



## Lake Havasu City Fire Department

### Fire Prevention Bureau

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**FD Specification #06**  
**Welding and Other Hot Work**

**2018 IFC, Ch. 35, 50 & 53**

**Rev. 9/01/2021**  
**Page 1 of 5**

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## OVERVIEW

The primary hazards associated with hot work operations are the production of ignition sources such as sparks, hot slag, radiant, conductive or convective heat, which can ignite nearby combustible materials in addition to the storage, use, and handling of compressed gases, such as acetylene, oxygen, argon and carbon dioxide and/or LPG cylinders containing propane and butane, which all pose high fire and explosion potential.

## PURPOSE

To provide safety guidelines and requirements for companies and individuals who conduct hot work within Lake Havasu City.

## SCOPE

This specification applies to welding, cutting, open torches, heat-treating, grinding, hot riveting, and other hot work or processes which present similar hazards.

## DEFINITIONS

1. **Hot work** is a term meaning any hazardous operation including thermal cutting, welding, use of open torches, brazing, glass blowing, or similar operations.
2. **Hot work area** is the area exposed to sparks, hot slag, or radiant or convective heat as a result of hot work.
3. **Hot work equipment** is electric or gas welding or cutting equipment used for hot work.
4. **Hot work safety checklist** is a site-specific inspection of the hot work area to identify flammable materials, hazardous processes, or other potential fire hazards that could be present.

## PERMITS

Permits are not required at this time. However, the provisions of the adopted fire code apply to all hot work operations.

## REQUIREMENTS

Persons conducting hot work must conform to the following:

1. All hot work operations must comply with requirements contained in 2018 IFC Ch. 35 *Welding and Other Hot Work* and other relevant chapters in the fire code. Where conflicts arise between this specification and the provisions of the adopted fire code, the fire code provisions must be followed.

2. A fire watch must be provided during hot work activities and continue for a minimum of 30 minutes after the conclusion of the hot work. The fire code official is authorized to extend the fire watch based on the hazards or work being performed. A fire watch is not required when the hot work area has no fire hazards or combustible exposures.
3. The fire watch must include the entire hot work area. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a single individual must have additional personnel assigned to fire watches to ensure that exposed areas are monitored.
4. Individuals designated as fire watch must:
  - a. Be aware of the inherent hazards of the work site and equipment involved.
  - b. Have adequate fire extinguishing equipment readily available, and be trained in its use.
  - c. Extinguish any and all unwanted fires resulting from hot work operations.
  - d. Have the authority to stop hot work operations when found unsafe.
  - e. Communicate an alarm or order an evacuation when necessary.
  - f. Confirm that all relevant items specified in the Hot Work Safety Checklist (located at the end of this document) are satisfactorily addressed.
5. Hot work must NOT be conducted in rooms or areas where flammable liquids or vapors, lint, dust or combustible storage is at risk of ignition from sparks or hot metal, or in other locations as determined by the fire code official.
6. Hot work areas must not contain combustibles or be provided with appropriate shielding to prevent sparks, slag or heat from igniting exposed combustibles.
7. Openings or cracks in walls, floors, ducts, or shafts within the hot work area must be tightly covered or shielded to prevent passage of sparks or slag.
8. Floors must be kept clean within hot work area.
9. Conveyor systems, capable of carrying sparks to distant combustibles, must be shielded or shut down.

### **PRE-HOT WORK INSPECTION**

The responsible party, in conformance with the following, must conduct a pre-hot work inspection to ensure:

1. The site is clear of combustibles, or combustibles are adequately protected.
2. Exposed construction is of non-combustible materials and suitable shields protect combustible materials.
3. Openings in construction are protected.
4. Floors are kept clean and clear of combustibles.
5. There are no exposed combustibles on the opposite side of any partitions, walls, ceilings, and floors.
6. Fire watches are assigned, equipped, and properly trained.

7. Fire extinguishers are verified as operable, serviced, and available. A minimum **2-A:20-B:C** rated fire extinguisher or a charged water hose equipped with a nozzle must be located within 30 feet of the location where hot work is conducted and accessible without climbing stairs or ladders.
8. Visible hazard identification signs are provided: **CAUTION- HOT WORK IN PROGRESS - STAY CLEAR**. Signs must be conspicuously posted to warn others before they enter the hot work area.

## **CYLINDERS**

1. All materials in cylinders must meet the exempt amounts for compressed and flammable gases contained in IFC Ch. 50, Tables 5003.1.1
2. Oxygen manifolds: Oxygen manifolds must not be located in an acetylene generator room or in close proximity to cylinders of combustible gases. Oxygen manifolds must be located away from materials such as oil, grease or any substance likely to cause or accelerate fire.
3. Fuel-gas manifolds: Where it is necessary to manifold fuel-gas cylinders having an aggregate capacity in excess of exempt amounts, cylinders and manifolds must be located outside, or in a room or building, complying with building code for a group H, Division 2 Occupancy. Ventilation must be provided as required by the mechanical code at a rate of 1 CFM per square foot of floor area.
4. Location: Portable oxygen/fuel-gas welding equipment located inside of buildings must be stored in a well-ventilated dry location at least 20 feet from combustible material and away from elevators, stairs, gangways, or means of egress.

## **ARC WELDING EQUIPMENT**

1. Installation: Electrical equipment must be in accordance with manufacturer's recommendations and the National Electrical Code (NEC).
2. Emergency disconnects: Switches or circuit breakers must be provided so that fixed electrical welders and control equipment can be disconnected from supply circuits. Disconnects must be installed in accordance with NEC. The switches or circuit breakers must be labeled "Emergency Disconnect" and be visible from the equipment.
3. Damaged cables must be removed from service until repaired or replaced.

## **FIXED HOT-WORK AREAS**

Fixed hot-work areas must meet the above requirements and:

1. Floors in fixed hot work areas must have non-combustible surfaces.
2. Partitions segregating hot-work areas must be noncombustible and securely connected to the floor so that there is no gap between the floor and partition. Walls must prevent the passage of sparks, slag, and heat from the hot-work area.

### Hot Work Safety Checklist

**A "No" answer may indicate a hazardous condition and requires careful consideration and due diligence before engaging in hot work operations. Y=Yes, N=No**

#### General Safety Precautions:

1. Has the employee had sufficient training to accomplish the job safely? Y (\_\_\_) N (\_\_\_)
2. Has the employee been briefed on hazards unique to this particular job? Y (\_\_\_) N (\_\_\_)
3. Has the employee read the manufacturer's instructions, cylinder labels, & MSDSs. Y (\_\_\_) N (\_\_\_)
4. Is heat and impact resistant clothing being used? Y (\_\_\_) N (\_\_\_)
5. Is the proper clothing being worn to reduce skin burns? Action Taken: Y (\_\_\_) N (\_\_\_)
6. Are leather aprons, leggings, and sleeves worn for very hot work? Y (\_\_\_) N (\_\_\_)
7. Are dry welders gloves used during arc welding? Y (\_\_\_) N (\_\_\_)
8. Are proper respirators used when welding cadmium, lead or other materials where toxic fumes could form? Y (\_\_\_) N (\_\_\_)
9. Have fire resistant shields been placed over floors, walls, or other objects that could potentially catch fire? Y (\_\_\_) N (\_\_\_)
10. Have all flammable items in the hot work area been removed or covered? Y (\_\_\_) N (\_\_\_)
11. Is consumption (eating, drinking, smoking) prohibited while hot work is in progress? Y (\_\_\_) N (\_\_\_)
12. Have all ducts that could carry sparks been closed? Y (\_\_\_) N (\_\_\_)
13. Is adequate ventilation present in the hot work area? Y (\_\_\_) N (\_\_\_)
14. Where welding is conducted near combustible material, is a firewatcher routinely posted with operational fire extinguishers? Y (\_\_\_) N (\_\_\_)

#### Gas Welders:

1. Are cylinders regularly checked for leaks? Y (\_\_\_) N (\_\_\_)
2. In storage areas, are cylinders stored upright and secured in a separate, dry, ventilated, fire-protected room? Y (\_\_\_) N (\_\_\_)
3. Are cylinders always turned off after use? Y (\_\_\_) N (\_\_\_)
4. Are workers briefed to never roll or drop cylinders? Y (\_\_\_) N (\_\_\_)
5. Are workers briefed to never use oxygen to blow dust away? Y (\_\_\_) N (\_\_\_)
6. Is smoking forbidden during welding operations? Y (\_\_\_) N (\_\_\_)
7. Do workers regularly review the MSDSs for the gases they are using? Y (\_\_\_) N (\_\_\_)
8. Do workers know the proper lubricants for compressed oxygen cylinder connections? Y (\_\_\_) N (\_\_\_)

**Arc Welders:**

1. Are welders de-energized before touching electrical parts? Y (\_\_\_) N (\_\_\_)
2. Are objects to be welded on, separately grounded? Y (\_\_\_) N (\_\_\_)
3. Do welders know the correct size cable, with intact insulation, for a given operation? Y (\_\_\_) N (\_\_\_)
4. Do welders know that jewelry should not be worn when welding? Y (\_\_\_) N (\_\_\_)
5. Are work surfaces, floors, and objects dry before starting to weld? Y (\_\_\_) N (\_\_\_)
6. Is it forbidden to weld in the rain? Y (\_\_\_) N (\_\_\_)

**Hot Work in Confined Spaces:**

1. Is the atmosphere tested before entering and while working? Y (\_\_\_) N (\_\_\_)
2. Do gas cylinders remain outside at all times? Y (\_\_\_) N (\_\_\_)
3. Is the space properly ventilated? Y (\_\_\_) N (\_\_\_)
4. Are written procedures available? Y (\_\_\_) N (\_\_\_)
5. Has additional Personal Protective Equipment (PPE) been considered? Y (\_\_\_) N (\_\_\_)
6. Are safety attendants properly equipped and is first aid equipment readily available? Y (\_\_\_) N (\_\_\_)


**REFERENCES**

2018 IFC Ch. 35 *Welding and Other Hot Work*

2018 IFC Ch. 50 Hazardous Materials

2018 IFC Ch. 53 *Compressed Gases*

**Note:** This FD Specification is intended to be a guide only. For full installation, fire-flow, location, distribution, and maintenance requirements, refer to the references above. Where conflicts exist between this document and the applicable codes and standards, the above references must supersede.

APPROVED:  DATE: 9/1/2021  
Scott Hartman, Fire Marshal