



### 1. Purpose

This safety program is intended to evaluate and identify the specific hazards where hot work is performed, communicating information concerning these hazards, and establishing appropriate procedures and protective measures for our employees and contractors.

This procedure establishes Kennesaw State University's (KSU's) process for managing hot work activities, including conducting risk assessments, providing authorization, and creating awareness in order to prevent injuries or loss from fire or explosion due to hot work activities.

### Scope

This program applies to any hot work activities capable of initiating a fire or explosion and covers all KSU employees, students, contractors, and other personnel at workplaces under the management or control of KSU.

The following operations are not covered within this standard: electric or furnace-heated soldering irons and flameless heat guns. These operations should be covered by specific local procedures where these operations take place in areas specifically constructed, protected, and arranged to accommodate safe hot work process, e.g., welding shops, and that have been adequately assessed for risks and these risks have been controlled. This may include specific operations in laboratories, workshops, and commercial kitchens.

### 2. Definitions

**Hot work** – Work involving operations capable of initiating fires or explosions. This includes, but is not limited to, welding, burning, grinding, flame cutting, flame heating, brazing, soldering, and plasma cutting.

**Hot work permit (“permit”)** – A document issued by KSU for the purpose of authorizing performance of a specified hot work activity.

**Permit Authorizing Individual (PAI)** – The individual designated by KSU to authorize hot work.

**Project Manager** – An employee who is responsible for planning, procurement, and execution of a project.

### 3. Roles and Responsibilities

#### A. Environmental, Health, and Safety Department

The Environmental, Health, and Safety (EHS) Department's roles and responsibilities are as follows:

- Develop, manage, review, and revise the Hot Work Safety Program.
- Communicate requirement of the program to affected member of the campus community.
- Issue hot work permit and conduct inspection to ensure compliance.
- Take responsibility for the overall management of the Hot Work Program.
- Establish permissible areas for hot work activities.
- Serve as the Permit Authorizing Individual (PAI).
- Ensure individuals involved in hot work operations, including contractors, are familiar with the provisions of this program.

## **B. Project Managers**

Project managers have the following roles and responsibilities:

- Communicate KSU hot work requirements to all contractors under their purview.
- Make available and distribute hot work permits to KSU personnel and contractors upon request.
- Coordinate all hot work requests with contractors

## **C. Permit Authorizing Individual**

The permit authorizing individual (PAI) must be aware of the hazards posed by the hot work process and be familiar with applicable regulations. Additional roles and responsibilities include the following:

- Take responsibility for the safe operation of hot work activities.
- Determine the type of hot work operation to be conducted.
- Determine the identity of the hot work operator.
- Conduct pre-operational fire safe precautions.
- Assess the work area where the hot work is to be conducted for site-specific flammable materials, hazardous processes, or other potential fire hazards.
- Issue the hot work permit prior to work commencing.
- Determine if a fire watch is required; if a fire watch is not required, the PAI will conduct a final check after the completion of hot work operations to detect and extinguish smoldering fires.

## **D. Employee and Contractor Conducting Hot Work**

Employees and contractors conducting hot work activities have the following roles and responsibilities:

- Ensure all hot work equipment is in safe operating condition; defective equipment should be repaired by a qualified person prior to use or be withdrawn from service.
- Ensure adequate fire watch is maintained during and after hot work activities as necessary.
- Cease hot work operations if unsafe conditions.
- Notify the PAI upon completion of hot work activities.

## **E. Fire Watch**

Fire Watches must be used when any of the following take place or any of the following conditions exist:

- Work activities that involve torching, welding, cutting, brazing, and soldering.
- Work activities that could create an ignition source.
- Situations where larger than minor fires may develop.
- Areas where appreciable combustible materials in building construction or contents are closer than 35 feet to the point of operation.
- Areas where appreciable combustible materials are more than 35-feet away but could be easily ignited by sparks.
- Instances where wall or floor openings within a 35-foot radius are exposed to combustible material, including concealed spaces in walls, floors, and ceilings.
- When combustible materials are adjacent to the opposite side of partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.
- Any time or situation as deemed necessary by the Fire and Life Safety Team.

Fire Watch responsibilities include the following:

- Be familiar with facilities for sounding an alarm in the event of a fire.
- Watch for fires in all exposed areas and try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm.
- Stay onsite for at least a half-hour after the completion of hot work to assess hot-spots, smoldering material, and fires.
- Attend fire extinguisher use training, or training in equivalent fire protection methods.
- Have fire extinguishing equipment readily available at the location where hot work is being done and on opposite sides of adjacent bulkheads and floors when the potential of conductive heat transfer exists.
- Guard against a fire starting in their assigned area.
- Not engaging in activities or tasks other than that of the Fire Watch.
- Make a complete inspection of the exposed areas for possible hot spots or fire.
- Make an initial inspection of all exposed areas immediately following the completion of hot work operations.

## **4. Procedures**

### **A. Fire Prevention and Protection**

Welders, cutters, their supervisors, and owners of the property where hot work is being performed should refer to the National Fire Protection Association (NFPA) Standard 51B – Standard for Fire Prevention in Use of Cutting and Welding Processes.

Cutting or welding must be permitted only in areas that are or have been made fire safe. Before cutting or welding is permitted, the area must be inspected by a member of the Fire and Life Safety Department for authorizing cutting and welding operations. This individual must

designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.

The basic precautions for fire prevention during hot work are as follows:

- If the object to be welded or cut cannot readily be moved, the area must be made safe by removing combustibles or protecting combustibles from ignition sources.
  - All combustibles must be relocated at least 35 feet (10.7 m) from the worksite. Where relocation is impracticable, combustibles must be protected with flameproof covers or otherwise shielded with metal or welding curtains.
- If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards must be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards, or equivalent precautions taken.
  - Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions must be taken so that no readily combustible materials on the floor below will be exposed to sparks that may drop through the floor. The same precautions must be observed with regard to cracks or holes in walls, open doorways and open or broken windows. If the above requirements cannot be followed, then welding and cutting will not be performed.
  - Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards must be provided to prevent ignition.
  - If welding is to be done on a metal wall, partition, ceiling or roof, precautions must be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work must be provided.
  - Welding must not be attempted on a metal partition, wall, ceiling, or roof having a combustible covering or on walls or partitions of combustible sandwich-type panel construction.
  - Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs must not be undertaken if the work is close enough to cause ignition by conduction.
- Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor must be swept clean for a radius of 35 feet (10.7 m).
  - Combustible floors must be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment must be protected from possible shock.
- Ducts and conveyor systems that might carry sparks to distant combustibles must be suitably protected or shut down.

- Suitable fire extinguishing equipment must be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hoses or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

Cutting or welding must not be permitted in the following situations:

- In areas not authorized by management.
- In sprinkler-protected buildings while such protection is impaired.
- In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside unclean or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.
- In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulfur, baled paper, or cotton.

## **B. Welding and Cutting Containers**

No welding, cutting, or other hot work may be performed on used drums, barrels, tanks, or other containers until they have been cleaned so thoroughly as to make certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors.

Any pipelines or connections to the drum or vessel must be disconnected or blanked.

All hollow spaces, cavities or containers must be vented to permit the escape of air or gases before preheating, cutting, or welding.

Purging with inert gas is recommended.

## **C. Confined Spaces**

Ventilation is a prerequisite to work in confined spaces.

When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines must be left on the outside.

Before operations are started, heavy portable equipment mounted on wheels must be securely blocked to prevent accidental movement.

Where a welder must enter a confined space through a manhole or other small opening, means must be provided for quickly removing the welder in case of emergency.

- When safety belts and lifelines are used for this purpose, they must be so attached to the welder's body that his body cannot be jammed in a small exit opening.
- An attendant with a preplanned rescue procedure must be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

When arc welding is to be suspended for any substantial time, such as during lunch or overnight, all electrodes must be removed from the holders and the holders carefully located so that accidental contact cannot occur, and the machine disconnected from the power source.

During gas welding or cutting operations, to eliminate the possibility of gas escaping through leaks of improperly closed valves, the torch valves must be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period, such as during lunch hour or overnight. Where practicable the torch and hose must also be removed from the confined space.

After welding operations are completed, the welder must mark the hot metal or provide some other means of warning other workers.

## **5. Safety Information**

### **A. Health Protection**

A welder or helper working on platforms, scaffolds, or runways must be protected against falling. This may be accomplished using railings, safety belts, lifelines, or some other equally effective safeguards.

Welders must place welding cable and other equipment so that it is clear of passageways, ladders, and stairways.

First-aid equipment must always be available. All injuries must be reported as soon as possible for medical attention. First aid must be rendered until medical attention can be provided.

### **B. Ventilation**

The requirements for health protection and ventilation have been established based on the following three factors in arc and gas welding which govern the amount of contamination to which welders may be exposed:

1. Dimensions of space in which welding is to be done (with special regard to height of ceiling).
2. Number of welders.
3. Possible evolution of hazardous fumes, gases, or dust according to the metals involved.

When performing welding in a space entirely screened on all sides, the screens must be arranged so that no serious restriction of ventilation exists. It is desirable to have the screens so mounted about 2 feet (0.61 m) above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby workers from the glare of welding.

Local exhaust or general ventilating systems must be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable concentration as specified in 29 CFR 1910.1000 – Air Contaminants.

Numerous potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and

cutting. The suppliers of welding materials must determine the hazard, if any, associated with the use of their materials in welding, cutting, etc., and carry the following notices on tags, boxes, or other containers:

CAUTION	Used for all filler metals and fusible granular materials.	Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z49.1 Safety in Welding and Cutting published by the American Welding Society.
WARNING: CONTAINS CADMIUM – POISONOUS FUMES MAY BE FORMED ON HEATING	Used for brazing (welding) filler metals containing cadmium in significant amounts.	Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators – See ANSI Z49.1. If chest pain, cough, or fever develops after use call physician immediately.
CAUTION: CONTAINS FLUORIDES	Used for brazing and gas welding fluxes containing fluorine compounds.	This flux when heated gives off fumes that may irritate eyes, nose, and throat. Avoid fumes - use only in well-ventilated spaces. Avoid contact of flux with eyes or skin. Do not take internally.

Mechanical ventilation must be provided when welding or cutting is done on specific metals.

- In a space of less than 10,000 cubic feet (284 m (3)) per welder.
- In a room having a ceiling height of less than 16 feet (5 m).
- In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.

Such ventilation must be at the minimum rate of 2,000 cubic feet (57 m(3)) per minute per welder, except where local exhaust hoods and booths as defined by 6.3, or airline respirators approved by the U.S. Bureau of Mines for such purposes are provided.

Natural ventilation is considered sufficient for welding or cutting operations where regulatory restrictions are not present.

### 1. Local Exhaust Hoods and Booth

Mechanical local exhaust ventilation may be by means of either of freely movable hoods or a fixed enclosure.

Freely movable hoods intended to be placed by the welder as near as practicable to the work being welded and provided with a rate of air-flow sufficient to maintain a velocity in the

direction of the hood of 100 linear feet (30 m) per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3- inch (7.6 cm) wide flanged suction opening are shown in the following table:

<b>Welding zone</b>	<b>Minimum air flow *(1) cubic feet/minute</b>	<b>Duct Diameter</b>
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3 ½
8 to 10 inches from arc or torch	425	4 ½
10 to 12 inches from arc or torch	600	5 ½

\*(1) When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.

\*(2) Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.

A fixed enclosure with a top and not less than two sides which surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet (30 m) per minute.

## **2. Ventilation in Confined Spaces**

All welding and cutting operations carried on in confined spaces must be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency.

- This applies not only to the welder but also to helpers and other personnel in the immediate vicinity.
- All air replacing that withdrawn must be clean and respirable.

In circumstances for which it is impossible to provide such ventilation, NIOSH approved airline respirators or hose masks must be used.

In areas immediately hazardous to life, a full-facepiece, pressure-demand, self-contained breathing apparatus (SCBA) or a combination full- facepiece, pressure-demand supplied-air respirator with an auxiliary, self-contained air supply approved by NIOSH must be used.

Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or SCBA approved by MSHA or NIOSH, a worker must be stationed on the outside to ensure the safety of those working within.

Oxygen must never be used for ventilation.

## **3. Fluorine Compounds**

A fluorine compound is one that contains fluorine, as an element in chemical combination, not as a free gas.



In confined spaces, welding or cutting involving fluxes, coverings, or other materials which contain fluorine compounds, additional ventilation must be provided.

The need for local exhaust ventilation or airline respirators for welding or cutting in other than confined spaces will depend upon the individual circumstances. However, experience has shown such protection to be desirable for fixed-location production welding and for all production welding on stainless steels.

Where air samples taken at the welding location indicate that the fluorides liberated are below the maximum allowable concentration, such protection is not necessary.

#### **4. Zinc**

In confined spaces welding or cutting involving zinc-bearing base or filler metals or metals coated with zinc-bearing materials, additional ventilation must be provided.

Indoors, or cutting involving zinc-bearing base or filler metals coated with zinc-bearing materials must be done under a hood or in an equivalent exhaust system.

#### **5. Lead**

In confined spaces, welding involving lead-base metals (erroneously called lead-burning), additional ventilation must be provided.

Indoors, welding involving lead-base metals must be done under a hood or in an equivalent exhaust system.

In confined spaces or indoors, welding or cutting operations involving metals containing lead, other than as an impurity, or metals coated with lead-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators.

Such operations, when done outdoors, must be done using a NIOSH approved respirator.

In all cases, workers in the immediate vicinity of the cutting operation must be protected by local exhaust ventilation or airline respirators

#### **6. Beryllium**

Welding or cutting indoors, outdoors, or in confined spaces involving beryllium-containing base or filler metals must be done using local exhaust ventilation and airline respirators.

Local exhaust ventilation and airline respirators are not required when atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations.

In all cases, workers in the immediate vicinity of the welding or cutting operations must be protected as necessary by local exhaust ventilation or airline respirators.

#### **7. Cadmium**

In confined spaces or indoors, welding or cutting operations involving cadmium-bearing or cadmium-coated base metals must be done using local exhaust ventilation or airline respirators. Local exhaust ventilation and airline respirators are not required when atmospheric tests under the most adverse conditions show that employee exposure is within acceptable concentrations. Such operations, when done outdoors, must be done using a NIOSH approved respirator, such as fume respirators.

Welding (brazing) involving cadmium-bearing filler metals must be done using adequate ventilation.

## **8. Mercury**

In confined spaces or indoors, welding or cutting operations involving metals coated with mercury-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators.

Local exhaust ventilation and airline respirators are not required when atmospheric tests under the most adverse conditions show that employee exposure is within acceptable concentrations.

Such operations, when done outdoors, must be done using NIOSH approved respirators.

## **9. Cleaning Compounds**

In the use of cleaning materials, because of their possible toxicity or flammability, appropriate precautions such as manufacturer's instructions must be followed.

Degreasing and other cleaning operations involving chlorinated hydrocarbons must be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation.

In addition, trichloroethylene and perchloroethylene should be kept out of atmospheres penetrated by the ultraviolet radiation of gas-shielded welding operations.

## **10. Stainless Steel**

Oxygen cutting, using either a chemical flux or iron powder or gas-shielded arc cutting of stainless steel, must be done using mechanical ventilation adequate to remove the fumes generated.

### **C. Industrial Applications – Mechanical Piping Systems**

The requirements in this program for fire prevention and protection, protection of personnel, health protection and ventilation, oxygen-fuel gas welding and cutting, and arc welding and cutting must be observed.

The use of X-rays and radioactive isotopes for the inspection of welded piping joints must be in conformance with the ANSI Standard for Non-Medical X-ray and Sealed Gamma-Ray Sources, ANSI Z54.1.

## D. Hot Work Permit

Prior to starting hot work, a hot work permit must be initiated by the individual that will be conducting the hot work operations, or their onsite supervisor. The requester must notify the Fire and Life Safety Team before beginning hot work operations by requesting a hot work permit. The requestor must conduct a thorough safety inspection prior to submitting the hot work permit for processing. The hot work area must be inspected by the Fire and Life Safety Team before the hot work begins. In the event during normal hours fire alarm system/devices need to be disabled, contact the Fire and Life Safety Supervisor at 470 578-3321 or visit 601 Chamblee Way SE Marietta, GA. Normal Business hours are Monday through Friday, between 7am and 3pm.

Hot work permits can be issued via email by completing the online form [here](#) or in person between the hours of 8:00 AM and 12:00 PM Monday through Friday at the Fire and Life Safety Office located at 601 Chamblee Way SE Marietta, GA. Bldg. F1. Hot work permit requestors are expected to plan for the day. Be prepared to provide the following information:

- Affiliation to the campus (e.g., employee or contractor).
- Cell phone number of the person requesting the permit.
- Type of hot work to be conducted.
- Location of work area (must be specific).
- Time hot work activity is to begin.
- Expected duration of hot work activity.

The following procedures provide the requirements needed to obtain a hot work permit during normal business hours versus off business hours. A hot work permit will be issued for a period of no more than 1 day unless written authorization has been given on the permit signed by a member of the Fire and Life Safety Team.

- When necessary, the Fire and Life Safety staff will be contacted and meet the requestor at the designated hot work activity area and will complete an inspection with the individual who is to perform the hot work activity.
- Once the work area is deemed safe to conduct hot work, the Fire and Life Safety Supervisor will make the necessary arrangements to have the fire alarm system and/or devices potentially affected by the hot work activity disabled.
- Prior to signing the hot work permit, the Fire and Life Safety Team must contact Facilities Operations Department to confirm the affected fire suppression system is fully operational.
- The Fire and Life Safety Team must complete the inspection and issue the hot work permit specific to the hot work activity in the area for the designated time frame. Hot work activities occurring over multiple days will require a new hot work permit each day.
- If hot work activities will extend past the original time frame, the requestor must contact the Fire and Life Safety Supervisor immediately to ensure that the fire alarm system has not been reactivated.

- Upon completion of the hot work activity, the requestor must contact the Fire and Life Safety Supervisor (470-578-2954) stating that the hot work activity is complete, and that the Fire Watch(s) as appropriate is/are now posted and will remain at the location(s) for a duration of 30 minutes.
- Following the minimum 30-minute Fire Watch period, the requestor or individual performing Hot Work will re-inspect the hot work area(s), and then contact the Fire and Life Safety Team reporting all conditions are safe.
- The Fire and Life Safety Team will close out the hot work permit by conducting a final inspection, which shall be a minimum of one hour following the Fire Watch period, to ensure all conditions are safe and then have the fire alarm system and/or device(s) re-instated back into full operational status by contacting the Facilities Operations Department.

The following procedures provide the requirements needed to obtain a hot work permit during off business hours. This hot work permit request procedure applies to hot work activities which will begin, occur, or be completed during off business hours.

- The requestor must complete the [Hot Work Permit Request Form](#) online and submit the form to the Fire and Life Safety Team. The form must be submitted with a minimum of one week's advanced notice.
- The Fire and Life Safety Team will review the Hot Work Scheduling Request Form for approval and notify the requestor and the Facilities Operations Department. The review process may require a site visit and further discussion into the scope of the hot work activity.
- If the request is approved, the requestor will either conduct the hot work activity during normal business hours or have the contractor's project manager contact EHS to further discuss the hot work activity with the Fire and Life Safety Team and Facilities Operations.

After hours emergency requests should be directed to EHS at 678-449-7693 or 470-578-6666.

## **E. Personal Protection**

Employees exposed to the hazards created by welding, cutting, or brazing operations must be protected by personal protective equipment (PPE).

### **1. Head Protection**

Helmets or hand shields must be used during all arc welding or arc cutting operations, excluding submerged arc welding, and must be made of a material which is an insulator for heat and electricity. They must be arranged to protect the face, neck, and ears from direct radiant energy from the arc.

Helmets must be provided with filter plates and cover plates designed for easy removal. All parts must be constructed of a material which will not readily corrode or discolor the skin. Helmets, shields, and goggles must be not readily flammable and must be capable of withstanding sterilization.

## 2. Eye Protection

Goggles or other suitable eye protection must be used during all gas welding or oxygen cutting operations. Helpers or attendants must be provided with proper eye protection.

Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection.

All operators and attendants of resistance welding or resistance brazing equipment must use transparent face shields or goggles, depending on the job, to protect their faces or eyes, as required.

Eye protection in the form of suitable goggles must be provided where needed for brazing operations. Goggles must be ventilated to prevent fogging of the lenses as much as practicable.

All glass for lenses must be tempered, substantially free from striae, air bubbles, waves, and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows must be smooth and parallel.

Lenses must bear some permanent distinctive marking by which the source and shade may be readily identified. The following is a guide for the selection of the proper shade numbers. These recommendations may be varied to suit the individual's needs.

Welding Operation		Shade #
Shielded metal-arc welding	1/16-, 3/32-, 1/8-, 5/32-inchelectrodes	10
Gas-shielded arc welding-nonferrous	1/16-, 3/32-, 1/8-, 5/32-inchelectrodes	11
Gas-shielded arc welding-ferrous	1/16-, 3/32-, 1/8-, 5/32-inchelectrodes	12
Shielded metal-arcwelding	3/16-, 7/32-, 1/4-inchelectrodes	12
	5/16-, 3/8-inch electrodes	14
Atomic hydrogen welding		10-14
Carbon arc welding		14
Soldering		2
Torch brazing		3 or 4
Light cutting	Up to 1 inch	3 or 4
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

\*Note: In gas welding oxygen cutting where the torch produces a high yellow light, it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

All filter lenses and plates must meet the test for transmission of radiant energy prescribed in ANSI/ISEA Z87.1 - American National Standard Practice for Occupational and Educational Eye and Face Protection.

For protection from arc welding rays, where the work permits, the welder should be enclosed in an individual booth painted with a finish of low reflectivity such as zinc oxide (an important factor for absorbing ultraviolet radiations) and lamp black, or must be enclosed with noncombustible screens similarly painted.

Booths and screens must permit circulation of air at floor level.

Workers or other persons adjacent to the welding areas must be protected from the rays by noncombustible or flameproof screens or shields or shall be required to wear appropriate goggles.


### **3. Protective Clothing**

Appropriate protective clothing required for any welding operation will vary with the size, nature, and location of the work to be performed.

## **6. Training**

All personnel performing hot work must be trained in proper equipment operation; handling and storage of welding materials; compressed gas safety; chemical hazards; and the Hot Work Program. Additional training may also be necessary in permit required confined space entry, control of hazardous energy, and the proper selection of use and PPE. KSU does not accept responsibility for the training of contractors. Contractors must be made aware of the hazards related to the tasks being performed.

## Appendix A – Hot Work Permit

 <b>KENNESAW STATE UNIVERSITY</b>  <b>Environmental Health &amp; Safety Department</b>	<h3 style="color: #0056b3;">Hot Work Permit</h3>		
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All temporary operations involving open flames or producing heat and/or sparks require a Hot Work Permit. This includes, but is not limited to, brazing, cutting, grinding, soldering, thawing, and welding.

### Instructions for Fire Safety Supervisor

1. Verify precautions listed at right (or do not proceed with the work).
2. Complete page 1 and retain for job files.
3. Post page 2 in vicinity of hot work.

DATE \_\_\_\_\_ JOB NO. \_\_\_\_\_

LOCATION/BUILDING & FLOOR (be specific) \_\_\_\_\_

DESCRIPTION OF WORK BEING PERFORMED \_\_\_\_\_

NAME OF PERSON DOING HOT WORK \_\_\_\_\_

The above location has been examined, the precautions checked on the Hot Work Checklist have been taken to prevent fire, and permission is authorized for this work.

SIGNED: \_\_\_\_\_  
(Permit Authorizing Individual)

SIGNED: \_\_\_\_\_  
(Person doing Hot Work)

SIGNED: \_\_\_\_\_  
(Fire Watch)

TIME  
STARTED: Date: \_\_\_\_\_ Time: \_\_\_\_\_ AM/PM

Date: \_\_\_\_\_ Time: \_\_\_\_\_ AM/PM

### Fire Watch Sign Off

Work area and all adjacent areas to which sparks and heat might have spread were inspected during the fire watch period and were found fire safe.

SIGNED: \_\_\_\_\_

### Final Checkup (minimum 30 minutes after Hot Work)

Work area was monitored for \_\_\_ hour(s) following hot work and found fire safe.

SIGNED: \_\_\_\_\_

### Hot Work Checklist

- Sprinklers and hose streams in service/operable.
- Hot Work Equipment in good condition.
- Alarm system is in test/bypass, if needed.
- Multi-purpose fire extinguisher and/or water pump can.

### Requirements Within 35 Feet of Work

- Dust, lint, debris, flammable liquids, and oily deposits removed; floors swept clean.
- Combustible floors (e.g., wood, tile; carpeting) protected.
- No flammable or combustible material present or otherwise protected.
- All wall and floor openings covered.
- Walkways protected beneath hot work.

### Work on Walls or Ceilings

- Combustibles moved away from other side of wall.

### Work in Confined Spaces

- Confined space cleaned of all combustibles (example: grease, oil, flammable vapors).
- Containers purged of flammable liquids/vapors.
- Follow confined space guidelines.

### Fire Watch/Hot Work Area Monitoring

- Fire watch will be provided during and for 30 minutes after work, including any breaks.
- Fire watch personnel is trained in use of this equipment and familiar with location of sounding alarm.
- Fire watch may be required for opposite side of walls, above, and below floors and ceilings.

### Other Precautions Taken

-