

	Environmental Health and Safety Manual	
	Policy Number: EH&S 1-14	
Title: Welding and Cutting		
Effective Date: 9/93	Revision: 2/97	Number of Pages: 7

PURPOSE: To establish safe working practices during welding and cutting operations.

SCOPE: Affects all University employees and outside contractors who perform welding and/or cutting operations.

DEFINITIONS:

Designated Area: A safe area where welding and cutting is authorized.

Fire Watch: Trained personnel who are in attendance during the entire cutting and welding operation and are immediately available to extinguish a fire or take other effective action if needed.

Hot Work Permit: A special permit issued by Environmental Health and Safety which authorizes specific cutting or welding work at a specific location and time. (See Appendix A.)

Welder: Any operator of electric or gas welding or cutting equipment.

RESPONSIBILITIES:

I. Departments: To ensure that the provisions of this policy are understood and practiced by their employees. Specifically, the department is to:

1. Determine if the work will be done in an area which contains or has the potential to contain combustibles or other hazardous materials.
2. Protect the combustibles in the area of operation using one of the following measures:
 - a. moving the work area to an area free of combustibles
 - b. moving or shielding the combustibles
 - c. scheduling the work during a time when the combustibles are not likely to be in the area.

3. Obtain a Hot Work Permit from the Department of Environmental Health and Safety for any work that is to be performed outside of a designated area.
4. Ensure that workers are provided with and using proper safety equipment, including personal protective equipment and fire extinguishing equipment.
5. Designate a fire watch when required.
6. Ensure that the work area is given a final inspection one-half hour after job completion to locate and extinguish possible hot spots or fires.

II. Department of Environmental Health and Safety

1. Review and approve, in coordination with a departmental representative, locations approved for welding and cutting activities (designated areas).
2. Maintain a list of designated areas.
3. Periodically inspect designated areas to be sure that conditions have not become unsafe for welding and/or cutting.
4. Issue Hot Work Permits for work being done outside of the designated areas, after the area has been inspected and approved by the Department of Environmental Health and Safety.
5. Provide training for fire watches, and ensure that the proper fire fighting equipment is in working condition, and is available to standby personnel.
6. Suspend welding and cutting work if conditions become unsafe for the work being performed.

III. Fire Watch

1. Be trained by the Department of Environmental Health and Safety in the use of appropriate fire fighting equipment and how to notify appropriate personnel in the event of a fire.

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2. Correct or stop any conditions which may lead to a fire and report conditions to their department at the earliest opportunity.
3. Monitor the welding and cutting work on both sides of the wall or floor and be on the alert for signs of a fire.
4. Attempt to extinguish fires appropriate to the available equipment and level of training.
5. Remain at the work site to monitor for smoldering fires while work is in progress and for at least thirty (30) minutes following job completion. If the fire watch must leave the work site, all cutting and welding must stop.

IV. Welders

1. Read and understand this policy.
2. Check their equipment to ensure that it is in good working order.
3. Use appropriate safety equipment, including eye and face protection, hand protection, body protection, head protection, hearing protection and respiratory protection, as needed.
4. Obtain a Hot Work Permit for any non-designated areas.
5. Avoid welding or cutting operations where conditions ARE NOT SAFE.
6. Stop work when conditions change from those set when work was approved. If fire watch must leave work site, operations must cease and the welder must remain at work site for one-half hour following job completion to monitor for fires.
7. Be trained as deemed necessary by the Department of Environmental Health and Safety.

PROCEDURES:

I. Work Areas

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1. Designated Areas

Cutting and welding are permitted at any time in designated areas if conditions are appropriate and proper safety precautions are taken.

2. Permit Required Areas

When welding or cutting work is to be done outside of a designated area, it is necessary to obtain a Hot Work Permit from Environmental Health and Safety before work can be started. Notification of job intent should be given at least forty-eight (48) hours in advance.

Special Procedures for Permit Required Areas:

- a. Hot Work Permit: Area must be reviewed and inspected by the Department of Environmental Health and Safety and precautions on permit must be complied with.
- b. Combustible materials: Combustible materials within thirty-five (35) feet of the work must be removed from the area or shielded with a fire resistant material. Edges of cover must be tight to floor and overlaps properly secured.
- c. Floors: Combustible materials on the floor (paper, wood shavings, etc.) must be swept clean for a radius of thirty-five (35) feet. Combustible floors may be kept wet or protected with fire resistant shields. Operators of electric arc welding equipment must be protected from the possibility of shock due to wet floors.
- d. Ducts: Ducts or systems that might carry sparks to distant combustibles shall be suitably protected or shut down.
- e. Combustible Walls: If walls, partitions, ceiling or roof are comprised of combustible material, fire-resistant shields shall be used.
- f. Noncombustible Walls: If cutting or welding is done on a metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of nearby combustibles. Where combustibles cannot be relocated, a fire watch shall be positioned.

- g. Ventilation: Temporary local exhaust ventilation or other arrangements may be necessary to minimize or eliminate airborne contaminants.

II. Special Conditions

1. Work Stoppage

When work is stopped for an extended period of time, such as lunch breaks or overnight, the equipment must be shut down and secured to prevent accidental sparking.

2. Confined Space

Any welding or cutting that is to be done in a confined space shall be in compliance with the University's Confined Space Policy.

3. Welding or Cutting Containers

No cutting, welding, or other hot work is to be performed on used drums, barrels, tanks, or other containers that may have contained flammable materials, greases, tars, acids, or other materials which may produce flammable or toxic vapors when heated. Any pipe lines or connections to the vessel must be disconnected or blanked.

4. Venting and Purging

All hollow spaces, cavities, or containers are to be vented to permit the escape of air or gases before preheating, cutting, or welding. Purging with inert gas is recommended.

5. Outside Contractors

Contractors shall perform all cutting and welding procedures in accordance with the policies and procedures set forth in the University's Welding and Cutting Policy.

III. Personal Protective Equipment

Personal protective equipment for eyes, face, head, and extremities; protective clothing; respiratory devices, and protective shields and barriers, shall be used and maintained in a sanitary and reliable condition. Selection of appropriate devices should be made in conjunction

with the Department of Environmental Health and Safety.

1. Eye and Face Protection

Safety glasses or goggles and face shields shall be worn by welders. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection. Helpers and fire watch personnel shall wear eye and face protection as appropriate

2. Head Protection

Helmets which protect the face, neck, and ears from direct radiant energy shall be worn during all welding and cutting operations.

3. Protective Clothing

The size, nature, and location of the welding or cutting operation will determine the extent of the leather protective clothing required. Except when engaged in light work, flame-proof gauntlet gloves shall be worn.

4. Other

Hearing/respiratory protection may be required when performing overhead work or in confined spaces.

5. Protective Barrier

In production work, a sheet metal screen should be provided in front of the welder's legs to provide protection against sparks and molten metal.

Where work permits, the welder should be enclosed in an individual booth painted with a low reflectivity finish or enclosed with noncombustible screens.

INQUIRIES/REQUESTS:

Environmental Health and Safety
110 Suffolk Hall
Zip 6200
Main Office: 632-6410

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TITLE: Welding and Cutting	POLICY: 1-14
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FAX: 632-9683

RELATED FORMS:

Hot Work Permit

RELATED DOCUMENTS:

29 CFR 1910.252 *Welding, Cutting and Brazing*

ANSI Z49.1-1994 *Safety in Welding, Cutting and Allied Processes*

ANSI/NFPA 51B-1994 *Fire Prevention in Use of Cutting and Welding Processes*

ANSI/AWS F4.1-94 *Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping*

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Appendix A

HOT WORK PERMIT

Department _____ Location _____

Date of Inspection _____

Work area must be inspected by Environmental Health and Safety before issuance of Hot Work Permit.

Describe source of ignition (e.g., acetylene torch, soldering, electric arc, etc.):

GENERAL SAFETY

YES	NO	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Welder, Fire Watch, and Supervisor familiar with Welding and Cutting Policy.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Welding and cutting equipment in good working condition.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Workers fitted with appropriate safety equipment.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fire Watch properly trained; knows location of appropriate fire fighting equipment.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fire Watch knows how to sound fire alarm.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fire detection and/or sprinkler system in service.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Area within 35 feet of work properly swept.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Combustibles and flammables within 35 feet of work removed or
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Combustibles and flammables protected with appropriate shields.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Floor and wall openings covered.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pipe lines or connections disconnected or blanked.

WORK ON WALLS/CEILINGS

Areas adjacent to walls being worked on checked for combustibles, and those materials removed.

CONFINED SPACE WORK

Confined Space Entry Permit required?
 Equipment cleaned of all combustibles.
 Space purged of all flammable vapors and/or gases.

FIRE ALARM SYSTEM IMPAIRMENT

Are there fire alarm devices in area that could be impacted from welding fumes or smoke? If yes, Environmental Health and Safety must be notified of any fire alarm system impairments.

APPROVALS AND AUTHORIZATIONS

This permit is valid only so long as work conditions existing at the time of issuance continue. It expires on any change in condition that adversely affects safety in work area.

Issue Date/Time _____ Expiration Date/Time _____

Special Conditions _____

Signature of EH&S Representative

Signature of Area/Job Supervisor

Signature of Welder(s)

Signature of Fire Watch

_____ Work areas were inspected 30 minutes after job completion. (Initials)