**Oxygen and Fuel Gas Manifolds**
**Oxy-fuel gas**
**3-22-12**

**(12) Oxygen and Fuel Gas Manifolds**

(a) When working with oxygen and fuel gas manifolds you must: 350(e)(1)

**(**A) Label each manifolds with the name of the product they contain: 350(e)(1)

(i) Use permanent signage or 350(e)(1)

(ii) Use painted letters one inch high 350(e)(1)

(B) Place oxygen and fuel gas manifolds in safe, well ventilated and accessible locations.

(C) Use manifolds that are either approved separately for each component part or as an approved assembled unit. 253(c)(1)(i)

(D) Limit the total capacity of fuel-gas cylinders connected to one manifold inside a building. The total capacity must not exceed 300 pounds (135.9 kg) of liquefied petroleum gas or 3,000 cubic feet ($m^3$) of other fuel-gas, except as provided for in paragraph (a)(F). 253(c)(1)(ii)

(E) Separate more than one manifold connected to cylinders located in the same room by: 253(c)(1)(ii)

(i) At least 50 feet, or 253(c)(1)(ii)

(ii) A noncombustible partition that:

(I) Extends at least 18 inches above the tallest container and is not less than 5 feet high

(II) Extends laterally at least 18 inches beyond the sides of the containers.

(III) Has a fire-resistance rating of at least one-half hour. 253(c)(1)(ii)

(F) Locate fuel-gas cylinders connected to one manifold having an aggregate capacity exceeding 300 pounds of liquefied petroleum gas or 3,000 cubic feet of other fuel-gas: 253(c)(1)(iii)

(i) Outdoors, or 253(c)(1)(iii)

(ii) In a separate building or room constructed in accordance with the rules on acetylene generators (14)(d)(H)(i), (d)(H)(ii), and (d)(H)(iii) and (14)(d)(I)(i), (d)(I)(ii), (d)(I)(iii) 253(c)(1)(iii)

(G) Ensure that separate manifold buildings or rooms used for storage of calcium carbide and cylinders containing fuel gases: 253(c)(1)(iv)

(i) Are well-ventilated. 253(c)(1)(iv)

(ii) Do not have open flames for heat or lighting. 253(c)(1)(iv)

(iii) Are in compliance with Storage (6)(e)(B) when cylinders exceed 2000 cubic feet or 300 pounds of liquefied petroleum gas.

(H) Use approved pressure regulating devices on high-pressure fuel-gas manifolds. 253(c)(1)(v)

(I) Use manifold hose connections that are not interchangeable on all ends of the supply hose that leads to the manifold 350(e)(3)

(J) Keep hose connections free of grease and oil. 350(e)(3)

(K) Cap manifold and header hose connections when not in use. 350(e)(4)

(b) When working with oxygen and fuel gas manifolds you must not:

(A) Locate oxygen and fuel gas manifolds in enclosed spaces. 350(e)(2)

(B) Use adaptors that permit the interchange of manifold hose connections. 350(e)(3)

(C) Place anything on top of a manifold when in use which will: 350(e)(5)

(i) Damage the manifold 350(e)(5)

(ii) Interfere with the quick closing of the manifold valve(s). 350(e)(5)

(c) When using high-pressure oxygen manifolds (for use with cylinders having a Department of Transportation service pressure above 200 psig (1.36 MPa)) you must:

(A) Use manifolds that are either approved separately for each component part or approved as an assembled unit. 253(c)(2)(i)

(B) Separate oxygen manifolds from fuel-gas cylinders or combustible materials (especially oil or grease) by a: 253(c)(2)(ii)

(i) Minimum distance of 20 feet, or 253(c)(2)(ii)

(ii) Noncombustible partition that: revision of 253(c)(2)(ii)

(I) Extends at least 18 inches above the tallest container and is not less than 5 feet high

(II) Extends laterally at least 18 inches beyond the sides of the containers.

(III) Has a fire-resistance rating of at least one-half hour.

(C) Limit oxygen cylinders connected to one manifold to a total gas capacity of 6,000 cubic feet except as provided in paragraph (c)(E). 253(c)(2)(iii)

(D) Separate manifolds by:

(i) At least 50 feet or

(ii) A noncombustible partition that: revision of 253(c)(2)(iii)

(I) Extends at least 18 inches above the tallest container and not less than 5 feet high

(II) Extends laterally at least 18 inches beyond the sides of the containers.

(III) Has a fire-resistance rating of at least one-half hour.

(E) Locate an oxygen manifold inside a building having other occupancy,with an aggregate cylinder capacity of more than 6,000 cubic feet of oxygen, in a separate room that is: 253(c)(2)(iv)

(i) Of noncombustible construction having a fire-resistance rating of at least one-half hour or 253(c)(2)(iv)

(ii) A noncombustible partition that: revision of 253(c)(2)(iv)

(I) Extends at least 18 inches above the tallest container and is not less than 5 feet high

(II) Extends laterally at least 18 inches beyond the sides of the containers.

(III) Has a fire-resistance rating of at least one-half hour.

(F) Comply with the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 55-2010 when an oxygen manifold or oxygen bulk supply system has more than~~:~~ 25,000 cubic feet of oxygen (measured at 14.7 psia and $70^0$ F, connected in service, ready for service, or unconnected reserves on hand at the site. 253(c)(2)(v)

~~(i)13,000 cubic feet of oxygen (measured at 14.7 psia) and 70° F, connected in service or ready for service, or~~ 253(c)(2)(v)

~~(ii) 25,000 cubic feet of oxygen (measured at 14.7 psia and 70° F, including unconnected reserves on hand at the site.~~ 253(c)(2)(v)

(G) Use approved pressure regulating devices on high-pressure oxygen manifolds. 253(c)(2)(vi)

(d) When using high pressure oxygen manifolds you must not locate them in an acetylene generator room. 253(c)(2)(ii

(e) When using low-pressure oxygen manifolds with cylinders having a Department of Transportation service pressure not exceeding 200 psig (1.36 Mpa) you must:

(A) Use manifolds that: 253(c)(3)(i)

(i) Are constructed for use with oxygen at a pressure of 250 psig. 253(c)(3)(i)

(ii) Have a minimum bursting pressure of 1,000 psig; 253(c)(3)(i)

(iii) Are protected by a safety relief device that will relieve at a maximum pressure of 500 psig. 253(c)(3)(i)

NOTE: DOT-4L200 cylinders safety device relieve at a maximum pressure of 250 psig, or 235 psig if vacuum insulation is used. 253(c)(3)(i)

(B) Use hose and hose connections subject to cylinder pressure that have a bursting pressure of 1,000 psig. 253(c)(3)(ii)

(C) Test and prove manifolds are gas-tight at a pressure of 300 psig. 253(c)(3)(iii)

(D) Use oil-free non-combustible fluid for test oxygen manifolds. 253(c)(3)(iii)

(E) Locate manifolds to comply with paragraphs (c)(B), (C), (D), (E), and (F) and all their parts. 253(c)(3)(iv)

**Comment [cnw1]:** SUE: do we need to list those parts also?

(F) Post the following sign at each manifold: 253(c)(3)(v)

Low-Pressure Manifold
Do Not Connect High-Pressure Cylinders
Maximum Pressure – 250 psig

(f) When using portable outlet headers you must:

(A) Equip each outlet on the service piping from which oxygen or fuel-gas is withdrawn, to supply a portable outlet header, with a readily accessible shutoff valve. 253(c)(4)(ii)

(B) Use hose and hose connections that comply with paragraph (a)(I) of this section when connecting the portable outlet header to the service piping. 253(c)(4)(iii)

(C) Provide master shutoff valves for both oxygen and fuel-gas at the entry end of the portable outlet header. 253(c)(4)(iv)

(D) Provide a hydraulic back-pressure valve, installed at the inlet and preceding the service outlets, on portable fuel-gas service outlet headers unless one of the following is installed at each outlet and approved for use: 253(c)(4)(v)

(i) Pressure-reducing regulator, 253(c)(4)(v)

(ii) Back-flow check valve, or 253(c)(4)(v)

(iii) Hydraulic back-pressure valve. 253(c)(4)(v)

(E) Provide oxygen service header outlets with pressure reducing regulators or direct hose connections. 253(c)(4)(v)

(F) Provide each valve assembly with a detachable outlet seal cap, chained or otherwise attached to the body of the valve on the portable header service outlet. 253(c)(4)(vi).

(G) Use materials and fabrication procedures for portable outlet headers that comply with the rule on Service piping Systems paragraphs (13)(a)(A-L), (13)(b)(A-F), (13)(f)(A-C) (. 253(c)(4)(vii)

(H) Provide frames for portable outlet headers that will: 253(c)(4)(viii)

(i) Secure the equipment in the correct operating position. 253(c)(4)(viii)

(ii) Protect them from damage during handling and operation. 253(c)(4)(viii)

(g) When using portable outlet headers you must not use them indoors except for temporary service when a direct supply outlet located on the service piping system cannot be accessed. 253(c)(4)(i)

(h) To comply with manifold operation procedures you must:.

(A) Ensure that cylinder manifolds are installed under the supervision of someone familiar with the proper practices with reference to their construction and use. 253(c)(5)(i)

(B) Ensure all manifolds and parts used in methods of manifolding are used only or the gas or gases for which they are approved. 253(c)(5)(ii)

(C) Install approved flash arresters between each acetylene cylinder and the coupler block. 253(c)(5)(iii)

NOTE: For outdoor use only, and when the number of cylinders coupled does not exceed three, one flash arrester installed between the coupler block and regulator is acceptable. 253(c)(5)(iii)

(D) Install manifold acetylene and liquefied fuel-gas cylinders in a vertical position. 253(c)(5)(v)

(E) Maintain approximately equal pressure in the gas cylinders connected to and discharged simultaneously through a common manifold. 253(c)(5)(vi)

(i) To comply with manifold operation procedures you must not connect more than 3,000 cubic feet of aggregate capacity of fuel-gas cylinders to a portable manifold inside a building. 253(c)(5)(iv)