

Welding and Cutting Operations

11.1 Gas Welding and Cutting

The following guidelines are requirements for gas welding and cutting:

- a) Welding and cutting shall be performed only by experienced and properly instructed persons.
- b) When welding or cutting in elevated positions, precautions shall be taken to prevent sparks or hot metal from falling onto people or flammable material below.
- c) Suitable fire extinguishing equipment shall be immediately available at all locations where welding and cutting equipment is used.
- d) Matches shall not be carried by welders when engaged in welding or cutting operations.
- e) Matches shall not be used to light a torch; a torch shall not be lighted on hot work. A friction lighter or stationary pilot light shall be used.
- f) A fire watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a fire hazard. A fire check shall be made of the area one half hour after completion of welding.
- g) Where combustible materials such as paper clippings or wood shavings are present, the floor shall be swept clean for a radius of 35 feet before welding.
- h) Suitable eye protection is to be worn by the welder.
- i) Combustible floors shall be kept wet or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc-welding or cutting equipment shall be protected from possible shock. Do not cut material lying on a concrete floor as concrete may explode when heated.
- j) Approved back flow check valves shall be used on gas welding rigs in both gas and oxygen lines.
- k) Welding hose shall be inspected for cracks and damaged and shall not be repaired with tape. If any damaged other than superficial scratches or marks are observed on the hose it must be taken out of service.

- l) Machinery, tanks, equipment, shafts or pipes that could contain explosive or highly flammable materials shall be thoroughly cleaned and decontaminated prior to the application of heat.
- m) In dusty or gaseous spaces where there is a possibility of an explosion, welding or cutting equipment shall not be used until the space is adequately ventilated.
- n) Adequate ventilation or approved respiratory equipment shall be used while welding in confined spaces or while brazing, cutting or welding zinc, brass, bronze, stainless steel or galvanized or lead coated material.
- o) Cadmium bearing materials:
 - i. Proper respiratory protection must be used when welding or cutting cadmium bearing metals.
 - ii. Indoors or in confined spaces, local exhaust ventilation or airline respirators shall be used.
 - iii. Outdoors, respiratory protection such as approved fume respirators shall be used.

11.2 Electric Welding and Cutting

The following guidelines are requirements for electric welding and cutting

- a) Electric welding equipment shall be operated only by authorized persons who are experienced and properly instructed.
- b) The electric welding machine shall be properly grounded prior to use.
- c) Suitable fire extinguishing equipment shall be readily available in the work area.
- d) Specifications, limitations, and instructions supplied by the manufacturer or affixed to the machine shall be followed.
- e) To protect the eyes, face and body during electrical welding and cutting, the operator shall wear an approved helmet, proper protective gloves and clothing. Helpers or attendants shall wear proper eye protection. Other employees shall not observe electric welding operations unless they use approved eye protection. Shields should be put up in other work is occurring in the visual vicinity.

- f) Proper eye protection shall be worn to guard against flying particles when the helmet is raised.
- g) Welding screens shall be used whenever other persons could be exposed to the arc of the welding operation. Welders shall not strike an arc with an electrode, whenever there are persons nearby who might be affected by the arc.
- h) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.
- i) When the welder must leave his work or stop work for any appreciable length of time or when the welding machine is to be moved, the power supply switch to the equipment shall be opened.

11.3 Compressed Gas Cylinders

The following guidelines are requirements for the storage of compressed gas cylinders:

- a) They shall not be dropped, jarred or exposed to temperature extremes.
- b) Cylinders shall have the valve cap or valve protection device in place at all times, except when in actual use.
- c) Cylinders shall not be rolled and shall not be lifted by the valve or valve cap; a suitable cradle or other device shall be used.
- d) Cylinders shall have their contents properly identified.
- e) Compressed gas cylinders, whether full or empty, shall be stored in an upright position and chained or otherwise secured so they cannot fall or be upset.
- f) Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease) a minimum distance of 20 feet or by a 5 foot high non-combustible barrier.
- g) Cylinders shall not be stored where they might become part of an electric circuit or within five feet of an electrical outlet.
- h) Employees shall never force connections which do not fit nor shall they tamper with the safety relief devices of cylinder valves.

- i) Before the regulator is removed from a cylinder, the valve shall be closed and all pressure released from the regulator.
- j) A leaking cylinder shall not be used. Such cylinders shall be taken outdoors away from sources of ignition. The supervisor shall be notified.
- k) A flame shall never be used to detect gas leaks.
- l) The recessed top of cylinders shall not be used as a place for tools.
- m) No attempt shall be made to mix gases in a cylinder or to transfer gas from one cylinder to another.
- n) Oil, grease or similar materials shall not be allowed to come in contact with any valve, fitting, regulator or gauge of oxygen cylinders.
- o) Acetylene cylinders shall be properly secured and always used, transported, or stored in a vertical position. Cylinders shall be protected from sparks, flames and contact with energized electrical equipment.
- p) Chlorine containers shall be stored and properly secured in a cool place and protected against moisture. Every precaution shall be taken to prevent accidental discharge of the gas, and protective equipment shall be readily available for use in an emergency.
- q) Chlorine cylinders never shall be used or stored near flammable materials. Should a chlorine leak develop, the cylinder shall be placed so that only "gas" escapes. (An ammonia swab may be used to detect leaks.) Water should not be sprayed or poured on chlorine leaks.
- r) Should a leak develop, self-contained breathing apparatus shall be used before entering the area to determine the extent of or repair the leak.