
Reference: Ontario Health and Safety Act, Regulation 213/91 Construction Projects), Sections 122-124

Welding, Burning and Soldering - General Requirements

1. Compliance with Acts and Standards:

All electric and gas welding and cutting equipment, installations and operations shall be in conformity with:

- (a) the manufacturer's recommendations, and
- (b) Canadian Standards Association W-117 "Code for Safety in Electric and Gas Welding and Cutting Operations".

2. Control of Contaminants:

Where welding or burning or soldering operations emit harmful fumes and gases, ventilation shall be provided.

3. Local Exhaust Requirements:

A ventilation system shall be provided during

- (a) welding or cutting of metals, alloys, or coated metals;
- (b) spraying metal or other materials at high temperatures; or
- (c) air-arc gouging, plasma-arc, or silver soldering operations.

4. Gas Welding and Burning:

- (a) Compressed and liquified gas systems shall be so located or guarded as to provide protection from physical damage.
- (b) Protection of equipment from heat, flame, sparks, and electrical contacts. Workers shall prevent sparks or flames from coming in contact with cylinders, regulators or hoses of compressed gas systems, and all charged gas cylinders shall be protected from any source of excessive heat.

- (c) Cylinders shall be so located that there is no risk of contact with energized electrical conductors.

5. Equipment Inspection:

Before putting any gas-welding or burning equipment into use workers shall ensure that all parts are free from defects, leaks, or oil and grease. Only standard fittings, designed and manufactured for the specific compressed gas service, shall be used. All equipment will be inspected at least annually or better.

6. Correct use of Control Devices:

- (a) Welding equipment, including regulators and automatic reducing valves and hoses, shall be used only for the gas for which they are designed.

- (b) Prohibition of Copper Fittings and Tubing:
Copper fittings or tubing shall not be used in systems carrying acetylene gas.

- (c) Prevention of Flashbacks:
Suitable safety devices to prevent reverse gas flow shall be installed on both hoses at either the torch or regular connections.

7. Handling, Storage, Transportation and use of Cylinders:

- (a) Compressed gas cylinders shall:
- (i) not be hoisted by slings or magnets, or
 - (ii) not be dropped or subjected to impact, or
 - (iii) not be handled by means of the regulators nor used as rollers or work supports, and
 - (iv) normally be kept upright and secured against falling during storage, transportation and use.

(b) Acetylene cylinders which have been stored or transported in a horizontal attitude shall be placed in a vertical position for at least one hour before use.

8. Valve Protection:

(a) Cylinder valves shall be closed when work is finished and when cylinders are empty. Valve protection covers shall be kept in position when the cylinders are not connected for use. Keys shall be kept in place in key-operated acetylene cylinder valves whenever the cylinders are connected for use.

(b) Valve Opening Precautions: Operators shall not stand directly in front of regulator pressure gauges while a cylinder valve is being opened.

Electric Welding

1. Protection against Electric Welding Arc Radiation:

No arc welding shall be carried out unless all workers exposed* (*40 feet [12 m] is the recommended minimum distance from which the electric arc should be seen by the naked eye) to radiation from the arc flash wear suitable eye protection or are protected by adequate screens, curtains or partitions. Such screens, curtains or partitions shall be made of or be treated with fire resistant materials or coatings. Coatings shall have a non-reflective surface.

2. Chipping and Cleaning:

Workers shall wear eye protection when chipping or cleaning welds.

Miscellaneous Requirements

1. Tripping Hazards:

(a) Welding work areas shall be kept free of electrode stubs, metal scrap, and other slipping or tripping hazards. Receptacles for electrode stubs shall be provided and used.

(b) Welding cables and hoses shall be arranged to prevent tripping hazards.

2. Radiation Protection:

All workers, exposed to the hazard of radiation from welding or burning operations, shall use helmets, goggles and other appropriate personal protective equipment.

3. Protective Clothing:

All workers engaged in welding or burning operations shall wear:

- (a) flame retardant work clothing, and ** (**work clothing made of polyester, acetate or acrylic fibres or mixtures of these with cotton or wool should not be used. These are moderately flammable and will melt while burning causing deep and extensive burns to the skin. Work clothing made of laminated fabric containing polyurethane sponge should not be worn as they may readily ignite and burn. Preferred work clothing should be made of cotton, wool or nylon fibres. The fabric should have a smooth, tightly woven finish).
- (b) leather gauntlet type gloves and arm protection, and
- (c) an apron of leather or other suitable material for heavy work, and
- (d) eye and face protection against harmful radiation, or particles of molten metal or while chipping and grinding welds, and
- (e) substantial safety footwear, made of leather or other equally firm material.

4. Presence of Flammable or Explosive Substances:

- (a) No burning, welding, or other hot work shall be done on any vessel, tank, pipe enclosure or structure enclosure.

All work shall be sent out to a reputable contractor who is familiar with working on enclosures as noted above.

(b) Continuing Tests:

Where testing procedures are utilized, additional tests shall be made at intervals that will ensure the continuing safety of the workers.

5. Marking Hot Work:

Where practical, recently welded or flame cut work shall be marked "HOT" to indicate to workers that the work piece presents a hazard of burning.

6. Precautions to prevent a fire shall be taken when using a blow torch or welding or cutting equipment or a similar piece of equipment.

7. Fire Extinguishers:

At least one (1) fire extinguisher of a suitable type and capacity shall be kept immediately available at all work locations where welding or cutting is done. Fire extinguisher locations shall be clearly identified.

8. No arc welding electrode or ground lead shall be hung over a compressed gas cylinder.

9. Receptacles for electrode stubs shall be provided and used.