Hot Work / Welding Quiz

QUESTION

What are the situations when workers should not be allowed to weld or cut’

ANSWER

- Areas where management has not approved cutting or welding
- Buildings with sprinkler systems that prevent cutting or welding
- Areas with explosive atmospheres due to flammable gases, dust, vapors or liquids in the air
- In areas close to large amounts exposed, readily ignitable materials like paper bales, cotton, or bulk sulfur

WHY IS IT RIGHT

DEFINITION

Hot work is any work that involves ‘burning, welding, or a similar operation that is capable of initiating fires or explosions.’ It’s not just work that involves flames. You don’t need a flame to generate heat. Activities such as drilling, soldering, brazing, tapping, grinding, heat treating, chipping, thawing pipes, and abrasive blasting’often referred to as sand blasting’are all considered hot work.

Hazards / Dangers

Hot work produces electrical arcs or flames that can reach up to 10,000. High temperatures, sparks and slag, are also an ever-present danger. Hot work equipment, such as arc welding circuits, can cause serious or fatal electrocution. **Arc welding** produces intense UV light that can damage welders' retinas.

Health Effects

These components in welding smoke can affect the welder's lungs, heart, kidneys and central nervous system. Long-term exposure to welding smoke can cause chronic respiratory problems, decreased lung capacity, heart disease, skin disease, hearing loss, kidney damage, reproductive harm, and other diseases.

Key Requirements

Before you should allow any welding or cutting activity to occur, you should first inspect the work area to ensure it allows for safe welding and cutting. Outline and document all precautions in the form of a written permit. Consider the following fire prevention and protection and personnel protection when you assess each work area.

Fire Prevention and Protection

Following basic fire prevention and protection procedures, employers should eliminate fire hazards within the vicinity, provided the object being cut or welded cannot be readily moved. If you can't relocate fire hazards, and the welded or cut item can't be moved, you should take care to install guards that will shield surrounding objects from sparks, heat, and slag. If neither of the above options are possible within the welding or cutting area, then you should not weld or cut in that area. **Workers should not be allowed to weld or cut in any of the following situations:**

- Areas where management has not approved cutting or

welding
- Buildings with sprinkler systems that prevent cutting or welding
- Areas with explosive atmospheres due to flammable gases, dust, vapors or liquids in the air
- In areas close to large amounts exposed, readily ignitable materials like paper bales, cotton, or bulk sulfur

Extra Precautions

You may need to take extra precautions when working with or near combustible material, such as those that might be on the floor below the working area. Sparks that fall through cracks in the floor could impact the combustible material below. You should take increased precautions regarding open doorways, windows, or cracks or holes in the wall. In any event, working and accessible fire extinguishing equipment are a must. Depending on the work you are performing, you may choose to use buckets of water or sand, portable fire extinguishers, or water hoses. If you are performing work that could ignite more than a minor fire, you must have a fire watcher on duty at all times. Fire watchers are also required when you are working with or near combustible material (see 1910.252(a)(2)(iii)(A)(1-4) for more details).

General Rule

Employers and supervisors should take care to keep staff well informed of the regulations surrounding hot work, as well as the potentially life threatening consequences of deviating from the regulations. Workers may not always be aware of nearby combustibles, explosive atmospheres, or other nearby hazards. Supervisors are also required to ensure fire watchers are available at all times during any welding or cutting activity.

HOT WORK PERMITS

Before hot work operations begin in a non-designated location, a completed hot work permit is required.

The following conditions must be confirmed before permitting the hot work to commence:

- Equipment to be used (e.g. welding equipment, shields, personal protective equipment, fire extinguishers) must be in satisfactory operating condition and in good repair.
- The floor must be swept clean for a radius of 35 ft if combustible materials, such as paper or wood shavings are on the floor,
- Combustible floors (except wood on concrete) must be kept wet or be covered with damp sand (note: where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock)., or be protected by noncombustible or fire-retardant shields.
- All combustible materials must be moved at least 35 ft away from the hot work operation. If relocation is impractical, combustibles must be protected with fire-retardant covers, shields or curtains. Edges of covers at the floor must be tight to prevent sparks from going under them, including where several covers overlap when protecting a large pile.

WHY IS EVERYTHING ELSE WRONG

PREVENTION

Staying safe is encapsulated in the 4 following procedures.

A. Hot work management program.

B. Substitutes / Alternatives.

C. Good Practices Checklist.

D. Personal Protective Equipment.

These four aspects incorporate the basis of preventative and precautionary steps to protect workers from harm in dangerous hot work undertakings.

A. Hot Work Management Program

Hot work programs are designed to control or eliminate hot work hazards and their risks including policies, procedures, and the assignment of responsibilities for all aspects of hot work.

1. Policies

- Where hot work is permitted.
- When hot work is permitted.
- Who authorizes, performs, and monitors hot work activities.

2. Procedures

- What must be assessed before permitting/performing hot work in an area or on a process piece of equipment or area.
- What to do to prepare an area for hot work.
- What to do if hot work cannot be avoided in a particularly hazardous area.
- What hot work tools are required’
- How to obtain a hot work permit, when they are required, and who can administer them.

3. Training

- Employees, supervisors, maintenance individuals, fire wardens, trained fire watch individuals, and contractors all have different roles, and must be trained accordingly.

4. Communications

- Posting procedures.

- Posting policies.
- Posting signs in areas that are prohibited from having hot work performed in them.

B. Substitutes / Alternatives

Assess the substitutes or alternate method for any risks or hazards. Do not introduce any new risks or hazards.

C. Good Practices Checklist

- Make sure that all equipment is in good operating order before work starts.
- Make sure that all appropriate personal protective devices are available at the site and each worker has been trained on how to use, clean, and store them properly.
- Inspect the work area thoroughly before starting. Look for combustible materials in structures (partitions, walls, ceilings).
- Move all flammable and combustible materials away from the work area.
- If combustibles cannot be moved, cover them with fire resistant blankets or shields. Protect gas lines and equipment from falling sparks, hot materials, and objects.
- Sweep clean any combustible materials on floors around the work zone. Combustible floors must be kept wet with water or covered with fire resistant blankets or damp sand.
- Use water ONLY if electrical circuits have been de-energized to prevent electrical shock.
- Remove any spilled grease, oil, or other combustible liquid.
- Vacuum away combustible debris from inside ventilation or other service duct openings to prevent ignition. Seal any cracks in ducts. Prevent sparks from entering into the duct work. Cover duct openings with a fire-resistant

barrier and inspect the ducts after work has concluded.

- Make sure that appropriate fire extinguishers (e.g., ABC fire extinguishers) are available and easily accessible.
- Make sure that the first-aid boxes are available and easily accessible.
- Block off cracks between floorboards, along baseboards and walls, and under door openings, with a fire-resistant material. Close doors and windows.
- Cover wall or ceiling surfaces with a fire resistant and heat insulating material to prevent ignition and accumulation of heat.
- Secure, isolate, and vent pressurized vessels, piping and equipment as needed before beginning hot work.
- Inspect the area following work to ensure that wall surfaces, studs, wires or dirt have not heated up.
- Post a trained fire watcher within the work area, including lower levels if sparks or slag may fall during welding, including during breaks, and for at least 60 minutes after work has stopped. Depending on the work done, the area may need to be monitored for longer (up to 3 or more hours) after the end of the hot work until fire hazards no longer exist.
- Eliminate explosive atmospheres (e.g., vapors or combustible dust) or do not allow hot work.
- Shut down any process that produces combustible atmospheres, and continuously monitor the area for accumulation of combustible gases before, during, and after hot work.
- If possible, schedule hot work during shutdown periods.
- Comply with the required legislation and standards applicable to your workplace.

D. Personal Protective Equipment

Eye and face protection, such as goggles and face shield or helmets, helps protect workers from hot sparks and molten particles. Other common PPE for hot work includes insulated

gauntlet gloves, hard-toed high-top shoes, leather aprons, insulated coveralls, safety glasses, helmets and hard hats, and leggings or high boots. Workers should always keep their clothes fully buttoned and uncuffed when performing hot work and wear wool or insulated fabrics. When welding overhead objects, workers will need extra protection, like heat-resistant shoulder covers, aprons, head covers, leggings, and suits. You must provide most types of PPE to your employees and train them on how to properly use, maintain, and dispose of it.

Hot work is dangerous and even deadly, but with proper training and protective measures, your facility can reduce welding-related injuries and illnesses. Follow all precautions for hot work and remove or cover flammable and combustible materials before your employees begin. Ensure that all employees are provided with PPE and use it correctly.