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WELDER QUALIFICATION FOR IN-SERVICE WELDING

D-30.4

Department:	Gas System Maintenance and Technical Support	**Section:** System Integrity	**Date:** 04-27-99
Approved by:	[redacted]	**Approved by:** S. Y. Chwistek	

Rev. #00: This is a new document.

Purpose and Scope

This gas standard provides requirements for qualification of welders who conduct welding in accordance with Gas Standard D-23, "In-service Welding."

Acronyms

API:	American Petroleum Institute
GMAW:	gas metal arc welding
GPM:	gallons per minute
kJ/inch	kilojoules per inch
OD:	outside diameter
SMAW:	shielded metal arc welding
SMYS:	specified minimum yield strength

General Information

1. A welder qualified under this standard may perform in-service welding within the limitations of his/her qualifications as established in Gas Standard D-30.2, "Arc Welder Qualification for Working on Pipelines that Operate at Over 20% of SMYS."
2. Before any production welding is performed, welders shall be qualified under this gas standard using a qualified procedure. The weld shall meet the visual inspection requirements of Gas Standard D-40, "Weld Inspection" and shall also be destructively tested as described in this gas standard, "Qualification for Controlled Heat Input Welding," Item 8, and "Qualification for Temper Bead Welding," Item 5.

Qualification for Controlled Heat Input Welding

1. This test may be given for either SMAW or GMAW.
2. The welder shall make a sleeve weld on a 12" OD, X-42, or a greater pipe with a 1/2" thick by 12" long A242, A441 or A572 sleeve. The welder shall make one circumferential weld. The test coupon shall be in the 5G position.
3. The test pipe shall be filled with water flowing at a minimum rate of 10 GPM while the test is conducted.
4. During deposition of the circumferential weld, the welder shall demonstrate the ability to maintain a minimum heat input of 40 kJ/inch.
5. For SMAW, the heat input shall be verified by measuring the "run-out ratio" during welding.

   Run-Out Ratio = Weld Length/(Original Electrode Length – Stub Length)
6. The run-out ratio for 1/8" type XX18 electrodes with a minimum heat input of 40 kJ/inch is 0.38.
7. For GMAW, the heat input shall be calculated after measuring the amperage, arc voltage, and travel speed.

   Heat Input (kJ/inch) = Amperage x Voltage x 60/(Travel Speed [inch/minute])
8. The completed assembly shall have four nick-break specimens removed from the circumferential weld and be tested per API 1107.

Welder Qualification for In-service Welding

Qualification for Temper Bead Welding

1. This test may be given for either SMAW or GMAW.
2. The welder shall make a sleeve weld on a 12" OD, X-42, or a greater pipe with a 1/2" thick by 12" long A242, A441 or A572 sleeve. The welder shall make one circumferential weld. The test coupon shall be in the 5G position.
3. The test pipe shall be filled with water flowing at a minimum rate of 10 GPM while the test is conducted.
4. During deposition of the circumferential weld, the welder shall demonstrate the ability to deposit and properly position weld beads in the sequence and at the minimum heat input levels described in the welding procedure.
5. The completed assembly shall have four nick-break specimens removed from the circumferential weld and be tested per API 1107.

Retesting and Records

1. Welders who fail the qualification test shall undergo further training or practice before retesting. The extent of training or practice required shall be determined by the welding inspector.
2. Records of all welders 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 five years.
   B. All "Employee Qualification and Requalification" records must be retained through temporary lapses in a welder's qualification.
   C. The record shall be made by filling out Exhibit 1 of Gas Standard D-30.2 and indicating that the record is for in-service welding.

Revision Notes

Revision 00 has the following changes:

1. This is a new document.
2. This document is part of Change 45.