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Welding, Cutting, and Brazing

I. PURPOSE: To establish safe work practices during Welding, Cutting, and Brazing operations

II. SCOPE: Affects all university employees and outside contractors who perform Welding, Cutting, and/or Brazing operations.

III. DEFINITIONS:

Designated Area: An area where Welding, Cutting, and or Brazing is authorized.

Hot Work Permit: A special permit issued by the Campus Environmental Officer or Designee which authorizes specific Welding, Cutting, and Brazing activities at a specific location and time. (See Appendix A).

Welder/Welder Operator: Any operator of electric or gas welding and cutting equipment.

Fire Watch: Trained personnel who are in attendance during the entire Welding and Cutting operation and are immediately available to extinguish a fire or take other effective action if necessary.

1. RESPONSIBILITIES:

Departments/Contractors: To ensure that the provisions of this policy are understood and practiced

by their employees. Specifically, the department/contractors shall:

1. Determine if the work will be done in an area which contains or has the potential to contain combustibles or other hazardous materials.

1. Protect the combustibles in the area of operation using one of the following measures:

1. moving the work area to an area free of combustibles
2. moving or shielding the combustibles
3. scheduling the work during a time when the combustibles are not likely to be in the area.

1. Obtain a Hot Work Permit from the Campus Environmental Officer or Designee

for any work that is to be performed outside of a designated area.

1. Ensure that workers are provided with and using proper safety equipment, including personal protective equipment and fire extinguishing equipment.

1. Designate a Fire Watch when required.

1. Ensure that the work area is given a final inspection one-half hour after job completion to locate and extinguish possible hot spots or fires.

Campus Environmental Officer or Designee

1. Review and approve, in coordination with a departmental representative, locations approved for welding and cutting activities (Designated Areas).

1. Maintain a list of Designated Areas and authorized Designee's

2. Inspect designated areas to be sure that conditions have not become unsafe for welding and/or cutting.

1. Issue "Hot Work Permits" for work being done outside of the Designated Areas, after the area has been inspected and approved.

1. Provide training for fire watches, and ensure that the proper firefighting equipment is in working condition, and is available to standby personnel.

1. Suspend welding and cutting work if conditions become unsafe for the work being performed.

Fire Watch

1. Be qualified in the use of appropriate firefighting equipment and be aware of university emergency procedures in the event of a fire.

1. Immediately correct or stop any conditions which may lead to a fire and report conditions to their Supervisor and Campus Environmental Officer.

1. Monitor the welding and cutting work on both sides of the wall or floor and be on the alert for signs of a fire.

1. Attempt to extinguish fires appropriate to the available equipment and your level of training.

1. Remain at the work site to monitor for smoldering fires while work is in progress and for at least thirty (30) minutes following job completion. If the fire watch must leave the work site, all cutting and welding must stop.

Welders

1. Read and understand this work instruction.
2. Check their equipment to ensure that it is in good working order.
3. Use appropriate safety equipment, including eye and face protection, hand protection, body protection, head protection, hearing protection and respiratory protection, as needed.
4. Obtain a "Hot Work Permit" for any non-designated areas.
5. Avoid welding or cutting operations where conditions **ARE NOT SAFE**.
6. Stop work when conditions change from those set when work was approved. If fire watch must leave work site, operations must cease and the welder must remain at work site for thirty (30) minutes following job completion to monitor for fires.

2. PROCEDURES

Work Areas

1. **Designated Areas:** Cutting and welding are permitted at any time in designated areas if conditions are appropriate and proper safety precautions are taken. These areas will be inspected, approved, and recorded by Campus Environmental Officer.
1. **Permit Required Areas:** When welding or cutting work is to be done outside of a designated area, it is necessary to obtain a Hot Work Permit from the Campus Environmental Officer (or designee) before work can be started. Notification of job intent should be at least forty-eight (48) hours in advance. (Emergency's posing a risk to life safety and/or properties which require immediate "Hot Work" activities may be authorized by the "Director of Building Trades and Landscape Maintenance" should the Campus Environmental Officer not be available).

Special Procedures for Permit Required Areas:

1. Hot Work Permit: Area must be reviewed and inspected by the Campus Environmental Officer or Designee and precautions on permit must be complied with.
2. Combustible materials: Combustible materials within thirty-five (35) feet of the work must be removed from the area or shielded with a fire resistant material. Edges of cover must be tight to floor and overlaps properly secured.
3. Floors: Combustible materials on the floor (paper, wood shavings, etc.) must be swept clean for a radius of thirty-five (35) feet. Combustible floors may be kept wet

or protected with fire resistant shields. Operators of electric arc welding equipment must be protected from the possibility of shock due to wet floors.

4. Ducts: Ducts or systems that might carry sparks to distant combustibles shall be suitably protected or shut down.
5. Combustible Walls: If walls, partitions, ceiling or roof are comprised of combustible material, fire-resistant shields shall be used.
6. Noncombustible Walls: If cutting or welding is done on a metal wall, partition, ceiling or roof, precautions shall be taken to prevent ignition of nearby combustibles. Where combustibles cannot be relocated, a fire watch shall be positioned.
7. Ventilation: Temporary local exhaust ventilation or other arrangements may be necessary to minimize or eliminate airborne contaminants.

Special Conditions:

1. Work Stoppage

When work is stopped for an extended period of time, such as lunch breaks or overnight, the equipment must be shut down and secured to prevent accidental sparking.

1. Welding or Cutting Containers

No cutting, welding, or other hot work is to be performed on used drums, barrels, tanks, or other containers that may have contained flammable materials, greases, tars, acids, or other materials which may produce flammable or toxic vapors when heated. Any pipe lines or connections to the vessel must be disconnected or blanked.

1. Venting and Purging

All hollow spaces, cavities, or containers are to be vented to permit the escape of air or gases before preheating, cutting, or welding. Purging with inert gas is recommended.

1. Out-side Contractors

Contractors shall perform all cutting and welding procedures in accordance with the policies and procedures set forth in the University's Welding, Cutting, and Brazing work instruction. Copy will be on file within the university website for use by PSU Office of Planning, Design, and Construction.

Personal Protective Equipment:

Personal protective equipment for eyes, face, head, and extremities; protective clothing; respiratory devices, and protective shields and barriers, shall be used and maintained in a sanitary and reliable condition. Selection of appropriate devices should be made in conjunction with the Campus Environmental Officer.

1. Eye and Face Protection

Safety glasses or goggles and face shields shall be worn by welders. 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. Helpers and fire watch personnel shall wear eye and face protection as appropriate.

1. Head Protection

Helmets which protect the face, neck, and ears from direct radiant energy shall be worn during all welding and cutting operations.

1. Protective Clothing

The size, nature, and location of the welding or cutting operation will determine the extent of the leather protective clothing required. Except when engaged in light work, flame-proof gauntlet gloves shall be worn.

1. Other

Hearing/respiratory protection may be required when performing overhead work or in confined spaces.

1. Protective Barrier

In production work, a sheet metal screen should be provided in front of the welder's legs to provide protection against sparks and molten metal. Where work permits, the welder should be enclosed in an individual booth painted with a low reflectivity finish or enclosed with noncombustible screens.

INQUIRES/REQUEST: Campus Environmental Officer

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RELATED DOCUMENTS: 29 CFR 1910.252 "Welding, Cutting, and Brazing"

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