ENVIRONMENTAL HEALTH & SAFETY
UNIVERSITY of WASHINGTON

HOT WORK: OTHER HAZARDS

WELDING SAFETY – PHYSICAL HAZARDS

Hot work operations, including welding, pose a number of physical hazards. Most welding on campus will involve either a gas flame or an electrically generated arc. In addition to the general hazards listed below, each operation must be evaluated for specific hazards it may pose.

ELECTRICAL HAZARDS

Is there an electric shock hazard?

Electric shock is a serious risk facing a welder. In arc welding operations, the primary voltage inside the welding equipment can be as high as 600 volts and the secondary (or welding) voltage is often 20-100 volts. A welder can be shocked by touching two different objects that have voltage between them. Depending on the conditions, this could injure or kill.

How can I prevent electric shock?

Electric shock can occur if you touch a hot lead inside the welder while you are touching the case or other grounded metal while the power to the welder is on. Remember:

- Turning the power switch off may not turn the power off to the welder.
- The welder must be unplugged or the circuit de-energized to fully cut power.
- A welder must be installed by qualified personnel to ensure it is compatible with intended uses and the input is the correct phase.

Additional information on electrical safety can be found on the EH&S website.

FIRE HAZARDS

What are the fire hazards?

The intense heat at the arc and flame from the torch present clear fire hazards. Another major fire hazard comes from the sparks and slag (molten metal) produced during the process. Sparks can spray up to 35 feet from the welding area and can cause a fire if they contact a flammable or combustible material.

How do reduce my risk of fire hazards?

- The area must be inspected before you start welding operations.
- A fire watch is generally required for all welding operations not in a dedicated welding booth. The fire watch must observe the process, watching where sparks and slag land, and look for signs of smoke or fire.
- Additional fire watch personnel may be required if the welding is in a location where these sparks or slag may penetrate a wall or floor, or on a raised platform.
- Because a spark may encounter a combustible object and smolder slowly, the fire watch should continue at least 30 minutes after welding is complete.

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These general fire safety rules should be followed during welding operations:

- Welders should be aware of the location of their nearest exits and fire alarm pull stations (if provided) and have a fully charged fire extinguisher ready.
- Those expected to use the extinguisher must be trained. Basic training is available online, but hands-on training is required for those performing hot work or acting as fire watch for hot work operations. Both can be accessed on the EH&S website.

COMPRESSED GAS HAZARDS

Gas welding uses a fuel gas cylinder, often acetylene, as a torch to form a flame. In oxy-fuel welding, pure oxygen is used instead of air to increase the temperature of the flame, which differentiates welding from soldering or brazing. Gas cylinders pose a number of hazards and must be properly managed.

Some types of welding, such as metal inert welding (MIG) and tungsten inert welding (TIG), use shielding gases to protect the weld area from oxygen or moisture. These are often inert gases such as argon, helium and carbon dioxide, which can reduce the amount of breathable oxygen in the air. For more information and respiratory precautions, see the General Welding Safety – Respiratory Health Hazards Focus Sheet on the EH&S website.

Additional information to reduce risk from compressed gases can be found on the EH&S website.

THERMAL HAZARDS

How can I protect myself from high heat during welding operations?

- Wearing appropriate Personal Protective Equipment (PPE) can help prevent burns.
- Use welding goggles and helmets to protect the eyes from glare and flying sparks.
- Wear heavy leather gloves, protective long-sleeve jackets, long pants and closed-toe shoes.

FLASHBACK

Flashback can occur in gas welding when the flame burns back up the hose lines. A resulting explosion in the hose could injure or kill the operator.

What can I do to prevent flashback?

- Make sure the system is equipped with a flashback arrestor.
- Operate the equipment at the recommend pressure.
- Equipment should be inspected regularly to ensure proper function.

For questions related to this topic, contact EH&S at 206.543.7262.