

HOT WORKS PROCEDURE

1. PURPOSE

- 1.1 The purpose of this document is to ensure the safe operation of hot work equipment in accordance with the requirements set forth in 29 CFR 1910 Subpart Q - *Welding, Cutting and Brazing*.
- 1.2 To pinpoint areas where hot work can be conducted, to establish what controls shall be utilized and to determine what training is needed.
- 1.3 To identify hot work operations e.g. any activity involves the use of an open flame or spark producing equipment. Such activities include, but not limited to, welding, cutting, brazing, burning, grinding and soldering operations.

2. RESPONSIBILITIES

2.1 **Hot Work Operator** The hot work operator is responsible for ensuring that all equipment is inspected prior to use, that equipment is in good operating order and that the appropriate controls have been put in place in accordance with this procedure.

2.2 Fire Watchers

Shall have fire extinguishing equipment readily available and be trained in its use. They shall be familiar with the equipment 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.

2.3 Management

Shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and based on fire potentials, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas. Designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes. Ensure that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process. Advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

2.4 Supervisor/Manager

Shall be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process. Determine that combustible materials and hazardous areas present or likely to be present in the work location have been identified. Ensure combustibles are protected from sources of ignition. Secure authorization for the cutting or welding operations from the designated management representative. Determine that the hot work operator secures his approval that conditions are safe before going ahead. Ensure that fire

protection and extinguishing equipment are properly located at the work location. Where fire watches are required, ensure that they are available.

3. SAFETY

Prior to the beginning of the work the hot work operator shall evaluate the need for engineering controls and the type personal protective equipment.

3.1 Engineering Controls – A fume collector shall be used as a control to allow for the adequate removal of welding fumes from the hot work operators breathing zone. A fume collector shall be selected for a hot work operation based on the following circumstances:

3.1.1 The number of hot work operators conducting hot work in one area, simultaneously (minimum of 10,000 cubic feet per welder),

3.1.2 The possible evolution of hazardous fumes, gases, or dust as a result of the use of such metals as Fluorides, Zinc, Beryllium, Mercury, Cadmium, Lead, Stainless Steel, and/or Cleaning Compounds.

3.1.3 The hot work being performed is in an enclosed, confined or screened area, which is not equipped with adequate ventilation.

3.2 Protective Eye Protection – All glass for lenses shall be tempered, substantially free from air bubbles, waves and other flaws. Except when a lens is used to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows shall be smooth and parallel.

3.2.1 Lenses shall bear some permanent distinctive marking by which the source and shade may be readily identified.

3.2.2 The following is a guide for the selection of the proper shade numbers.

Welding operation	Shade No.
Shielded metal-arc welding - 1/16, 3/32, 1/8, 5/32 inch electrodes	10
Gas-shielded arc welding (nonferrous) - 1/16, 3/32, 1/8, 5/32 inch electrodes	11
Gas-shielded arc welding (ferrous) - 1/16, 3/32, 1/8, 5/32 inch electrodes	12
Shielded metal-arc welding: 3/16, 7/32, 1/4 inch electrodes 5/16, 3/8 inch electrodes	12-14
Atomic hydrogen welding	10-14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	5 or 6
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and over	6 or 8

3.2.3 A welding helmet with filter lenses and plates must meet the test for transmission of radiant energy prescribed in ANSI Z87.1-1968.

3.3 Protective Clothing - Employees exposed to the hazards created by welding, cutting, or brazing operations shall use heat resistant apron, sleeves and gloves that are appropriate for hot work operations.

3.4 Protective Screens – Shall be put in place to protect persons from the visual effects of viewing arc welding or cutting and during gas or oxygen cutting or welding.

4. PROCEDURE

4.1 Area Inspection

4.1.1 Prior to starting work a safety coordinator shall inspect the area using the following checklist as a guideline.

- Verification that the hot work operator(s)/fire watch are trained in the safe operation of their equipment;
- Verification that the apparatus used for the hot work is in good condition;
- Verification that the hot work operator(s)/fire watch understand the emergency procedures in the event of a fire or general emergency;
- Proper location of fire protection and extinguishing equipment;
- Verification that operator(s) are utilizing personal protective equipment; and
- Verification that the proposed work does not jeopardize the health and safety of the operator or others.
- Verification that all combustible materials have been cleared from the area. Where materials cannot be removed, protection has been provided by non-combustible or purpose-made blankets.
- Verification that flammable liquids have been removed from the area.
- Verification that floors have been swept clean.
- Verification that combustible floors have been covered with overlapping sheets of non-combustible material or wetted and liberally covered with sand. All openings and gaps (combustible floors or otherwise) are adequately covered.
- Verification that adequate protection is in place to contain the sparks from extending beyond the work area, including to the floor below.

- Verification that combustible materials have been moved away from the far side of walls or partitions where heat could be conducted, especially where these incorporate metal.
- Verification that enclosed equipment or confined space (tanks, containers, dust collectors etc.) has been emptied and tested, or is known to be free of flammable concentrations of vapour or dust.

4.1.3 If the aforementioned criteria are not met, work should not start until all concerns are corrected.

4.1.4 If there are automatic fire detection devices present in the immediate area that need to be deactivated to prevent alarms, the safety coordinator / hot work operator must contact the Client / Primary Contractor to place the system in an 'off-line status', so smoke and heat detectors that might be affected by the work do not trigger a building evacuation.

4.2 Fire Watch

4.2.1 HRS Group UK requires a fire watch when hot work is performed in a location where the following condition(s) exist:

- Combustible materials in building construction or building contents are closer than 35 feet to the point of operation of the hot work;
- Combustible materials are more than 35 feet away, but are easily ignited by sparks;
- Wall or floor openings within a 35 feet radius expose combustible materials in adjacent areas, including concealed spaces in walls or floors; and
- Combustible materials are adjacent to the opposite side of partitions, walls, ceiling, or roofs and are likely to be ignited.

4.2.2 The fire watch shall be maintained during all breaks and a half hour after completion of the hot work operation in order to detect and extinguish smoldering fires on the floors above, below and adjacent to the hot work area if applicable.

4.2.3 The hot work area shall be monitored for an additional two hours. This method of monitoring shall be determined by the Safety Coordinator. A final review shall take place by a Safety Coordinator / hot work operator thereafter to ensure the hot work area is free from fire.

4.4 Prohibitions

Hot work shall not be permitted in the following areas until the conditions prohibiting hot work have been modified:

- In the presence of explosive atmospheres, or in situations where explosive atmospheres may develop inside contaminated or improperly prepared tanks or equipment which previously contained flammable liquids;

- In areas with an accumulation of combustible debris, dust, lint and oily deposits;
- In areas near the storage of exposed, readily ignitable materials such as combustibles;
- On a container such as a barrel, drum or tank that contained materials that will emit toxic fumes when heated; and/or
- In a confined space, until the space has been inspected and determined to be safe.

5. TRAINING

Employees shall be trained on all aspects of this procedure prior to initial assignment and whenever there is a change.