

AWS QC 3-89

Standard for AWS Certified Welders

Keywords — AWS Certified Welders
Welders
Welder Certification
Welder Qualification

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Standard for AWS Certified Welders

Prepared by
AWS Qualification and Certification Committee

Under the Direction of
AWS Education and Certification Council

Approved by
AWS Board of Directors
October 31, 1989

Abstract

This Standard describes a program administrated by the American Welding Society (AWS) for the certification of welders. The AWS Certified Welder Program allows for the transference of welder qualification from employer to employer without retesting. The standard establishes the minimum requirements for welder participation in the program and the methods to be used by employers for adopting the program.



American Welding Society

550 N.W. LeJeune Road, Miami, Florida 33126

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International Standard Book Number: 0-87171-341-1

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This Standard is subject to revision at any time by the AWS Qualification and Certification Committee. It must be reviewed every five years and if not revised, it must be either reapproved or withdrawn. Comments (recommendations, additions, or deletions) and any pertinent data that may be used in improving this Standard are requested and should be addressed to the Director, Qualification and Certification Department, American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126. Such comments will receive careful considerations by the AWS Qualification and Certification Committee and the author of the comments. Guests are invited to attend all meetings of the AWS Qualification and Certification Committee 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 Qualification and Certification Committee. A copy of these Rules can be obtained from the American Welding Society, 550 N.W. LeJeune Road, Florida 33126.

Personnel

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*Advisory Member

Foreword

(This Foreword is not a part of the AWS QC 3, *Standard for AWS Certified Welders*, but is included only for information).

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

- (1) Welder performance qualification standards.
- (2) Standard welding procedure specifications.
- (3) Accredited performance qualification test facilities.
- (4) AWS welder certification requirements.

This Standard contains the criteria for AWS Certified Welder Program and the AWS National Registry of Welders. Public listing or disclosure is at the option of the individual welder. It is expected that all four elements outlined above will allow the transfer of welder qualification from employer to employer. This potential transfer of welder qualification can effect financial savings to the welding industry.

The purpose of this Standard for AWS Certified Welders is:

- (1) to determine the ability of welders to deposit sound welds in accordance with standardized requirements.
- (2) to impose sufficient controls on the documentation and maintenance of certification to allow transfer between employers without requalification, where allowed by Standard or Contract documents.

Dedication. The Q&C Committee dedicates the publication of this Standard to Dalton E. Hamilton and Charla S. Cardoni. At the time of his death in May, 1988, Dalton Hamilton was the Chairman of the Q&C Committee. His efforts, clear thinking, ability to find consensus and tireless work contributed significantly to the Q&C Committee. At the time of her death in December, 1988, Charla Cardoni was the Special Assistant to the AWS Executive Director. From 1982 to September, 1988, she was the Director of the AWS Q&C Department. Her business management training and experience brought a sense of direction and order that contributed significantly to the AWS certification programs.

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AWS QC 3-89

Standard for

AWS Certified Welders

1. Scope

1.1 Program. The rules for American Welding Society (AWS) Certified Welder Program and the requirements for maintenance of certification are provided in this Standard. This Standard also requires the use of accredited test facilities for qualification testing.

1.2 Exclusion. This Standard does not prevent a manufacturer, fabricator, or contractor from continuing to qualify welders in accordance with other Standards. Employers may impose additional requirements in addition to this Standard, as they deem necessary.

1.3 Limitation. Welders participating in the American Welding Society Certified Welder Program shall be limited to those welding variables provided in the applicable Supplements.

1.4 Safety Precautions. Safety precautions shall conform to the latest edition of ANSI/ASC Z49.1-88, *Safety in Welding and Cutting*, published by the American Welding Society.

2. Definitions

Terms used in this Standard are defined in ANSI/AWS A3.0-88, *Standard Welding Terms and Definitions*, and as follows:

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

applicant. An individual who makes application to AWS for certification.

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

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

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

inspector. A person who performs inspection activities to verify conformance to specific requirements.

NDE Level III. An individual who has been qualified and certified by their employer to function as a Level III within the limits as outlined in the ASNT, Recommended Practice, SNT-TC-1A, and their companies written practice. Copies of SNT-TC-1A may be obtained from:

American Society for Nondestructive Testing
4153 Arlingate Plaza
Columbus, Ohio 43228
1-800-222-2768

Q&C Committee. The Qualification and Certification Committee of the American Welding Society (address correspondence to: Qualification and Certification Department, AWS, 550 N.W. LeJeune Road, Miami, Florida 33126).

Q&C Department. The AWS Qualification and Certification Department, American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126.

testing. An element of verification for the determination of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions.

test supervisor. An AWS Certified Welding Inspector (CWI) designated by the Accredited Test Facility.

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

welder. One who performs a manual or semiautomatic welding operation.

welder performance qualification. The demonstration of a welder's ability to produce welds meeting prescribed standards.

other guidelines. As used in this Standard, the word **should** denotes a guideline; the word **shall** denotes a requirement; and the word **may** denotes a choice.

3. Acceptance of AWS Certified Welders by Employers

3.1 Review. Companies employing AWS certified welders should review the requirements of this Standard, the welder identification/qualification limits and check the welder identification with Q&C Department for current status. The employers shall maintain a record of the certification(s) accepted (See Form QC-WF2) as a minimum during the period the welder is employed.

3.2 Responsibility. The employers of AWS Certified Welders are responsible for the work performed by the employees. The employers may accept the AWS certification without additional testing or may add requirements they feel are necessary to meet a specific need.

4. Test Facilities

4.1 Test Facility Accreditation. Each test facility shall be accredited by the AWS designated third-party assessment agency prior to performing welder qualification tests under this Standard. The process of accrediting test facilities is defined in AWS Standard QC 4-89, *Accreditation of Test Facilities* for AWS Certified Welder Program.

4.2 Selection. The list of accredited test facilities shall be provided by AWS. The specific date and time for testing shall be established by the Test Supervisor with the applicant. The accredited test facility shall designate the Test Supervisor.

4.3 Restriction. To minimize any appearance of conflict of interest, an applicant shall not be tested by a Test Supervisor who conducted or was responsible for training the applicant. Testing at the applicant's current employment location is allowed only if their test facility is accredited by the third-party assessment agency as a function independent from training, fabrication, manufacturing, or construction operation(s).

5. Certification Requisites

5.1 Application. An application (See Form QC-WF4) for AWS certification as a welder shall be completed for tests in the Supplement for which certification is desired. The applicant shall have photographic identification such as a driver's license or similar identity document that has the photograph as an integral part of the document.

5.2 Eye Examination. Each applicant shall pass a visual acuity examination prior to testing for certification, and to recertification, with or without corrective lenses, to prove:

(1) near-vision acuity on Snellen English or equivalent, at twelve inches; and

(2) Far-vision acuity of 20/40 or better

Eye examinations shall be administered by an Optometrist, Physician, Registered Nurse, Certified Physician's Assistant, or a current qualified and certified NDE Level III. Eye Examination results shall be submitted to the Test Facility prior to testing. Eye examination shall not be administered more than six months prior to the certification or recertification date, as applicable (See Art. 11. for recertification eye examination requirements).

5.3 Weld Test. Each applicant shall pass the test described in the Supplements for which the application has been made. Each applicant shall comply with all requirements of the Supplements, applicable to welding of the test assembly, under the direction of the Test Supervisor (See Art. 7.). The Test Supervisor at the test facility shall be provided with the applicant's Performance Qualification Test Record form(s) and completed application.

6. Identification/Certification Documents

6.1 Cards. The applicant upon successful certification shall be issued an identification/qualification limits card encased in plastic. The identification/qualification limits card shall be used to identify certified welders and their limits of certification.

6.2 Card Care. The welder identification/qualification limits card issued by AWS shall be preserved in good condition by the welder. The cards are the property of the AMERICAN WELDING SOCIETY and shall be returned on demand. Should the card become illegible, a new one shall be requested. The welder shall, as soon as possible after it is discovered, report lost or stolen cards to the Q&C Department.

Evidence of tampering with the card shall require return of the card to the Q&C Department for examination and a subsequent investigation and may result in suspension, revocation of qualification, or a requirement of requalification, depending upon circumstances and the explanation provided with return of the card.

7. Test Requirements

7.1 Identification. The applicant shall be assigned an identification letter, symbol or number coded to his social security number, and this identification shall be used by the test facility for the identification of test materials and records.

7.2 Verification. Prior to the initiation of welding the applicant's identification shall be checked by the Test Supervisor against the photograph of the applicant's driver's license or similar identity document.

7.3 Safety Equipment. The applicant shall use personal safety equipment applicable for the welding process. The safety requirements of the accredited test facility shall be followed by the welder and shall conform to the requirements of ANSI/ASC Z49.1.

7.4 Eye Correction. When eye correction is required, the applicant shall use the eye correction during the qualification test. Eye correction may be provided by eyeglasses, contact lenses or by corrective lenses incorporated into the welding helmet.

7.5 Material Check. The base material and filler metal identifications shall be checked by the Test Supervisor at the time of tack welding and prior to the initiation of joint welding.

7.6 Fit-up. The applicant shall prepare the specified test assembly for welding in accordance with the appropriate Supplement, and under the direction of the Test Supervisor. Tack welds shall be placed in locations specified by the Test Supervisor.

7.7 Assembly Control. The Test Supervisor shall witness placing of the test assembly in the specified welding position and shall mark the test assembly or secure it such that it remains in the specified position until welding has been completed.

7.8 Positioning. All cleaning, grinding, chipping of slag or other in-process operations shall be performed with the test assembly in the specified welding position. Evidence of removal of the test assembly or movement from the original location, except by accidental means (subject to concurrence by the Test Supervisor) shall be cause for test termination.

8. Documentation of Welder Performance Qualification

8.1 Reporting. All welder performance qualification tests that have met the specified requirement, shall be documented on the Welder Performance Qualification Record (See Form QC-WF1) supplied by the Q&C Department.

8.2 Eye Correction. When eye correction is required, the type of eye correction used shall be reported.

8.3 Record Verification. Each Welder Performance Qualification Record shall be signed and dated by the Test Supervisor and the "facility representative" of the accredited test facility.

9. Retests

If an applicant fails to meet the requirements of one or more test welds, a retest may be allowed by the Test Supervisor, under either of the conditions in Article 9.1 or 9.2. Completed reports of successful tests are to be sent to AWS Q&C Department.

9.1 Immediate. An immediate retest may be made consisting of two test welds of each type and position that the welder failed. All retest specimens shall meet all the specified requirements.

9.2 Delayed. If an applicant has had further training or practice, a SINGLE retest may be provided. A complete retest of the types of welds and positions failed shall be made. The retest shall be completed within 30 calendar days of the original failure. If retesting is not completed within 30 days, the applicant is required to completely reapply.

10. Period of Effectiveness

The AWS certification of a welder shall be effective for a period of one year from the date of certification. Prior to the end of the certification period, the application for recertification may be made as follows:

- (1) By testing in accordance with Art 7., OR
- (2) By submitting Form QC-WF3 (See Art. 11.) attesting to having welded satisfactorily in each six month period of the one year with the process(es).

11. Maintenance of Certification

The Maintenance of Welder Performance Qualification record (See Form QC-WF3) and an Eye Examination Record (Form QC-WF5) shall be submitted by the

welder to the Q&C Department at least three weeks prior to expiration of certification. The Maintenance and Certification Record shall be certified by the employer(s) as to the dates listed or by an accredited test facility, if based on a test. An annual eye examination is required in order to maintain certification (See Form QC-WF5)

12. Renewal of Certification

When a welder's certification has expired, renewal of qualification for each specific welding process may be made in a single test weld (plate or pipe) of any thickness, position and material included in a WPS previously used for qualification and for which the acceptance standards were met. Testing shall be accomplished and verified by

an Accredited Test Facility. The renewal test shall be completed before one year has elapsed after the certification expired.

13. Revocation

The Q&C Committee has the authority to refuse, suspend, refuse renewal, or revoke a welder's certification for due cause. The methods to be used by the Q&C Department and Q&C Committee in proceeding with revocation action are defined in the ADMINISTRATIVE PROCEDURES FOR WELDER DECERTIFICATION. Copies of the procedures are available on request from the Q&C Department.

AWS QC-3

PERFORMANCE QUALIFICATION TEST RECORD

Eye correction required Yes ☐ No ☐Type of Eye Correction: Eye glasses ☐
Contact lenses ☐
Magnifiers ☐

Name _____ Social Security # _____

Welder ☐ Operator ☐

Qualified with AWS WPS No. _____ Supplement No. _____ Test No. _____

Process(es) _____ Manual ☐ Semi-Automatic ☐ Automatic ☐ Machine ☐

Test base metal specification _____ To _____

Material number (M or P Number) _____ To _____

Shielding Gas _____ Flow Rate _____

AWS filler metal classification _____ F no _____ Size _____

Backing Yes ☐ No ☐Consumable Insert Yes ☐ No ☐Double Welded ☐ or Single Welded ☐Short circuiting arc (GMAW) Yes ☐ No ☐Current AC ☐ DC ☐Back Purging Yes ☐ No ☐Test resultsVisual test results Pass ☐ Fail ☐Radiographic test results NA ☐ Pass ☐ Fail ☐Bend test results NA ☐ Pass ☐ Fail ☐

PROCESS(es) QUALIFIED FOR _____

POSITION(s) QUALIFIED FOR:

Groove:Pipe 1G ☐ 2G ☐ 5G ☐ 6G ☐ 6GR ☐ (T) Min _____ Max _____ Diameter _____ Range _____Plate 1G ☐ 2G ☐ 3G ☐ 4G ☐ (T) Min _____ Max _____Consumable Insert ☐ Backing type ☐**Fillet:**Pipe 1F ☐ 2F ☐ 4F ☐ 5F ☐ (T) Min _____ Max _____Plate 1F ☐ 2F ☐ 3F ☐ 4F ☐ (T) Min _____ Max _____Vertical Up ☐ Down ☐ Weld Deposit Min _____ Max _____Single side ☐ Double side ☐

The above named person is qualified for the welding process(es) used in this test within the limits of essential variables shown above, including materials and filler metal variables of the AWS Standard for welder certification and _____ Code or Standard. I hereby certify that I was not involved in the training of the above named individual as a welder:

Date Tested _____ Signed by _____
Test Supervisor

AWS CWI No. _____

Signed by _____
Corporate Representative Title

Form QC-WF1—Performance Qualification Test Record

COMPANY ACCEPTANCE OF AWS CERTIFIED WELDERS

We have reviewed AWS Standard QC3 requirements for AWS Certified Welders and accept the qualification tests performed for the following welders:

NAME**AWS Certified Welder No.**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

We take full responsibility for the application of welding procedures and welders to the work performed.

Date

By: _____

Authorized Representative

Company_____
Location

Form QC-WF2—Company Acceptance of AWS Certified Welders

QC-3 MAINTENANCE OF CERTIFICATION

Name _____
last first middle

S.S. # _____ Date Certified _____

Period of this maintenance report _____

Weld Process(es) _____

Type of weld performed Groove ☐ Fillet ☐

Process(es) Qualified _____

Employed by _____
company street city state zipFrom _____ To _____
month day year month day year

We certify that the above named welder who has been certified under the AWS QC-3 program, has performed welding with the process(es) shown, during the period listed above.

Name _____
Employer

Send to:

American Welding Society
Attn: Q & C Department
550 N.W. LeJeune Road
Miami, FL 33126

Title _____

Address _____

Form QC-WF3—Maintenance of Certification

APPLICATION FOR AWS CERTIFIED WELDER

For AWS Use Only	
SITE CODE _____	
Check # _____	Date Received _____
Amount _____	Account # _____
Credit Card # _____	Expiration Date: _____
Please Check Visa <input type="checkbox"/> MC <input type="checkbox"/> AMEX <input type="checkbox"/>	
Received QC _____	

1. Be sure to read AWS QC3 thoroughly BEFORE filling out this form, especially section 5.1. Please PRINT or TYPE.

2. CHECK THE PERFORMANCE TEST DESCRIPTION YOU WILL TAKE

☐ A. D1-SM-F4-P-A-L

☐ B. D1-SM-F4-P-A-U

☐ C. D1-SM-F4-P-F-U

3. PERSONAL

LAST NAME	FIRST	MIDDLE
STREET		APARTMENT NUMBER
CITY	STATE	ZIP CODE
COMPANY (If mailing address is company, give name of company)		
()		
TELEPHONE #	SOCIAL SECURITY NUMBER	BIRTH DATE
SEX <input type="checkbox"/> M <input type="checkbox"/> F	COLOR EYES _____	HEIGHT _____
		WEIGHT _____
Have you taken a previous AWS Certified Welder Examination? <input type="checkbox"/> Yes <input type="checkbox"/> No		
If yes, give date and location _____		
Have you ever been QC3 Certified? _____		
Give certification number _____		

4. EDUCATIONAL BACKGROUND

Where you received training as a welder or learned welding skills.

Name and Address of Institution	From	To

I hereby authorize the American Welding Society to release the data contained in this application on a need to know basis.

VISUAL ACUITY RECORD

The welder is required to pass an eye examination, with or without corrective lenses, to prove (1) near vision acuity on Snellen English, or equivalent, at 12 inches; and (2) far vision acuity of 20/40, or better. This form is to be completed by the eye examiner and is subject to the following conditions.

The eye examiner shall be either an Optometrist, a Medical Doctor, a Registered Nurse, a Certified Physician's Assistant or an SNT-TC-1A Level III Examiner; and must indicate his or her title in the space provided below.

***The date of the eye exam shall not be more than 6 months prior to the date of the welding test on recertification.**

TESTS	Meets without eye correction	Meets with eye correction	Does not meet
1. Far Vision 20/40 or better	_____	_____	_____
2. Near Vision Snellen English at a distance of 12 inches	_____	_____	

I certify that I, _____, administered an eye exam
PRINTED NAME OF EYE EXAMINER

to _____, on _____ which demonstrated the vision capabilities above.
PRINTED NAME OF APPLICANT MO/DAY/YEAR

I hold the following job title: Check one:

- ☐ Optometrist ☐ Medical Doctor
☐ Registered Nurse ☐ Certified Physician's Assistant
☐ NDE Level III Examiner

License No. (if applicable) _____

Signature of Eye Examiner Address

Telephone Number () _____

Supplement 1

Welder Performance Qualification

ANSI/AWS D1.1 Test—Requirements

S1.1 Scope

This Supplement to AWS QC 3 specifies requirements for welder qualification to comply with the requirements of ANSI/AWS D1.1, *Structural Welding Code—Steel*.

S1.2 Welding Procedure Specification

S1.2.1 ANSI/AWS D1.1 requires that written welding procedure specifications be prepared by the manufacturer, fabricator or contractor and shall be available to those authorized to use or examine them. A written performance welding procedure specification is included in AWS QC 3 which will cover the requirements for the variables indicated. The welding of the test plates shall be performed in accordance with the performance welding procedure specifications of AWS QC 3.

S1.2.2 Providing written welding procedure specifications (WPS's) for production applications is the user's responsibility.

S1.3 Test Identification

S1.3.1 Welder qualification tests shall be performed in accordance with the written Welding Procedure Specification and corresponding Performance Test Description, included herein.

S1.3.2 Each Performance Test Description shall include the welding variables for the specific test, such as: welding process, base material (type and size), filler material type, weld root conditions, welding position, vertical welding progression, thickness of deposited weld metal, the WPS used in qualification testing, and the EXAMINATION required to be performed.

S1.3.3 Each Performance Test Description shall define the limits of qualification for each test based on the requirements of ANSI/AWS D1.1.

S1.4 Responsibility

S1.4.1 Qualification testing in accordance with QC 3 shall be performed under the direction of a person designated as the Test Supervisor, who shall be a current AWS CERTIFIED WELDING INSPECTOR (CWI) in accordance with AWS QC 1.

S1.4.2 The Test Supervisor shall be responsible for performance qualification in accordance with this Supplement.

S1.4.3 At any time during qualification testing, if the Test Supervisor determines that the welder does not exhibit the skill to perform the test satisfactorily, the test may be terminated.

S1.4.4 The Test Supervisor is responsible for determining if a welder may retest immediately or needs additional training or practice. (Reference RETESTS, Article 9.)

S1.4.5 The Test Supervisor shall be responsible for enforcement of test shop cleanliness, safety and rules of procedures, as established by the Test Facility QC Manual.

S1.5 Test Requirements

Tests shall comply with the following:

(1) Qualification tests shall be visually examined and accepted to the requirements of S1.6.1, prior to non-destructive and/or mechanical tests.

S1-1

(2) Nondestructive and/or mechanical testing shall be in accordance with the Performance Test Description which is based on Supplement 1 of this Standard, and S1.6.2 and S1.6.3.

S1.6 Examination Methods and Acceptance Standards

S1.6.1 Visual Examination. The acceptance criteria for the visual examination of the qualification test assemblies shall be as defined in ANSI/AWS D1.1, Section 5

Part C. The visual examination shall be performed by a CWI.

S1.6.2 Nondestructive Examination. Radiographic examination (when specified in Test Description) and acceptance criteria shall be as defined in ANSI/AWS D1.1, Section 5 Part C. The personnel interpreting the results shall be qualified to ASNT SNT-TC-1A, LEVEL II. The personnel performing the radiographic work may be qualified to either LEVEL II or LEVEL I.

S1.6.3 Mechanical Testing. The mechanical testing and acceptance criteria shall comply with ANSI/AWS D1.1, Section 5 Part C.

SUPPLEMENT 1**PERFORMANCE TEST DESCRIPTION****Test Number: D1-SM-F4-P-A-U**

Welding Process: Shielded Metal Arc Welding (SMAW)

Base Material: ANSI/ASTM A-36, 1" thickness (rolling direction perpendicular to bevelled edge)

Material Form: Plate

Filler Metal: ANSI/AWS A5.1, Class E-7018 (Group: F4)

Weld Joint Detail: ANSI/AWS D1.1, Para. 5.18

Backing: Prequalified steel plate from ANSI/AWS D1.1

Welding Position: 3G & 4G (See ANSI/AWS A3.0-89, Figure 14)

Weld Progression (Vert): up

WPS No.: 1-QC-W1

Test Required: Visual plus 2 side bends. Radiography may be used in lieu of bend tests.

LIMITS OF WELDER QUALIFICATION

Code: ANSI/AWS D1.1

Weld Process: SMAW

Base Material: Prequalified steels from ANSI/AWS D1.1

Filler Metal: Group F4 and lower

Groove Weld Thickness: Unlimited

Fillet Weld Size: All

Positions: All

Weld Progression: Vertical, up

Backing: Required for full penetration, single groove welds

Pipe/tubing Dia.: Over 24"

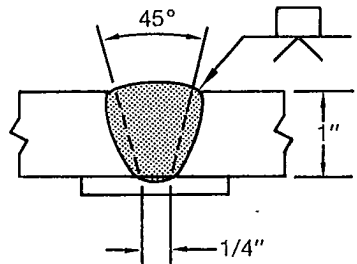
Material Form: Plate, pipe, shapes, strip, tubing as listed in ANSI/AWS D1.1

QC 3 PERFORMANCE WELDING

PROCEDURE SPECIFICATION

Material specification ASTM A - 36
 Welding process Shielded Metal Arc (SMAW)
 Manual or machine Manual
 Position of welding Vertical and Overhead
 Filler metal specification AWS A5.1
 Filler metal classification E7018
 Flux N/A
 Shielding gas N/A Flow rate N/A
 Single or multiple pass Multiple pass
 Single or multiple arc Single arc
 Welding current Direct current
 Polarity Electrode positive
 Welding progression Vert-up weave, OH-stringer beads
 Root treatment None
 Preheat and interpass temperature 70° F min. - 500° max.
 Postheat treatment None

WELDING PROCEDURE

Pass no.	Electrode size	Welding current		Travel speed	Joint detail
		Amperes *	Volts		
1, 2	3/32"	75 - 120	19 - 24	Manual	
Balance	or 1/8"	110 - 160	19 - 24	Manual	
	1/8"	110 - 160	19 - 24	Manual	
	or 5/32"	140 - 220	19 - 24	Manual	
	*Consult Manufacturers recommendations for specific ranges.				

This procedure may vary due to fabrication sequence, fit - up, pass size, etc., within the limitation of variables given in 4B, C, or D and 5.1.2 of AWS D1.1, (1986) Structural Welding Code.
year

Procedure no. 1 - QC - W1

Manufacturer or contractor American Welding Society

Revision no. 0

Authorized by RE Blawie

Date May 15, 1989

SUPPLEMENT 1

PERFORMANCE TEST DESCRIPTION

Test Number: D1-SM-F4-P-A-L

Welding Process: Shielded Metal Arc Welding (SMAW)

Base Material: ANSI/ASTM A-36, 3/8" thickness (rolling direction perpendicular to bevelled edge)

Material Form: Plate

Filler Metal: ANSI/AWS A5.1, Class E-7018 (Group: F4)

Weld Joint Detail: ANSI/AWS D1.1, Para. 5.19

Backing: Prequalified steel plate from ANSI/AWS D1.1

Welding Position: 3G & 4G (See ANSI/AWS A3.0-89 Figure 14)

Weld Progression (Vert): up

WPS No.: 1-QC-W2

Test Required: Visual plus one root bend and one face bend. Radiography may be used in lieu of bend tests.

LIMITS OF WELDER QUALIFICATION

Code: ANSI/AWS D1.1

Weld Process: SMAW

Base Material: Prequalified steels from ANSI/AWS D1.1

Filler Metal: Group F4 and lower

Thickness: Groove: 1/8" thru 3/4"

Fillet Weld Size: All

Positions: All

Weld Progression: Vertical, up

Backing: Required for full penetration, single groove welds

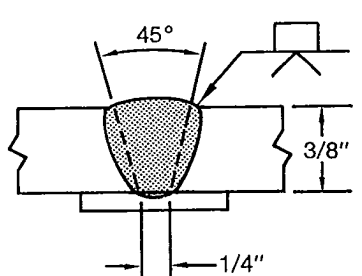
Pipe/tubing Dia.: Over 24"

Material Form: Plate, pipe, shapes, strip, tubing as listed in ANSI/AWS D1.1

QC 3 PERFORMANCE WELDING PROCEDURE SPECIFICATION

Material specification ASTM A - 36
Welding process Shielded Metal Arc (SMAW)
Manual or machine Manual
Position of welding Vertical and Overhead
Filler metal specification AWS A5.1
Filler metal classification E7018
Flux N/A
Shielding gas N/A Flow rate N/A
Single or multiple pass Multiple pass
Single or multiple arc Single arc
Welding current Direct current
Polarity Electrode positive
Welding progression Vert - up weave, OH - stringer beads
Root treatment None
Preheat and interpass temperature 70° F min. - 500° max.
Postheat treatment None

WELDING PROCEDURE

Pass no.	Electrode size	Welding current		Travel speed	Joint detail
		Amperes *	Volts		
A11	3/32"	75 - 120	19 - 23	Manual	
	or 1/8"	110 - 160	19 - 23	Manual	
		*Consult Manufacturers recommendations for specific ranges.			

This procedure may vary due to fabrication sequence, fit - up, pass size, etc., within the limitation of variables given in 4B, C, or D and 5.1.2 of AWS D1.1, (1986 year) Structural Welding Code.

Procedure no. 1 - QC - W2

Manufacturer or contractor American Welding Society

Revision no. 0

Authorized by RE Blawie

Date May 15, 1989

SUPPLEMENT 1

PERFORMANCE TEST DESCRIPTION

Test Number: D1-SM-F4-P-F-U

Welding Process: Shielded Metal Arc Welding (SMAW)

Base Material: ANSI/ASTM A-36, 1" thickness (rolling direction perpendicular to bevelled edge)

Material Form: Plate

Filler Metal: ANSI/AWS A5.1, Class E-7018 (Group: F4)

Weld Joint Detail: ANSI/AWS D1.1, Para. 5.18

Backing: Prequalified steel plate from ANSI/AWS D1.1

Welding Position: Flat (1G) (See ANSI/AWS A3.0-89, Figure 14)

Weld Progression (Vert): N/A

WPS: 1-QC-W3

Test Required: Visual plus 2 side bends. Radiography may be used in lieu of bend tests.

LIMITS OF WELDER QUALIFICATION

Code: ANSI/AWS D1.1

Weld Process: SMAW

Base Material: Prequalified steels from ANSI/AWS D1.1

Filler Metal: Group F4 and lower

Material Thickness: Groove unlimited

Positions: Groove: Flat; Fillet: Flat & Horizontal

Fillet Weld Size: All

Weld Progression: N/A

Backing: Required for full penetration, single groove welds

Pipe/tubing Dia.: Over 24"

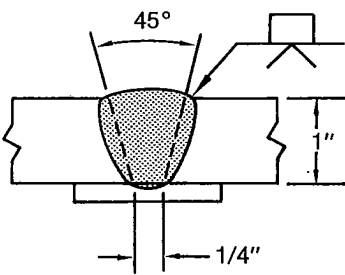
Material Form: Plate, pipe, shapes, strip, tubing as listed in ANSI/AWS D1.1

QC 3 PERFORMANCE WELDING

PROCEDURE SPECIFICATION

Material specification ASTM A - 36
 Welding process Shielded Metal Arc (SMAW)
 Manual or machine Manual
 Position of welding Flat
 Filler metal specification AWS A5.1
 Filler metal classification E7018
 Flux N/A
 Shielding gas N/A Flow rate N/A
 Single or multiple pass Multiple pass
 Single or multiple arc Single arc
 Welding current Direct current
 Polarity Electrode positive
 Welding progression Stringer beads
 Root treatment None
 Preheat and interpass temperature 70° F min. - 500° max.
 Postheat treatment None

WELDING PROCEDURE

Pass no.	Electrode size	Welding current		Travel speed	Joint detail
		Amperes *	Volts		
All Balance	3/32"	75 - 120	19 - 24	Manual	
	or 1/8"	110 - 160	19 - 24	Manual	
	1/8"	110 - 160	19 - 24	Manual	
	or 5/32"	140 - 220	19 - 24	Manual	
*Consult Manufacturers recommendations for specific ranges.					

This procedure may vary due to fabrication sequence, fit - up, pass size, etc., within the limitation of variables given in 4B, C, or D and 5.1.2 of AWS D1.1, (1986) Structural Welding Code.
year

Procedure no. 1 - QC - W3

Manufacturer or contractor American Welding Society

Revision no. 0

Authorized by RE Blawie

Date May 15, 1989

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