



WELDING, CUTTING, BRAZING & GRINDING (HOT WORK)

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1.0 **PURPOSE**

The purpose of this program is to prevent injury or loss to property while ensuring safe work conditions during welding, cutting, brazing, and grinding operations.

2.0 **APPLICABILITY AND SCOPE**

Welding, torching, brazing and grinding are common practices in University shops and instructional areas. Supervisors and instructors must ensure that all equipment is code-compliant, in safe working order and that users are properly trained.

3.0 **DEFINITIONS**

Hot Work - welding, cutting, brazing, grinding, and other operations capable of producing sufficient heat to initiate combustion or create an explosion.

4.0 **APPLICABLE REGULATIONS AND STANDARDS**

California:	Title 8, Section 6777 - Hot Work Permits Title 8, Section 4851 - Arc Welding and Cutting
Federal:	29 CFR 1910 Subpart Q - Welding, Cutting, Brazing 29 CFR 1910.251 - Definitions

- 29 CFR 1910 252 - General requirements
- 29 CFR 1910.253 - Oxygen-fuel Gas Welding and Cutting
- 29 CFR 1910.255 - Resistant Welding

5.0 RESPONSIBILITIES

Environmental Health and Safety will oversee the administration of this program, but ultimate responsibility for its implementation rests with each department on campus.

5.1 Employee / Student Responsibilities

Authorized users must receive training regarding the contents of this program and safe use of the specific equipment they will be working with. It is the responsibility of each authorized user to observe safe working practices while performing hot work.

5.2 Department / Instructor/ Supervisor Responsibilities

It is the responsibility of each supervisor affected by this program to:

- Recognize its responsibility for the safe use of cutting, welding, brazing and grinding equipment in their work areas;
- Establish safe areas for cutting and welding (refer to section 6.0);
- Ensure hot work procedures are being implemented and followed;
- Ensure that supervisors, cutters and welders are trained in the safe operation of the equipment;
- Review expired permits to ensure proper implementation of this program;
- Ensure that contractors meet or exceed University procedures and practices.

5.3 Environmental Health and Safety Responsibilities

It is the responsibility of the Environmental Health and Safety Department to:

- Provide technical assistance and training;
- Provide blank permit forms.

6.0 DESIGNATED “SAFE AREAS” FOR HOT WORK

Departments that regularly conduct hot work activities should designate a safe area where individual permits are not required.. This area must:

- Contain a functioning automatic sprinkler system, and have fire extinguishers of the proper type in the immediate vicinity;
- Be located at least 35ft. (11m) away from combustible, flammable, and explosive materials;
- Be shielded visually from other areas;
- Have adequate ventilation;
- Have a “Warning” sign posted to warn of potential hazardous fumes from welding operations.

7.0 WRITTEN HOT WORK PERMIT SYSTEM

Complete a hot work permit for any temporary operation involving open flames or producing heat and/or sparks. This includes, but is not limited to: Brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing and Welding (Only work that can't be performed in the safe area should be

completed in other areas). The following permit conditions must be met prior to starting hot work:

- The location where the work is to be done has been personally examined, and:
 - Sprinklers, where provided are in operational and will not be taken out of service until this work has been completed;
 - There is no flammable lint, dust, vapors and liquids and unpurged tanks or equipment in the area;
 - This work will be confined to the area or equipment specified in the permit.
- The following safeguards have been provided:
 - Floors and surrounds have been swept clean and wet down;
 - Adequate portable extinguishing equipment – fire hose, extinguishers, water pails, etc., are present;
- If the work involves cutting, welding, or other spark producing activity, the following additional safeguards are present:
 - All combustibles have been located 35 ft. from the operation and the remainder protected with **fire-resistive** tarpaulins or metal shields;
 - All floors and wall openings within 35 ft. of operations have been covered tightly;
 - Responsible personnel have been assigned to watch for dangerous sparks in the area, as well as floors above and below.
- Flame or spark producing equipment to be used has been inspected and found in good repair.
- Arrangements have been made for a patrol of the area, including floors above and below during and lunch or rest period and for at least one half hour after the work has been completed.

8.0 ENSURING ADEQUATE VENTILATION

- Ensure mechanical local exhaust ventilation is provided and used for hot work in all confined spaces and in welding areas where any of the following conditions exist:
 - The ceiling height is less than 16 feet;
 - There is less than 100 cubic feet of space per welder;
 - Exposures to toxic gases or welding fumes are not known or exceed published occupational exposure limits.

9.0 PERSONAL PROTECTIVE EQUIPMENT

Ensure appropriate PPE (eye, face, respiratory, fire- and flash resistant clothing, etc.) is selected and used based on an informed assessment of job-specific hazards (See Appendix B).

10.0 SAFE STORAGE AND HANDLING OF CYLINDERS

- Store oxygen and fuel gas cylinders separately with the protective valve caps in place. Except when in use, store these cylinders at least 20 feet apart or separated by a 5 ft. noncombustible wall.
- Transport cylinders on cylinder carts equipped with a cylinder restraint such as a chain or a strap.
- Ensure regulators are compatible with the cylinder and its contents and are provided with check valves/backflow prevention devices.

11.0 TRAINING

Authorized users must receive training regarding the contents of this program and safe use of the specific equipment they will be working with.

12.0 PROGRAM APPROVAL AND REVIEW

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By: A. Gordon, E. Garcia, E. Becker, J. Vasquez