CANADIAN STANDARDS ASSOCIATION

Z7396.1-09

Medical gas pipeline systems — Part 1: Pipelines for medical gases and vacuum

7.3 Fittings

7.3.1

Fittings used for connecting copper pipe shall be

(a) constructed from wrought copper, brass, or bronze;
(b) made especially for soldered or brazed connections (except as permitted by Clause 7.3.2); and
(c) suitable for the maximum pipeline pressure that can be encountered in the construction, testing, and service of the system.

7.3.2

The following fittings may be used in lieu of brazed copper joints:

(a) For pipe sizes 12.5 mm (1/2 in) or less, fittings that are not made especially for soldered or brazed connections may be used, provided that the fitting as installed is visible in the room or is readily accessible for maintenance.
(b) Dielectric fittings may be used where required by the manufacturer of special medical equipment to electrically isolate the equipment from the pipeline distribution system.
(c) Axially swaged, elastic strain preload fittings providing metal-to-metal seal may be used provided that the fittings have pressure and temperature ratings not less than that of a brazed joint and, when complete, are permanent and non-separable.

7.3.3

Where provision is made for future extension of existing medical gas systems, the pipes shall be valved and fitted with brazed caps.

7.4 Joints

7.4.1

All joints in the piping shall be made with silver brazing alloy conforming to AWS Classification BCuP-5 in conformance with AWS A5.8/A5.8M, with the following exceptions:

(a) fittings that meet the criteria of Clause 7.3.2;
(b) connections at valves;
(c) connections to equipment that requires threaded connectors; and
(d) connections within a stationary liquid supply system.

For copper-to-copper connections, a flux shall not be used. In silver brazing of dissimilar metals, only a product conforming to AWS brazing flux No. 3A shall be permitted. Particular care shall be exercised in applying flux to ensure that it will not penetrate to the inside of the pipe. Where such a product is used, the outside of the tube and fittings shall be washed with hot water after brazing to remove residual flux.

7.4.2

Threaded joints shall be installed using a sealing compound that is suitable for the gas being transmitted.
Note: *The use of threaded joints in medical gas piping systems should be minimized.*

7.4.3

During the brazing of pipe connections, and where safe when performing final connections and emergency repairs, the interior of the pipe shall be maintained with a nitrogen atmosphere. This shall be done by purging the pipe a sufficient number of times to remove all air and oxygen and by maintaining a small purge flow to prevent the re-entry of air or oxygen.
Note: *The presence of oxygen within the pipe during brazing will cause oxidation of the inside of the pipe at the joint. The oxide formed can be released as a particulate matter and can cause problems for the life of the piping system.*

7.4.4

If pipe extensions/pigtails are brazed to equipment or fittings (valves, terminal units, etc.) or if brazed piping forms part of a source unit, the brazed joints shall be purged as specified in Clause 7.4.3.