**2021 Worksheet # 8**

**Installation of Piping and Equipment:**

**Pipe Labeling:**

**Pages:**

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1. A continuous tape or marker shall be placed immediately above the buried pipeline enclosure and shall be identified by \_\_\_\_\_\_\_\_\_.

a. Chemical symbol

b. Color code

**c. Specific name**

d. Facility numbering

 2. Brazing procedures and brazier performance for the installation of medical gas and vacuum piping shall be qualified in accordance with\_\_\_\_\_\_\_\_\_\_\_\_.

a. UA 101

b. AWS B31.3

c. ASSE standard 6010

**d. ASME section IX**

3. Flex hose and connectors, both metallic and non-metallic, shall be no longer than necessary and shall have a minimum burst pressure of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. 800 psi

b. 500 psi

c. 300 psi

**d. 1000 psi**

 4. If a nonmetallic flexible connector is being used in a category 1 health care facility to connect the manifold to the gas distribution piping, what is maximum length permitted for the flexible connector\_\_\_\_\_\_\_\_?

a. As much as it takes

b. The use of flexible connectors is not permitted

**c. they shall be no longer than necessary**

d. 5 Ft. rule

5. Medical gas and vacuum systems with the same contents shall be permitted to be interconnected with an\_\_\_\_\_\_\_\_\_\_\_\_\_ valve installed between the systems.

 a. Source valve

b. Riser valve

c. Service valve

**d. In-line valve**

6. In potentially damp locations, copper tube hangers or supports that are in contact with the copper tube shall be\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Plastic coated

b. Electrically insulated from the tube

c. Material that will not absorb moisture

d. All of the above

7. Mains and branches in medical gas and WAGD piping systems shall be not less than \_\_\_\_\_\_\_\_.

**a. 1/2” NPS**

b. 3/8” NPS

c. 5/8” NPS

d. 3/4” NPS

 8. Mains and branches in medical-surgical vacuum systems shall not be less than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. 7/8” NPS

b. 1/2” NPS

c. 5/8” NPS

**d. 3/4” NPS**

9. Metallic flexible joints shall be permitted in the pipeline for expansion joints, seismic protection, thermal expansion, or vibration control shall be as the following\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Made of bronze, copper, stainless steel

b. Suitable for service 300 psig, 1000℉

c. Provided with brazing extensions

**d. All of the above**

10. NFPA 99 specifies that the medical gas piping system shall be protected against all condition EXCEPT which of the following\_\_\_\_\_\_?

a. Corrosion

b. Physical damage

**c. Combustible liquids**

d. Freezing

11. Performance qualification of brazers shall remain in effect indefinitely unless the brazer does not braze with the qualified procedure for a period exceeding \_\_\_\_\_\_\_\_\_\_\_\_\_\_ months.

a. 18

**b. 6**

c. 24

d. 12

12. Pipe labels shall be located at intervals of not more than \_\_\_\_\_\_\_\_ft.

a. 15

**b. 20**

c. 10

d. 25

13. Piping shall not be installed at which of the following locations \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

a. Kitchens

b. Elevator shafts

c. Areas with open flames

**d. All of the above**

14. Prior to any work the installer of medical gas and vacuum piping shall provide and maintain documentation on the job site for the qualification of \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_.

a. **Brazing procedures, Individual brazers**

b. Brazing procedure records (BPQR483) only

c. Individual braziers, brazing record

d. All of the above

15. Runouts to alarm panels and connecting tubing for gauges and alarm devices shall be permitted to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. ⅝ O D

b. ⅜ NPS c. ⅛ NPS

**d. ⅜ O D**

16. The ambient temperature around the medical gas piping is limited to \_\_\_\_\_\_\_\_\_\_\_\_ degree maximum.

a. 130 ⁰C

b. 129 ℉

**c. 130 ℉**

d. 129 ⁰C

17. The installation of medical gas and vacuum system shall be made by qualified, competent technicians who are experienced in performing such installations, \_\_\_\_\_\_\_\_\_\_\_\_\_ who actually install the piping system.

**a. Including all personnel**

b. All plumbers that work on the medical center

c. All cleanup crew that has 5 years’ experience

d. Any personnel the contractor send to the medical center

18. The installation of medical gas and vacuum systems shall be made by experienced, qualified and competent installers. The installers shall meet the requirements of \_\_\_\_\_\_\_\_\_\_\_\_\_.

a. AWS B31.3

b. ASME section IX

c. ASSE standard 6001

**d.** **none of the above**

19. The minimum backfilled cover for buried piping shall be 36", except that a minimum cover shall be reduced to \_\_\_\_\_\_\_\_\_\_\_where there is no potential for damage from surface loads.

a. 24″

b. 16″

**c. 18″**

d. 20″

20. To identify medical gas or vacuum system piping, the piping shall be labeled by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Stenciling name of system

b. Adhesive markers

c. Stenciling the chemical symbol

**d. Any of the above**

21. Underground piping buried outside of buildings shall be installed below the local level of frost penetration and shall be protected by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Conduit

b. Enclosure

c. Cover

**d. Any of the above**

22. When brazing, joints shall be continuously purged with oil free, dry nitrogen NF to prevent the formation of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the inside surfaces of the joint.

a. Volatilized liquid

b. Polymeric material

**c. Copper Oxide**

d. Crystallization

23. Which of these is an NFPA 99 requirement for the labeling of pipes in a medical gas system \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

a. Reflective label

b. Fixed label

c. Label shall wrap completely around the pipe

 **d. Color coding**

24. Metallic flexible joints that is provided with brazing extension shall be permitted to be concealed in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Walls

b. Ceilings

c. Partitions

**d. All of the above**

25. When Corrugated Metal Tube (CMT) is use, the supports shall be installed accordance to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

a. Authority Having Jurisdiction

b. ASSE Publications

c. Mechanical Engineers

**d. Manufacturer instructions**

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