

OSHA Training Toolbox Talk: Cutting, Welding, & Compressed Gas Safety - Hot Work Procedures

[Reference: 1910.252 / 1926.352]

Based on fire potentials in the workplace, management has established designated areas for cutting, welding, and other hot work. But in areas not designated for conducting hot work, the heat, flames, or sparks generated can easily lead to a fire or explosion. The following is a general overview of various precautions that must be implemented in those areas during welding and cutting operations.

- Before cutting, welding, or other hot work is permitted in areas other than those established by management for cutting and welding operations, the area shall be inspected by an authorized supervisor responsible for approving cutting and welding operations. He or she shall designate precautions to be followed in granting authorization to proceed, preferably in the form of a written permit *(reference your company hot work permit for details, if available, or the sample attached)*.
- Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use when hot work is performed. Such equipment may consist of a fire hose or portable fire extinguishers, or in some cases even pails of water or buckets of sand, depending upon the nature and quantity of the combustible material exposed.
- If an object to be welded or cut cannot readily be relocated to a safe area, all movable fire hazards in the vicinity shall be taken to a safe place located away from the hot work.
- If the object to be welded or cut cannot be moved to a safe area and if all the fire hazards in the vicinity cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and protect the immovable fire hazards.
- Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways, and open or broken windows.
- Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of 35 feet. Combustible floors shall be kept wet, covered with damp sand, 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.
- Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down when welding or cutting is conducted nearby.
- Where welding or cutting is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.
- If welding or cutting 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, preferably by relocating the combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided.

- Designated fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or where any of the following conditions exist:
 - ✓ Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation;
 - ✓ Appreciable combustibles are more than 35 feet away but are easily ignited by sparks;
 - ✓ Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors; or,
 - ✓ Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.
- Fire watchers, when required to be on stand-by, shall have fire extinguishing equipment readily available, and be trained in its use. They shall be familiar with facilities for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm.
- A fire watch shall be maintained for at least a half-hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.
- Hot work is not permitted in the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.
- Hot work is also not permitted in areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper, or cotton.
- No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel shall also be disconnected or blanked.
- All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting, or welding on their exterior. Purging the inside with inert gas such as nitrogen, when approved by a responsible supervisor, is also recommended.

If these precautions cannot be met, welding or cutting, as well as any other type of “hot work” such as grinding or brazing, is not permitted.

Does anyone have any comments or questions about today’s discussion on hot work procedures that we can use to prevent fires and explosions while conducting welding, cutting, or other hot work? Please sign the training certification form to ensure you get credit for attending today’s toolbox training session.

SAMPLE HOT WORK PERMIT *(revise this template as necessary to reflect actual conditions at your specific operations)*

This Hot Work Permit is required for any operation involving open flames or producing heat and/or sparks, and must be completed and signed by an authorized supervisor and posted at the site. Hot Work includes, but is not limited to brazing, torch cutting, grinding, soldering, and welding. If these precautions cannot be met, Hot Work is not permitted.

General fire protection:

- Sprinkler protection in service (if present), and suitable fire extinguishers or fire hoses available

Requirements within 35 f of hot work:

- Flammable liquid, dust, lint and oily deposits removed and floor swept clean
- Explosive atmosphere in area eliminated (hot work is not to be conducted in a classified area unless made safe)
- Nearby activities evaluated for conditions that could be affected by hot work
- Path of likely sparks evaluated
- Combustible floors wet down, covered with damp sand or fire-resistive sheets
- Other combustible material removed where possible. Otherwise, protect with approved welding pads, blankets and curtains or metal shields
- All wall and floor openings covered
- Fire resistive covers and metal shields provided as needed
- Ducts and conveyors that might carry sparks to distant combustible material protected or shut down
- Appropriate portable fire extinguisher(s) located within the hot work area

Hot work conducted on walls, ceilings or roofs:

- Construction is noncombustible and without combustible covering or insulation
- Combustible material on other side of walls, ceilings or roofs is moved away

Hot work conducted on outside of enclosed equipment (i.e., welding on the outside of drums, tanks, pipes, or other vessels):

- Enclosed equipment cleaned of all combustible material
- Containers purged of flammable liquid/vapor
- Pressurized vessels, piping and equipment removed from service, isolated and vented

Hot work conducted inside of enclosed spaces (i.e., inside of tanks):

- Atmosphere continuously monitored with gas detector
- Adequate ventilation provided
- Area purged of any flammable or toxic vapors
- Other permits completed as required: e.g.: Confined space entry, lockout/tagout, live electrical work

Hot work/Fire safety notifications:

- Escape routes maintained and known by personnel
- Location of nearest fire alarm known
- If no alarm present, what method will be used to raise the alarm? (List in other precautions area below)

Fire watch/Hot work area monitoring:

- Fire watch trained in use of equipment and in sounding alarm
- Fire watch is provided with suitable extinguishers
- Fire watch will be provided for a minimum of 30 minutes after work has ceased

Other Precautions/Special Instructions: _____

SPECIFIC AREA WHERE HOT WORK AUTHORIZED TO BE CONDUCTED: _____

AUTHORIZING SUPERVISOR SIGNATURE: _____ **Date:** _____