

1.0 GENERAL

- 1.1 Each welder shall be required to demonstrate his ability to make sound welds in order to maintain quality construction for all piping systems. Welder qualification or requalification tests shall be made in accordance with the following procedures.
- 1.2 Employees shall pass a qualification test before being allowed to weld on pipe or fittings that are or will be 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 standard.
- 1.3 For persons who have previously qualified, requalifying tests shall be required as a result of any one of the following conditions:
  - \*1.3.1 The test is performed after the last day of the twelfth calendar month following the calendar month in which the last previous test was satisfactorily passed.
  - 1.3.2 A welder has not worked at the particular welding process for a period of six months or more.
  - 1.3.3 There is specific reason to question the ability of the welder to make sound welds.
  - 1.3.4 Change in 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, from manual to semi-automatic or automatic.
  - 1.3.5 Change in pipe material from ASTM or API Standard 5L and 5LX grade X42 groups to API Standard 5LX groups in excess of grade X42 and vice versa.
  - 1.3.6 Change in position for butt welds only, a change from vertical to horizontal or vice versa.
  - 1.3.7 Change in filler metal from one classification group to another.

LIMITED TO WORK ON LINES DESIGNED TO OPERATE AT HOOP STRESS LESS THAN 20% OF SMYS.

APPROVED BY														
JLL	WER	10	5-15-86	REV'D. PARA. 1.8, 2.4.2 & 2.4.3; CHG'D SHTS 1 THRU 4										
EHF	EFS			TO REV. 10										
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	CJT	REV.	DATE	DESCRIPTION		GM	DWN.	CHKD.	SUPV.	APVD.				
GM	PIPING - DATA SHEET										B/M			
SUPV.	WELDER QUALIFICATION FOR UNDER 20%										DWG. LIST			
DSGN.	OF SMYS										SUPSDS			
DWN.	GAS STANDARD										SUPSD BY			
CHKD.	PACIFIC GAS AND ELECTRIC COMPANY										SHEET NO. 1 of 6 SHEETS			
O.K.	SAN FRANCISCO, CALIFORNIA										804496	REV. 9		
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- 1.3.8 Change in direction vertical-down to vertical-up or vice versa.
- 1.4 After testing the specimens in accordance with the Standard D-31, the report forms (Pages 5 and 6) shall be prepared.
- 1.5 The district offices are to retain all test reports in order to verify that the welder has maintained qualification.
- 1.6 The 4" or 6" testing spools in 4-1/2" lengths with 37-1/2° bevels on one end are available from Central Warehouse, Code 02-2579 for 4" x .156 (oxyacetylene qualification), 02-2580 for 6" x .156 (arc welder qualification).
- 1.7 The 3/4" x 4.5" long EH pipe nipples BOE are also available from Central Warehouse, Code 02-2578.
- 1.8 4" sleeve and nipple for sleeve weld test is available from Central Warehouse, Code 02-2059.

## 2.0 WELDER QUALIFICATION AND REQUALIFICATION TESTS

### 2.1 Arc Welder Qualification

2.1.1 The following tests are required for arc welder qualification:

- (1) Butt weld with 6" diameter x 4.5" minimum length spools (.156" w.t. recommended).
- (2) Sleeve on 4" pipe (fillet welds), sleeve - .188 w.t. x 3" L, Pipe - .156" w.t. x 9" L.
- (3) Branch connection - 3/4" x 4.5" long EH nipple on 2", 3", or 4" pipe.

See Section 2.3 for test weld procedures.

2.1.2 A welder passing the tests specified on 2.1.1 is qualified to arc weld pipe and fittings on all systems with a design pressure stress level of less than 20% of SMYS. See Standard D-30.2 for qualification requirements for higher stress levels.

### 2.2 Oxyacetylene Welder Qualification

\* 2.2.1 The following tests are required for oxyacetylene qualification:

- (1) Butt weld with 4" diameter x 4.5" minimum length spool (0.156" W.T. recommended). This part of the test may be

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satisfied by successfully completing the 2" butt weld requirement for oxy-acetylene qualification on pipe over 20% SMYS, provided an additional 2 coupons are subjected to root bend tests (refer to Gas Std. D-30.1). G.O. 112 (latest revision) requires that 3 of 4 coupons pass root bend tests for qualification of welders on low stress level pipe.

~~Perform butt weld test on one end of sleeve weld test specimen.~~

- (2) Sleeve on 4" pipe. (Same as arc weld qualification).
- (3) Branch connection - 3/4" x 4.5" long EH nipple on 2", 3", or 4" pipe. (Same as arc weld qualification).

See Section 2.3 for test weld procedure.

2.2.2 A welder passing the test specified in 2.2.1 is qualified to oxyacetylene weld pipe and fitting for 4" and smaller pipe and service connections on pipe 8" and smaller for all systems with a design pressure stress level of less than 20% of SMYS. See Standard D-30.1 for qualification for butt welds at over 20% of SMYS.

2.3 Test Weld Procedure

2.3.1 Arc welds are performed using the methods outlined in Standard D-22. Oxyacetylene welds are performed using the methods outlined in Standard D-20.

2.3.2 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.

2.4 Test Weld Inspection Requirements

2.4.1 All test welds shall be visually inspected. Sleeve requires visual inspection only. Welds shall be free of cracks, inadequate penetration, unrepaired burn through (as applicable) and other defects. Weld bead and adjacent area shall present a neat workman like appearance. Arc burn due to striking an arc out of the weld groove is not allowed. Any weld not meeting these requirements shall be failed, without performing any destructive tests.

*See Insert*

\* 2.4.2 Butt welds shall be destructively tested in addition to visual tests. Take samples shown on page 7 (drawing 282917).

\*Revised

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*See insert*

Four root bend samples are required. Three of the four samples must pass in order for the welder to qualify. See Standard D-31 for specimen tests and requirements.

- \* 2.4.3 ~~A knock off test, in addition to the visual inspection, is required for the branch connection.~~
- 2.5 A requalification test shall be performed in the same manner as the initial test as outlined in Section 2.1 and 2.2.

3. QUALIFICATION RETESTS

- 3.1 Employees who fail to meet the requirements for a qualification test may be retested immediately. In such a case, he shall make two welds of each type on which he was failed. For the guided root bend test, satisfactory welds will be indicated if no more than one specimen out of each weld is rejected (see Section 2.3). In addition, rejection of specimens from both welds at the same specimen position shall be cause for rejection. For the knock-off test, both specimens must pass.
- 3.2 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.

4. RECORDS

- 4.1 Records for all welders who have been qualified under this standard shall be retained as outlined below.
- 4.2 All Employee Qualification and Requalification records must be retained for a minimum duration of five years.
- 4.3 All Employee Qualification and Requalification records must be retained through temporary lapses in a welder's qualification.
- 4.4 The record shall be made by filling out form 75-27 or form 75-51 (Gas Standard D-30, page 5, 6).

\*Revised

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## INSERT

\* 1.3.1 A period of <sup>plus or minus one month</sup> one year 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.

Insert

D-30

- 2.4.2 Butt welds which pass the visual inspection shall be destructively tested. Take samples shown on page 7 (Drawing 282917).  
(Remainder of section the same)
- 2.4.3 A knock off test shall be performed on branch connections which have passed the visual inspection.