

energies in oxygen. Many such materials can be ignited by friction at a valve seat or stem packing or by adiabatic compression produced when oxygen at high pressure is rapidly introduced into a system initially at low pressure.

1310.1.2 Materials used in central supply systems shall meet the following requirement [NFPA 99:5.1.3.4.4]:

In those portions of systems intended to handle oxygen or nitrous oxide at gauge pressures of less than 21bar (300 psi), material construction shall be compatible with oxygen under the temperatures and pressures to which the components can be exposed in the containment and use of oxygen, nitrous oxide, mixtures of these gases, or mixtures containing more than 23.5 percent oxygen. [NFPA 99:5.1.3.4.4(1), (2)]

1310.2 Certification of medical gas and medical vacuum systems shall conform to the requirements of Section 1327.0 of this code, the Authority Having Jurisdiction and NFPA 99, *Standard for Health Care Facilities* or equivalent International Standard(s) approved by the Authority Having Jurisdiction.

1310.3 Prior to any installation work, the installer of medical gas and vacuum piping shall provide and maintain documentation on the job site for the qualification of brazing procedures and individual brazers that are required under Section 1310.6. [NFPA 99:5.1.10.10.11.4]

1310.3.1 Each length of tube shall be delivered plugged or capped by the manufacturer and kept sealed until prepared for installation. Fittings, valves, and other components shall be delivered sealed, labeled, and kept sealed until prepared for installation. [NFPA 99:5.1.10.1.2 and 5.1.10.1.3]

1310.4 Medical gas and medical vacuum systems shall be supplied from a source consisting of not less than two units – primary and secondary, e.g., a manifold consisting of two cylinder banks with not less than two cylinders in each bank, not less than two air compressors, or not less than two vacuum pumps. However, two supply pipelines are not required.

1310.5 Health care organization personnel shall be permitted to install piping systems if the requirements of this chapter are met during installation. [NFPA 99:5.1.10.10.11.5]

1310.6 Brazing procedures and brazer performance for the installation of medical gas and vacuum piping shall be qualified in accordance with either Section IX, “Welding and Brazing Qualifications,” of the ASME *Boiler and Pressure Vessel Code*, or AWS B2.2, *Standard for Brazing Procedure and Performance Qualifications*, both as modified below or equivalent

International Standard(s) approved by the Authority Having Jurisdiction. [NFPA 99:5.1.10.10.12.1]

1310.6.1 Brazers shall be qualified by visual examination of the test coupon followed by sectioning. [NFPA 99:5.1.10.10.12.2]

1310.6.2 The Brazing Procedure Specification (BPS) shall address cleaning, joint clearance, overlap, internal purge gas flow rate, and filler metal. [NFPA 99:5.1.10.10.12.3]

1310.6.3 The brazing procedure specification and the record of brazer performance qualification shall document filler metal used, cleaning, joint clearance, overlap, internal purge gas, and flow rate during brazing of coupon, and the absence of internal oxidation in the completed coupon. [NFPA 99:5.1.10.10.12.4]

1310.6.4 Brazing procedures qualified by a technically competent group or agency shall be permitted under the following conditions:

- (1) The brazing procedure specification and the procedure qualification record meets the requirements of this standard.
- (2) The employer obtains a copy of both the brazing procedure specification and the supporting qualification records from the group or agency and signs and dates these records, thereby accepting responsibility for the qualifications that were performed by the group or agency.
- (3) The employer qualifies not less than one brazer following each brazing procedure specification used. [NFPA 99:5.1.10.10.12.5]

1310.6.5 An employer shall be permitted to accept brazer qualification records of a previous employer under the following conditions:

- (1) The brazer has been qualified, following the same or an equivalent procedure that the new employer uses.
- (2) The new employer obtains a copy of the record of brazer performance qualification tests from the previous employer and signs and dates these records, thereby accepting responsibility for the qualifications performed by the previous employer. [NFPA 99:5.1.10.10.12.6]

1310.6.6 Performance qualifications of brazers shall remain in effect indefinitely unless the brazer does not braze with the qualified procedure for a period exceeding six months, or there is a specific reason to question the ability of the brazer. [NFPA 99:5.1.10.10.12.7]

1311.0 Plan Review.

1311.1 Before any medical gas or medical vacuum system is installed or altered in any hospital, medical