

SANTA ROSA FIRE DEPARTMENT

FIRE PREVENTION BUREAU

INSPECTION CHECKLIST

July 1, 2010



MEDICAL GAS INSTALLATION INSPECTION CHECKLIST

Address:		Permit #:
Inspector:	Date Inspected:	Status:
Inspector:	Date Inspected:	Status:
A-Approved, R-Re-inspection Required		

This Checklist outlines general requirements. Information contained herein applies to typical instances and may not address all circumstances.

GENERAL

UPC1330.2 Inspection request. Telephone a minimum of 48 hours in advance of the inspection.

- | | Y | N | |
|-----|--------------------------|--------------------------|---|
| 1. | <input type="checkbox"/> | <input type="checkbox"/> | UPC1329.2 Test preparation |
| 2. | <input type="checkbox"/> | <input type="checkbox"/> | Approved plans and permit on site. |
| 3. | <input type="checkbox"/> | <input type="checkbox"/> | Applicant (installer) to supply all materials for acceptance testing. |
| 4. | <input type="checkbox"/> | <input type="checkbox"/> | Only oil free dry nitrogen shall be used for test. |
| 5. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA99-5.1.10.3.8.2 Separate tests. Leak testing shall be accomplished by separately charging and testing each individual piping system. |
| 6. | <input type="checkbox"/> | <input type="checkbox"/> | UPC 1302.1 Installer's Certification. The AHJ shall require evidence of competency of the installer's certification specifically identifying competency in installation of medical gas systems. |
| 7. | <input type="checkbox"/> | <input type="checkbox"/> | Rough test (before attachment of system components) |
| 8. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA 99 4-5.4.1.2. System lines shall be blown clear by means of oil free nitrogen and cross connection checked. |
| 9. | <input type="checkbox"/> | <input type="checkbox"/> | Med Gas: Test at 1½ times the working pressure (never less than 150 psig). Maintain pressure until each joint is checked by the installer with an approved leak detector. |
| 10. | <input type="checkbox"/> | <input type="checkbox"/> | UPC1329.6 Vacuum piping: Negative pressure at 12 mmHg for 24 hours. |
| 11. | <input type="checkbox"/> | <input type="checkbox"/> | Final test |
| 12. | <input type="checkbox"/> | <input type="checkbox"/> | System shall be pressurized to 1½ times the working pressure (never less than 150 psig) and joints checked by the installer with inspection and acceptance by the Fire Inspector. |
| 13. | <input type="checkbox"/> | <input type="checkbox"/> | Med. Gas: System pressure to be leak free. (gauge variations due to changes in ambient temperature are acceptable) |
| 14. | <input type="checkbox"/> | <input type="checkbox"/> | UPC1329.7 Vacuum piping: To remain at negative pressure at 12 mmHg. |

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Medical Gas Installation

- | Y | N | |
|-----|--------------------------|--|
| 15. | <input type="checkbox"/> | <input type="checkbox"/> Pipelines shall be purged of test gas with nitrous oxide/oxygen before use. |
| 16. | <input type="checkbox"/> | <input type="checkbox"/> Each cylinder shall be provided with a pressure reducing regulator. |

CONSTRUCTION & VENTILATION

- | | | |
|-----|--------------------------|--|
| 17. | <input type="checkbox"/> | <input type="checkbox"/> UMC 1320.1 Piping joints. Copper to copper joints shall be brazed with silver braising alloy at 1000 degrees Fahrenheit. |
| 18. | <input type="checkbox"/> | <input type="checkbox"/> Piping shall be seamless Type "K" or "L" copper tubing, hard temper for exposed locations and soft temper for concealed locations. All materials shall be prepared for oxygen service. Copper tubing shall be a minimum 3/8 outer diameter. |
| 19. | <input type="checkbox"/> | <input type="checkbox"/> UFC 7401.6.3 Piping exposed to possible damage shall be protected in conduit. |
| 20. | <input type="checkbox"/> | <input type="checkbox"/> UMC13.17.4 Piping for medical vacuum shall be listed seamless Type K or L copper tubing, or other approved or listed material. Schedule 40 or "heavier" PVC is acceptable for medical vacuum systems. |
| 21. | <input type="checkbox"/> | <input type="checkbox"/> CFC 3006.1 Room Construction. Quantities in excess of exempt amount require one hour construction in medical gas exterior room, interior room or a gas cabinet. . |
| 22. | <input type="checkbox"/> | <input type="checkbox"/> CFC 3006.2 One-hour exterior room: One hour rated fire resistive construction with any interior openings protected. At least one exterior wall and at least one fire sprinkler. Two 36 cubic inch vents; one within 6" of floor and one within 6" of the ceiling. . |
| 23. | <input type="checkbox"/> | <input type="checkbox"/> CFC 3006.2.2 One-hour interior room (no exterior wall): One hour rated fire resistive construction, makeup air shall come from the exterior and a fire sprinkler is required. Supply and exhaust vent ducts to be within one-hour shaft enclosures from the room to the exterior. Mechanical ventilation required at 1 cfm/per ft ² of floor area. |
| 24. | <input type="checkbox"/> | <input type="checkbox"/> CFC 3006.2.3 Gas cabinets: Connected to exhaust port, equipped with a self-closing door and constructed of not less than 0.097-inch (12 gauge) steel and internally fire sprinklered. Ventilation at face of access ports not less than 200 fpm; minimum of 150 fpm at any point of the access port or window. |
| 25. | <input type="checkbox"/> | <input type="checkbox"/> CFC 3006.3 Exterior supply locations: Oxidizer medical gas systems in quantities greater than the exempt amount. |
| 26. | <input type="checkbox"/> | <input type="checkbox"/> NFPA99-4-5.1.2.10 Piping imbedded within concrete floors or concrete walls shall be installed in a continuous protective conduit unless exempted. |
| 27. | <input type="checkbox"/> | <input type="checkbox"/> Piping underground shall be in a continuous protective enclosure. |
| 28. | <input type="checkbox"/> | <input type="checkbox"/> NFPA99-5.1.10.3.5.2 Exception: Air pressure lines and vacuum lines for medical clinics are not required to be in a secondary conduit. Other medical gas piping installed below graded shall be installed in a conduit. (Can not be split conduits such as two halves of a pipe) |
| 29. | <input type="checkbox"/> | <input type="checkbox"/> NFPA99-5.1.3.3.2 Lockable Doors. Rooms containing medical gas, oxygen, medical air and other gases shall be lockable. Key shall be accessible in knox box. |
| 30. | <input type="checkbox"/> | <input type="checkbox"/> NFPA99-5.1.10.3.5.2 Storage. Medical gases shall be stored in areas dedicated to the storage of such gases without other storage or uses. . |

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- | | Y | N | |
|-----|--------------------------|--------------------------|--|
| 31. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA99-5.1.3.3.2 Cylinders. Compressed gas cylinders shall be securely fastened to a supporting wall, with chains at two points, to prevent falling. Cylinders not in use shall have protective caps in place over the valves. |
| 32. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA 99 4-5.1.1.2 Electrical wall fixtures shall not be installed less than five (5) feet above the floor in storage rooms. . |

LABELING

- | | | | |
|-----|--------------------------|--------------------------|---|
| 33. | <input type="checkbox"/> | <input type="checkbox"/> | All medical gas piping and manifolds shall be permanently labeled with the gas they carry or control. |
| 34. | <input type="checkbox"/> | <input type="checkbox"/> | Piping labels shall not be more than 20' intervals and at every change in direction. |
| 35. | <input type="checkbox"/> | <input type="checkbox"/> | Labels shall be located before and after barriers, behind access doors, at inlets and outlets and vertically at every floor. |
| 36. | <input type="checkbox"/> | <input type="checkbox"/> | Labels shall be posted on access doors to enclosures containing medical gas piping, valves or components. Lettering at least 3/8" high & parallel to axis of pipe. |
| 37. | <input type="checkbox"/> | <input type="checkbox"/> | Labels shall include: Type of Gas; Direction of flow (arrows); working pressure. |
| 38. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA5.1.11 Labels for valves. All medical gas valves shall be labeled indicating "(type of gas) (source, main line, riser for, service) shutoff valve for (location or zone), "Do not open or close valve except in an emergency". Lettering to be at least 3/8" high. (see also UPC1324.5) |
| 39. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA99-5.1.3.1.2 Labels for cylinders. Compressed gas cylinders shall be labeled so that contents are identified. |
| 40. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA99-9.4.4.1 Door sign for oxidizing gases (i.e. Oxygen, Nitrous Oxide, etc) "CAUTION OXIDIZING GAS(ES) STORED WITHIN - NO SMOKING" |
| 41. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA99-5.1.3.1.6 Door sign for medical air "CAUTION MEDICAL GASES NO SMOKING OR OPEN FLAME" |
| 42. | <input type="checkbox"/> | <input type="checkbox"/> | NFPA99-5.1.3.1.5 Door sign for gases other than oxygen and medical air "CAUTION MEDICAL GASES - NO SMOKING OR OPEN FLAME - ROOM MAY HAVE INSUFFICIENT OXYGEN - OPEN DOOR AND ALLOW ROOM TO VENTILATE BEFORE ENTERING" |
| 43. | <input type="checkbox"/> | <input type="checkbox"/> | A NFPA 704 M label is required for the Medical Gas Room on the outside door. |

THIRD PARTY CERTIFICATION

- | | | | |
|-----|--------------------------|--------------------------|---|
| 44. | <input type="checkbox"/> | <input type="checkbox"/> | System Certification. Prior to placing system in service, system certification shall be completed by a qualified, AHJ approved independent 3rd party verification agency. |
| 45. | <input type="checkbox"/> | <input type="checkbox"/> | UPC1331.2. UPC1331.0 System certification documentation shall indicate compliance with |
| 46. | <input type="checkbox"/> | <input type="checkbox"/> | UPC1331.0 Documentation of system certification shall be provided to the Fire Inspector prior to final permit approval. |

REFERENCE TABLE

NFPA 99 Table 5.1.11 Standard Designation Colors and Operating Pressures for Gas and Vacuum Systems		
Gas Service	Abbreviated Name	Colors (Background/Text)
Medical air	Med Air	Yellow/black MEDICAL AIR 75 - 150 PSIG →
Carbon dioxide	CO2	Gray/black or gray/white
Helium	He	Brown/white
Nitrogen	N2	Black/white
Nitrous oxide	N2O	Blue/white
Oxygen	O2	Green/white or white/green
Oxygen/CO2 mixtures	O2/CO2 n%(n is % of CO2)	Green/white
Medical-surgical vacuum	Med Vac	White/black
Waste anesthetic gas disposal	WAGD	Violet/white
Other mixtures	Gas A %/Gas B%	Colors as above Major gas for background/ minor gas for text
Non-medical air (level 3 gas-powered device)		Yellow and white diagonal stripe/black
Non-medical and level 3 vacuum		White and black diagonal stripe/black boxed
Laboratory air		Yellow and white checkerboard/black
Laboratory vacuum		White and black checkerboard/black boxed
Instrument air		Red/white

Notes: NFPA 99 is not formally adopted by the UFC as indicated in 3006.4 but is a recognized standard where the UFC and the UPC are silent. Per UFC 3006.1 (amended) the medical gas system is to be in compliance with IFC 3006 (including veterinary use) however, all piping, manifolds, connections, regulators, alarms, sensors and associated equipment is to be in compliance with the UPC.