumption have resulted in new automotive structures being made of aluminum. This specification was undertaken to prepare minimum standards for manual, automatic, and robotic arc welding of aluminum components associated with the body and supporting structural members, such as, but not limited to: battery enclosures, body panels, bumpers, frames, space frames, cradles, wheels, drive shafts, and suspensions.

One objective of the committee was to prepare a specification that could be used by smaller suppliers of automotive components, who generally have no standards of their own for minimum arc welding quality.

All revisions to the 2017 edition are identified by a vertical line in the margin next to the text or an underline. The first edition of AWS D8.14M was printed in 2000.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS D8 Committee on Automotive Welding, American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33166.

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Specification for Automotive Weld Quality—Arc Welding of Aluminum

1. General Requirements

1.1 Scope This specification describes weld geometry and workmanship criteria essential to ensure acceptable quality of automotive and light truck weldments. This specification covers the arc and hybrid arc welding of aluminum alloys.

1.2 Units of Measurement This standard makes sole use of the International System of Units (SI).

1.3 Safety Safety issues and concerns are addressed in this standard, although health issues and concerns are beyond the scope of this standard. 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

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. 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.

AWS documents:

AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*;

AWS 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*;

AWS A5.10/A5.10M (ISO 18273 MOD) *Welding Consumables—Wire Electrodes, Wires and Rods for Welding of Aluminum and Aluminum Alloys-Classification*

AWS A5.32M/A5.32 (ISO 14175 MOD) *Welding Consumables—Gases and Gas Mixtures for Fusion Welding and Allied Processes*

AWS B2.1/B2.1M, *Specification for Welding Procedure and Performance Qualification*

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 document. As used in this specification, the word *shall* denotes a requirement, the word *should* denotes a guideline, and the word *may* denotes a choice. For the purposes of this document, the following definitions apply:

discrepant weld. A weld differing from the requirements of this standard. Even though this weld differs, it still may have useful engineering properties.

effective weld length. The weld length measured along the portion of a weld, whether straight or curved, that meets all the minimum acceptance requirements of the specification.

gap. The distance between two base components of the joint to be welded (see Figure 7). Note: AWS A3.0M/A3.0, *Standard Welding Terms and Definitions Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*, refers to gap as "a nonstandard term when used for root opening".

notching. A weld-heat-related burn back of material at the end of the joint, resulting in a notch (see Figure 2).

skip. An unwelded portion of a designated weld (see Figure 1).

suck-back. A concave surface on the side of the base metal opposite the point of weld metal application. This is illustrated in Figures 3 and 4. Note: AWS A3.0M/A3.0, *Standard Welding Terms and Definitions Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*, refers to suck-back as "a nonstandard term when used for underfill at the root surface".

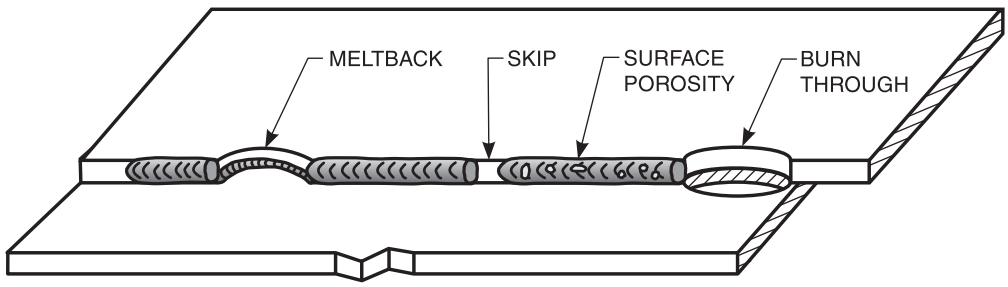


Figure 1—Examples of Discontinuities Found in Arc Welds

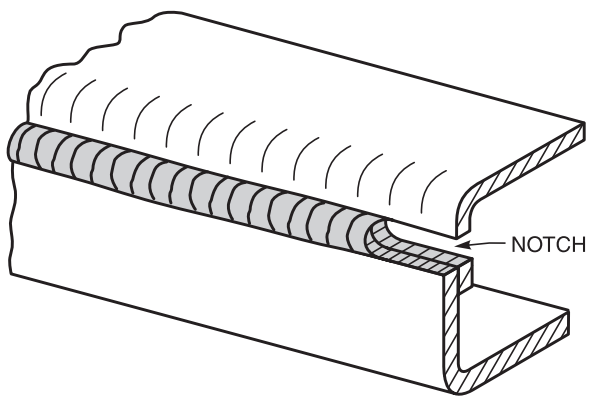


Figure 2—Example of Notching at the End of a Weld