

AWS D16.4M/D16.4:2025
An American National Standard

Specification for the Qualification of Robotic Arc Welding Personnel



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Specification for the Qualification of Robotic Arc Welding Personnel

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Prepared by the
American Welding Society (AWS) D16 Committee on Robotic and Automatic Welding

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification provides requirements for the qualification of robotic arc welding personnel at three different classifications—Associate Technician (AT), Technician (T), and Engineer (Eng).



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This standard is subject to revision at any time by the AWS D16 Committee on Robotic and Automatic Welding. It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn.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 D16 Committee on Robotic and Automatic Welding 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 D16 Committee on Robotic and Automatic Welding 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.

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Foreword

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

The AWS D16 Committee on Robotic and Automatic Welding was organized in 1985 to provide a centralized source for the exchange of technical information between manufacturers, installers, and operators of robotic and automated equipment.

The first edition of AWS D16.4 (AWS D16.4:1999, *Specification for the Qualification for Robotic Arc Welding Personnel*) provided guidelines for the qualification of arc welding personnel. The second edition (AWS D16.4M/D16.4:2005) included revisions based on the experience of the certification program for robotic arc welding personnel. The third edition reduced the levels of qualification from four to three and aligned education and experience requirements more realistically with those in industry.

The third edition changed the levels of qualification to Level 1—Certified Robotic and Automated Welding Operator (CRAW-O), Level 2—Certified Robotic and Automated Welding Technician (CRAW-T), and Level 3—Certified Robotic and Automated Welding Engineer (CRAW-E) from the second edition's qualification designations of Level 1—CRAW-L1, Level 2—CRAW-O, and Level 3—CRAW-T. Those certified under the second edition certification level designations were grandfathered into the corresponding third edition level designation.

The third edition also included changes to the figures from the second edition. Figures 1 and 2 were revised and Figure 3 removed.

The fourth edition changes the levels of qualification and titles to Level 1—Certified Robotic and Automated Welding Associate Technician (CRAW-AT), Level 2—Certified Robotic and Automated Welding Technician (CRAW-T), and Level 3—Certified Robotic and Automated Welding Engineer (CRAW-Eng) from the third edition's qualification designations of Level 1—CRAW-O, Level 2—CRAW-T, and Level 3—CRAW-E. An additional figure on suggested areas for cross-sections was added. A vertical line in the margin or underlined text in clauses, tables, or figures indicates an editorial or technical change from the 2015 edition.

The requirements for certification of Robotic Arc Welders are located in the QC19 document.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS D16 Committee on Robotic and Automatic Welding, American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Specification for the Qualification of Robotic Arc Welding Personnel

1. General Requirements

1.1 Scope. This standard provides requirements for the qualification of robotic arc welding personnel. This standard does not prevent a manufacturer, fabricator, or contractor from continuing to qualify robotic welding personnel according to other standards.

Qualification is limited to those performance variables provided in Tables 1 through 4 in this standard. There are three different levels in which qualification can be achieved. The three levels and acronyms are Level 1—Certified Robotic and Automated Welding Associate Technician (CRAW-AT), Level 2—Certified Robotic and Automated Welding Technician (CRAW-T), and Level 3—Certified Robotic and Automated Welding Engineer (CRAW-Eng).

1.2 Units of Measurement. This standard makes use of both the International System of Units (SI) and U.S. Customary Units. 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; some safety and health information is provided, but such issues are not fully 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.

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.