
	WELDER QUALIFICATION FOR UNDER 20% OF SMYS	D-30
Asset Type: Gas Transmission and Distribution		Function: Design and Construction
Issued by: [REDACTED]		Date: 03-26-09
		
Rev. #02: This document replaces Revision #01. For a description of the changes, see Page 6.		

Purpose and Scope

This numbered document is used to determine the ability of the welder to make sound welds in order to maintain quality construction for all piping systems operating under 20% of SMYS.

Acronyms

- API: American Petroleum Institute
- ASTM: American Society for Testing and Materials
- BOE: beveled on one end
- CFR: Code of Federal Regulations
- CSP: Code of Safe Practices
- EH: extra heavy
- GC: General Construction
- GT&D: Gas Transmission and Distribution
- L: length
- MAOP: maximum allowable operating pressure
- OD: outside diameter
- SMYS: specified minimum yield strength
- WT: wall thickness

References

	Document
<u>Oxyacetylene Weld Procedure</u>	D-20
<u>Arc Welding Procedure Requirement - All Stress Levels</u>	D-23
<u>Standard of Acceptability for Welding Non-Destructive and Destructive Testing</u>	D-31
<u>Weld Inspection</u>	D-40
<u>Oxyacetylene Tools and Equipment</u>	M-20.1
<u>Shielded Metal Arc Welding Tools and Equipment</u>	M-20.2
<u>Gas Metal Arc Welding (MIG) Tools and Equipment</u>	M-20.3
<u>Miscellaneous Welding Tools and Equipment</u>	M-20.4
<u>Welding Personal Protective Equipment</u>	M-20.5
<u>CSP, Section 1: General Rules</u>	
Personal Protective Equipment	Rule 2
Face and Eye Protection	Rule 4
Hand and Foot Protection	Rule 5
Clothing and Jewelry	Rule 11
Compressed Gases	Rule 15
Tools and Equipment	Rule 29
<u>CSP, Section 13: Gas Distribution and Transmission Systems</u>	
Suitable Clothing and Personal Protective Equipment	Rule 1313
CFR, <u>Qualification of Welders</u>	49 CFR 192.227
API, <u>Qualification of Welders</u>	1104 Section 6

Welder Qualification for Under 20% of SMYS

General Information

Welder qualification or requalification tests shall be made in accordance with the following procedures:

1. Employees shall pass a qualification test before being allowed to weld on pipe or fittings that are or will be a part of a natural gas piping system. Trainees who have successfully completed the Apprentice Fitter Primary Shop Training will only be allowed to perform welding on pipe sizes in which they have qualified until subsequent qualification testing of these welders complies with qualification test requirements in this document.
2. Qualification and requalification tests shall be performed under the supervision of a qualified welding inspector. This inspector shall not leave the immediate area while qualification and requalification testing is being performed. For the purpose of this document, a qualified welding inspector is a designated employee that has the experience and knowledge to judge the quality of welds (refer to Numbered Document D-40). The supervisor shall not designate a welding inspector without the prior approval of the GTRD weld inspection and testing group. The inspector need not be present when the welder performs the weld for the 6-month verification test. The supervisor must verify that the test specimen was performed by the welder.
3. For employees who have previously qualified, requalifying tests shall be required as a result of any one of the following conditions:
 - A. A period of 1 year plus or minus 1 month has elapsed since the previous qualification test. A welder must be requalified within the period from the month preceding to the month following his last annual anniversary requalification.
 - B. A welder has not worked at the particular welding process for a period of 6 months or more.
 - C. There is specific reason to question the ability of the welder to make sound welds.
 - D. There is a change in the welding process from gas to shielded arc welding or vice versa, from one gas or one arc welding process to another gas or another arc welding process, or from manual to semi-automatic or automatic.
 - E. There is a change in pipe material from ASTM or API Standard 5L and 5LX Grade X-42 groups to API Standard 5LX groups in excess of Grade X-42 and vice versa.
4. After testing the specimens in accordance with Numbered Document D-31, prepare the report forms (Forms FD-30-A and FD-30-B). For information on record retention, refer to "Records" section.
5. Company contractors and QC/Ss* must meet the same qualifications as Company employees to perform welding. Under no circumstances, shall individuals perform work for which they are not qualified or have been disqualified. Company contractors and QC/Ss* shall be qualified for only the specific welds for the particular job to which they are assigned. Contact gas field support personnel to schedule qualifications at (925) 371*1894.

* QC/S * An applicant contractor or subcontractor who meets the current requirements of Gas Rule 15 or 16.

Table 1 Approved Products

Description		Size	Code
Test Spools	Oxyacetylene Qualification	4" Diameter x 4-1/2" x 0.156%0.188" WT With 37-1/2° Bevels on Both Ends (API 5L Grade B/X-42)	022579
	Arc Welder Qualification	6" Diameter x 4-1/2" x 0.156%0.188" WT With 37-1/2° Bevels on Both Ends (API 5L Grade B/X-42)	022580
Pipe Nipples		3/4" Diameter x 4-1/2" EH BOE	022576
Test Sleeve Assembly		4" Diameter x 9" L x 0.156%0.188" WT With 3" L x 0.250" WT Sleeve	022059

Welder Qualification and Requalification Tests

6. Arc Welder Qualification
 - A. The following tests are required for arc welder qualification:
 - (1) Make a butt weld with 6" diameter x 4-1/2" minimum length spools (0.156%0.188" WT recommended).
 - (2) Make a sleeve on 4" pipe (fillet welds), sleeve * 0.250" WT x 3" L, pipe * 0.156%0.188" WT x 9" L.
 - (3) Make a branch connection, 3/4" x 4-1/2" L EH nipple on 2", 3", or 4" pipe.

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- B. A welder passing the tests specified in Item 6A above is qualified to arc weld pipe and fittings on all systems with a design pressure stress level of less than 20% SMYS and a diameter of 12" or smaller. See Numbered Document D-30.2 for qualification requirements for higher stress levels.

7. Oxyacetylene Welder Qualification

- A. The following tests are required for oxyacetylene qualification:

- (1) A butt weld with a 4" diameter x 4-1/2" minimum length spools (0.156"/0.188" WT recommended). 49 CFR 192 (latest revision) requires that three of four coupons pass root bend tests for qualification of welders on low-stress-level pipe. Perform a butt weld test on one end of the sleeve weld test specimen.
- (2) A sleeve on 4" pipe. (Same as arc weld qualification.)
- (3) A branch connection * 3/4" x 4-1/2" L.E.H nipple on 2", 3", or 4" pipe. (Same as arc weld qualification.)

- B. A welder passing the test specified in Item 7A above is qualified to oxyacetylene weld pipe and fittings for 4" and smaller pipe, and service connections on 8" and smaller pipe for all systems with a design pressure stress level of less than 20% SMYS.

8. Test Weld Procedure

- A. Arc welds are performed using the methods outlined in Numbered Document D-22. Oxyacetylene welds are performed using the methods outlined in Numbered Document D-20.
- B. The butt welds and sleeve welds are made with the pipe in the horizontal fixed position. The branch connection is made with the header in the horizontal fixed position and the branch not more than 45° from the top of the header. For all test welds, no movement or rotation of the pipe is allowed during welding.
- C. The oxyacetylene and arc welding of test assemblies shall not exceed 2 hours to complete.

9. Test Weld Inspection Requirements

- A. All test welds shall be visually inspected. Sleeve welds require visual inspection only. Welds shall be free of cracks, inadequate penetration, unrepaired burn through (as applicable), and other defects. The weld bead and adjacent area shall present a neat, workman-like appearance. Arc burn due to sniking an arc out of the weld groove is not allowed. Any weld not meeting these requirements shall be failed without performing any destructive tests.
- B. Butt welds which pass the visual inspection shall be destructively tested. Take samples as shown in Figure 4 and Figure 5 on Page 5.
- C. Four root bend samples are required. Three of the four samples must pass in order for the welder to qualify. Refer to Numbered Document D-31 for specimen tests and requirements.
- D. A knock-off test shall be performed on branch connections which have passed the visual inspection.

10. A requalification test shall be performed in the same manner as the initial test as outlined in the "Arc Welder Qualification" and "Oxyacetylene Welder Qualification" sections, Item 6 on Page 2 and Item 7 on Page 3.

Qualification Tests

11. Employees who fail to meet the requirements for a qualification test may be retested immediately. In such a case, the employee shall make two welds of each type that failed to meet the requirements. For the guided root bend test, satisfactory welds will be indicated if no more than one specimen out of each weld is rejected (see the "Test Weld Inspection Requirements" section, Item 9.) In addition, rejection of specimens from both weld tests at the same specimen position shall be cause for rejection. For the knock-off test, both specimens must pass.
12. The qualification test may be terminated at any point when it becomes apparent to the welding inspector that the welder lacks the skills necessary to produce satisfactory results or exceeds the time limits as outlined in the "Test Weld Procedure" section, Item 8C on Page 3.
13. Employees who fail to meet the requirements for a qualification test shall be required to have further training or practice. In such a case, a complete retest shall be made subsequent to such training or practice.

Records

Records for all welders who have been qualified under this document shall be retained as outlined below:

14. All employee qualification and requalification records must be retained for a minimum duration of 5 years.

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15. The record shall be made by completing Form ED-30-A and/or ED-30-B, respectively.
16. Use a separate test report for each qualification or verification. Do not combine a qualification and verification test on a single test report.
17. The division/GT&D offices are responsible for retaining all test reports for their respective employees to verify that the welders have maintained their qualification(s).
18. GT&D welding and testing group is responsible for retaining test reports for GC employees.

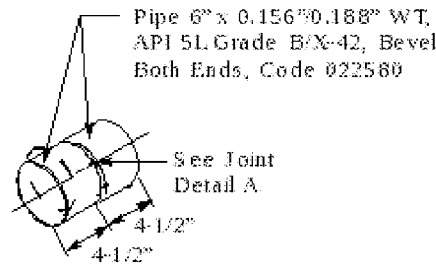


Figure 1
Arc Butt Weld Test
 Two Spools Required

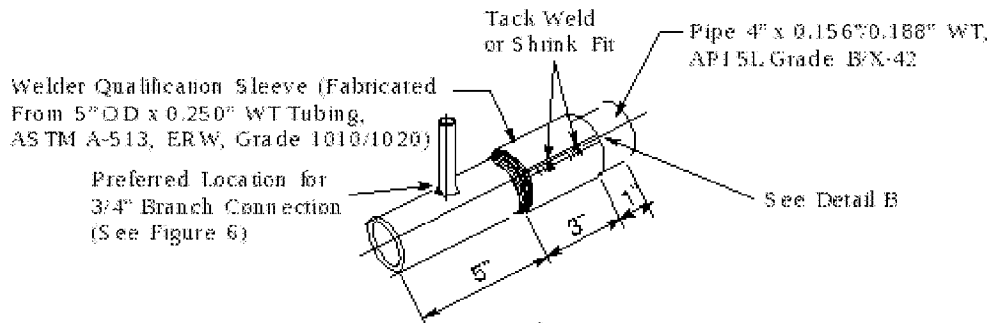
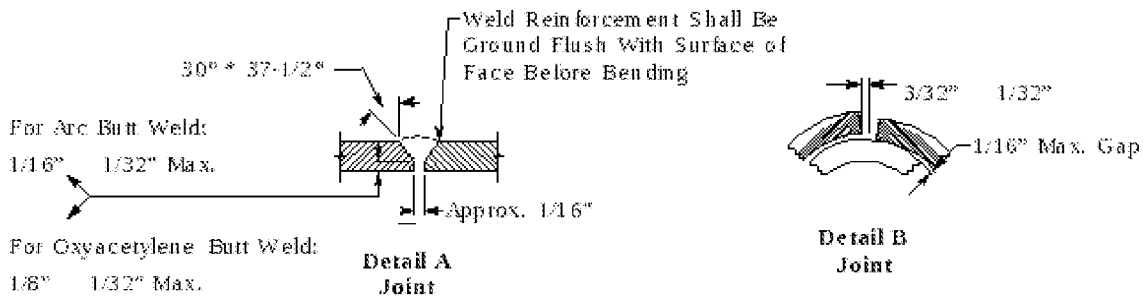


Figure 2
Arc Sleeve Weld Test
 Sleeve Tack Welded or Shrink Fit to Pipe
 Welder Performs All Welds for Visual Inspection
 Complete Sleeve Assembly, Code 022059



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Welder Qualification Sleeve
 (Fabricated From 5" OD x 0.250" WT
 Tubing, ASTM A-513, ERW, Grade 1010/1020)

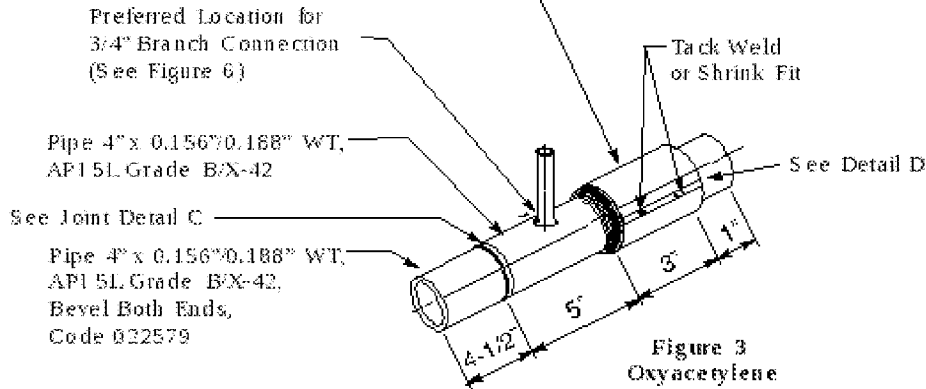


Figure 3
Oxyacetylene
Butt and Sleeve Weld Test
 Perform Butt Weld Test on One End of Sleeve Weld Test Specimen
 Complete Sleeve Assembly, Code 022059
 4" Pipe, 4-1/2" Long, Code 022579

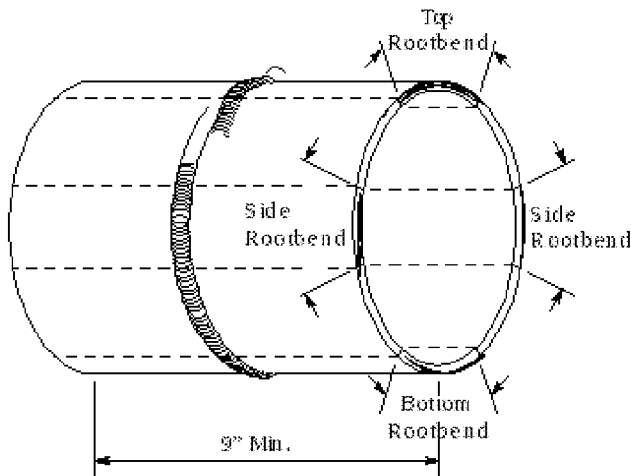
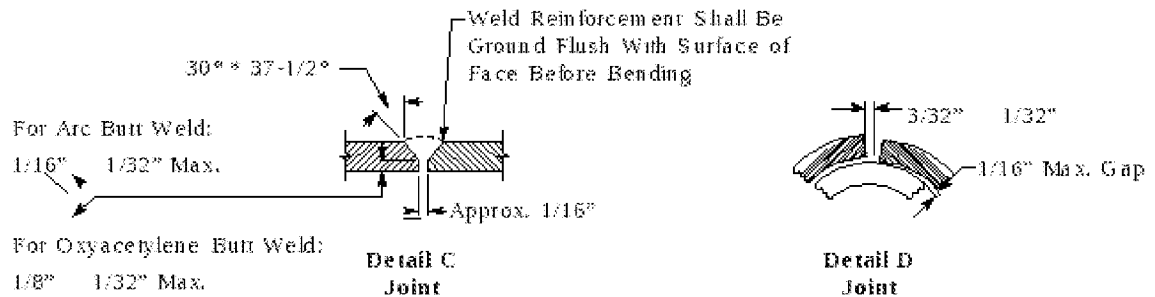


Figure 4
Specimen Selection

Note: Bend Specimens in Guided Bend Jig.
 See Numbered Document D-31 for Weld Quality Requirements.

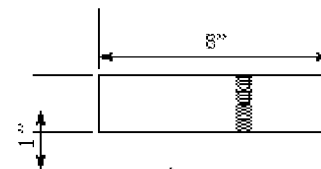


Figure 5
Test Sample Specimen

Note: Figure 4 and Figure 5 illustrate preparation of arc and oxyacetylene butt weld specimens.

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3/4" x 4-1/2" LEH Service Nipple BOE, Code 022578

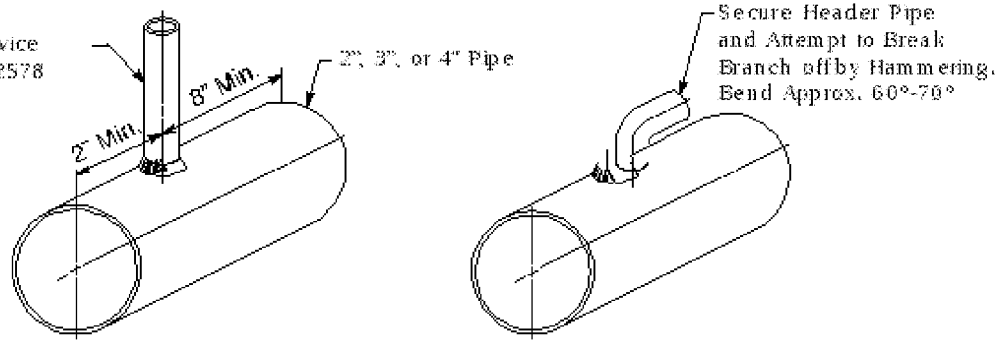


Figure 6
Service "Knock-Off" Test

For Welders Working on Pipe Lines With MAOP or Future Design Pressure That Produces a Hoop Stress of Less Than 20% of SMYS

Attachments

- Attachment A . . . Form FD-30-A "Arc Weld Test Report"
- Attachment B . . . Form FD-30-B "Oxyacetylene Weld Test Report"

Revision Notes

Revision 02 has the following changes:

1. Added Item 5 to the "General Information" section on Page 2.
2. Deleted the reference to Numbered Document M-25.
3. This document is part of Change 61.