



## **ABOUT HOT WORK AND WELDING SAFETY**

LENGTH: 12 MINUTES

### **PROGRAM SYNOPSIS:**

Our workplace is full of hazards, hazards that can hurt us or kill us. Controlling these hazards and preventing injuries is the point of our safety and health program. One such hazard is the risk of fire and injuries during hot work and welding operations. Ensuring that workers performing these operations understand and follow safe work practices can prevent injuries and save lives. That is the point of our facility's safety policies regarding hot work and welding and that is the point of this program. So, pay close attention as we "get to the point" about hot work and welding safety.

Topics include clothing and PPE, designated and non-designated areas, fire watch duties, good housekeeping, pre-job inspection and protecting co-workers from hazards.

### **PROGRAM OBJECTIVES:**

After watching the program, the participant will be able to explain the following:

- What clothing and PPE is required for hot work and welding;
- What designated and non-designated areas are;
- Which precautions should be taken before work begins;
- What good housekeeping practices should be followed during operations;
- How to protect co-workers from hot work hazards.

### **PROGRAM OUTLINE**

#### **CLOTHING & PERSONAL PROTECTIVE EQUIPMENT**

• For safe welding and hot work to occur, there are some important precautions that must be taken before the work begins. First and foremost, you must make sure you are wearing the appropriate clothing and personal protective equipment to prevent injuries to your eyes, skin and lungs.

##### ***Clothing***

- At a minimum, welders should wear long sleeves and long pants made of 100 percent natural fiber clothing such as cotton or wool.
- Fire-resistant or FR rated clothing is also available and may be required for some hot work operations.
- Any clothing containing synthetic fibers such as rayon or polyester should not be worn. These fabrics can ignite easily and melt into your skin, causing severe burn injuries.

##### ***Eye Protection***

- To protect your eyes from flying debris and particles in the work area, safety glasses with side shields should always be worn.
- Safety glasses should also be worn under your welding helmet so your eyes are protected anytime your shield is raised.
- Safety glasses that protect against incidental exposure to infrared radiation or IR safety glasses are recommended for workers in welding or hot work areas; however, keep in mind that IR safety glasses do not protect you from direct exposure to the harmful light of a welding arc.
- To protect your eyes from the arc, make sure that the lens in your welding helmet is the appropriate shade for your welding application. It's a good rule of thumb to use the darkest shade that still allows you to clearly view the work while welding.
- If you use an auto-darkening hood, consult the manufacturer's instructions for the helmet and its auto-darkening lens. Many of these hoods have adjustable settings and modes. Incorrect use can inadvertently leave you exposed to the arc.
- Make it a point to turn it on and hold it up to a bright light before use to make sure it is functioning properly.

##### ***Hand Protection***

- When selecting protection for your hands, keep in mind that today's welding gloves offer optimal dexterity when compared to traditional heavy leather welding gloves.
- Make sure to choose a glove that fits comfortably and allows liberal movement of your hands and fingers. Make sure that the glove is appropriate for the type of welding to be performed.
- Many burns occur when intensely heated materials burn through welding gloves. Such items should be handled with holders or clamps designed for this purpose. Welding gloves are not designed to directly hold extremely hot materials.

##### ***Foot Protection***

- To protect your feet, high-top leather boots should be worn. Your pant legs should be pulled over the top of the boots to prevent sparks from falling inside.
- If you must place your body in a position where the tops of your boots are exposed to falling slag, then spatter guards, or spats, are recommended to protect the ankle and instep from burns.

##### ***Respiratory Protection***

- The air quality of welding and hot work operations is monitored to ensure that the air ventilation is adequate to prevent the inhalation of toxic fumes and gases. When air testing indicates that ventilation is not adequate, then some type of respiratory protection will be required.
- The three most widely used types of respirators for welding applications are the half-mask respirator, the powered air-purifying respirator or PAPR and the supplied air respirator or SAR.

- Half-mask respirators can be worn underneath a welding helmet without obstructing the welder's field of vision. Those with an assigned protection factor of 10 with high efficiency oil-proof particulate filters are recommended.
- Powered air-purifying respirators, or PAPRs, have a blower that pumps ambient air through an air purifying element and a hose into the user's helmet. These respirators have an assigned protection factor of 25, providing better protection than half-mask respirators.
- Supplied-air respirators, or SARs, connect from the helmet to a unit on the welder's belt which is attached to an air-purification system with an air hose. These devices also provide an assigned protection factor of 25.

#### **DESIGNATED AREAS & NON-DESIGNATED AREAS**

- Welding and hot work operations may be conducted in "designated" hot work areas or "non-designated" hot work areas. A designated hot work area is an area that has been designed as a safe and permanent location for hot work to be performed.
- These "designated areas" for hot work are free of combustible materials, have a non-combustible working surface, are equipped with appropriate mechanical ventilation, have a fire extinguisher on hand and are suitably segregated from adjacent work areas.
- When hot work is performed in these types of approved and designated areas, a hot work permit is not required and, other than normal safe work practices, no special procedures must be followed.
- Whenever possible, any objects to be welded should be moved into a designated hot work area; however, there are often times when a piece of equipment is too large to move into a designated area or the work to be done involves pipes and other stationary objects that can't be moved.
- When this is the case, the hot work operation must be done in a non-designated area and special precautions must be followed and a hot work permit must be obtained.

#### **PRECAUTIONARY MEASURES**

- The hot work permit serves as a checklist of the precautions that must be taken to ensure the work is conducted safely. The person who issues the hot work permit must verify all precautionary measures have been taken before signing the permit and allowing work to begin.
- Several important precautions that must be taken before any hot work proceeds include wetting down or covering the floor in sand or with fire-resistant blankets if the flooring is made of combustible material and removing any accumulations of combustible dust and other combustible debris or objects within 35 feet of the work zone.
- Combustible materials that cannot be moved must be covered with approved welding curtains or blankets.
- A fully-charged fire extinguisher rated for the class of any possible fire that could ignite must also be located near the work zone.

#### **FIRE WATCH DUTIES**

- Some hot work operations will require a fire watch. Generally, a fire watch will be required when there is the potential for anything larger than a minor fire.
- The person assigned as the fire watch may stop the hot work if unsafe conditions transpire during the task.
- The fire watch should continue observing the work zone for 30 minutes after the hot work is completed.

#### **GOOD HOUSEKEEPING**

- Good housekeeping is another important responsibility for welders and others who conduct hot work. Making it a point to follow good housekeeping practices will help prevent injuries, fires and make the work process more efficient.
- Before striking an arc, clear excess materials and debris from the work zone. Only have on hand the materials you need to complete the immediate task.
- Keep only the amount of cables and hoses you need in the work area and place them in locations where they won't become tripping hazards.
- Before beginning the operation, plan the work flow and organize supplies and equipment in positions where they won't become hazards or interrupt the process.
- After completing the work, return all equipment and supplies to their proper storage area and clean up any left over materials and debris.

#### **PRE-JOB INSPECTION**

- Prior to welding, cutting or performing other hot work activity, all tools, machines, tanks, hoses and cables must be inspected to make sure they are in good working order.
- Make sure insulation on electrical cables isn't damaged and there are no exposed bare conductors.
- Also, make sure all arc welding and electrical equipment is properly grounded.
- Always follow our organization's policies for securing, transporting and storing compressed gas cylinders used in hot work operations. Keep safety caps in place and securely chain them during transport.

#### **PROTECTING CO-WORKERS FROM HOT WORK HAZARDS**

- Since many welding and cutting operations take place while working near co-workers and pedestrians, you must make it a point to take the necessary precautions to protect them from hot work hazards.
- Utilize welding screens or curtains when other workers could be exposed to sparks and harmful light.
- Before cutting or grinding, make sure no one is in the area where your sparks will fly.
- Alert any nearby workers before you strike an arc.
- Avoid walking up to, touching or otherwise startling a co-worker who is actively welding or cutting. Instead, wait for them to finish and then get their attention from a safe distance away.
- While working in close proximity to other welders, make sure to communicate your intended work plan.
- If your plan deviates or if you need to make an unexpected movement, alert nearby co-workers to keep clear.
- Always maintain control of the welding handle and trigger. When your task is complete, put the welding handle in a location where it won't be contacted by others.