



Welder Certification



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1.0 PURPOSE

The purpose of this International Personnel Certification Schemes (IPCS) is to define RSA minimum qualification and certification requirements of Welder in accordance with The American Society for Mechanical Engineer (ASME) Section IX, Boiler and Pressure Vessel Code, and The American Welding Society (AWS) D1.1, Structural Welding Code.

2.0 SCOPE

- 2.1 This IPCS has been developed to assist in meeting the minimum requirements for qualification and certification of personnel seeking for Welder certification in accordance with ASME IX 2019 Edition and AWS D1.1 2020 Edition.
- 2.2 The Range of Qualification of Welder covered by this IPCS are listed in Section 6.0 as used in accordance with the applicable codes, standards, specifications and regulations referenced below.
- 2.3 Certification to this IPCS provides an attestation of general competence of the Welder. The employers are responsible for the work performed by the welders. The employers may accept IPCS Welder certification without additional testing or may add requirements as deemed necessary to meet a specific need. Some standards or contract documents may require the owner, engineer, or other individuals to approve the use certified Welders (without requalification) on their work.
- 2.4 Employers who employ IPCS Welders shall be fully aware of the provisions of the certification. The employers shall specifically note the extent of qualification as stated on the IPCS Welder identification/qualification limits card. The employers shall verify the welder's prior work history, or otherwise determine that the qualification(s) apply to the employer's work.

3.0 REFERENCES

- a. ASME Section IX:2019, Boiler and Pressure Vessel Code – Welding, Brazing and Fusing Qualifications.
- b. AWS D1.1:2020, Structural Welding Code – Steel
- c. ISO 9606-1:2012, Qualification Testing of Welders - Fusion Welding - Part 1 Steels
- d. RSA-QM-1001 Revision 0, Quality Manual - RSA Certification Body Quality Management System.

4.0 ABBREVIATIONS, TERMS AND DEFINITIONS

For the purposes of this document, the abbreviations, terms and definitions given in the reference documents listed in 3.0 above shall apply.

5.0 JOB AND TASK DESCRIPTION

5.1 Required Competence

- 5.1.1 The purpose of conducting Welder Qualification Test (WQT) is to demonstrate that welder's ability to produce a sound welded joint when using a Welding Procedure Specification (WPS) or Standard Welding Procedure Specification (SWPS).
- 5.1.2 The required competence will be dependent on the selected standard of WQT, as chosen by the welder, or the sponsor/employer.
- 5.1.3 In addition to the actual process of welding, welder are also expected to be competent and knowledgeable in verbal and written instructions, their own health and safety and others around them, setting up of equipment, and in the use of ancillary equipment such as grinders.
- 5.1.4 Where job knowledge is to be tested the welder is also expected to have the required knowledge regarding health and safety, welding consumables, parent materials, welding equipment, welder certification, and welding imperfections. The required job knowledge will be dependent on the selected standard of WQT, as chosen by the welder or the sponsor/employer, the welding process, and the type of parent material.

5.2 Abilities

The required ability (aside from the welding itself) will be dependent on the selected standard of WQT, as chosen by the welder or the sponsor/employer. Factors to be considered may include quality of vision, and fitness i.e. the ability to weld in varying positions.

6.0 RANGE OF QUALIFICATION

- 6.1 A welder is to be qualified in relation to the following range of qualification:
- standard,
 - welding process,
 - welding position,
 - base metal, and
 - base metal dimension.
- 6.2 The welder or the sponsor/employer shall choose any one the following codes and standards for qualification:
- ASME IX, or
 - AWS D1.1
- 6.3 Welding process shall be choose from one or combination of the following:
- Shielded Metal Arc Welding – SMAW,
 - Gas Tungsten Arc Welding – GTAW, and/or
 - Flux Cored Arc Welding – FCAW.
- 6.4 Welding position selected shall be as Table 1.

Table 1: Welding Positions

No.	Description	Welding Position	
		Butt Weld	Fillet Weld
1	Flat	1G	1F
2	Horizontal	2G	2F
3	Vertical	3G	3F
4	Overhead	4G	4F
5	Pipe – Horizontal	5G	-
6	Pipe – All positions	6G	-
7	Pipe – All positions and restricted	6GR	-

- 6.5 Base metal shall include the following:
- ASME Section IX – Metal grouping e.g. P1, P2, P3, etc.
 - AWS D1.1 – Metal specification e.g. A514, A516, etc.
- 6.6 Base metal dimension shall include the following:
- Plate – thickness of weld metal deposited.
 - Pipe – outside diameter and thickness of weld metal deposited.

7.0 PRE-REQUISITE

- 7.1 The welder (and their sponsor/employer if not self-employed) must satisfy themselves that the individual is deemed to have the required competency, knowledge, and physical ability prior to commencing with any test.
- 7.2 All WQT conducted by RSA shall be performed in accordance with a qualified WPS, or if one is not available, then a SWPS. The supply or production of a SWPS for use during the welder certification test lies solely with the welder, or their sponsor/employer.
- 7.3 If the welder capabilities are in doubt, then training or practice time in accordance with Section 8.0 below should be considered prior to taking any tests.

8.0 TRAINING REQUIREMENTS

- 8.1 Welder qualification tests (WQT) are skill-based, the requirement for job knowledge is not mandatory. The WQT is therefore skill-based only.
- 8.2 If training or practice time is required then this can be taken at any provider of the welder's choice (or his/her sponsor/employer if not self-employed).
- 8.3 The training of welders, control of their qualification and maintenance of their skills are the responsibility of sponsor/employer. Certification Department shall verify and be satisfied that the welders are appropriately qualified.
- 8.4 Any training or practice offered by RSA is not a prerequisite. Furthermore, any training or practice offered by RSA will not have a bearing on the result of any WQT and does not imply as such.

9.0 INDUSTRIAL EXPERIENCE

A certified welder whose work record has not been properly maintained will be required to new WQT in accordance with Section 12.0. This includes welders who fail to submit their card and work record to RSA at the time of re-validation.

10.0 CONDUCT OF EXAMINATION

- 10.1 WQT shall be conducted at locations assigned by Examination Department and at dates and times designated in advance by Certification Department. WQT location may be a laboratory or workshop approved by RSA, provided the test is conducted by an authorised Examiner appointed by Certification Department.
- 10.2 At the examination, the welder shall have in his possession valid proof of identification and an official notification of the examination, which shall be shown to the examiner.
- 10.3 The WQT may be terminated at any stage, whenever it becomes apparent to the Examiner conducting the tests that the welder being tested does not have the required skill to produce satisfactory results.
- 10.4 RSA expects the following from its welder candidates:
 - a. Aggression or threatening behaviour towards an examiner will not be tolerated.
 - b. Anyone displaying this type of attitude will have his/her test terminated. Any fees paid will not be refunded.
 - c. Any attempts to cheat during a test or to mislead the examiner will not be tolerated. This also includes the removal of confidential test material for the purposes of copying or sharing with others. If anyone is found to be cheating, then his/her test will be terminated, and any fees paid will not be refunded.
 - d. Candidates are expected to be mindful of their own health and safety and others around them, and obey any instructions relating to health and safety given by the examiner.
- 10.5 Any welder who, during the course of WQT, does not abide by rules or who perpetrates, or is an accessory to, fraudulent conduct shall be excluded from all further WQT for a period of at least one (1) year.
- 10.6 Examiners are responsible to conduct the following:
 - a. Conducting and witnessing WQT,
 - b. Visual inspection before, during and after welding,
 - c. Interpretation of NDT/destructive test results, and
 - d. Evaluation of welder test coupon in accordance with the selected standard.
- 10.7 NDT weld testers are responsible to conduct the followings:
 - a. Conducting NDT (radiographic or ultrasonic test), and
 - b. Interpretation of NDT results including radiographs.
- 10.8 DT Weld Testers are responsible to conduct the followings:
 - a. Performing destructive testing (bend test, fracture test or macroscopic examination), and
 - b. Interpretation of destructive test results.

11.0 WELDER QUALIFICATION TEST

11.1 Requirements

11.1.1 The welder shall make a complete weld joint on a weld test coupon in accordance with an approved WPS or SWPS. The welding process shall be witnessed by an Examiner, completed weld shall be tested by Weld Tester and the final result shall be verified by the Examiner.

11.1.2 All welder test coupons for butt welds and for fillet welds are to be prepared in accordance with the selected standard.

11.1.3 The WQT shall be completed within a time span of four (4) hours. This includes the time required for set-up and welding, but does not include grinding. Weld test coupons that are not completed within four (4) hours shall be rejected.

11.1.4 The weld test coupon shall be examined and tested as follows:

- a. For butt welds:
 - i. Visual examination, and
 - ii. Bend test, or
 - iii. Radiographic test may be carried out in lieu of bend.
- b. For fillet welds
 - i. Visual examination, and
 - ii. Fracture test, or
 - iii. Two macro sections may be taken in lieu of the fracture test.

11.2 Visual Examination

11.2.1 The welds shall be visually examined prior to the cutting of the test specimen for the bend test and fracture test. The result of the WQT is to show the absence of cracks or other serious imperfections.

11.2.2 Imperfections detected are to be assessed in accordance with the selected standard.

11.3 Bend Test

11.3.1 Transverse bend test specimens are to be in accordance with the selected standard.

11.3.2 Two face bend test and two root bend test specimens are to be tested for initial qualification test, and one face and one root bend test specimens for extension of approval. For thickness 12mm and over, four side specimens (two side specimens for extension of approval) with 10 mm in thickness may be tested as an alternative.

11.3.3 At least one bend test specimen shall include one stop and restart in the bending part, for root run or for cap run.

11.3.4 The test specimens are to be bent through 180 degrees. After the test, the test specimens shall not reveal any open defects in any direction greater than 3mm. Defects appearing at the corners of a test specimen during testing shall be investigated case by case.

11.4 Radiographic Test

When radiographic testing is used for butt welds, imperfections detected shall be assessed in accordance with selected code standard.

11.5 Fracture Test (Fillet Weld)

The fracture test is to be performed by folding the upright plate onto the through plate. Evaluation shall concentrate on cracks, porosity and pores, inclusions, lack of fusion and incomplete penetration. Imperfections that are detected shall be assessed in accordance with selected standard.

11.6 Macro Examination

11.6.1 When macro examination is used for fillet welds, two test specimens are to be prepared from different cutting positions; at least one macro examination specimen shall be cut at the position of one stop and restart in either root run or cap run. These specimens are to be etched on one side to clearly reveal the weld metal, fusion line, root penetration and the heat affected zone.

11.6.2 Macro sections shall include at least 10mm of unaffected base metal.

11.6.3 The examination is to reveal a regular weld profile, through fusion between adjacent layers of weld and base metal, sufficient root penetration and the absence of defects such as cracks, lack of fusion etc.

12.0 GRADING

12.1 Each welder shall have passed the mechanical and visual examinations.

12.2 Welders may be qualified by Radiographic Testing or Ultrasonic Testing in-lieu of Mechanical Testing when:

- a. making a groove weld using SMAW and GTAW welding process, except for P-No. 21 through P-No. 26, P-No. 51 through P-No. 53, and P-No. 61 through P-No. 62 metals.
- b. welders making groove welds in P-No. 21 through P-No. 26 and P-No. 51 through P-No. 53 metals with the GTAW process.

13.0 RE-TEST

13.1 When a welder fails a WQT, the following shall apply.

- a. In cases where the welder fails to meet the requirements in part of the tests, a retest may be welded immediately, consisting of another test assembly of each type of welded joint and position that the welder failed. In this case, the test is to be done for duplicate test specimens of each failed test.

All retest specimens shall meet all of the specified requirements.

- b. In cases where the welder fails to meet the requirements in all parts of the required tests or in the retest prescribed in Section 13.1a above, the welder shall undertake further training and practice.
- c. When there is specific reason to question the welder's ability or the period of effectiveness has lapsed, the welder shall be re-qualified in accordance with the tests specified in Section 11.0.

13.2 Where any test specimen does not comply with dimensional specifications due to poor machining, a replacement test assembly shall be welded and tested.

14.0 QUALIFICATION ASSESSMENT

14.1 The criteria for initial certification will be dependent on the specific standard of WQT, as chosen by the welder or the sponsor/employer.

14.2 The chosen assessment method(s) and acceptance criteria (pass or fail) are also established by the specific standard of WQT chosen by the welder or the sponsor/employer.

- 14.3 Pass or fail decisions are made solely against the acceptance criteria established by the specific standard of WQT selected by the welder or his/her sponsor/employer, and not on the opinion of the examiner or any other RSA employee.

15.0 IPCS CERTIFICATION

- 15.1 Qualification certificates shall be issued when the welder has passed the WQT in accordance with Section 11.0. The Certification Department shall be responsible for the control of the validity of the certificate and the range of the approval.
- 15.2 The following items shall be specified in the certificate:
- Essential variables for each process used to produce the weld test coupon.
 - Range of qualification for base metal, welding processes, filler metal type, types of welded joint, plate thicknesses and welding positions.
 - Results of the required testing and nondestructive examinations.
 - Identification of the procedure specification(s) followed during the test.
 - Date of weld qualification test.
 - Name, date of birth, identification and the photograph of the welder.
 - Name of sponsor/employer.
- 15.3 When a certificate is issued, the relative documents such as test reports and/or revalidation records shall be archived as annexes to the copy of certificate according to the rules of the selected standard.
- 15.4 The status of approvals of each individual qualification is to be demonstrated when requested.

16.0 CERTIFICATION VALIDITY

- 16.1 The welder's qualification begins from the date of welding of the weld test coupon, provided that the required testing has been carried out and the test results obtained were acceptable. The certificate needs to be confirmed every six (6) months otherwise the certificate(s) become(s) invalid.
- 16.2 The validity of the certificate may be extended as specified in Section 22.0. The chosen method of the extension of qualification shall be stated on the certificate at the time of issue.

17.0 CONDITION OF CERTIFICATION

- 18.1 The certificate is to be signed at six (6) months intervals by the sponsor/employer representative who is responsible for production weld quality provided that all the following conditions are fulfilled:
- The welder shall be engaged with reasonable continuity on welding work within the current range of approval. An interruption for a period no longer than six (6) months is permitted.
 - The welder's work shall in general be in accordance with the technical conditions under which the approval test is carried out.
 - There shall be no specific reason to question the welder's skill and knowledge.

- 18.2 If any of these conditions are not fulfilled, RSA is to be informed and the certificate is to be suspended.
- 18.3 Sponsor/employer or the certified person themselves have the following responsibilities:
- a. Not to continue to use the certificate past its expiry date.
 - b. Not to continue to use the certificate if it has been suspended or withdrawn.
 - c. Not to use the certificate if prolonged absence in excess of six (6) months from the profession (due to illness, change of employment, or leave) has occurred.
 - d. Not to continue to use the certificate if capabilities such as vision and fitness have become impaired.

18.0 CERTIFICATION VERIFICATION

- 18.4 RSA shall release certification test results only to the applicant, or to a person or agency designated by the applicant upon written request, and with notarized and witnessed release.
- 18.5 Requests for verification of status and certification number of Welders shall be provided to the requestors. Only the certification number, date certified, expiration date, photo, current status (current, revoked, etc.), and certification limitations (corrected vision, etc.) shall be provided by the RSA staff members without the express written approval of the inspector or certificate holder.

19.0 SUSPENSION AND WITHDRAWAL

- 19.1 RSA shall suspend or withdraw any certificates from its register as a result of any of the following:
- a. If any proven evidence is found that cheating occurred during the original test.
 - b. If any attempts are made to duplicate and then edit any certificates.
 - c. if WQT or certification fees are not paid when due.
- 19.2 For any of the above, RSA shall refuse to confirm certification status upon enquires from any other interested parties.

20.0 CONFIRMATION OF VALIDITY

- 20.1 The qualifications of a welder for a process shall be confirmed every six (6) months by the person responsible for welding activities or by the Examination Department. This is confirming that the welder has worked within the range of qualification and extends the validity of the qualification for a further six (6) month period.
- 20.2 The above rule is applicable to all options of revalidation specified in 22.0.

21.0 REVALIDATION OF WELDER QUALIFICATION

21.1 Revalidation shall be carried out by Examination Department.

21.2 The skill of the welder shall be periodically verified by one of the following methods:

- a. The welder shall be retested every three (3) years.
- b. Every two (2) years, two welds made during the last six (6) months of the validity period shall be tested by radiographic or ultrasonic testing or destructive testing and shall be recorded. The acceptance levels for imperfections shall be as specified. The weld tested shall reproduce the original test conditions except for thickness and outside diameter. These tests revalidate the welder's qualifications for an additional two (2) years.
- c. A welder's qualifications for any certificate shall be valid as long as it is confirmed according to Section 21.0 and provided all the following conditions are fulfilled:
 - i. the welder is working for the same manufacturer for whom he or she qualified, and who is responsible for the manufacture of the product,
 - ii. the manufacturer has documented that the welder has produced welds of acceptable quality based on application standards and the welds examined shall confirm the following conditions:
 - welding position(s),
 - weld type, and
 - backing.

22.0 RECORDS

Personnel certification records shall be maintained and updated for the duration of 10 years after expiry and shall include the following:

- a. Name of certified individual.
- b. Range of qualifications and limitations (if any), as applicable.
- c. Educational background and experience of certified individuals.
- d. Records indicating satisfactory completion of training, if any.
- e. Current WQT copy(ies) or evidence of successful completion of tests.
- f. Results of visual, NDT and DT examinations.
- g. Dates of certification and/or recertification.
- h. Name and qualification of examiner.