

*SUNY at Fredonia*  
*Environmental Health & Safety Department*

**Title:** Fire Prevention in Use of Cutting and Welding Processes (Hot Work Program)

**Effective Date:** 6/05/08

**Revision Date:**

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**I. INTRODUCTION**

This program has been implemented to ensure compliance with NFPA standard 51B and OSHA Standard 29CFR 1926.352.

Cutting and certain arc welding operations produce literally thousands of ignition sources in the form of sparks and hot slag. The electric arc or the oxy-fuel gas flame and the hot work pieces are also inherent ignition sources.

Anything that is combustible or flammable is susceptible to ignition by cutting, heating, and welding processes. The most common materials likely to become involved in fire are combustible building construction such as floors, partitions, and roofs; combustible contents such as wood, paper, textiles, plastics, chemicals, and flammable liquids and gases; and combustible ground cover such as grass and brush.

Preventing cutting, heating, and welding fires can best be achieved by implementing a hot work program which requires the separation of combustibles from ignition sources or the shielding of combustibles from sparks and molten slag.

**II. RESPONSIBILITY**

**A. Management**

EH&S at SUNY at Fredonia shall recognize its responsibility for the safe usage of cutting, heating and welding equipment on its property and:

1. Based on fire potentials, establish approved areas for cutting, heating and welding.
2. Design and implement a Hot Work Permit Program
3. Designate an EH&S Professional Staff member as the individual responsible for authorizing cutting, heating and welding operations in areas not specifically designed or approved for such processes.
4. Ensure that the person welding, cutting, heating and their supervisors are suitably trained in the safe operation of their equipment, the safe use of the process, and emergency procedures in the event of fire.
5. Insist that only approved equipment be used.
6. Select contractors to perform cutting, welding, heating who have suitably trained personnel and who have an awareness of the magnitude of the risks involved.

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7. Advise all contractors about flammable materials or hazardous conditions of which they may not be aware.
- B. Supervisors

The supervisor of cutting, welding, heating operations in areas not designed or approved for such processes may be a foreman, plant manager, contractor, or other qualified individual. The supervisor shall:

1. Be responsible for the safe handling of the cutting, welding, or heating equipment and for the safety during the cutting, welding, heating process.
  2. Determine the combustible materials and hazardous areas present or likely to be present in the work location.
  3. Protect combustibles from ignition by the following:
    - a) Have the work moved to a location free from dangerous combustibles.
    - b) If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.
    - c) See that cutting, welding, heating are so scheduled that operations that might expose combustibles to ignition are not started during cutting, welding, heating.
  4. Secure authorization for the cutting, welding, heating from an EH&S Professional Staff member.
  5. Determine that the person cutting, welding, heating, etc. secures approval that conditions are safe before going ahead with cutting, welding, heating.
  6. Determine that fire protection and extinguishing equipment are properly located at the site.
  7. Where firewatchers are required, see that they are available at the site.
  8. Where a firewatcher is not required, make a final check-up one-half hour after the completion of cutting, welding, heating operations to detect and extinguish possible smoldering fires.
- C. Cutting, Welding, Heating, etc.

The person cutting, welding, heating shall handle the equipment safely and use it so as not to endanger lives and property, as follows:

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1. Have approval by the supervisor before starting to cut or weld.
2. Cut or weld only where conditions are safe.
3. Continue to cut or weld only so long as conditions are unchanged from those under which approval was granted.

### **III. PERMISSIBLE AREAS**

Cutting, welding, heating shall be permitted only in areas that are or have been made fire-safe.

Permitted areas include:

1. Specific areas designed or approved for cutting, welding, heating. Designated welding, cutting, heating areas shall:
  - a) Be authorized as a designated cutting, welding, heating area by an EH&S Professional Staff member, and;
  - b) Not be permitted in sprinklered buildings while such protection is impaired, and;
  - c) Not be permitted in the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air) or explosive atmospheres that may develop inside unclean or improperly prepared drums, tanks, or other containers and equipment that have previously contained such materials, and;
  - d) Not be permitted in areas where flammable materials are used or stored.
  - e) Not permitted in areas where heavy dust concentrations are present.
  - f) Not be permitted within 35 feet of exposed combustible materials.

### **IV. HOT WORK PERMITS**

- A. A Hot Work Permit determination is required to be performed for welding, cutting, heating in any area not designated as a welding, cutting, heating area per this program.
- B. If it is determined that a Hot Work Permit is required, a permit for the scope of work must be obtained from an EH&S Professional Staff member.
- C. Before applying for a Hot Work Permit, the supervisor (or designee) must inspect the area to ensure that it is a fire safe area. The following must be verified:

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1. Cutting, heating, welding equipment to be used shall be in satisfactory operating condition and in good repair.
2. 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.
3. 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, cutting, heating equipment shall be protected from possible shock.
4. Where practical, all combustibles shall be relocated at least 35 feet horizontally from the work site. Where relocation is impractical, combustibles shall be protected with flameproofed covers or otherwise shielded with metal or fire-resistant guards or curtains. Edges of covers at the floor shall be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile.
5. All flammable materials and liquids will be removed from the area.
6. All empty containers, which formerly held a flammable liquid, will be removed from the area.
7. Heavy concentrations of dust will be eliminated to reduce potential fire hazard.
8. Openings or cracks in walls, floors, or ducts within 35 feet of the site shall be tightly covered to prevent the passage of sparks to adjacent areas.
9. Conveyor systems that might carry sparks to distant combustibles shall be suitably protected.
10. Where cutting, heating, welding is done near walls, partitions, ceiling, or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition. If welding, cutting, heating 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 combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided. Welding, cutting, heating shall not be attempted on a metal partition, wall, ceiling, or roof having combustible covering, nor on walls or partitions of combustible sandwich-type panel construction.
11. Cutting, welding, heating 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 conduction.

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12. Fully charged and operable fire extinguishers, appropriate for type of possible fire, shall be available at the work area. Where hose lines are available, they shall be connected and ready for service.
  13. When welding, heating, cutting is done in close proximity to a sprinkler head, a wet rag shall be laid over the head and then removed at the conclusion of the welding, heating, cutting operation. Special precautions shall be take to avoid accidental operation of automatic fire detection or suppression systems.
  14. Nearby personnel shall be suitably protected against heat, sparks, slag, etc.
- D. The Supervisor must use the “Pre-Hot Work Permit Checklist” found in this program to verify the items listed above.
- E. The Supervisor must send the completed “Pre-Hot Work Checklist” along with a completed “Temporary Hot Work Permit” to an EH&S Professional Staff member for review.
- F. An EH&S Professional Staff member will review the application. If approved the application will be sent back to the supervisor who must post it in the area where the hot work is to be preformed.
- G. Upon completion of the hot work, the supervisor will verify that the area was checked for smoldering fire one ½ hour after completion of hot work then send the completed Hot Work Permit back to an EH&S Professional Staff member for close out of the project.
- H. An EH&S Professional Staff member will keep copies of all applicable paperwork pertaining to the project on file in the EH&S office.
- I. An EH&S Professional Staff member or designated representative may inspect the work area prior, during, and after the job has been complete.

**V. FIRE WATCHERS**

- A. The supervisor responsible for the cutting, heating, welding process to take place in a non-designated cutting, heating, welding area will be required to use fire watchers where the following conditions exist:
1. Combustible material is in the building construction or combustible contents stored in the area are closer than 35 feet to the point of operation, or;
  2. Combustibles are stored more than 35 feet away but are easily ignited by sparks, or;
  3. Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors, or;

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4. 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, or;
  5. The fire suppression and/or detection system in the area has been disarmed or is disabled.
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- B. Firewatchers shall have fire-extinguishing equipment readily available and be trained in its use, including practice on test fires.
  - C. Firewatchers shall be familiar with the facilities and procedures for sounding an alarm in the event of a fire.
  - D. Firewatchers shall watch for fires in all exposed areas, and try to extinguish them only when obviously within the capacity of the equipment available, or otherwise they must sound the alarm immediately.
  - E. A fire watch shall be maintained for at least a half-hour after completion of cutting, heating, welding operations to detect and extinguish smoldering fires.

**VI. ADDITIONAL PRECAUTIONS**

- A. For the elimination of possible fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the enclosed space whenever the torch is not to be used or whenever the torch is left unattended for a substantial period of time, such as during the lunch period. Overnight and at the change of shifts, the torch and hose shall be removed from the confined space. Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas-consuming device.
- B. Drums, containers, or hollow structures which have contained toxic or flammable substances shall, before welding, cutting, or heating is undertaken on them, either be filled with water or thoroughly cleaned of such substances and ventilated and tested.
- C. Before heat is applied to a drum, container, or hollow structure, a vent or opening shall be provided for the release of any built-up pressure during the application of heat.