



Prepared by: [Redacted]

	ARC WELDER QUALIFICATION FOR WORKING ON PIPELINES THAT OPERATE AT OVER 20% OF SMYS		D-30.2	
	Department: Asset Investment Planning	Section: Gas Asset Strategy	Approved by: [Redacted]  Original Signed By	
Rev. #03: This document replaces Revision #02. For a description of the changes, see Page 4.		Date: 11-30-06		

Purpose and Scope

This gas standard establishes the requirements for arc welding on all grades of pipe and fittings.

Acronyms

- API: American Petroleum Institute
- AWS: American Welding Society
- CFR: Code of Federal Regulations
- OD: outside diameter
- psi: pounds per square inch
- SMYS: specified minimum yield strength

References

Gas Standard

Arc Welding Procedure Requirement – All Stress Levels	D-22
Standard of Acceptability for Welding: Nondestructive and Destructive Testing	D-31
Weld Inspection	D-40

General Information

1. A welder qualified under this gas standard may perform arc welding on all grades of pipe and fittings up to and including X-70. This would include all natural gas lines designed to operate at stress levels of 20% or more of the SMYS to comply with 49 CFR Part 192, latest edition.
2. The gas standard definitions contained in the API Standard 1104, latest edition, and referenced in Appendix A of 49 CFR Part 192, latest edition, shall apply to this standard.

Qualification Test

3. The qualification test administrator may terminate a qualification test at any point when it becomes apparent that a welder lacks the skill necessary to produce satisfactory results.
4. Welders may use a grinder during a qualification test only to grind the stringer bead (root pass) before applying the hot pass (second pass), to feather starts and stops, or to clean and remove occasional minor undercut, porosity, or slag. Grinding shall not be used extensively during the course of a test for removing gross welder-induced defects. Excessive use of a grinder shall be grounds for termination of the test.
5. Welders shall use the same welding technique and proceed with the same speed that was used to qualify the weld procedure.
6. Qualification and requalification tests shall be performed under the supervision of a qualification test administrator. A qualification test administrator shall have knowledge and complete comprehension of the applicable PG&E gas standards, PG&E welding procedure specifications, and sections pertaining to welder qualification in API 1104 and 49 CFR.
7. Before performing any production welding on pipelines or components designed to operate at over 20% of SMYS, welders shall be qualified using an approved procedure. The weld shall meet the visual inspection requirements of [Gas Standard D-40](#), section "Visual Inspection." The weld shall also be qualified by either the radiographic testing requirements of [Gas Standard D-31](#) (for butt welds only), or the destructive testing requirements of [Gas Standard D-31](#). The radiographic testing requirements are located under the "Standard of Acceptability Nondestructive Testing" section. The destructive testing requirements are located in either the "Standards of Acceptability – Destructive Testing" or the "Destructive Testing of Welded Joints – Branch Welds" section.

D: Welding and Soldering

Arc Welder Qualification for Working on Pipelines that Operate at Over 20% of SMYS

- A. The following tests can be performed on steel pipe of any grade; however, the qualification test described below is based on using API 5L Grade B pipe.
- (1) Butt Weld - The welder shall make a butt weld on 12-3/4" OD x 0.375" wall thickness pipe in the fixed position with the axis of the pipe either in the horizontal plane or inclined from the horizontal plane at an angle not exceeding 45° (see Figure 1 on Page 3). The 6010 butt weld test shall not exceed 2 hours and the 7018 butt weld test shall not exceed 3 hours.
 - (2) Branch Connection for Full Qualification – The welder shall layout, cut, fit, and weld a full size branch connection on 12-3/4" OD pipe. The weld shall be made with the run pipe axis in the horizontal position and the branch pipe axis extending vertically downward from the run (see Figure 2 on Page 4). The 6010 branch connection test shall not exceed 6 hours and the 7018 branch connection test shall not exceed 7 hours.
- B. Scope of Qualification
- (1) Full Qualification - A welder who has successfully completed the 12-3/4" OD butt weld qualification test described in Paragraph 7A(1) and a full size 12-3/4" OD branch connection weld described in Paragraph 7A(2) shall be qualified to weld on natural gas pipelines in all positions; on all wall thicknesses, joint designs (including fillet welds), and fittings; and on all pipe diameters and all grades of pipe if the essential variables in Paragraph 8 remain unchanged.
 - (2) A welder whose qualification is based on nondestructive testing may not weld on compressor station pipe or components.
 - (3) Note that when welding with low-hydrogen electrodes, the essential variables listed in Paragraph 8 are changed from those used in the qualification procedure described in Paragraph 7A. Welders must be requalified using the new procedure before making these welds.

Requalification

8. If any of the following essential variables are changed, the welder must be requalified using the new procedure.
- A. A change from one welding process to any other welding process or combination of welding processes.
 - B. A change in the direction of welding from vertical up to vertical down or vice versa. (The direction of welding shall be only as allowed by [Gas Standard D-22](#).)
 - C. A change in filler metal classification from Group 1 or 2 to Group 3, or from Group 3 to Group 1 or 2. (See Table 1.)

Table 1 Filler Metal Classification Groups

Group	AWS Specification	Electrode
1	A5.1	E6010, E6011
	A5.5	E7010, E7011
2	A5.5	E8010, E8011, E8011
3	A5.1	E7015, E7016, E7018
	A5.5	E8015, E8016, E8018

9. Requalifying Arc Welders

- A. Welders shall be requalified no later than the last day of the sixth calendar month following the calendar month in which the last previous test was satisfactorily passed. Requalification may consist of successfully passing a radiographic examination of a production butt weld, or by repeating the butt weld test in Paragraph 7. If the sixth month expires before requalification, the welder must pass the full qualification test again (Paragraph 7).
- B. A requalification test using the destructive method of testing as described in Paragraph 7 may also be required if there is reason to question the welder's ability.

Arc Welder Qualification for Working on Pipelines that Operate at Over 20% of SMYS

Retests

10. If, in the opinion of the qualification test administrator, a welder fails to pass the qualification or requalification test because of an unavoidable condition or conditions beyond his/her control, the welder may be given a second opportunity to qualify by repeating the test(s) required for qualification or requalification. No further retests shall be given until the welder gets further training or has more practice.
11. Welders who fail the qualification test as described in Paragraph 7, or the requalification test as described in Paragraph 9, and who do not meet the conditions described in Paragraph 10, must:
 - A. Undergo further training or practice before retesting. The extent of training or practice required shall be determined by the qualification test administrator.
 - B. Pass both the "butt weld" test and the "branch connection" test outlined in Paragraph 7 in order to be qualified, or requalified if previously qualified.

Records

12. Records for all welders who have been qualified under this gas standard shall be retained as outlined below:
 - A. All "Employee Qualification and Requalification" records must be retained for a minimum of 5 years.
 - B. All "Employee Qualification and Requalification" records must be retained even through temporary lapses in a welder's qualification.
 - C. The "Employee Qualification and Requalification" record shall be documented by filling out NO TAG, "Arc Welder Qualification Test."

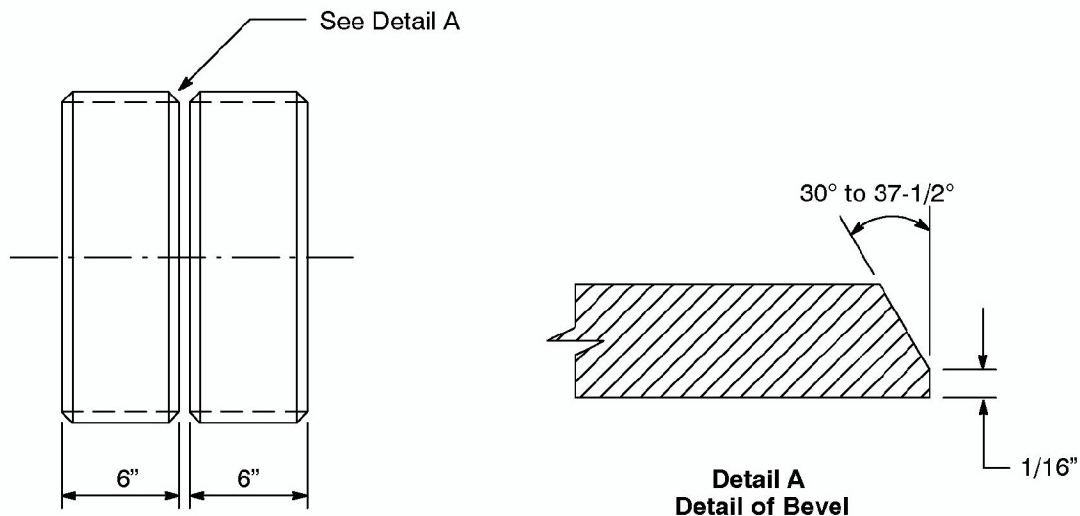


Figure 1
Butt Weld Test Spools

Butt Weld Test Spools Notes

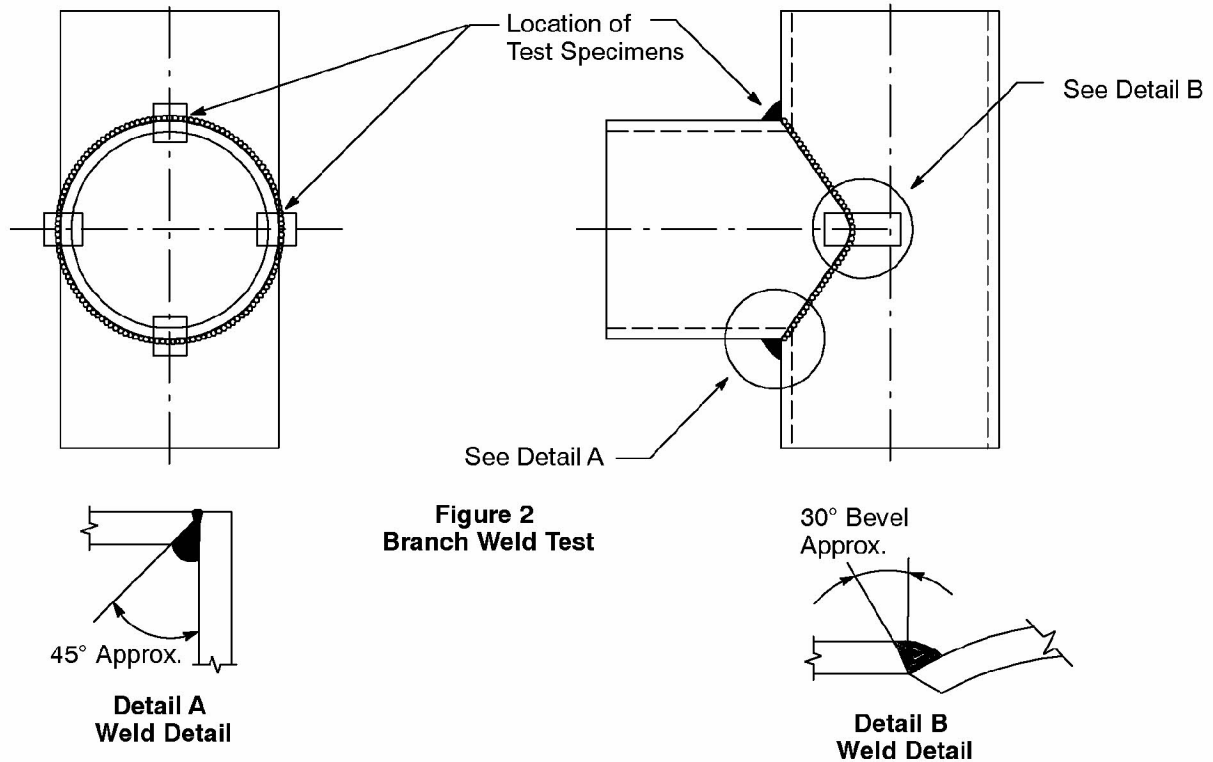
1. Welders can use spools to qualify for both cellulose-coated and low-hydrogen electrodes, as documented in [Gas Standard D-22](#).
2. Refer to [Gas Standard D-31](#), for the type, number, and location(s) of butt weld test specimens.
3. Welds must meet the visual testing requirements of [Gas Standard D-40](#), and either the radiographic testing requirements or the destructive testing requirements of [Gas Standard D-31](#).

Ordering Instructions

Specify

Spool, test, 12-3/4" OD, 0.375" wall thickness, API 5L Grade B, 6' length with 30° through 37.5° bevel at both ends. Gas Standard D-30.2, Code 022583.

**Arc Welder Qualification for Working on Pipelines
that Operate at Over 20% of SMYS**



Branch Weld Test Notes

1. Tests for welding a branch connection for full qualification.
 - A. The pipe is 12-3/4" OD x 0.375" wall thickness, API 5L Grade B.
 - B. The welder must lay out, cut, fit, and weld a branch fitting connection. A full hole is to be cut in the run.
 - C. The weld is to be made with the run pipe axis fixed in the horizontal position and the branch pipe axis extending vertically downward from the run.
 - D. The weld must meet the visual testing requirements of [Gas Standard D-40](#), Section 4, and the destructive testing requirements of [Gas Standard D-31](#).
 - E. Four nick break specimens are required from the locations indicated. Specimens shall meet the requirements of [Gas Standard D-31](#).
2. Tests for welding a branch connection for limited qualification.
 - A. The pipe is 6-5/8" OD x 0.280" wall thickness, API 5L Grade B.
 - B. Follow the directions as described in Paragraphs 1B through 1E above.

Revision Notes

Revision 03 has the following changes:

1. Revised the title block to reflect changes in the department organization.
2. Added the "References" section.
3. Replaced the terms "welding inspector" and "inspector" with the term of a "qualification test administrator."
4. Deleted Item 9C – a requirement that annually, all welders working on compressor station piping must pass a butt weld test using destructive method of testing as per Gas Standard D-31.
5. Removed Exhibit 1, "Arc Welder Qualification Test" form, from this standard. This form (FD-30.2-A) is now a standalone MS Word document.
6. This document is part of Change 59.