

**Hot Work Procedure 1910.119**  
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## **Hot Work Procedure 1910.119**

**PURPOSE:** To control the hazards of welding, brazing, flame cutting, hot riveting, grinding, chipping, soldering, and other activities that produce sparks or use flame.

**POLICY:** Before hot work is performed, a pre-work evaluation, work site inspection, and fire protection evaluation must be performed.

Anyone performing hot work should be thoroughly familiar with the requirements set forth in the Occupational Safety and Health Administration (OSHA) regulations 29 CFR 1910.251 and 1910.252 entitled welding, cutting and brazing.

OSHA 1019.119 (K) regulation requires a hot work system be in place. Permit systems vary from simple verbal procedures to formal paperwork depending on site circumstances.

**PROCEDURE:** The first step toward achieving welding safety is to follow the safety and maintenance instructions supplied by the manufacturer of the apparatus.

**PRE-WORK EVALUATION:** The following questions should be asked:

- Can the work be moved to a fire-safe maintenance area?
- Are hot-work personnel properly trained and authorized?

**EQUIPMENT CHECK:** Repair or replace excessively worn equipment. Discontinue using unsafe or defective equipment until repairs are made. Use replacement parts specified by the manufacturer of the equipment.

### **THE WORK AREA:**

1. The work area must have a fireproof floor. Concrete floors are recommended.
2. Use heat-resistant shields to protect nearby walls or unprotected flooring from sparks and hot metal.
3. Maintain adequate ventilation to prevent the concentration of oxygen/fuel gas, flammable gases and/or toxic fumes.

Ventilation requirements are established in part (c) of the OSHA regulation 29 CFR.

**HAZARD COMMUNICATION:** Material Safety Data Sheets (MSDS's) are available for each gas you use. Warning signs or markings should be posted to warn other workers of hot metal.

**WARNING SIGN:** After welding operations, the welder must mark the hot metal or provide some other means of warning other workers.

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### CONFINED SPACE (OSHA 1910.252) HOT WORK:

1. **Ventilation:** Ventilation is a prerequisite to work in confined spaces. For ventilation requirements see paragraph (c) Health protection and ventilation of OSHA 1910.252.
2. **Securing cylinders and machines:** When welding or cutting is to be performed in any confined spaces the gas cylinders and welding machines are to be left on the outside. Heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.
3. **Lifelines:** Where a welder must enter a confined space thru a manhole or other small opening, means must be provided for quickly removing him in case of an emergency. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welding at all times and be capable of putting rescue operations into effect.
4. **Electrode removal:** When arc welding is to be suspended for a substantial period of time, such as during lunch or overnight, all electrodes must be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.
5. **Gas cylinder shutoff:** Whenever the torch is not to be used for a substantial period of time, such as lunch or overnight, the torch valves must be closed and the fuel-gas valves and oxygen supply to the torch positively shut off at some point outside the confined area.

**PROTECTIVE APPAREL:** OSHA 1910.252 outlines protective equipment requirements.

All operators and attendants must wear ventilated goggles with tempered lenses and the proper shade number to protect eyes from injury and to provide a good visibility of the work.

Appropriate protective clothing will vary with the size, nature and location of the work to be performed. Protective flameproof gauntlet gloves, sleeves, flameproof aprons, and safety shoes protect skin and clothing from sparks and slag. Keep all protective apparel free from oil and grease.

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### FIRE AND EXPLOSION PREVENTION

**INTRODUCTION:** Welding, cutting, and allied processes produce molten metal, sparks, slag, and hot work surfaces. These can cause fire or explosion if precautionary measures are not followed.

#### MAIN CAUSES OF FIRES IN WELDING AND CUTTING – FLYING SPARKS:

- Sparks can travel up to 35 feet (10 meters) on a horizontal direction from the work area.

*Note: Sparks and molten metal can travel greater distances when falling.*

- Sparks can pass through or become lodged in cracks, clothing, pipe holes, and other small openings in floors or partitions.

#### TYPICAL COMBUSTIBLE MATERIALS AND CONDITIONS:

- Parts of buildings such as floors, partitions, and roofs.
- Contents of buildings such as wood, paper, clothing, plastics, chemicals, and flammable liquids and gases.
- Outdoor combustible materials include dry leaves, grass, and brush.
- Welding and cutting have caused explosions when performed in spaces containing flammable gases, vapors, liquids, or dusts.

#### HOW TO PREVENT FIRES:

- Remove any combustible material from the work area.
- Where possible, move the work to a location well away from combustible materials.
- If relocation is not possible, protect combustibles with a cover made of fire-resistant material.
- Remove or make safe all combustible materials for a radius of 35 feet (10 meters) around the work area.
- Using fire-resistant material, cover or block all open doorways, windows, cracks, and other openings.

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- If possible, enclose the work area with portable fire-resistant screens.
- Protect combustible walls, ceilings, floors, etc. from sparks and heat with fire-resistant covers.
- If working on a metal wall, ceiling, etc. prevent ignition of combustibles on the other side by moving the combustibles to a safe location.
- If relocation of combustibles cannot be done, designate someone to serve as a fire watch, equipped with a fire extinguisher, during the welding operation and for at least one half-hour after welding is completed.
- Do not weld or cut on material having a combustible coating or combustible internal structure, as in walls or ceilings, without an approved method for eliminating the hazard.
- Do not dispose of hot slag in containers holding combustible material.
- Keep a charged fire extinguisher nearby, and know how to use it.
- After welding or cutting, make a thorough examination for evidence of fire. Remember that easily visible smoke or flame may not be present for some time after the fire has started.
- Be aware that overloading and improper sizing can cause overheating of electrical equipment and possible fire hazard.
- Be sure all electrical equipment and wiring are installed properly and have recommended circuit protection.
- Be sure the work cable is connected to the work as close to the welding area as practical. Work cables connected to the building framework or other locations some distance from the welding area increase the possibility of the welding current passing through lifting chains, crane cables, or other alternate circuits. This can create fire and shock hazards or overheat lifting chains or cables until they fail.
- Do not weld or cut in atmospheres containing dangerously reactive or flammable gases, vapors, liquids, or dust.
- Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapors.
- Do not apply heat to a workpiece covered by an unknown substance or whose coating can produce flammable, toxic, or reactive vapors when heated.

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- Provide adequate ventilation in work areas to prevent accumulation of flammable gases, vapors, or dusts.
- Clean and purge containers before applying heat.
- Vent closed containers, including castings, before preheating, welding, or cutting. Venting prevents the buildup of pressure and possible explosion due to the heating and expansion of gases.

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### FUMES AND GASES

**INTRODUCTION:** Many welding, cutting, and allied processes produce fumes and gases, which may be harmful to your health.

**DEFINITIONS:**

- Fumes are solid particles which originate from welding consumables, the base metal, and any coatings present on the base metal.
- Acquaint yourself with the effects of these fumes and gases by reading the Material Safety Data Sheets (MSDSs) for all materials used (consumables, base metals, coatings, and cleaners).
- Depending on material involved ranges from irritation of eyes, skin, and respiratory system to more severe complications.
- Effects may occur immediately or at some later time.
- Where ventilation is questionable, use air sampling to determine the need for corrective measures.
- Use mechanical ventilation to improve air quality.

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### **LOCKOUT/TAGOUT**

**INTRODUCTION:** Sometimes work must be performed on equipment, pipelines, and machinery that may contain moving parts, pressurized gases or liquids, electrical energy, or other hazards. Contact with any of these may result in injury or death. Lockout/tagout procedures must be followed.

#### **DEFINITIONS:**

- “Lockout” means to install a locking device that keeps the switch, valve, or other mechanism from being turned on or opened.
- “Tagout” means to put a tag on the locking device. The tag indicates DANGER or WARNING, along with a brief message. The tag must have a place to put the date and person’s name who lockedout the equipment so that he or she may be easily found or notified.

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### RESISTANCE SPOT WELDING

**INTRODUCTION:** Resistance Spot Welding utilizes a combination of heat, pressure, and time. As the name implies, it is the resistance of the material to be welded to current flow that causes a localized heating in the part. The pressure is exerted by the tongs and tips. The time is how long current flows in the joint, which is determined by the material thickness and type, amount of the current, and cross-sectional area of the welding tips and contact surfaces.

**SAFETY HAZARDS:** Resistance Spot Welding is not an open-arc process. Since the weld is made inside the workpieces, there are different and unique hazards to consider. Here are the major ones to be aware of and prepare for before actually making a weld.

- Flying sparks can cause fire and explosion.
- Flying sparks and hot metal are often thrown off from the weld joint and can burn or injure eyes and skin.
- Electric shock from wiring is a possible hazard.
- Hot metal and parts can cause burns.
- Moving parts, such as tongs, tips, and linkages, can injure fingers and hands.
- Fumes from spot welding on parts coated with cleaners, paints, and platings can be hazardous.

#### HOW TO AVOID HAZARDS:

- Wear safety goggles or a face shield. Wear long sleeved shirts. Do not weld near flammables move them away. Keep a fire extinguisher nearby, and know how to use it.
- Wear dry insulating gloves. Install and ground unit according to all codes. Disconnect power before servicing.