



This section covers the safety requirements for welding, cutting, and brazing operations for General Industry and Construction type projects that occur in our workplace. Such operations are also known as “hot work” jobs. Most of our work will fall under OSHA General Industry Standard at 29 CFR 1910.252. For detailed information and regulations go to <https://www.osha.gov/SLTC/weldingcuttingbrazing/>.

Some projects may involve outside contractors and the scope of work falls under the Construction Industry requirement (29 CFR 1926.350 to 1926.354).

[https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_id=10696&p\\_table=STANDARDS](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10696&p_table=STANDARDS)

Supervisors and Managers are responsible to identify the type of work and implement such requirements.

Steward Observatory requires employees and any subcontractors, to comply with applicable OSHA regulations, NFPA 51B-1962, **Standard for Fire Prevention during Welding, Cutting, and Other Hot Work**, and University of Arizona Risk Management Services guidelines.

Hot work is defined as cutting and welding operations for construction/demolition activities that involve the use of portable gas or arc welding equipment, or involve soldering, grinding, or any other similar activities producing a spark, flame, or heat.

The University of Arizona Risk Management Services requires both employees and contractors to obtain a **Hot Work permit** prior to beginning any torch cutting, welding or brazing activities that are conducted with portable gas or arc equipment or involve soldering, grinding or any other similar activities producing a spark, flame or heat on University of Arizona construction projects.

Reference:

**Hot Work Requirements:**

<https://risk.arizona.edu/campus-safety/fire-safety/hot-work-requirements>

**Fire Safety Precautions Checklist:**

<https://risk.arizona.edu/campus-safety/fire-safety/fire-safety-precautions-checklist>

prior to initiating work with outside contractors. The Steward Observatory policy for welding, cutting, brazing or burning operations ensures basic precautions for personnel safety and fire prevention, or else the operations must not be performed.



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**Such precautions include:**

- Training of employees to include assessment of hazards, ventilation, personnel protective equipment, fire extinguisher use, storage and handling of equipment and working safely with fuel gas in welding and cutting operations.
- Appropriate personal protective equipment for eyes (vented goggles or other suitable), head, face, ears, neck (helmet) and hands (shields extremities) that must be worn at all times while welding cutting, brazing, or burning.
- Assessment of the work site to ensure adequate ventilation. And, to wear respirator equipment when necessary. Consider a thorough review of the OSHA standards referenced above if welding anything with cadmium, fluorides, mercury or other materials that might give off poisonous fumes. For more information, see **Controlling Hazardous Fume and Gasses During Welding:** [https://www.osha.gov/Publications/OSHA\\_FS-3647\\_Welding.pdf](https://www.osha.gov/Publications/OSHA_FS-3647_Welding.pdf)



- Assessment of potential hot work hazards for compressed gas, electrical, fumes, combustibles, falls and the work environment.
- The welder will consider the safety of others in the worksite by placing glare shields, barricades, or other barriers as necessary.
- A fire watch shall be placed for all field-welding operations.
- Designate a worker as a “fire watch” whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist.
- Appreciable combustible material in building construction or contents is 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 that expose combustible material in adjacent areas including concealed spaces in walls or floors.
- 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.
- If the welding project itself must take place at a specific location, all fire hazards in the vicinity of a welding or cutting operation must be moved to a safe place before welding may begin.
- Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use and should generally be in reach of any welding operation.

**A few practices for working safely apply in many situations:**

- When working above ground or floor level, use a platform with toeboards and standard railings or safety harnesses and lifeline. Also, protect workers from stray sparks or slag in the area below an elevated surface where welding is taking place.
- Aim the welding torch away from cement or stone surfaces. Moisture within these materials could cause them to explode when they reach a certain temperature.
- When finished welding or cutting, warn other workers of hot metal by marking or putting up a sign. Keep floors clean by putting electrode or rod stubs in an appropriate container. Keep floors clear of tripping hazards; store tools safely.
- Never use bad conductors, damaged regulators, torches, electrode holders or other defective equipment.
- Do not arc or resistance weld while standing on damp surfaces, or weld in rain.
- Routinely inspect and maintain welding equipment, including welding cylinders. Inspect cylinders regularly to make sure all parts are in good working order, especially manifolds, distribution piping, portable outlet headers, regulators and hose or hose connections. Be sure that welding torches and regulators have flashback arresters installed according to gas flow requirements



**Anti-Flash Back Valves:** If welding carts are used frequently, Aire Lirquide (UA Cryogenic supplier) recommends installing two anti-flashback valves on each end of the welding hose. This redundancy protects the user and equipment from damage and explosions from cuts and burns on the hose.

**Oxygen Cylinder Fire Barrier:** To prevent potential of fire and/or explosion ANSI Z49.1-1967 addresses the required fire barrier for oxygen cylinders in storage. This ANSI standard applies OSHA wide to both General Industry and Construction.

- An oxygen cylinder is considered to be in storage when it is reasonably anticipated that gas will not be drawn from the cylinder within 24 hours (overnight hours included). At that point, the storage requirements must be met.
- Section 1926.350(a)(10) requires that oxygen cylinders that are in storage be separated from fuel-gas cylinders and combustible materials (especially oil or grease). It specifies that the cylinders either be separated by a minimum of 20 feet (6.1m) or have a non-combustible firewall (with a fire resistance rating of one-half hour) at least five feet high (1.5m). An example of an acceptable cart is the Harper Steel Fire Barrier Cart, AirGas Part Number HRPFB-1 or manufacture number FB-1.