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Title <i>WELDING & HOT WORK SAFETY</i>	Effective Date 05/29/12

Purpose

Welding and Hot Work, such as brazing or grinding, present a significant opportunity for fire and injury. All precautions described in this program must be applied prior to commencing any welding or hot work by company employees or contractors. Reference: [OSHA 29 CFR 1910.252](#)

Definitions

Welding/Hot Works Procedures: any activity which may result in sparks, fire, molten slag, or hot material which has the potential to cause fires or explosions.

Examples of Hot Works: Cutting, Brazing, Soldering, Thawing Pipes, Torch Applied Roofing, Grinding, or Welding.

Special Hazard Occupancies: Any area containing Flammable Liquids, Dust Accumulation, Gases, Plastics, Rubber, or Paper Products.

Training

Training shall include:

- Review of requirements listed in [OSHA 1910.252](#)
- Use of Hot Works Permit System
- Supervisor Responsibilities
- Fire Watch Responsibilities - specifically, the fire watch must know:
 1. That their ONLY duty is Fire Watch
 2. When they can terminate the watch
 3. How to use the provided fire extinguisher
 4. How to activate fire alarm if fire is beyond the incipient stage
- Operator Responsibilities
- Contractors Responsibilities
- Documentation requirements
- Respirator Usage requirements
- Fire Extinguisher training

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Procedures

OSHA 29 CFR 1910.25 required fire prevention actions for welding/hot works.

1. Where practicable all combustibles shall be relocated at least 35 feet from the work site. **Where relocation is impractical, combustibles shall be protected with flame proof covers, shielded with metal, guards, curtains, or wet down material to help prevent ignition of material.**
2. Ducts, conveyor systems, and augers that might carry sparks to distant combustibles **shall be protected or shut down.**
3. Where cutting or welding is done near walls, partitions, ceilings, or a roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.
4. If welding is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat. **Where combustibles cannot be relocated on the opposite side of the work, a fire watch person shall be provided on the opposite side of the work.**
5. Welding shall not be attempted on a metal partition, wall, ceiling, or roof having a covering or on walls having combustible sandwich panel construction.
6. Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by combustion.
7. In areas where there is dust accumulation of greater than 1/16 inch within 35 feet of the area where welding/hot works will be conducted. *All dust accumulation should be cleaned up following the housekeeping program of the facility before welding/hot works are permitted.*
8. Suitable extinguishers shall be provided and maintained ready for instant use.

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9. A fire watch person shall be provided during and for 2 hours past the completion of the welding project.
10. A cutting/welding permit will be issued on all welding or cutting outside of the designated welding area.
11. Cutting or welding shall not be permitted in the following situations:
 - In areas not authorized by management.
 - In sprinkled buildings while such protection is impaired.
 - In the presence of potentially explosive atmospheres, e.g. a flammable
 - In areas near the storage of large quantities of exposed, readily ignitable materials.

Fire Prevention A designated welding area should be established to meet the following requirements:

- Floors swept and clean of combustibles within 35 ft. of work area.
- Flammable and combustible liquids and material will be kept 35 ft. from work area.
- Adequate ventilation providing 20 air changes per hour, such as a suction hood system should be provided to the work area.
- At least one 10 lb. dry chemical fire extinguisher should be within access of the 35 ft. of work area.
- Protective dividers such as welding curtains or non-combustible walls will be provided to contain sparks and slag to the combustible free area.

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*Welding Outside
of Designated
Areas*

- Portable welding curtains or shields must be used to protect other workers in the welding area.
- A hot works permit must be completed and complied with prior to welding operation.
- Respiratory protection is mandatory unless an adequate monitored air flow away from the welder and others present can be established and maintained.
- Plastic materials be covered with welding tarps during welding procedures
- Fire Watch must be provided for all hot work operations.

Welding SOPs

The following pages list the *Welding Standard Operating Procedures* (SOP) and are applicable for all electric and gas welding. These SOPs are to be posted at each Designated Welding & Hot Work Area for quick reference and review.

SOP - Electric Welding

Perform Safety Check on all equipment

- Ensure fire extinguisher is charged and available
- Ensure electrical cord, electrode holder, and cables are free from defects (no cable splices are allowed within 10 feet of the electrode holder.
- Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
- Ensure the welding unit is properly grounded.

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- All defective equipment must be repaired or replaced before use.

Remove flammables and combustibles

- No welding is permitted on or near containers of flammable material, combustible material, or unprotected flammable structures.
- Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation).

Ensure Adequate Ventilation and Lighting

Execute Hot Work Permit procedures

Set Voltage Regulator No higher than the following for:

- Manual Alternating Current Welders - 80 volts
- Automatic Alternating Current Welders - 100 volts
- Manual or automatic Direct Current Welders -100 volts

Uncoil and spread out welding cable To avoid overheating, ensure proper contact of work leads and connections, remove any metal fragments from magnetic work clamps (to avoid electric shock do not wrap welding cables around a body part and avoid welding in wet conditions)

Fire watch for one hour after welding & until all welds have cooled

Perform final fire watch and terminate permit.

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SOP: Gas Welding

Perform Safety Check on all equipment

- Ensure tanks have gas and fittings are tight
- Ensure fire extinguisher is charged and available
- Ensure hoses have no defects
- Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
- All defective equipment must be repaired or replaced before uses.

Remove flammables and combustibles

- No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.
- Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation)

Use an authorized Air Filtering Respirator, if required

Ensure Adequate Ventilation and Lighting

Execute Hot Work Permit procedures

Open Valves on Oxygen and Gas tanks to desired flow

Shut Tank Valves & relieve hose pressure. Store hoses

Fire watch for one hour after welding & until all welds have cooled

Perform final fire watch and terminate permit.