Hot Works Permitting Plan
Cutting, Welding, & Brazing

Environmental Health, Safety, and Risk Management Department
Box 6113, SFA Station
Nacogdoches, Texas 75962-6113

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Purpose
This procedure has been prepared as a guide for contractors, building maintenance, and equipment repair personnel (including persons who perform cutting, welding, and brazing), fire watchers, their supervisors (including outside contractors), and building manager on whose property cutting, welding, and brazing is to be performed.

Scope
This standard covers provisions to prevent loss of life and property from fire in the use of oxy-fuel gas and electric arc cutting, welding, and brazing equipment.

Welding and Cutting
The hazards of welding and cutting may include fire and explosion, electrical shock, eye injury, burns and noxious fume inhalation. Therefore, safe welding practices must be observed at all times. Specific details and requirements are contained CFR 1910.252 of the Occupational Safety and Health Act.

Only fully qualified personnel, who are familiar with required safety practices, will be authorized to perform welding operations.

Personal Protective Equipment:
- Eye Protection. Welding helmets shall be used during all arc-welding operations. Welding goggles or other suitable eye protection shall be used during all gas welding or cutting operations and as needed for brazing operations. Eye protection shall be worn when chipping scarf or metal fragments.
- Protective Clothing. All welders should wear flameproof gauntlet gloves. Flameproof aprons may be desirable for protection against radiated heat and sparks. All clothing should be reasonably free from oil or grease. Safety shoes (steel toe shoes) should be worn whenever there is a possibility of foot injury from heavy or sharp objects being dropped.

Brazing
Silver brazing alloy, frequently called "silver solder," is an extremely valuable industrial material used for joining metals and alloys such as silver, copper, brass, bronze, stainless steel carbon steel and dissimilar combinations where it is necessary to perform the joining of these metals at low temperatures.

Brazing is a safe operation when proper practices are followed. As in all operations, there are certain hazards to be avoided. In brazing the major hazards are heat, chemicals and fumes.

Hazards
Since brazing is a process requiring heat, precautions should be taken for handling hot objects to prevent workers from being burned.
- Proper outer clothing, preferably woolen, and eye protection should be worn.
- Chemicals such as acids and alkalis sometimes used to clean parts before brazing and can produce chemical burns if allowed to come in contact with the skin.
• Protective gloves should be used when handling these chemicals.
• Brazing fluxes are mixtures of chemicals and the caution notice on the package should be followed.

Fumes generated during brazing can be a serious hazard.
• Brazing fluxes generate fluoride fumes when heated. Cadmium in silver brazing alloys vaporizes when overheated and produces cadmium oxide, fumes are inhaled into the respiratory tract, they can cause pulmonary distress, shortness of breath, and in cases of severe exposure, may cause death.

Do's and Dont’s in Working with Silver Solder
• Know what materials you are working with. Be sure you are not brazing on cadmium plated parts.
• Read warning labels on filler metals and fluxes and follow label instructions.
• Wear eye and face protection and protective clothing as required by the job.
• Work in well-ventilated areas, or use air-supplied respirators as required by the job.
• Apply heat to base metal - not directly to the brazing filler metal.
• Do not overheat either the base metal or the brazing filler metal.
• Wash hands thoroughly after handling brazing fluxes and filler metals.

Procedures for Welding, Cutting and Brazing
Before any welding, cutting, or brazing is begun personnel shall:
• Establish approved areas for welding, cutting, or brazing or establish procedures for approval of welding, cutting, or brazing operations;
• Designate an individual responsible to authorize welding, cutting, or brazing operations in areas not specifically designed or approved for such processes. The individual shall be aware of the fire hazards involved and shall be familiar with the provisions of this guide;
• Ensure that only approved apparatus, such as torches, manifolds, regulators, or pressure reducing valves, and acetylene generators, be used;
• Ensure that employees conducting the work and their supervisors are suitably trained in the safe operation of their equipment, and emergency procedures in the event of a fire;
• Select contractors to perform welding, cutting, or brazing who employ suitably trained personnel and who have an awareness of the magnitude of the risks involved;
• Advise all contractors of their duties and responsibilities during “hot works” operations.
• Before welding, cutting, or brazing, a “hot works” permit must be obtained from the Environmental Health, Safety, and Risk Management (Safety Department), the HVAC Department or designated representative.
• The area shall be inspected by the supervisor responsible for the work or their designated representative and if necessary by the Safety Department personnel to ensure that welding, cutting, or brazing equipment is in satisfactory operating condition;
• All combustible materials in the area have been moved to a safe distance from the work or the combustibles have been properly shielded from ignition sources;
• The supervisor shall ensure that appropriate fire protection and extinguishing equipment are properly located on site;
• The supervisor shall make arrangements for a fire watch to remain on site for at least one-half hour after the completion of welding, cutting, or brazing operations to detect and extinguish possible smoldering fires;
• The supervisor shall ensure that a copy of the “hot works” permit is located on the job site and that the Safety Department has been notified and received a copy of the permit.

Hot Works Permit
• Prior to issuing a hot works permit the area will be inspected by the Safety Department or designated representative.
• Before welding, cutting, or brazing is permitted and at least once a day while the permit is in effect, the area shall be inspected by the Safety Department or designated representative to ensure it is a fire safe area. The individual shall designate precautions to be followed on the “hot works” permit. This individual shall sign the permit and notify the Safety Department that the work is authorized, and shall verify the following:
  • Cutting and welding equipment to be used shall be in satisfactory operating condition.
  • Where combustible material such as paper, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of 35 feet (11 m).
  • Combustible floors (except wood on concrete) shall 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 shall be protected from possible electric shock.
  • All combustibles shall be located at least 35 feet (11m) horizontally from the work site. Where relocation is impractical, combustibles shall be protected with flame proof covers or otherwise shielded with metal or fire-resistant guards or curtains. Edges of covers at the floor shall be tight to keep sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile.
  • Openings or cracks in walls, floors, or ducts within 35 feet (11m) of the site shall be tightly covered to prevent the passage of sparks to adjacent areas.
  • Conveyor systems that might carry sparks to distant combustibles shall be protected.
  • When welding, cutting, or brazing is done near walls, partitions, ceilings, or roofs of combustible construction, fire resistant shields or guards shall be provided to prevent ignition. If welding, cutting, or brazing is to be done on a metal wall, partitions, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. When combustibles are not relocated, a fire watch on the opposite side from the work shall be provided. Welding shall not be attempted on a metal partition, wall, ceiling, or a roof having a combustible covering, or on walls or partitions of combustible sandwich-type panel construction.
• Welding, cutting, or brazing on pipes or other metal in contact with combustible walls, partitions, ceilings, or roof shall not be undertaken if the work is close enough to cause ignition by conduction.
• Fully charged and operable fire extinguishers, appropriate for the type of fire, shall be available at the work area.
• Contractors are responsible for furnishing appropriate fire extinguishers during the project.
• Where welding, cutting, or brazing is done in close proximity to a sprinkler head, a wet rag shall be laid over the head and then removed at the conclusion of the cutting or welding operation. Special precautions shall be taken to avoid accidental operation of automatic fire detection or suppression systems (e.g., special extinguishing systems).
• Nearby personnel shall be suitably protected against heat, sparks, slag, etc.
• The Safety Department or their designated representative is responsible to isolate fire protection devices (smoke/heat detectors). Detectors cannot be covered without prior approval from the Safety Department.
• All personnel involved in the welding, cutting, or brazing operation must be familiar with Stephen F. Austin State University emergency procedures.

**Ventilation**

• Adequate ventilation (natural, mechanical, or respirator) must be provided for all welding, cutting, brazing, and related operations. Adequate ventilation depends on the following factors.
• Volume and configuration of space in which operations occur.
• Number and type of operations generating containments.
• Allowable levels of specific toxic or flammable containments being generated.
• Natural airflow (rate and direction) and general atmospheric conditions where work is being done.
• Location of the welder and other person’s breathing zones in relation to the containments or sources.
• Natural ventilation is acceptable for welding, cutting, and related processes where the necessary precautions have been taken to keep the welder’s breathing zone away from the welding or brazing plume.

**Special Ventilation Concerns**

• Certain materials sometimes contain in the consumables, base metals, coatings, or atmospheres of welding or cutting operations, have low or very low permissible exposure limits (American Conference of Governmental Industrial Hygienists, Threshold Limit Value 1.0mg/m3 or less). Among these materials are:

  Antimony  
  Arsenic  
  Barium  
  Beryllium  
  Cadmium  
  Chromium
Cobalt
Copper
Manganese
Mercury
Nickel
Selenium
Silver
Vanadium

• The material safety data sheet (MSDS) must be on site available to identify any of the materials listed above that might be present.
• Whenever these materials are encountered as designated constituents in welding, brazing, or cutting operations, special ventilation precautions shall be taken to assure the level of containments in the atmosphere is below permissible limits or recommendations.

A special thanks to The University of Texas Health Science Center at Houston.
HOT WORKS PERMIT

Before approving any welding, cutting, or brazing permit, a SFASU designated representative must inspect the work area and confirm that precautions have been taken to prevent fire in accordance with safety requirements. Please use this form to inform SFASU Safety Department of an upcoming cutting or welding activity.

Department: _________________________________
Building: _________________________________
Room: _________________________________
Work to be done:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Contractor: ___________________________________________________________
Representative: ______________________________
Telephone:        ______________________________
Permit Expires: (Circle One)          1Day          2Days          3Days
SFASU representative is responsible for ensuring that the location where the work is to be done is inspected, and necessary precautions are taken prior to the work being commenced.

Name of SFASU representative responsible for cutting, welding, or brazing: ______________________________

FINAL CHECK-UP:
Work area and all adjacent area to which sparks and heat might have spread (including floors above and below and opposite sides of walls) were inspected one half hour after the work was completed were found fire safe.

To be signed by: (Supervisor of Fire Watcher) __________________________________________
TELEPHONE NUMBERS
Emergency# 911
Environmental Health Safety and Risk Management—(936) 468-4442 7:00-4:00 Mon.-Fri.
Fax: (936)468-7312
SFASU University Police--- (936)468-2608
Physical Plant --- (936) 468-3206—7:00-4:00 Mon.-Fri.
Housing Operations—(936)468-6602—8:00-5:00 Mon-Fri.
All other buildings notify building occupants

SAFETY PRECAUTIONS
__ Sprinklers are in service (if applicable)
__ Cutting and welding equipment in good repair
__ Lead is not present on object(s) to be cut or welded (29 CFR 1926.62)
__ Welding on galvanized metals of any type shall be approved by Environmental
  Health, Safety, and Risk Management Department and shall conform OSHA 1910.252
  (c)(1)(iii)
__ Fire Alarm System isolated and UPD notified. If so location within 35 feet of work.
__ Floors are swept clean of combustibles
__ Combustible floors are wetted down, covered with damp sand, metal or other shields
__ No combustible material or flammable liquids present
__ Unmovable combustible and flammable are protected with covers, guards, metal
  shields
__ All wall and floor openings are covered
__ Cover suspended beneath work to collect sparks
__ Work on walls or ceilings
__ Construction work is noncombustible and without combustible coverings
__ Combustibles moved away from opposite side of wall
__ Sprinklers identified within 2 feet of hot works. If so contact Physical Plant at (936)
  468-3206 for precautions to prevent an accidental sprinkler head discharge.
__ Work on enclosed equipment (Tanks, containers, ducts, dust collectors, etc.)
__ Equipment cleaned of all combustibles
__ Containers purged of flammable vapors
__ Fire Watch will be provided during and one half hour after operation
__ Supplied with appropriate fire extinguisher
__ Trained in use of equipment and in sounding fire alarm

Please submit a completed copy to: Environmental Health, Safety, and Risk Management
PO Box 6113
SFA Station Nacogdoches Texas 75962-6113
Office (936) 468- 4442
Fax (936) 468-7312

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