AWS QC47:2016-AMD3

Specification for AWS Certification of Welders and Accreditation of Test Facilities



American Welding Society®

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Specification for AWS Certification of Welders and Accreditation of Test Facilities

1st Edition

Revises AWS QC47:2016-AMD1

Prepared by the
American Welding Society (AWS) Subcommittee on Welding Test Facilities and Welders

Under the Direction of the
AWS Qualification and Certification Committee

Approved by the
AWS Board of Directors

Abstract

This specification describes a program administrated by the American Welding Society (AWS) for accreditation of test facilities used to perform welder qualification and testing for the certification of welders. The AWS Certified Welder Program provides a means for the transference of welder qualifications from employer to employer without retesting. This specification defines the minimum requirements for welder participation in the program and the methods to be used by employers for adopting the program. This specification defines the minimum requirements for welder participation in the program and the methods to be used by employers for adopting the program.

American Welding Society®

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Foreword

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

The American Welding Society (AWS) Certified Welder Program was established to identify all elements necessary to implement an AWS National Registry of Certified Welders. Five key elements are identified:

(1) Welder Performance Qualification Standards Criteria

(2) AWS B2 Standard Welding Procedure Specifications

(3) Accredited Performance Qualification Test Facilities

(4) Accredited Custom Programs

(5) AWS Welder Certification Requirements

The purpose of AWS QC47, *Specification for AWS Certification of Welders and Accreditation of Test Facilities*, is to establish that Welder Performance Qualification Test Facilities have the personnel, organization, experience, procedures, knowledge, equipment, capability, and commitment to conduct proper welder performance qualification testing. This specification describes the requirements and functions of the test facility and custom programs to achieve AWS QC47 accreditation and defines the responsibilities of the test facility and AWS. The purpose of the AWS National Registry of Certified Welders is to document the ability of welders to deposit sound welds and to impose controls on the documentation and maintenance of certification.

AWS QC47:2016, *Specification for AWS Certification of Welders and Accreditation of Test Facilities* combined AWS QC4, *Standard for Accreditation of Test Facilities for AWS Certified Welder Program* and AWS QC7, *Standard for AWS Certified Welders*, and revisions include major changes in the format of the combined documents. This specification superseded AWS QC4 and AWS QC7 and all its supplements.

AWS QC47:2016-AMD2 contains the criteria for the AWS National Registry of Certified Welders and AWS Certified Welder Custom Programs. Public listing or disclosure is the option of the individual welder. In many cases, this specification shall allow the transfer of a welder qualification from employer to employer. This potential transfer of welder qualifications may result in financial savings for the welding industry. Underlined text in the clauses, subclauses, tables, figures, or forms indicates a change from AWS QC47:2016-AMD1.

AWS QC47:2016-AMD3 amended the requirements for logging and tracking qualification maintenance. Underlined text in 8.3.1 indicates a change from AWS QC47:2016-AMD2.

The evolution of AWS QC47, *Specification for AWS Certification of Welders and Accreditation of Test Facilities*, is shown below:

AWS QC4	*Standard for Accreditation of Test Facilities for AWS Certified Welder Program*
AWS QC7	*Standard for AWS Certified Welders*
AWS QC47:2016	*Specification for AWS Certification of Welders and Accreditation of Test Facilities*
AWS QC47:2016-AMD1	*Specification for AWS Certification of Welders and Accreditation of Test Facilities*
AWS QC47:2016-AMD2	*Specification for AWS Certification of Welders and Accreditation of Test Facilities*
AWS QC47:2016-AMD3	*Specification for AWS Certification of Welders and Accreditation of Test Facilities*

Comments and suggestions for the improvement of this specification are welcome. They should be sent to the Managing Director, AWS Certification Department, American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

Table of Contents

Page No.

Personnel v
Foreword vii

1. General Requirements 1
1.1 Scope 1
1.2 Program 1
1.3 Other Requirements 1
1.4 Safety 2

2. Normative References 2

3. Terms and Definitions 3

4. Welders—General Responsibilities 4

5. Employers of AWS Certified Welders—Responsibilities 5

6. AWS—General Responsibilities 5

7. Accredited Test Facility (ATF)—General Responsibilities 5

8. Welders—Specific Requirements of AWS National Registry of Certified Welders 6
8.1 AWS Welder Credentials 6
8.2 Suspension and Revocation of Credentials 6
8.3 Certification Maintenance 6

9. AWS—Specific Requirements 6

10. ATF—Specific Requirements 6
10.1 ATF Quality Management System 6
10.2 ATF Personnel 8
10.3 ATF Equipment 8
10.4 ATF Material Control 9
10.5 ATF—Conducting the Test 10

11. Accreditation of Test Facilities 10
11.1 General 10
11.2 Application Requirements 11
11.3 Audit 11
11.4 Reporting 11
11.5 Granting Accreditation 12

12. Accreditation Appeals Procedure 12

13. Maintaining Accreditation 12
13.1 Period 12
13.2 Annual Report 12
13.3 Expiration 12
13.4 Errors and Omissions 12

14. Revocation of Accreditation 12
14.1 Complaints 12

Page No.

14.2 Disciplinary Actions 12
14.3 Enforcement 13

15. Reinstatement of Accreditation 13

16. Custom Programs 13
16.1 AWS Responsibilities 13
16.2 Program Owner Responsibilities 15
16.3 AWS Qualification and Certification Committee Responsibilities 15
16.4 Post Onsite Audit Process 15
16.5 Mandatory Requirements for Custom Programs 15

17. AWS Mandatory Administrative Forms 15

Annex A (Normative)—Procedure for the Use of Alternative Welding Procedure Specifications for Welder Qualification other than AWS B2 AWS SWPSs 17

Annex B (Informative)—Requesting an Official Interpretation on an AWS Standard 19

List of AWS Documents on Qualification and Certification 21

Specification for AWS Certification of Welders and Accreditation of Test Facilities

1. General Requirements

1.1 Scope. This specification describes the accreditation of AWS Accredited Test Facilities (ATF); the testing of welders; and the certification of welders desiring to be listed in the AWS National Registry of Certified Welders (NRCW). The Program establishes the controls and methods to maintain an AWS NRCW. This specification supersedes AWS QC4, *Standard for Accreditation of Test Facilities for AWS Certified Welder Program*, and AWS QC7, *Standard for AWS Certified Welders* and all its supplements. The elements of this program establish requirements for:

(1) Certified Welders

(2) Accredited Test Facilities

(3) Qualifiers

Users wishing to set up welder test facilities not leading to AWS accreditation are advised to consult AWS B5.4, *Specification for the Qualification of Welder Test Facilities*. Users wishing to obtain AWS accreditation as an AWS ATF and certify welders for entry into the AWS NRCW shall meet the requirements of this specification.

ATFs accredited to QC47 will have a scope of testing that covers the four basic arc welding processes in compliance with relevant American codes and standards (AWS, ASME, API, etc.). Additionally, ATFs applying for accreditation may choose to extend the scope of testing to include other processes and testing methods by documentation and/or demonstration of the ATF's capabilities in those processes or testing methods. Users of this specification who seek to extend the scope of testing are required to contact the AWS Accreditation Department for specific requirements.

1.2 Program. This specification shall be used by welders, qualifiers, Certified Welding Inspectors (CWI), Senior Certified Welding Inspectors (SCWI), employers, non-destructive examination (NDE) technicians, and AWS Accredited Test Facility personnel to recognize and implement their responsibilities in the program.

Certification under the AWS Certified Welder Program for inclusion in the NRCW shall be conducted using AWS B2 Standard Welding Procedure Specifications (SWPSs) or an alternative Welding Procedure Specification (WPS), as described in Annex A. Performance testing methods and visual acceptance criteria are derived from the governing standard chosen by the candidate or candidate's employer. It is the responsibility of the candidate or candidate's employer to select the SWPS and governing standard that is suitable for the work planned for production.

When no governing standard is specified, the performance testing method and acceptance criteria shall be selected from the current revisions of AWS B2.1, *Specification for Welding Procedure and Performance Qualification.*

Participants (ATFs and qualifiers) in this program conduct performance qualification tests that can result in certification in the AWS Certified Welder Program. Participants in this program may also conduct performance qualification tests that do not result in certification in the AWS Certified Welder Program.

1.3 Other Requirements. This specification shall be used for all welder performance testing conducted by the AWS Accredited Test Facility for welders that will be entered into the NRCW. In situations where the AWS ATF is requested to conduct welder performance testing in accordance with programs that have requirements different from this specification, the requirements of this specification may be waived. In all such circumstances, the ATF bears the responsibility for establishing that all variations comply with the published requirements of the governing standard and are included in the ATF's quality manual.

1.4 Safety. Safety and health issues and concerns are beyond the scope of this standard and therefore are not addressed herein. It is the responsibility of the user to establish appropriate safety and health practices. 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 done in conformance with this specification may involve materials that are classified as hazardous. The user should determine the applicability of any regulatory limitations prior to use.

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:

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

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

AWS B2, *Standard Welding Procedure Specifications (SWPSs)*

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

AWS B4.0, *Standard Methods for Mechanical Testing of Welds*

AWS B5.4, *Specification for the Qualification of Welder Test Facilities*

AWS D1.1/D1.1M, *Structural Welding Code—Steel*

AASHTO/AWS D1.5, *Bridge Welding Code*

AWS QC1, *Specification for AWS Certification of Welding Inspectors*

AWS QC9, *Administrative Procedures for Alleged Violations of AWS Certification Programs*

ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*

AWS *Best Practices for Performing a Welder Qualification Test*

American Petroleum Institute (API) standard:

API 1104, *Welding of Pipelines and Related Facilities*

American Society of Mechanical Engineers (ASME) standard:

ASME Boiler and Pressure Vessel Code, Section IX: *Welding, Brazing, Qualifications and Fusing*

American Society for Nondestructive Testing (ASNT) standard:

ASNT SNT-TC-1A, *Personnel Qualification and Certification in Nondestructive Testing*

ASTM International standard:

ASTM E94, *Standard Guide for Radiographic Examination*

International Organization for Standardization (ISO) standard:

ISO 19011, *Guidelines for Auditing Management Systems*

3. Terms and Definitions

Terms used in this specification are defined in AWS A3.0, *Standard Welding Terms and Definitions (*current edition). Terms applicable to auditing shall be as defined in ISO 19011, *Guidelines for Auditing Management Systems* (current edition). As used in this specification, the word **shall** denotes a requirement; the word **should** denotes a guideline; and the word **may** denotes a choice. The following terms are not found in AWS A3.0, *Standard Welding Terms and Definitions*, or are modified for the purposes of this certification specification:

acceptance criteria. Specified limits placed on characteristics of an item, process, or service as defined in governing welding standards or other contract documents.

accreditation. Official certification that a school or course has met standards set by external regulators.

Accredited Custom Program. An organization that owns and maintains direct oversight and responsibility of the Custom Program with the endorsement of AWS.

Accredited Test Facility (ATF). A facility that applies to AWS and receives accreditation. An Accredited Test Facility may be a laboratory that does not perform welder qualification testing.

AWS Certified Welder. A welder who meets the requirements of QC47 for welder performance qualification.

AWS National Registry of Certified Welders. A database of welders who have successfully passed a performance qualification test in accordance with this specification and who have met all requirements for maintenance of certification. Access to information in the AWS National Registry of Certified Welders may provide for the acceptance of welder proficiency from employer to employer.

Certificate of Conformance (COC). A document attesting that a base or filler metal is manufactured in accordance with industry-recognized requirements.

certification. The act of determining, verifying, and attesting in writing to the qualification of personnel in accordance with specified requirements.

electronic signature. An electronic identifier that is created by a computer and is intended by the party using it to have the same intent, effect, and authority as the use of a manual (either written or facsimile) signature.

facility manager. An individual(s) designated by the ATF who can make legally binding commitments and statements on behalf of the ATF.

facility representative. An individual(s) designated by the ATF, who is a manager with administrative responsibility for the ATF and is also responsible for the direction and implementation of all the requirements defined in this certification specification for the ATF.

governing standard. The industry standard that is selected and used to determine the specific test method and acceptance criteria for visual inspection and NDE of test coupons. A standard may be a code, specification, recommended practice, method, classification, or guide. Some common choices are AWS D1.1, *Structural Welding Code—Steel*, AWS D1.5, *Bridge Welding Code*, API 1104, *Welding of Pipelines and Related Facilities* and ASME *Boiler and Pressure Vessel Code*, Section IX: *Welding, Brazing, Qualifications and Fusing*.

inspection. Examination or measurement to verify whether an item or activity conforms to specified requirements.

inspector. An individual performing activities to verify conformance to specification requirements.

Material Test Report (MTR). A document provided by the supplier indicating the material conforms with the requirements of the standard or specification referenced by the purchase order. The MTR typically lists the acceptable

ranges of the elements present and the acceptable ranges for the mechanical properties, e.g., ultimate tensile strength, yield strength, elongations, hardness, etc. as specified by the applicable material specification. The chemistry and the mechanical properties listed on the MTR are specific to a particular heat number or the specific material delivered.

program owner. The organization that owns and maintains direct oversight and responsibility of the Custom Program with the endorsement of AWS.

qualifier. A CWI or SCWI who has successfully passed the AWS Welder Performance Qualifier Endorsement, and employed or contracted by the ATF, who is considered qualified to conduct welder qualification tests.

quality manager. An individual designated by the ATF to be responsible for quality management system compliance by maintaining documentation, document control, quality policies, procedures, processes, programs, and practices to assure the ATF's continuous conformance with the QC47.

quality procedure. Documentation of how a particular operation is performed.

quality record. Documentation providing evidence that activities have been performed or results have been achieved.

routing sheet. A document used by qualifiers to capture test information and provide consistent sequential test information to the test candidate, including a sequential list of mandatory hold points where the qualifier must indicate acceptance before the qualification process proceeds.

test. The overall activity leading to the qualification of an individual as an AWS Certified Welder.

test candidate. A person who is applying to be certified or qualified as a welder in accordance with the requirements of QC47.

verification. The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, and documents conform to specified requirements.

welder. One who performs manual, semiautomatic, mechanized, or automatic welding. The term welder as used in this document also refers to operators, brazers, and plastics welders.

Welder Performance Qualifier Endorsement. A unique endorsement to the AWS QC1 Program that tests the CWI or SCWI's knowledge and capability of conducting welder performance qualification tests.

Welding Procedure Qualifier Endorsement. A unique endorsement to the AWS QC1 Program that tests CWI or SCWI's knowledge and capability to qualify welding procedure specifications.

4. Welders—General Responsibilities

Welders shall:

(1) Complete the application using accurate information.

(2) Be aware and agree to the applicable welding code/standard, process, test description, WPS, type of qualification test to be administered, and the applicable visual acceptance criteria.

(3) Provide government-issued picture identification at the time of the welding test.

(4) Arrive at the ATF or test site properly attired and with appropriate tools and personal protective equipment (PPE) to take the test.

(5) Be prepared to follow the applicable WPS and all directions given by the qualifier.

(6) Complete the assigned task to the best of their ability.

(7) Conduct all operations in a safe manner and bring to the attention of the qualifier any issues related to safety or the conduct of the performance test. Be prepared to take a welder performance qualification test.

(8) Safeguard all credentials that are issued.

(9) Maintain the continuity requirements and other program requirements.