35-6 PNEUMATIC TESTING

Mass-produced pressure vessels that otherwise qualify for exemption from impact testing per UG-20(f) may be pneumatically tested as described below in lieu of the hydrostatic test requirements of UG-20(f)(2):

(a) The maximum allowable working pressure to be stamped on the vessel shall not exceed 500 psig (3.5 MPa).

(b) Materials used for pressure-retaining portions of the vessel, and for non-pressure parts attached to pressure parts by welds having a throat thickness greater than 1/4 in. (6 mm), shall be restricted to those listed in the notes of Figure UCS-66.

(c) The following thickness limitations apply:
   (1) For butt joints, the nominal thickness at the thickest welded joint shall not exceed 3/16 in. (13 mm).
   (2) For corner joints or lap welds, the thinner of the two parts joined shall not exceed 1/8 in. (13 mm).

(d) The minimum metal temperature during the pneumatic test shall be maintained at least 30°F (18°C) above that given on Figure UCS-66 for the governing material classification and thickness combination in UCS-66(a).

(e) The UW-50 NDE requirements are not applicable for mass-produced pressure vessels.

(f) The pneumatic test pressure shall be at least equal to 1.3 times the maximum allowable working pressure to be stamped on the vessel, multiplied by the lowest ratio (for the materials of which the vessel is constructed) of the stress value $S$ for the test temperature of the vessel to the stress value $S$ for the design temperature (see UG-21). In no case shall the pneumatic test pressure exceed 1.3 times the basis for calculated test pressure as defined in Mandatory Appendix 3, section 2 by more than 10%. The pressure in the vessel shall be gradually increased to not more than one-half of the test pressure. Thereafter, the test pressure shall be increased in steps of approximately one-tenth of the test pressure until the required test pressure has been reached. Then the pressure shall be reduced to a value equal to the test pressure divided by 1.3 and held for a sufficient time to permit inspection of the vessel. This inspection may be performed as a separate test. The visual inspection of the vessel at the required test pressure divided by 1.3 may be waived, provided
   (1) a suitable gas leak test is applied
   (2) substitution of the gas leak test is by agreement reached between Manufacturer and Inspector
   (3) all welded seams that will be hidden by assembly are given a visual examination for workmanship prior to assembly.
Endnote 101:

101 Air or gas is hazardous when used as a testing medium. It is therefore recommended the vessel be tested in such a manner as to ensure personnel safety from a release of the total internal energy of the vessel. See also ASME PCC-2, Article 501, Mandatory Appendix 501-II, “Stored Energy Calculations for Pneumatic Pressure Test,” and Mandatory Appendix 501-III, “Safe Distance Calculations for Pneumatic Pressure Test.”

Insert Capital “S” as shown in bold underlined text