



Medical Technology Associates **ASSE 6010 Medical Gas Installers Course**

Course Description

This course is divided into the following Two Sections –
The main focus of this 32 hour Medical Gas Pipeline Installer Course is to provide training and testing regarding the operation, application and code requirements to individuals who are responsible for the correct installation of medical gas pipeline systems.

Section # (1) Classroom Instruction provides information (2012 Edition of NFPA 99 Gas and Vacuum Systems and ASSE 6000) related to the material, components and equipment that the student might find themselves in contact with regarding the Medical Gas Pipeline System in Category 1, 2 and 3 Healthcare Facilities.

Section # (2) - 100 question **CLOSED BOOK** written test and brazing certification.

Course Outline – Length: 32 Hours

1. Installation of Piping (5.1.10.10 – 5.1.10.10.10.2) – Section Quiz # 1
 - A. Sizing
 - B. Protection
 - C. Location
 - D. Support
 - E. Underground
 - F. Branch Takeoffs

2. Qualification of Installers (5.1.10.10.11 – 5.1.10.10.12.7) – Section Quiz # 1
 - A. Who is a qualified Installer
 - B. Qualification of Brazing Procedures and Brazing
 - C. Employer Brazer Qualification Records

3. Labeling and Identification (5.1.11 – 5.1.11.4) – Section Quiz # 1
 - A. Piping
 - B. Shutoff Valves
 - C. Source Valves
 - D. Main Line Valves
 - E. Riser Valves
 - F. Service Valves

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- G. Station Outlets & Inlets
 - H. Alarm Panels
4. Installer Performed Tests (5.1.12.2 – 5.1.12.2.7.7) –Section Quiz # 2
- A. General
 - B. Blow Down
 - C. Pressure Test
 - D. Cross Connection
 - E. Piping Purge
 - F. Standing Pressure Test for Positive Pressure Medical Gas Piping
 - G. Standing Vacuum Test for Vacuum System
5. Performance Criteria & Testing(5.1.12 – 5.1.12.1.12.2) – Section Quiz # 2
Level I Gases, Medical Vacuum, WAGD
- A. General
 - B. Which Facilities need testing
 - C. What areas of each Facility need testing
 - D. Who is the responsible authority at each Facility
6. System Verification (5.1.12.3 – 5.1.13.2.2) – Section Quiz # 2
- A. General
 - B. Standing Pressure Test
 - C. Cross-Connection Test
 - D. Individual Pressurization
 - E. Pressure Differential
 - F. Valve Test
 - G. Alarm Test
 - H. Master Alarms
 - I. Area Alarms
 - J. Piping Purge Test
 - K. Piping Particulate Test
 - L. Piping Purity Test
 - M. Final Tie-In Test
 - N. Operational Pressure Test
 - O. Medical Gas Concentration Test
 - P. Medical Air Purity Test (Compressor System)
 - Q. Labeling
 - R. Source Equipment Verification
 - a. General
 - b. Gas Supply Sources



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- c. Medical Air Compressor Systems
- d. Medical-Surgical Vacuum Systems
- e.
- S. Level I Operation and Management
 - a. Special Precautions – Piped Patient Gas/Vacuum Systems
 - b. Gas/Vacuum Systems Information and Warning Signs
- 7. Central Supply Systems - (5.1 – 5.1.3.4) - Section Quiz - #3
 - A. Ventilation
 - B. Design & Construction
 - C. Identification and Labeling
 - D. Location
 - E. Emergency Oxygen Supply Connection
 - F. Bulk Oxygen
 - G. Manifolds
- 8. Medical Air Compressors – (5.1.3.5 – 5.1.3.5.15)-Section Quiz -#4
 - A. Reciprocating
 - B. Rotary Vane
 - C. Liquid Ring
 - D. Aftercoolers
 - E. Receivers
 - F. Dryers
 - G. Filters
 - H. Regulators
 - I. Local Alarms/Operating Alarms
 - J. Piping Arrangements
 - K. Dew Point
- 9. Medical Vacuum Systems – (5.1.3.6 – 5.1.3.7.6) - Section Quiz – #5
 - A. Locations
 - B. Receivers
 - C. Alarms
 - D. Piping
 - E. Exhaust
 - F. WAGD Sources, Alarms, Exhaust
- 10. Instrument Air (5.1.3.8 – 5.1.3.8.11) - Section Quiz – #6
 - A. Sources
 - B. Intake



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- C. Filters
 - D. Piping
 - E. Alarms
11. Valve Types (5.1.4 – 5.1.4.10.2) - Section Quiz - #6
- A. Types
 - B. Source
 - C. Main
 - D. Riser
 - E. Service
 - F. Zone Valves
 - G. In-Line Valves
12. Station Outlets/Inlets (5.1.5 – 5.1.5.16.1) – Section Quiz # 7
- A. Station Outlets/Inlets configuration description
 - B. Station Outlets/Inlets using Non-Standard Operating Pressures
13. Manufactured Assemblies (5.1.6- 5.1.8.2.4) - Section Quiz # 7
- A. Surface Mounted Medical Gas Rails
 - B. Pressure and Vacuum Indicators
 - C. Pressure and Vacuum Indicator Locations
14. Level I Warning Systems (5.1.9 – 5.1.9.5.4) - Section Quiz # 8
- A. General Information
 - B. Master Alarm
 - C. Area Alarm
 - D. Local Alarms
15. Level I Distribution (5.1.10 – 5.1.10.9.2) - Section Quiz # 9
- A. Positive Pressure Medical Gas Piping
 - B. Medical Vacuum and WAGD
 - C. Vacuum Tubing Marking
 - D. Fittings
 - E. Brazed Joints – cutting, cleaning
 - F. Dissimilar Metals – Inspection
 - G. Nitrogen Purge
 - H. Welded Joints, Prohibited Joints



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16. Level I, II & III Source Systems & Distribution (5.1.14 – 5.3.11.3.2)
- Section Quiz #10
 - A. Level I Support Gases
 - B. Level 2 Piped Gas and Vacuum Systems
 - C. Level 3 Piped Gas and Vacuum Systems

17. Written - Sample Final Exam – 100 Questions (Closed Book) -
 - A. Sample Final Exam Discussion -

18. Copper Tubing Brazing
 - A. Instruction and demonstration on the following Medical Gas Piping Brazing Techniques
 - a. Heating a Joint
 - b. Applying Brazing Filler Metal
 - c. Making Horizontal Joints
 - d. Making Vertical Joints
 - e. Safety Measures
 - B. Discuss Medical Gas Piping Course Brazing Technique and Horizontal & Vertical Brazing Procedure

19. Final Course Wrap-Up and Class Dismissal
 - A. Student Critique of class – Complete handout Questionnaire
 - B. Distribute Contact Information
 - C. Discuss Pipe Installers/Brazers State Requirements for maintaining Piping Installers Certification
 - D. Final review and questions

20. Written – N.I.T.C. Final Exam – 100 Questions (Closed Book) -
Final Exam is Proctored by N.I.T.C. Personnel

21. Practical Exam - Must Complete – 1 Vertical Coupon & 1 Horizontal Coupon
 - A. Brazing Inspection Proctored by N.I.T.C.



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Objective

The main objective of this 32 hour Medical Gas Course is to provide training and testing regarding the operation, application and code requirements to individuals who are responsible for the medical gas pipeline systems. Those who successfully complete the course and pass both exams will be awarded their certification.

Method of Evaluation

Each participant will be tested on their knowledge of Medical Gas Pipeline through a Minimum 100 Question Final Exam overseen by an N.I.T.C. Proctor. To receive a certification from the course, participants must pass the written exam with a score of 77% for NITC 6010.