



## ADMINISTRATIVE PRACTICES MANUAL

### SAFETY MANUAL – WELDING, CUTTING & BRASING:

#### 1.0 Scope and Application

This policy has been developed to establish safety requirements for all welding, cutting, brazing and soldering activities related to maintenance and construction type activities. This policy complies with Chapter SPS 332 (Public Employee Safety and Health) of the Wisconsin Administrative code as promulgated by the Wisconsin Department of Safety and Professional Services and 29 CFR Part 1910.211 through 1910.255 and Part 1926.350 through 1926.354 as promulgated by the U.S. Occupational Safety and Health Administration.

#### 2.0 Responsibilities

**Risk Management:** Support and management of this policy.

**Department Heads:** Implementation of policy.

**Supervisors:** Ensure policy is adhered to by employees and contractors. See specific requirements in Sections 7.0 and 8.0 of this policy.

**Employees:** Follow requirements contained in this policy.

All employees are responsible for complying with the requirements contained in this policy. Failure to abide by these requirements may subject the employee to disciplinary action, up to and including discharge.

#### 3.0 Departmental Polices and Requirements

This policy represents minimum welding, cutting brazing and soldering requirements. Additional procedures may be developed for departmental use. Consult your Supervisor for more detailed requirements associated with these activities in your department.

#### 4.0 Definitions

As used herein confined space is intended to mean a relatively small or restricted space such as a tank, boiler or pressure vessel.

#### 5.0 Training

Cutters or welders and their Supervisors must be suitably trained in the safe operation of their equipment and the safe use of the process.

#### 6.0 Documentation Requirements

A "Hot Work Permit" must be completed and posted in all areas where welding, cutting, soldering, or brazing activities are performed except for shop and garage areas.

#### 7.0 Applicable Requirements

The requirements contained in this policy represent minimum basic requirements for welding, cutting, brazing and soldering activities. Depending on the type of work to be performed, further requirements may be applicable. Supervisors are to consult 29 CFR Part 1926.350 through 1926.354 for construction related activities and 29 CFR Part 1910.211 through 1910.255 for all other types of activities.



## ADMINISTRATIVE PRACTICES MANUAL

Shop and garage areas are work areas in which welding, cutting, brazing, soldering and torch use are typically performed. These areas do not require the use of a "Hot Work Permit" system, although all work must still comply with the remaining requirements of this policy.

### 8.0 Management and Supervision Responsibilities

a) Before cutting or welding is permitted, the area shall be inspected by Supervisor who will designate precautions to be followed in granting authorization to proceed in the form of a written "Hot Work Permit". Copies of all issued permits will be kept on file by the Supervisor.

b) Advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

c) Supervisors shall also be responsible for following:

1) Ensuring that Personal Protective Equipment (PPE) is available and that its use is enforced.

2) Safe handling of the cutting or welding equipment and the safe use of the cutting or welding process.

3) Determining the combustible materials and hazardous areas present or likely to be present in the work location.

4) Have the work moved to a location free from dangerous combustibles.

5) 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.

6) See that cutting and welding are so scheduled that operations that might expose combustibles to ignition are not started during cutting or welding.

7) Secure authorization for the cutting or welding operations from the designated management representative.

8) Shall determine that the cutter or welder secures his approval that conditions are safe before proceeding.

9) Shall determine that fire protection and extinguishing equipment are properly located at the site.

10) Ensure fire watches are available at the site where required.

### 9.0 Basic Precautions

a) If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.



## ADMINISTRATIVE PRACTICES MANUAL

- b) If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.
- c) If the requirements stated in above cannot be followed then welding and cutting shall not be performed.

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.

### 10.0 Fire Safety

- a) Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose or portable extinguishers depending upon the nature and quantity of the combustible material exposed.
- b) Fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop.
- c) Fire watchers 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.
- d) Before cutting or welding is permitted, the area shall be inspected by the individual responsible for authorizing cutting and welding operations. The Supervisor shall designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.
- e) 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 (10.7 m). 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.
- f) Cutting or welding shall not be permitted in the following situations:
  - 1) In areas not authorized by management.
  - 2) In sprinklered buildings while such protection is impaired.
  - 3) 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.
  - 4) In areas near the storage of large quantities of exposed, readily ignitable materials.



## ADMINISTRATIVE PRACTICES MANUAL

- g) Where practicable, all combustibles shall be relocated at least 35 feet (10.7 m) from the work site. Where relocation is impracticable, combustibles shall be protected with flameproof covers or otherwise shielded with metal or asbestos guards or curtains.
- h) Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.
- i) Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.
- j) 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, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided.
- k) Welding shall not be attempted on a metal partition, wall, ceiling or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.
- l) 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 conduction.
- m) Cutting or welding shall be permitted only in areas that are or have been made fire safe. When work cannot be moved practically, as in most construction work, the area shall be made safe by removing combustibles or protecting combustibles from ignition sources.
- n) 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 be disconnected or blanked.
- o) All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

### 11.0 Confined Spaces

- a) Dane County's Confined Space Policy must be followed in addition to the following requirements when working in confined spaces.
- b) When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine be disconnected from the power source.
- c) In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable, the torch and hose shall also be removed from the confined space.
- d) Ventilation is a prerequisite to work in confined spaces. For ventilation requirements see 29 CFR 1910.211.



## ADMINISTRATIVE PRACTICES MANUAL

e) When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

f) Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose they shall be so attached to the welder's body that his body cannot be jammed in a small exit opening. An Attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

g) After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers.

### 12.0 Protection of Personnel

a) A welder or helper working on platforms, scaffolds, or runways shall be protected against falling by following the Dane County's Fall Protection Policy.

b) Welders shall place welding cable and other equipment so that it is clear of passageways, ladders, and stairways.

c) Helmets or hand shields shall be used during all arc welding or arc cutting operations, excluding submerged arc welding. Helpers or Attendants shall be provided with proper eye protection.

d) Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations.

e) All operators and Attendants of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

f) Where the work permits, the welder should be enclosed in an individual booth painted with a finish of low reflectivity such as zinc oxide (an important factor for absorbing ultraviolet radiations) and lamp black, or shall be enclosed with noncombustible screens similarly painted. Booths and screens shall permit circulation of air at floor level. Workers or other persons adjacent to the welding areas shall be protected from the rays by noncombustible or flameproof screens or shields or shall be required to wear appropriate goggles.

g) All protective equipment, helmets, goggles and protective clothing must meet the requirements contained in 29 CFR 1910.211.

### 13.0 Health Protection and Ventilation.

The welding and cutting of stainless steel or objects that contain degreasing or cleaning solvents and/or chlorinated hydrocarbon requires special procedures. In addition, materials, including welding rods, that may contain mercury, cadmium, beryllium, lead, zinc and or fluorine compounds must be worked upon using these special procedures. Supervisors will consult 29



SECTION: SAFETY MANUAL  
WELDING, CUTTING & BRASING  
JANUARY 2019

## **ADMINISTRATIVE PRACTICES MANUAL**

CFR 1910.211 for detailed procedures to be followed before allowing these materials to be worked upon.

**End Policy**