

1.0 SCOPE

1.1 The minimum requirements for testing and fabricating assemblies for natural gas service are specified herein. These requirements apply primarily to assemblies for purchase by PGandE. However, all items fabricated by PGandE must also meet these requirements, except the pre-installation hydrostatic test is not required for facilities which will receive an 8-hour post-installation test. (Refer to Gas Standard A-34, Appendix A.)

This standard applies to most filters, dehydrators, orifice meters, tests heads, tanks, and other assemblies and equipment. Products fabricated in accordance with a specification listed in Appendix A of G.O. 112 (Latest Edition) of the California Public Utilities Commission are generally excepted from this standard (see Paragraph 9.0). Other exceptions from this standard shall be authorized only by the Gas System Design Department. More stringent requirements for certain products or applications may be issued, if needed.

1.2 This standard shall not be interpreted in a manner which would allow relaxation of any requirements specified elsewhere. Other standards, specifications, or special instructions which are more stringent shall be followed.

Consult the Gas System Design Department if there are questions regarding compliance, application of this standard, or if further information is required.

2.0 QUALIFICATION OF WELDING PROCEDURES

Each welding procedure used in the fabrication of the assembly must be qualified under either Section IX of the ASME Boiler and Pressure Vessel Code, or Section 2 of API Standard 1104. The editions of the ASME Boiler and Pressure Vessel Code and API 1104 used for qualification of welding procedures shall be those referenced in the latest edition of G.O. 112, Part II, App. A.

3.0 QUALIFICATION OF WELDERS

3.1 For assemblies with a hoop stress level of less than 20% of SMYS, each welder shall be qualified under 3.2 below or shall be tested by one butt weld and one sleeve weld per Gas Standard D-30.

3.2 For assemblies with hoop stress of 20% or more of SMYS, each welder shall be qualified in accordance with Section IX of the ASME Boiler and Pressure Vessel Code or Section 3 of API Standard 1104. The editions of the



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PIPING - DATA SHEET
 Design and Test Requirements for Assemblies
 and Equipment
 GAS STANDARD

PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

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ASME Boiler and Pressure Vessel Code and API 1104 used for the qualification of welders shall be those referenced in the latest edition of G.O. 112, Part II, Appendix A.

4.0 WELD INSPECTION

4.1 Assemblies shall have 100% of all welds visually inspected by a qualified welding inspector. Visual inspection shall verify that:

4.1.1 Welding is performed in accordance with the welding procedure.

4.1.2 Weld is acceptable according to standards of Section 6 of API 1104, using the edition referenced in the latest edition of G.O. 112, Part II, Appendix A.

4.2 Assemblies with a hoop stress of 20% or more of SMYS shall have 100% of all butt welds on pipe or vessels 6" diameter or larger inspected by radiography.

Reference: G.O. 112 (Latest Edition), Paragraph 192.241, Paragraph 192.243 and Part II, Appendix A.

5.0 PRESSURE TESTS AT TIME OR ASSEMBLY (PRE-INSTALLATION TESTS)

All assemblies shall be hydrostatically tested to a minimum of 1.5 times the design pressure. The test duration shall be a minimum of one hour for those designed to operate under 30% of SMYS, and four hours for those designed to operate at 30% or more of SMYS.

Reference: G.O. 112 (Latest Edition), Paragraph 192.507(c) and Paragraph 192.505(e).

NOTE: (Refer to Gas Standard A-34, Appendix A for post-installation test requirements).

6.0 MATERIALS

6.1 All pipe shall be Grade B seamless except pipe 2 inches and smaller may be furnace butt welded if the operating pressure is limited to 400 psig maximum. Pipe shall be standard weight or heavier, unless an alternate is approved by the Gas System Design Department. Pipe shall be manufactured to API 5L, ASTM A-53 or ASTM A-106 specifications.

6.2 Where applicable, fittings and other material used in the assembly shall be manufactured under a specification listed in Appendix A of General Order 112 (Latest Edition).

7.0 REPORT

A test report shall be prepared for each assembly. This report shall specify hydrostatic test pressure and duration, and shall indicate that appropriate weld inspection was performed. Alternate (with prior approval for Gas System Design Department): for equipment purchased at the rate of at least several

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units per year and with a hoop stress of less than 20% of SMYS; the manufacturer may send a letter to the Gas System Design Department certifying that the units meet weld inspection and hydrostatic test requirements of this standard. This letter will eliminate the need for individual reports on the specified units.

8.0 PRESSURE RATING

8.1 Each assembly shall have a rated pressure which will not produce a hoop stress in the pipe component of the assembly which exceeds 50% of the SMYS of the material used. For pipe, this pressure shall be calculated using the following formula:

$$P = St/D$$

Where:

P = maximum rated pressure - psig

S = SMYS of material

D = nominal outside diameter of pipe - inches

t = nominal wall thickness of pipe - inches

All fittings used as components of assembly shall have a pressure rating equal to or in excess of the assembly's rated pressure. Refer to Section B of Gas Standards and Specifications for fitting ratings, material and ANSI manufacturing standards.

8.2 Weld inspection and hydrostatic test requirements are based on maximum calculated hoop stress at rated pressure.

9.0 REQUIREMENTS FOR ITEMS CONSTRUCTED UNDER A SPECIFICATION LISTED IN APPENDIX A OF GENERAL ORDER 112 (LATEST EDITION)

9.1 The supplier may be requested to provide verification that the product complies with the specification.

9.2 For items constructed under the ASME Boiler and Pressure Vessel Code, Section VIII; ASME test certificates will be required for hoop stress over 20% of SMYS. Exceptions shall be approved by the Gas System Design Department.

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