

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 1 of 9

UNIVERSITY OF PITTSBURGH HOT WORK PROGRAM

All hot work creates conditions which increase the probability for fire-related injury or property loss. Hot work includes but is not limited to brazing, cutting, grinding, soldering, torch-applied roofing, pipe thawing and welding. Each type of hot work presents specific hazards depending on the methods used, the materials used, and the environment involved.

The objective of this Hot Work Program is to reduce the potential for injury, fire and/or explosion resulting from the performance of the work. The procedures contained in this Program are applicable to all employees, property managers and outside contractors working at the University of Pittsburgh. The Department of Environmental Health and Safety (EH&S) provides oversight for this Program.

The Hot Work Program prohibits Hot Work activities in/on University facilities, until specific safety precautions are taken, and the work has been properly authorized. Hot Work locations are described as either a temporary Hot Work Site by the issuance of an approved Hot Work Permit; or a designated Hot Work Site that is maintained in such a way that would allow Hot Work to be performed without the issuance of a Hot Work Permit.

The following operations do not require a Hot Work Permit:

- Bunsen burners in laboratories,
- Small electric soldering irons used for repairing electronics only,
- Authorized grills on campus,
- Sterno products for University events, and
- University glass shop activities.

Sprinkler systems must not be disabled, and fire alarm systems must be operational during hot work. Smoke detectors in the vicinity of hot work should be bagged to prevent inadvertent activation, and bags must be removed immediately after work is completed.

1. Definitions:

Fire Watch: A person trained in the use of fire extinguishers that is designated to observe the area surrounding the hot work and is prepared to extinguish any fire that may be ignited. A properly maintained fire extinguisher of the appropriate hazard class is required in any area where appreciable combustible or flammable materials are within 35 feet of the hot work.

Hot work: Any temporary or permanent operation involving open flames or producing heat and/or sparks including but not limited to brazing, cutting, grinding, soldering, torch-applied roofing, pipe thawing and welding.

Hot Work Hazard Area: Any area where the presence of open flames, sparks or other products of hot work could present a significant fire and/or explosion hazard. These designated areas require a completed Hot Work Permit.

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 2 of 9

Hot Work Permit: A written checklist of procedures to be implemented before performing hot work in a hot work hazard area. Signing the completed permit is done to ensure that the proposed work has been reviewed for all applicable safety considerations. Permitted hot work shall be done in accordance with the details on the permit. If conditions change, the permit must be modified or reissued by the hot work's responsible person. Completed permits shall be maintained in the EH&S Department for one year.

Responsible Person: A person with training, experience and judgment to oversee hot work operations and who has the authority to direct changes or stop the work if necessary. Responsible Person reviews the site(s) prior to issuing permits as part of the hot work permit program and following up as the job progresses. Responsible person shall determine the hazards present or likely to be present at the work location and the precautions necessary to prevent an incident.

2. Hot Work Operational Requirements

- 2.1. Hot work is allowed only in areas that are or have been made fire-safe. Hot work may only be performed in either designated areas or permit-required areas. A permit-required area is an area made fire-safe by removing or protecting combustibles from ignition sources.
- 2.2. A designated hot work area is a specific area designed or approved for such work, such as a maintenance shop or a detached outside location that is of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas.
- 2.3. Hot work shall not be permitted in the following situations:
 - 2.3.1. In unauthorized areas, such as occupied office space.
 - 2.3.2. In sprinklered buildings, while such protection is impaired.
 - 2.3.3. In the presence of explosive atmospheres or potentially explosive atmospheres (e.g. on drums previously containing solvents).
 - 2.3.4. In explosive atmospheres that can develop in areas with an accumulation of combustible dusts (e.g. shop dust collectors).

2.4. Any hot work conducted in a confined space must be approved by a representative of the University Department of Environmental Health and Safety.

3. Permitting Instructions

- 3.1. No person shall be allowed to perform hot work operations unless he/she has been trained and authorized by their foreman or sub-foreman to do so.
- 3.2. Permits shall be completed and signed by the person responsible for the hot work.

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 3 of 9

- 3.3. All applicable precautions on the permit shall be followed.
- 3.4. Permits shall be posted at the worksite and sent to the Department of Environmental Health and Safety at the completion of work.
- 3.5. Permits are only good for a single shift on a single day as conditions at the work site may change from day to day.
- 3.6. When completing the PRECAUTIONS section of the Approval Form, an "X" in the appropriate column indicates that this particular precaution is required or N/A to indicate that the precaution is not applicable. The exact precautions will be left to the determination of the responsible person/foreman based upon the hazards present and the extent and type of hot work.
- 3.7. If the potential for an explosive or flammable atmosphere exists, an initial test with an analytical instrument capable of identifying % LEL shall be conducted. If the potential exists for accumulation of combustible gases or vapors throughout the hot work process, periodic atmospheric tests are required.
- 3.8. Enclosed equipment shall be thoroughly cleaned and purged of combustible and flammable materials or sufficiently inerted.
- 3.9. A fire watch shall be posted and supplied with suitable fire extinguishing equipment (extinguisher, water hose, fire hose).

4. **Fire Watch**

- 4.1. A Fire watch is required for any job requiring a permit and whenever welding or cutting is performed in locations where any of the following conditions exist:
 - 4.1.1. Appreciable combustible materials, ignitable by sparks or slag, are closer than 35 feet to the point of operation;
 - 4.1.2. Wall or floor openings within a 35 feet radius expose combustible materials in adjacent areas including concealed spaces in walls or floors;
 - 4.1.3. Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings or roofs and are likely to be ignited by conduction or radiation.
- 4.2. Personnel performing a fire watch:
 - 4.2.1. Must be trained in the use of fire extinguishing equipment.
 - 4.2.2. Shall be familiar with facilities for sounding an alarm in the event of a fire.

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 4 of 9

- 4.2.3. Shall watch for fires in all exposed areas, sound the alarm if necessary, and try to extinguish them only when obviously within the capability of the equipment available.
- 4.2.4. Shall have no other primary function.
- 4.2.5. Shall be maintained for 1 hour after completion of the hot work and during breaks and lunches to detect smoldering fires.
- 4.2.6. Shall know the location of the nearest phone and the Pittsburgh Campus emergency number (412-624-2121).

5. **Designated Hot Work**

Designated hot work areas include any outdoor location free of combustibles and away from pedestrians or by-standers, and all recognized Departmental Shops; Shops at Melwood (Facilities Management and Motor Pool), Frick Fine Arts, and the Theater Arts – Scene Shop in the Cathedral of Learning. For Designated hot work in areas that do not require a permit, the following general fire safety guidelines must be followed:

- 5.1. Hot work equipment shall be in good repair, and suitable fire extinguishing equipment shall be maintained ready for use while hot work is being performed.
- 5.2. If combustible materials are found in the area where hot work is planned, the work should be moved to a location free from combustibles. If the work cannot be moved, have the combustibles moved to a safe distance from the work (at least 35 feet) or have the combustibles properly protected. If combustibles cannot be moved or protected, a fire watch must be provided.
- 5.3. Combustible floors shall be wet down or covered with flame retardant covers.
- 5.4. Cover all wall, floor or ceiling openings that may cause a fire to start in an adjacent area.
- 5.5. Ensure that walls and ceilings are not combustible. Cover or wet as necessary.
- 5.6. Ducts, fans or conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.
- 5.7. For overhead work, position flame retardant tarp to contain sparks and slag. The higher the work, the larger the area that must be protected from falling sparks and slag.
- 5.8. If welding is to be done on a metal wall, partition, 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.

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 5 of 9

5.9. All other applicable University safety procedures shall be followed including but not be limited to personal protective equipment, confined space entry, compressed gas safety, and lockout/tagout.

6. Contractors

- 6.1. Contractors who have been awarded a project through the bidding process shall follow specifications documents for contractors.
- 6.2. Contractors are responsible for covering smoke detectors (both area and duct) that may be accidentally activated as a result of their work activities. The contractor will work with the FM Project Manager and the FM Safety Manager to identify and document affected detectors. The detectors must be uncovered at the completion of the shift or the work.
- 6.3. Contractors who have entered the project under a non-bidding process (i.e. purchase orders, standing purchase orders, and blanket orders) shall use Hot Work Permits obtained/issued by University EH&S staff or the FM Project Manager.
- 6.4. The Contractor is responsible for ensuring their employees and subcontractors are adequately trained in all aspects of conducting Hot Work safely, including individual completion of approved Hot Work Training.
- 6.5. Contractors shall not initiate any Hot Work activities until a permit is received from a trained and designated responsible person. When required, contractor must secure appropriate permits from the City of Pittsburgh.
- 6.6. Contractors are responsible for ensuring that their tools and equipment are in satisfactory condition and good repair, and the proper use of all personal protective equipment.
- 6.7. Contractors are responsible for protecting nearby personnel and passersby against heat, sparks, and hazards when working in occupied areas.
- 6.8. Contractors must ensure a Fire Watch is present at all times before beginning the Hot Work.

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 6 of 9

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

- 6.10. University Contractors should retain the completed Hot Work Permit Part 2 until the project is 100% complete and received final acceptance by the University.

- 6.11. Contractors should turn Hot Work Permits into Pitt FM Project Manager or EH&S at the conclusion of the project.

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 7 of 9

HOT WORK PERMIT


STOP!
Avoid hot work when possible! Consider using an alternative cold work method.

This Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks conducted outside a Hot Work Designated Area. This includes, but is not limited to: brazing, cutting, grinding, soldering, torch-applied roofing and welding.

<p style="text-align: center;">Instructions for Permit Authorizer</p> <ol style="list-style-type: none"> 1. Specify the precautions to take. 2. Fill out and keep Part 1 during the hot work process. 3. Issue Part 2 to the person doing the job. 4. Keep Part 2 on file for future reference, including signed confirmation that the post-work fire watch and monitoring have been completed. 5. Sign off final check on Part 2. 	<p style="text-align: center;">Part 1</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td> <td style="width: 10%; text-align: center;">Y</td> <td style="width: 10%; text-align: center;">NA</td> <td style="width: 70%;"></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td></td> <td>The fire pump is in operation and switched to automatic.</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td></td> <td>Control valves to water supply for sprinkler system are open.</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td></td> <td>Extinguishers are in service/operable.</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td></td> <td>Hot work equipment is in good working condition.</td> </tr> </table> <p style="text-align: center;">Requirements within 35 ft. 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Note: Emergency notification on back of form. Use as appropriate for your facility.

Need more permits? Order additional Hot Work Permits at fmglobalcatalog.com; or, download the FM Global Hot Work Permit App via fmglobal.com/apps.



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ADDITIONAL REQUIRED PRECAUTIONS:

University of Pittsburgh Safety Manual	EH&S Guideline Number: 02-007	
Subject: Hot Work Program Guidelines	Effective Date: 04/04/2018 Review Date: 09/25/2020	Page 8 of 9

WARNING

HOT WORK IN PROGRESS! Watch for fire!

Instructions

Person performing hot work: Record time started and display permit at hot work area. After hot work is completed, record time and leave permit displayed for fire watch.

Fire watch: Watch area during hot work and after work completion. Prior to leaving area, perform final inspection, sign, leave permit displayed and notify Fire Monitor or Permit Authorizer.

Fire Monitor: Monitor area after post-work fire watch completion. Perform final inspection, sign and return to Permit Authorizer.

HOT WORK BY

- Employee
 Contractor _____

DATE

JOB NUMBER

LOCATION OF WORK (BUILDING/FLOOR/OBJECT)

WORK TO BE PERFORMED

NAME OF PERSON PERFORMING HOT WORK

NAME OF PERSON PERFORMING FIRE WATCH

I verify the above location has been examined, the Required Precautions have been taken, and permission is authorized for this work.

PERMIT AUTHORIZER (PRINT AND SIGN)

THIS PERMIT EXPIRES ON (LIMIT AUTHORIZATION TO ONE SHIFT):

DATE: _____ TIME: _____ AM/PM

Hot Work Date: _____ Start Time: _____ am/pm
Finish Time: _____ am/pm

Post-Work Fire Watch _____ Finish Time: _____ am/pm

Name _____

Fire Monitor Person Other _____ Finish Time: _____ am/pm

Name/Other _____

Final Check _____ Time: _____ am/pm

Name _____

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Part 2

Y NA

- The fire pump is in operation and switched to automatic.
 Control valves to water supply for sprinkler system are open.
 Extinguishers are in service/operable.
 Hot work equipment is in good working condition.

Requirements within 35 ft. (10 m) of hot work

- Shield combustible construction using FM Approved welding pads, blankets and curtains.
 Remove combustibles or shield nonremovable combustibles using FM Approved welding pads, blankets and curtains.
 Isolate potential sources of flammable gas, ignitable liquid or combustible dust/lint (e.g., shut down equipment).
 Remove ignitable liquid, combustible dust/lint and combustible residues.
 Shut down ventilation and conveying systems.
 Remove combustibles and consider a second fire watch on opposite side of floor, wall, ceiling or roof when openings exist or thermally conductive materials pass through.
 Is work on a combustible roof? If yes, treat as a "Hot Work High-Risk Area" and provide **ADDITIONAL REQUIRED PRECAUTIONS** below.

Hot work on/in closed equipment, ductwork and piping

- Isolate equipment from service.
 Remove ignitable liquid and purge flammable gas/vapor.
 Prior to work, and/or during work, monitor for flammable gas/vapor. LEL reading(s): _____
 Remove combustible dust/lint or other combustible materials.
 Is work on/in equipment with nonremovable combustible linings or parts? If yes, treat as a "Hot Work High-Risk Area" and provide **ADDITIONAL REQUIRED PRECAUTIONS** below.

Fire watch/fire monitoring the hot work area

(Refer to FM Global Property Loss Prevention Data Sheet 10-3, *Hot Work Management*, for guidance on categorizing hot work areas.)

- Perform a continuous fire watch during hot work.
 Perform a continuous fire watch following hot work completion for 30 or 60 minutes depending on category.
 Perform fire monitoring following fire watch completion for 1 2 3 4 or 5 hours depending on category.

ADDITIONAL REQUIRED PRECAUTIONS:

<p align="center">University of Pittsburgh Safety Manual</p>	<p align="center">EH&S Guideline Number: 02-007</p>	
<p>Subject: Hot Work Program Guidelines</p>	<p>Effective Date: 04/04/2018 Review Date: 09/25/2020</p>	<p align="right">Page 9 of 9</p>

WARNING!

HOT WORK IN PROGRESS Watch for fire!

In case of emergency, call the contacts listed below
before attempting to extinguish the fire.

Contact	Number

WARNING!

