

DuPage County Environmental, Safety, Health & Property Loss Control Program Welder Safety

Purpose: Provide welders safety rules and procedures. Reference ANSI Z49.1:2005 standard.

Policy: Only qualified welders are permitted to perform welding and cutting operations. Qualified means a person who by reason of training, education and experience is knowledgeable in welding operations and is competent to judge the hazards involved. Qualifications/Certification through either the American Welding Society or American Society of Mechanical Engineers are recognized as is successful completion of vocational school welding training.

Before welding or hot cutting of stainless steel the Risk Management Coordinator must be consulted due to potential health hazard associated with such welding or hot cutting. Welding on stainless steel can produce hexavalent chromium. On February 28, 2006, OSHA promulgated a revised hexavalent chromium standard for general industry ("the Standard") that includes a permissible exposure limit ("PEL") for hexavalent chromium of 5 micrograms per cubic meter (" $\mu\text{g}/\text{m}^3$ ") measured as an 8-hour time-weighted average ("TWA").

PPE:

- Safety glasses with side shields or safety goggles
- Welder cap
- Welders hood with #5 lenses
- Leather safety boots
- Dry flame resistant gloves & clothing
- Long denim or flame resistant pants without cuffs and they should fit over top of boot to prevent hot slag from falling into boot
- Welder sleeves
- Flame resistant shirt
- Overhead welding work requires a hard hat with leather or other flame resistant shoulder covering.
- Frayed clothing is susceptible to ignition and should not be worn when welding or cutting.
- Hearing protection noting: flame resistant hearing protection when hazards to the ear canal exist.
- Flame resistant leggings and apron when necessary.
- Clothing should be kept clean, as oil and grease can reduce its protective qualities.

Ventilation: Adequate ventilation shall be provided for all welding, cutting, brazing and related operations. Always avoid breathing fumes. When controls such as ventilation fail to reduce air contaminants to allowable levels, or implementation of such controls are not feasible, then respiratory equipment shall be used to protect personnel from hazardous concentrations of airborne contaminants.

Operating:

All welding / cutting areas should have Safety Warning Signs posted and areas or persons adjacent to welding area be protected from radiant energy, welding splatter, eye damage and burns.

Oxygen/acetylene welding:

- a) Do not have butane lighter on person while welding or cutting.
- b) Keep caps on cylinders when not in use and cylinders secured.
- c) Never use oil on regulators, torches, fittings or other equipment that is in contact with oxygen.
- d) Never use oxygen as a substitute for compressed air.
- e) Backflow protection is needed to prevent oxygen from flowing into fuel gas system or vice a versa.
- f) Blow out cylinder valves before attaching regulators.
- g) Purge oxygen and fuel gas passages before lighting torch.
- h) Release adjusting screws on regulators before opening cylinder valves.
- i) Open cylinder valve slowly.
- j) Light acetylene before opening oxygen valve on torch.
- k) Do not allow flame cut sparks to hit hoses, regulators or cylinders. Fire resistant blankets can be used to protect.
- l) Never weld or use cutting torch on containers without determining what the contents were. If contents were flammable or combustible liquids or gases then you must replace the containers atmosphere with an inert gas such as nitrogen or fill with water before welding or cutting is performed.
- m) If welding in a confined space follow confined space procedure including not allowing gas cylinders in the confined space.
- n) When compressed gas cylinders are empty, close the valve, place cap on them and mark empty or MT.
- o) Do not allow flame cut sparks to hit hoses, regulators or cylinders. Remember such sparks can travel many feet away from the work.
- p) Never use acetylene at a pressure in excess of 15 psi. Higher pressures can cause an explosion.
- q) Never use oil grease or similar material on any fittings or apparatus in the oxyacetylene oxy-fuel gas system. Oil or grease in contact with oxygen can cause spontaneous combustion.

Arc Welding:

- a) Confirm equipment is grounded properly and is in good working condition
- b) Route the electrode and work cables together – Secure them with tape when possible.
- c) Never coil the electrode lead around your body.
- d) Do not place your body between the electrode and work
- e) Connect the work cable to the work piece as close as possible to the area being welded.
- f) Do not work next to welding power source.
- g) Confirm all the connections tight, including the earth ground.
- h) OSHA regulations require output terminals to be insulated.
- i) Are the electrode holder and welding cable well insulated and in good condition?
- j) Are the settings correct for the job you're about to begin?
- k) Is the work stable and easy to reach from where you're standing?
- l) Is the work lead connected securely?
- m) Is there enough dry insulation between your body and the work piece?
If concerned wear rubber boots.
- n) Do not touch the electrode or metal parts of the electrode holder with skin or wet clothing.
- o) Keep **dry** insulation between your body (including arms and legs) and the metal being welded or ground (i.e., metal floor, wet ground).
- p) Keep your welding cable and electrode holder in good condition. Repair or replace any damaged insulation.