

Great Western Painting

Cal/OSHA Gas Systems for Welding

GAS WELDING

Cal/OSHA T8 CCR 1536

Cal/OSHA T8 CCR 4799

Cal/OSHA T8 CCR 4845

Cal/OSHA T8 CCR 4848

When performing gas welding, the following precautions, work procedures, and operating procedures will be followed:

General Precautions:

1. Mixtures of fuel gases and air or oxygen may be explosive and shall be guarded against. No device or attachment facilitating or permitting mixture of air or oxygen with combustible gases prior to consumption, except at the burner or in a standard torch or blowpipe, shall be allowed unless approved for the purpose.
2. Backflow protection shall be provided by an approved device that will prevent oxygen from flowing into the fuel-gas system or fuel from flowing into the oxygen system. The backflow protection device shall be installed on either the torch or at each station outlet (i.e., the point at which gas is withdrawn from the permanent piping) either upstream or downstream of the shutoff valve for the oxygen or fuel gas station outlet valve(s).
3. Acetylene shall not be generated, piped (except in approved cylinder manifolds) or utilized at a pressure in excess of 15 pounds per square inch gauge pressure.
4. The use of liquid acetylene shall be prohibited.
5. Oil or grease shall not be permitted to come in contact with oxygen cylinders, valves, regulators or other fittings. Oxygen cylinders and apparatus shall not be handled with oily hands or gloves, or greasy materials. A jet of oxygen shall not be permitted to strike an oily surface, greasy clothes or enter a fuel oil or other storage tank.
6. Oxygen shall not be used from a cylinder or cylinder manifold unless a pressure-reducing device intended for use with oxygen, and so marked, is provided.
7. Fuel-gas shall not be used from cylinders through torches or other devices equipped with shutoff valves without reducing the pressure

through a suitable regulator attached to the cylinder valve or manifold.

Note: Low pressure air-gas torches may be used on small cylinders provided there is no shutoff valve on the torch.

8. Welding fuel-gas cylinders shall be placed with valve end up whenever they are in use. Liquefied gases shall be stored and shipped with the valve end up. Nothing shall be placed on top of an acetylene cylinder when in use which may damage the safety device or interfere with the quick closing of the valve.

9. Cylinders shall be handled carefully.

Note: Rough handling, knocks, and falls are liable to damage the cylinder, valve or safety devices and result in leakage.

10. Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. (This action is generally termed "cracking" and is intended to clear the valve of dust or dirt that might otherwise enter the regulator.) The valve shall be opened while standing to one side of the outlet; never in front of it. A fuel-gas cylinder valve shall never be opened up, cracked near other welding work or near sparks, flame, or other possible sources of ignition.

Exception: Hydrogen cylinders. See suppliers instructions before connecting the regulator.

11. Before a regulator is removed from a cylinder valve, the cylinder valve shall be closed and the gas released from the regulator.

12. If cylinders are found to have leaky valves or fittings which cannot be stopped by closing of the valve, the cylinders shall be taken outdoors away from sources of ignition and slowly emptied.

13. Cylinders having leaking fuse plugs or other leaking safety devices shall be plainly tagged, and the supplier shall be promptly notified of the condition and his instructions followed. A warning shall be placed near the cylinders prohibiting any approach to them with a lighted cigarette or other source of ignition.

14. Safety devices shall not be tampered with.

15. The cylinder valve shall always be opened slowly.

16. An acetylene cylinder valve shall not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.

17. Torches in use shall be inspected at the beginning of each working shift for leaking shutoff valves, hose couplings, and tip connections. Defective torches shall not be used. Clogged torch tip openings shall be cleaned with suitable cleaning wires, drills, or other devices designed for such purpose.
18. Torches shall be lighted by friction lighters or other approved devices, and not by matches or from hot work.
19. Unalloyed copper shall not be used for acetylene or acetylenic compounds except in listed equipment.
20. When flammable gas lines or other parts of equipment are being purged of air or gas, open lights or other sources of ignition shall not be permitted near uncapped openings.

No welding or cutting shall be performed on an acetylene or oxygen pipeline, including the attachment of hangers or supports, until the line has been purged. Only oil-free air, oil-free nitrogen, or oil-free carbon dioxide shall be used to purge oxygen lines.

21. If pipeline protective equipment incorporates a liquid, the liquid level shall be maintained, and a suitable antifreeze may be used to prevent freezing.
22. Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields shall be provided.
23. No person, other than the gas supplier, shall attempt to mix gases in a cylinder. No one, except the owner of the cylinder or person authorized by him, shall refill a cylinder.
24. **Cylinders containing oxygen or acetylene or other fuel or gas shall not be taken into confined spaces.**

Training of Operators and Instructions:

Employees in charge of the oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be instructed for this work before being left in charge.

Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be readily available.

Ventilation Requirements for Welding, Brazing, and Cutting:

Mechanical Ventilation for Indoor Operations:

Local exhaust systems providing a minimum air velocity of 100 lineal feet per minute in the welding zone shall be used except as otherwise specified by this section.

1. Where **local exhaust ventilation** is not feasible, mechanical dilution ventilation sufficient to prevent exposure to concentrations of airborne contaminants from exceeding the PEL will be provided
2. **Respiratory protective** equipment will be used when the ventilation requirements are not feasible.

Toxic Substances Used in Any Enclosed Space:

Local exhaust ventilation shall be used when potentially hazardous materials are employed as base metals, fluxes, coatings, platings or filler metals. These include, but are not limited to, the following materials:

Beryllium
Cadmium
Chromium
Fluorides
Lead
(Mercury
Zinc
Inert-gas metal-arc welding or oxygen cutting of stainless steel

Note: When the nature of the work is such that local exhaust ventilation is not an effective means for preventing potentially hazardous exposure levels supplied-air respirators shall be worn.

Toxic Substances Used in the Open Air:

Where toxic substances, such as those listed above are used, **respiratory protective equipment** shall be provided and used in accordance with our Respiratory Protection Program except as otherwise specified by this section.

1. In operations involving beryllium-containing base or filler metals, only supplied-air respirators shall be used.
2. Except for operations involving beryllium, cadmium, lead, or mercury, respiratory protective equipment is not required when natural or mechanical ventilation is sufficient to remove welding fumes from the breathing zone of the workers.

Improper Use of Welding Gases

Compressed gases used for welding and cutting shall not be used for ventilation purposes, comfort cooling, blowing dust from clothing, or cleaning the work area.

Chlorinated Hydrocarbons

Degreasing or other operations involving chlorinated hydrocarbons shall be located or controlled such that vapors from these operations will not enter the atmosphere surrounding any welding or cutting operations to prevent the degradation of such chlorinated hydrocarbon vapors to more highly toxic gases by the action of heat or ultraviolet radiation.

Precautionary Labels:

Hazardous materials used in welding and cutting shall bear precautionary labels as required by Section 5150 of the General Industry Safety Orders.

Fire Prevention and Suppression Procedure:

A fire prevention and suppression procedure will be established whenever any welding and cutting operations are taking place.

This would include installation and operation of all gas welding and cutting systems when used with gases and oxygen for welding, flame cutting, heating and heat treating operations and includes brazing and soldering.