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## Purpose

The ASU Fire Safety and Prevention Plan sets fire safety standards for practices, policies and procedures. This helps the ASU community conduct safe operations and ensures regulatory compliance. The plan aims to safeguard life, health, property and public welfare by monitoring and controlling the design, construction, quality of materials, occupancy use, location and maintenance of all buildings and structures within the campus community.

The plan includes methods designed to protect students, employees and guests from fire and safety hazards presented by diverse operations conducted at the university and to promote safe practices. The plan meets the fire prevention and safety and prevention requirements outlined in the Arizona Administrative Code and Occupational Safety and Health Act, encompassing uniform and nationally recognized codes and standards. The plan is to simplify and address the most common fire and safety compliance issues in the abovementioned regulations and standards.

## Scope and application

The plan aims to provide one comprehensive fire safety document for the campus community to reference to ensure safe practices are implemented in each university operation, as well as construction operations and special events conducted on university property or university-related functions on non-university property. The plan's provisions apply to the construction, alteration, moving, demolition, repair, maintenance and use of any building or structure. The university is a complex environment and warrants a plan to provide specific guidance for public assembly areas, classrooms, laboratories, restaurants, industrial operations, repair shops and warehouses. University Services' Capital Programs Management Group and Environmental Health and Safety are responsible, along with any architect or engineer, to enforce and comply with all requirements of AAC and OSHA or ensure compliance with the intent of the code. The [EHS Fire Safety and Prevention division](#) enforces all provisions of the [International Fire Code — 2018 edition and the National Fire Protection Association](#).

The plan applies to all university employees, functions and affiliations. In addition, the university has the following procedures, compliance guidelines and programs established to protect the university community from health hazards:

- [ASU Bloodborne Pathogens Exposure Control Plan](#) — applies to employees determined to have potential exposure to human blood and other potentially infectious materials as mandated by Occupational Safety and Health Administration.
- [ASU Chemical Hygiene Plan](#) — applies to employees engaged in the laboratory use of hazardous chemicals.
- [ASU EHS Compliance Guidelines](#).



- [ASU Hazard Communication “Employee Right-To-Know” Program](#) — applies to all employees.

## Responsibilities

Environmental Health and Safety promotes regulatory compliance with AAC and OSHA standards for ASU. EHS will serve as the custodian of all documents required by the plan, like the 2018 edition and the latest edition or revision of the International Building Code, International Mechanical Code, Interfraternity Council and the National Fire Protection Association. Departments and individuals can obtain an organizational chart defining EHS responsibilities and other EHS information by [contacting EHS](#) or [EHS Fire Safety and Prevention](#).

## EHS Fire Safety and Prevention

EHS Fire Safety and Prevention supplies the following services to the university:

- Conducts special events review.
- Ensures general safety.
- Investigates fires.
- Manages the fire inspection program.
- Monitors the fire protection testing, maintenance programs, hazard mitigation program and Intergovernmental Agreements. Corresponds and liaisons with regulators — state, federal and local.
- Plans and reviews the fire safety training program.
- Provides inspections and technical support for the university community.

## Fire safety partners and fire prevention officers

EHS Fire Safety and Prevention inspectors are responsible for the following:

- Administer regularly scheduled fire and safety inspections of every university facility based on the occupancy inspection determination.
- Certify fire protection equipment.
- Conduct follow-up inspections.
- Oversee investigations.
- Provide fire and safety training as requested.
- Review fire and safety plans.

## Deans, directors and chairs

Deans, directors and chairs are responsible for establishing a fire and safety policy and evacuation plan for their organization. The fire and safety policy and evacuation plan



must be specific to their operation to ensure compliance with the plan and all applicable codes and ensure all staff receives adequate fire and safety training.

### **Managers and supervisors**

Managers and supervisors are responsible for implementing all ASU and department fire and safety policies and evacuation plans. They must also certify that all staff are aware and trained on the procedures and evacuation plan. The policies and evacuation plan must be specific to their operation and comply with the plan and all applicable codes.

### **Employees and student workers**

Employees — any university-paid person, including students — are responsible for understanding the hazards involved with their occupation. They must be familiar with all safety precautions, location and use of fire protection and safety equipment, know the emergency evacuation plan for their area and demonstrate knowledge of the evacuation plan.

### **Inspections**

Environmental Health and Safety's Fire Safety and Prevention division conducts regularly scheduled inspections of all facilities based on the occupancy inspection determination on and off-campus, as well as special inspections for construction projects, child-care facilities, healthcare facilities, acceptance tests and inspections.

The EHS Fire Safety and Prevention and ASU Fire Systems Support Technologies jointly inspect and test the acceptance tests of fire protection and detection systems. EHS Fire Safety and Prevention has a database that maintains all fire safety documentation and reports, like existing building inspection reports, follow-up inspection reports and incident investigations. Every fire inspection, follow-up inspection, fire drill, test or investigation conducted by EHS is entered into the database, a report is generated and then sent to the appropriate or requested department representative.

Facilities are inspected periodically by scheduling a predetermined number of buildings each month per inspector. The occupants are responsible for ensuring that all code and safety issues are addressed appropriately and that a response memorandum — providing a status of each line item written on the inspection report — is sent back to the EHS Fire Safety and Prevention division before the follow-up inspection due date.

Although the jurisdiction resides with the EHS Fire Safety and Prevention division and the Department of Forestry and Fire Management, the local fire department may conduct pre-fire planning and familiarization inspections of university facilities. Any



safety hazards discovered by the city fire department must be directed to the EHS Fire Safety and Prevention division or the Department of Forestry and Fire Management.

### **Self-inspection program**

A self-inspection program is designed for the employee to be actively involved in the safety of their area and facility. EHS encourages all departments to have a fire and safety self-inspection program to ensure the facility is safe and that any safety hazards can be identified and mitigated appropriately. If you want to start a self-inspection program, please [contact EHS Fire Safety and Prevention](#). If you start the program, conducting monthly inspections of your area of responsibility is highly recommended. A copy of the completed inspection form should be sent to mail code 6412, scanned and [emailed to EHS Fire Safety and Prevention](#) or faxed to 480-965-0736.

### **Unsafe buildings or structures**

Any building, structure or portion of a building or structure that is structurally unsafe and does not have adequate egress constitutes a fire hazard, or is identified as dangerous to human life, is prohibited for use or occupancy and is declared a public nuisance. Any building or area of a building that is claimed to be a public nuisance must be abated by repair, rehabilitation or removal following the procedures outlined in the [International Code for the Abatement of Dangerous Buildings](#).

### **Violations**

It is unlawful for any person, department, unit, organization or corporation to erect, construct, enlarge, alter, repair, move, improve, convert, demolish, equip, use, occupy or maintain any building or structure or cause or permit a violation of any applicable codes or standards.

### **Modifications**

When there are practical difficulties involved in carrying out the provisions of this document or any other applicable codes or standards, EHS, CPMG and the Fire Safety and Prevention division may grant modifications for individual cases as long as the intent and purpose of the code is maintained and stipulations are adhered to. Modifications cannot lessen any fire protection requirements or structural integrity. Any variation to the code must be documented and maintained in the facility or project file of EHS and Construction Support Services. Variances to the IFC or IBC must be submitted and approved by the EHS Fire Safety and Prevention division before the construction phase.



## Plans review process

The university must comply with applicable building and fire codes for temporary and permanent building changes, the area of a building or temporary structure. Capital Programs Management Policy, application building and remodeling permits and inspections ensure the appropriate departments review proposed remodel and construction projects and compliance issues. Each department or unit is responsible for ensuring this permit process is accomplished and approved before engaging in any remodel or construction project. However, knowing all code issues cannot be assured in plan review is essential. Thus, inspections are performed to help ensure remodels and construction projects comply with applicable codes and certify that the project is accomplished safely.

## Certificate of occupancy

No building or portion of a building will be used or occupied without being issued a certificate of occupancy by ASU's building official or designated inspectors — for construction and renovation facilities — or Fire and Safety Inspection Report from the Fire Safety and Prevention division or EHS — for any instances other than construction or renovation-related circumstances.

Changes in building use must be approved by the ASU building official, EHS, the Fire Safety and Prevention division, CPMG and Facilities Development Management.

A temporary certificate of occupancy may be granted provided all life safety systems required are certified operational by the Fire Safety and Prevention division, and no substantial hazards will result from occupancy of any building or portion thereof before the same project is completed.

## Building and area use — a type of occupancy

Buildings and areas within buildings are designed to meet the requirements of a specific occupancy type. Requirements of a code or standard are implemented once an occupancy type has been established. A group and division classify occupancy types. [Refer to the International Building Code](#) or [IFC](#) for division breakdown.

Each occupancy group has specific construction and life safety system requirements that must be met and maintained. It is essential that the occupancy use of an area or building maintains both the construction and life safety criteria and submits any occupancy changes for approval to the ASU building official and the Fire Safety and Prevention division to ensure regulatory compliance and that a safe environment is maintained for the university community.

## Occupant load

Occupant loads of a building, area or portion of a building are established and enforced to ensure accessibility, building security and accommodate safe egress. An occupant load is determined after establishing the occupancy use and the contents of the building or area of the building.

Most assembly areas on campus have the occupant load posted at the entrance, or the number of fixed seats establishes the occupant load. The occupant load is calculated by dividing the usable square footage floor space by an occupant load factor. The occupancy use determines the occupant load factor. It is crucial to ensure that the occupant load is established and enforced to accommodate the safe egress of occupants. The IBC and IFC provide the minimum egress requirements and the maximum occupant load criteria and calculations. However, the IBC or IFC may have other more restrictive requirements.

Each department, organization or group is responsible for ensuring that minimum egress requirements are established and enforced. The EHS Fire Safety and Prevention division assists the university community in establishing occupant load limits to ensure egress of occupants is adequately accommodated.

## Guardrails

Guardrails are required for the following:

- Balconies or porches more than 30 inches above grade or the floor below.
- Landings and ramps.
- Open and glazed sides of stairways.
- Roofs used for tasks other than the service of a building.
- Unenclosed floor and roof openings.

Some exceptions include the loading side of loading docks, the auditorium side of a stage and vehicle service pits not accessible to the public. Guardrails must not be less than 42 inches in height and have intermediate rails or an ornamental pattern such that a sphere four inches in diameter cannot pass through. Guardrails are required with a top and mid rail, but the four-inch rule does not apply to employee areas only. [Refer to IBC Section 1015](#) and the [OSHA Occupational Safety and Health Standards](#) for more specific requirements and exceptions.



## Exit

The term “exit” is defined in the IBC as a continuous and unobstructed means of egress to a public way and will include intervening aisles, doors, doorways, gates, corridors, exterior exit balconies, ramps, stairways, pressurized enclosures, horizontal exits, exit passageways, exit courts and yards. The exit includes any occupied building area, continuing until the occupant safely exits the building.

Exits must be maintained as a safe system for egress. In addition, exits must be kept as a safe area for rescue assistance for those with mobility impairments above or below grade levels. The most common safety hazard is within the corridor. The fire code restricts combustible material use, storage or display within a corridor unless it is shielded with a transparent noncombustible material or fire retardant treated and does not obstruct the required exit width. [Contact the EHS Fire Safety and Prevention division](#) for information concerning directives or exceptions.

Each department, organization or group is responsible for ensuring that the exit is continuous and unobstructed and compliance with fire code issues. Authorization of any storage or use of any exit can be temporarily approved by submitting a request to the EHS Fire Safety and Prevention division. Level of fire protection, construction type, occupancy type and occupant loads are some factors assessed before any variation or authorization is granted.

The specifics on exit width and height, travel distances to an exit discharge, separation requirements, and aisle requirements are provided in [section 10 of the IBC](#) and IFC. Determining the exit widths and fire protection requirements depend on the following:

- Construction type.
- Longevity of the occupancy type.
- Occupant load.
- Suppression exists in the building.
- Type of fire detection.
- Type of occupancy.
- Type of seating.

## Seating and aisle spacing

Variables in determining seating arrangements include the following:

- Number of rows in a section.
- Number of seats in a row.
- Spacing of aisles.
- Spacing of cross aisles.
- Spacing requirements between seating.

To ensure compliance with IBC and assist departments and organizations with seating and aisle requirements, review the following guidelines that comply with most situations for public assembly areas:

- Accommodations for Americans with Disabilities Act must be adequately addressed. Contact an ADA officer for compliance information relating to ADA.
- Areas with several seats greater than 200 must be fastened together in groups of no less than three or attached to the floor.
- Seating in rows less than 14 must be 12 inches from the back row to the nearest projection.
- Dead-end vertical aisles for temporary seating must not exceed 21 rows.
- Minimum aisle space between rows must be 4–8 feet, depending on the event type, seating arrangement and occupant loads.
- The most protruding back part of a row must not be any closer than 22 inches from the most protruding front part of the row behind it for seating rows greater than 14 seats.
- Travel distance to an exit must not exceed 200 feet for non-sprinkled buildings and 250–300 feet for sprinkled buildings based on specific requirements.

If you cannot comply with every item above, [contact the Fire Safety and Prevention division](#) for further information and approval of alternate seating and aisle accommodations.

## Fire alarm systems and suppression systems

All university facilities are required to have, at minimum, a fire alarm system. All systems must be wired as a “Class A.” Determining the requirements of fire protection systems depends mainly on the occupancy type and type of construction. Refer to the IBC and IFC for specific fire alarm and fire-extinguishing systems requirements and NFPA for specific installation requirements.



Halon, Halon Alternative, Carbon dioxide and dry or wet chemical systems are alternative automatic fire-extinguishing systems and must be maintained per NFPA Standards. All alternative automated fire-extinguishing systems must be tested semi-annually by nationally recognized, authorized and trained personnel. The user group is responsible for ensuring that all unique systems are maintained and tested following NFPA. The user group must keep the maintenance and testing documents for at least five years and provide copies to the Fire Safety and Prevention division as requested.

## Standpipes

Standpipe systems may be required in facilities to accommodate fire department suppression activities. Standpipes can be wet or dry systems. The following are the three classifications of standpipes, including the city of Tempe fire department's specification requirements.

- Class I standpipe: A system with 2.5-inch outlets.
- Class II standpipe: A system with 1.5-inch outlets equipped with a fire hose connected to a water supply.
- Class III standpipe: A system with a 2.5-inch outlet or 1.5-inch and 2.5-inch outlets directly connected to a water supply and equipped with a fire hose on the 1.5-inch outlets.

**Note:** The city of Tempe and the city of Phoenix have requirements that are different than the national standard.

## Portable fire extinguishers

An accessible travel distance to an appropriate fire extinguisher is required for all areas of operation, while maximum travel distance depends on the nature of the occupancy. Hazardous occupancies must have an accessible fire extinguisher within 30 or 50 feet based on the occupancy and hazard. Non-hazardous areas must have an accessible fire extinguisher within 75 feet. Travel distance cannot include locked doors or changes in elevation.

The following are five classes of fires that any person should be aware of to select the proper fire extinguisher for extinguishment.

- Class A: Wood, paper, plastic or any other ordinary combustibles.
- Class B: Combustible and flammable liquids.
- Class C: Energized electrical equipment. Usually, a Class A or B once electrical equipment is de-energized.
- Class D: Combustible and flammable metals.
- Class K: Kitchen hood suppression systems and fire extinguishers using "K" products.



To minimize the confusion of selecting the appropriate fire extinguisher on campus, the university has installed multipurpose dry chemical — ABC-rated — fire extinguishers in all areas requiring a fire extinguisher, except for the following areas:

- Electrical, equipment and mechanical rooms. These rooms require Class B and C-rated dry chemical fire extinguishers.
- Depending on the hood system, kitchens with commercial hoods require Class B and C-rated dry chemical fire extinguishers or Class K.
- Particular hazard areas require a Class D fire extinguisher. The quantity of hazards dictates the need for a class D fire extinguisher.

No one at ASU is required to use a portable fire extinguisher.

### **Campus mall use**

Campus malls are designed for pedestrian traffic but must also accommodate authorized vehicle traffic. Authorized vehicles are ASU service vehicles, approved vendors and emergency vehicles. Temporary approval may be granted for special events provided they do not obstruct emergency vehicle access per IFC specifications. All drivers using the malls must park their vehicles in a manner that will maintain a minimum mall access width of 20 feet or 26 feet if fire hydrants are on both sides of the mall or areas an aerial apparatus is needed for setup for emergencies. They must meet a minimum height clearance of 15 feet per IFC and local jurisdictional requirements. All sides of university buildings must be accessible for emergency response vehicles and personnel within 150 feet or less.

All building exit doors, especially the main entry or exit, must be clear of any vehicles. Whenever possible, service vehicles should park in the service vehicle parking space, the nearest road or the nearest loading zone parking space.

### **Evacuation procedures**

An evacuation plan template can be obtained through the Fire Safety and Prevention division. Each facility on campus should have an emergency evacuation plan and procedures in addition to business continuity plans. The department and building occupants should develop and implement the evacuation plan and methods collaboratively. Some essential items that must be in the evacuation plan are as follows:

#### **Address issues regarding the evacuation of personnel with mobility impairments**

- Identify the responsibilities of occupants to assist in evacuation procedures.
  - Activate the building fire alarm system.
  - Call 911.



- Provide any information about the fire or emergency to the emergency responders.
- Identify a primary and secondary assembly area.
- Establish accountability procedures and responsibility.
- Evacuation procedures — emergency notification protocol and evacuation plan.
- General safety precautions include closing doors and understanding the use of life safety protection equipment, including fire extinguishers.
- Responsibilities of advising the on-scene emergency responder of vital information related to the emergency.

Other issues to consider when developing an emergency evacuation plan are as follows:

- Coordination with all occupants.
- Location of all exits.
- Type of fire protection systems.
- Types of exits and travel distance to each exit.

[Email the Fire Safety and Prevention division](#) or call 480-965-1823 for assistance in developing and implementing an evacuation plan.

## General safety

Safety precautions and prohibitions are necessary to ensure a safe environment for employees, visitors and occupants that live and work in residential facilities. The Fire Safety and Prevention division prohibits the following items or practices on state property:

- Any modification to a building or area of a building without a permit issued by FDM or CPMG — EHS must review permits.
- Battery charging inside buildings. **Exception:** Batteries that are completely sealed and do not emit any gases while recharging or when authorized by EHS and the Fire Safety and Prevention division.
- Bicycles, skateboards, smart boards, scooters and non-ADA, non-pedestrian manual or motorized modes of transportation in public and ASU buildings.
- Candles or open burning — approvals through the Fire Safety and Prevention division's Special Event Permit submission are required.
- Fireworks or pyrotechnics without the official approval of the Fire Safety and Prevention division.
- Obstructing, tampering with or misusing fire detection and fire suppression systems and their devices.
- Smoking is prohibited on ASU property by the policy. Still, the fire code restricts any open flames or smoking due to hazardous chemicals or materials use, storage, handling or dispensing, including the perimeter of campus properties.



- Storage in corridors and stairways, within 18 inches of fire sprinkler heads or 24 inches from the ceiling on non-fire sprinkled buildings. Only temporary authorization can be approved by the Fire Safety and Prevention division.
- Storage of any items near any heat sources. For example, lamps, transformers, heaters, generators, motors, etc.
- Trees or any other vegetation that are no longer living.
- Vehicles or any gas-powered equipment used or stored inside buildings an exception: temporary approval may be granted by the Fire Safety and Prevention division for special events.

For general safety guidelines for vendors, holidays, special occasion decorations or displays and special events, refer to the appropriate areas within this plan, university policies and compliance guidelines, or request related information from the Fire Safety and Prevention division.

### **Electrical safety**

To ensure that electrical work in buildings is installed following the National Electric Code and to protect the university and the university community, only journeyman electricians and licensed and bonded contractors are authorized to perform electrical work on campus buildings and equipment.

Any electrical equipment or outlets near a water source or exposed to outside weather conditions must be on a Ground Fault Circuit Interrupter to prevent shock and comply with NEC.

All electrical equipment and appliances must be tested and approved by a nationally recognized testing laboratory, such as Underwriters Laboratory and Factory Mutual. It is the user's responsibility to ensure that all electrical equipment and appliances are approved by a nationally recognized testing laboratory, inspected before use for any damage, repaired or discarded if damaged, and that equipment and appliances are used as recommended by the manufacturer.

The university has general safety requirements for using electrical equipment or devices in university buildings. It prohibits using electrical equipment or devices that do not comply with university policies, building or fire codes and the NEC.

### **Extension or flexible cord specifications — temporary use only**

- Devices or extension cords that increase outlet capacity — only surge protectors with individual circuit breakers are authorized.
- Minimum of 16 gauge with the ground, which are three-pronged male end.
- Only use an extension or electrical cords in the same room and area — prohibited through walls, doorways, ceilings, floors or running under carpets.



- The cord and both male and female ends must be intact with no damage, fraying or exposed wiring.
- Use of extension cords for permanent wiring. Extension cords are for temporary use and must meet the specifications in this section. Limit use to 90 days or less.

## Storage

Storage is necessary for day-to-day operations. However, improper and unauthorized storage creates a fire hazard and may violate the fire code. All building occupants must observe and comply with the following regarding storage:

- A minimum clearance of 18 inches from the deflector of a fire sprinkler head is maintained and 24 inches from the ceiling of non-fire sprinkled buildings.
- Bicycles, skateboards, smart boards, scooters and non-ADA no-pedestrian manual or motorized modes of transportation are prohibited in public and ASU buildings or any place that obstructs egress from a building or area of a building.
- Ensure appropriate aisle width and head clearance are maintained.
- Excessive amounts of combustible materials, storage or debris cannot be accumulated in the building.
- Loose papers, magazines, books or files must be put into boxes, stored in filing cabinets or stacked in an organized manner on shelves.
- Loose storage must be kept off floors.
- Storage must be maintained in an orderly manner.
- Storage of any chemicals, flammables, combustibles — liquids, solids or gases — must be approved and permitted by the Fire Safety and Prevention division.
- Storage of any material must not obstruct an exit, fire protection equipment or devices, or the view of exit signs.
- Storage under stairways is prohibited. Exceptions must be reviewed and approved by the Fire Safety and Prevention division.

Combustible materials must be separated from flammable and oxidizing materials. Any chemical, flammable or combustible material must be separated and stored, when required, in approved cabinets. For more information, refer to the safe handling and storage of peroxides section and the [Chemical Hygiene Plan Appendices on Hazardous Materials Storage](#).

## Flammable and combustible gases, liquids and solids

Flammable and combustible gases, liquids, solids, toxins, etc., require special storage, handling and dispensing consideration. Some key issues necessary for compliance and protection of human health are below:

- All areas must comply with the exempt amounts in the IBC and IFC tables or special conditions of a controlled space. The Fire Safety and Prevention division must approve exceptions.





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- All areas storing, handling or dispensing Class I liquids must comply with storage requirements outlined in the IFC and the NEC's electrical requirements.
- Spill control, drainage control and secondary containment: All buildings, rooms and areas must provide a means to control spillage and to contain or drain spillage and fire-protection water following IBC and IFC protocol.

All Class I and II flammable or combustible liquids require storage within an appropriate cabinet. Class III liquids may require storage within a proper cabinet. At the same time, the decision is based on the quantity, hazards within the area, type of occupancy and factors involved with mixed occupancies.

**Exception:** Groups A, B, E, F, I, M, R and S occupancies, the combined total quantities of flammable and combustible liquids used for demonstration, treatment and laboratory work not exceeding 10 gallons — 37.85 L — may be authorized without cabinets but must be in approved locations. Occupancy quantity limits of stored flammable or combustible liquids must not exceed the following:

- Quantities in Group A, B, E, F, I, M and S occupancies must not exceed amounts necessary for demonstration, treatment, laboratory work, maintenance purposes and operation of equipment. They must not exceed quantities outlined in the IFC.
- Quantities in Group R occupancies must not exceed amounts necessary for maintenance purposes and operation of equipment and must not exceed quantities outlined in IFC.

[Refer to EHS 122](#) for more information on compressed gases.





## Bonding and grounding

Static protection is necessary to prevent a fire or explosion from occurring. Bonding and grounding are essential precautions when dispensing Class I, II and III-A liquids. The basic concept is ensuring that two or more items where a transfer of a liquid will occur must be connected to the ground and each other. [Contact the Fire Safety and Prevention division](#) or refer to the IFC for more information on specific requirements.

## Special events

Special events are defined as any event that is not of regular occurrence and involves the public. All special events on university property or involving university personnel must have an ASU event coordinator [Special Event Registry](#) for the Fire Safety and Prevention division and other specific ASU entities to review, approve and provide recommendations to address any code, safety and insurance issues.

In every submitted request, the Fire Safety and Prevention division requires the following information:

- A copy of the certificate of insurance identifying ASU, the Arizona Board of Regents and the state of Arizona as additionally insured. Minimum coverage is determined by the EHS insurance coordinator and any contracts that may be involved with the event.
- Dates and times of the event.
- Event location.
- Layout plan of the event.
- Name, title and contact telephone numbers of the event coordinators — home, work and cell phone numbers
- The number of people expected.
- The number of vehicles expected — a permit may be required to park cars on campus. [Email ASU Parking and Transit Services](#) or call 480-965-6124 for more information.
- Special equipment to be used. For example, portable generators, cooking and lighting equipment, powered or motorized equipment, etc.
- Special hazards. For example, open flames, flammable and combustible liquids and gases, fireworks, pyrotechnics, etc.
- Type and purpose of the event.
- Type and size of any temporary structures which will require a certificate of fireproofing.

All requests will be reviewed for safety and fire code compliance, and the event coordinator will be contacted with an approval, rejection or special condition approval with stipulations to meet the intent of applicable codes.



## Permits

Permits are required by the Fire Safety and Prevention division for the following:

- Any condition, operation or use of materials considered hazardous, dangerous or unsafe.
- Fireworks or pyrotechnics.
- Hot work operations in confined spaces require a confined space permit. Hot work must comply with EHS 102 and the Hot Work Compliance Guidelines.
- Laboratories, research and other similar buildings or areas within buildings must have permits to operate, store and use hazardous chemicals. This is permitted through an EHS certification program called the Laboratory Management Information System.
- Open flames or open burning.
- Special events.
- Storage of chemicals over the International Fire Code and International Building Code exempt amounts or if considered a controlled area.

## Safe handling and storage of peroxides and peroxide-forming chemicals

### Background

Peroxides contain O-O bonds with an oxidation state of  $-1$ . Hydrogen peroxide —  $H_2O_2$  — and its organic peroxide derivatives are intrinsically unstable substances that spontaneously decompose under normal conditions. Special precautions must be taken when using peroxides due to their explosive nature and sensitivity to shock, friction, sparks and heat.

Alkali, group IA, and alkaline, group IIA, metals combine with oxygen to produce metallic peroxides. They are primarily oxidizer hazards; however, metallic peroxides are also water-reactive compounds. Metallic peroxides decompose when heated to form oxygen, which supports combustion. Refer to the EHS Chemical Hygiene Plan for more information.

## Hazard awareness and recognition

Common compounds known to form peroxides include, but are not limited to, the following:

- Aldehydes.
- Alkali and alkaline metals.
- Compounds containing allylic hydrogens, including most alkenes, cyclohexene and cyclooctane.
- Compounds containing benzylic hydrogen atoms, mainly if the hydrogen is on a tertiary carbon such as isopropyl benzene.
- Ethers, especially cyclic ether and those containing primary and secondary alkyl groups, including dioxane, tetrahydrofuran and diisopropyl ether.
- Vinyl and vinylidene compounds, such as vinyl acetate.

## Storage

Organo-peroxides should be isolated from all other compounds, especially flammables and combustibles. Ideally, they should be stored away from heat, ignition sources and light in a temperature-regulated, ventilated cabinet. Due to their unstable nature, peroxides should never be stored in bulk unless highly diluted. Polyethylene bottles are recommended for storing peroxides and superoxides and should be capped to release oxygen gas. Metallic peroxides should always be protected from moisture.

Peroxides and peroxide-forming compounds have a limited shelf life and should be purchased in small quantities. Each container should be labeled with the date of receipt and the date first opened; however, containers of ether should never be stored for more than twelve months, even if the bottle has never been opened. These chemicals should be purchased in small quantities.

Store the peroxide formers in a dark space and purge the headspace with an inert gas to prolong the shelf life of the chemical. Periodically test peroxide-forming chemicals for the presence of peroxides. Date all peroxide formers upon receipt and again upon opening. Waste peroxides and peroxide-forming chemicals must be collected in an appropriate container, labeled and disposed of properly by [submitting a waste pickup request](#). Waste may never be placed in the trash or down any drain.

## Handling

Containers of peroxide-forming compounds should be handled with care or not handled at all if any of the following are true:

- Has formed a precipitate.
- It is of uncertain age.
- Its physical properties, such as color and appearance, differ from pure substances.

Some of the most commonly available organic peroxides are toxic by inhalation, ingestion and skin absorption, and almost all are eye irritants. The below precautions and procedures should be followed:

- Consult the accompanying material safety data sheet.
- Date all peroxide formers upon receipt and again upon opening.
- Periodically test peroxide-forming chemicals for the presence of peroxides.
- Purchase in small quantities.
- Purge the headspace with an inert gas to prolong the shelf life.
- Store the peroxide formers in a dark space.

## Testing and stabilizing

Once a sealed container of a peroxide-forming compound is opened, the risk of peroxide formation is inevitable; however, some manufacturers add oxidation inhibitors, such as hydroquinone, to some peroxide-forming chemicals. A small amount of sodium pyrophosphate can be used as a stabilizer to prevent the decomposition of most forms of hydrogen peroxides, regardless of their concentration. This will only slow down the decomposition rate but will not stop it.

Several testing methods for the presence of peroxides are acceptable. The easiest way to test for peroxides is to use semi-quantitative test strips. These are available commercially from storerooms on campus — Quantofix-peroxide 100 from Macherey-Nagel — and outside vendors — Sigma-Aldrich, VWR etc.

Follow the directions on the test strip package to estimate peroxide levels in solvents. The peroxide concentration scale is available on the test strip package. The Quantofix test strips work in the pH range of 2–9. If testing highly acidic or basic solutions, buffer to bring it to the 2–9 pH range before testing. For testing hydroperoxides in organic solvents, such as isopropanol, diethyl ether, tetrahydrofuran, dioxane etc., moisten the test field with one drop of water after evaporating and drying the test solvent before comparing the color to the given scale. Please contact EHS at 480-965-1823 for guidance. Test strips for the detection of peroxides are also commercially available.



## Disposal

Please [submit an ASU EHS hazardous waste pickup request through CEMS](#) to dispose of hazardous materials. For assistance with the handling or disposal of chemicals, contact ASU EHS at 480-965-1823 during business hours. For more urgent after-hours assistance, contact the ASU Police Department at 480-965-3456 and request assistance from EHS. In the case of an emergency, call 911.

## Lamps and light bulb hazards

The U.S. Consumer Product Safety Commission has solicited an advisory concerning fire related to halogen lamps. The NFPA provided EHS with information on fires, injuries and fatalities related to lamps and light bulbs. The leading cause of these fires was combustible material located too close to the heat source, which accounted for roughly one-third of the lamp and light bulb fires. The following safety tips are recommended practices for the university community to ensure a safer community and help preserve life and property:

- A qualified person or the appliance must repair any damage, loose wiring or any other potential safety hazard must be discarded.
- Check for loose connections.
- Do not place a cloth over a light bulb to diffuse or soften the light. Buying low-wattage, soft white or pastel light bulbs can help you achieve this effect without creating a fire hazard.
- Replace halogen lamps with 60-watt incandescent lamps due to the higher heat emitting concerns of halogen lamps.
- Keep combustible materials away from lamps and light bulbs, such as piling linens near a bulb. Nothing should be stacked, rested against or placed on a lamp.
- Ensure that an insulated bushing or grommet protects lamp cords where the power cord enters the lamp to prevent abrasion.
- Purchase lamps that a recognized testing laboratory, such as Underwriters Laboratory, has listed.
- Read and follow the recommended use and safety precautions from the manufacturer.
- Use only light bulbs equal to or less than that for which the light fixture is rated. Using a higher-rated bulb can cause overheating and deterioration of the conductor insulation and an ignition source to nearby combustibles. EHS recommends using 60-watt light bulbs that do not exceed the appliance capacity.
- Wall lamps should not be set near curtains, furniture or any other material, including other walls.

**Note:** Improper use and unsafe practices can cause fires associated with lamps or light bulbs.



If you have any questions or need more information, please [contact the Fire Safety and Prevention division](#).

## Fire prevention, protection and safety — fact sheet

### Introduction

Many studies on injuries, deaths and property loss due to fire have introduced many life safety improvements through advanced technology and research.

Although the U.S. is one of the most technologically advanced nations, we continue to experience a higher life and property loss than most nations. The universities and colleges in the U.S. are no exception, especially the residential facilities, such as dormitories, sororities, fraternities and individual housing units. EHS, Facilities Development and Management, the Department of Forestry and Fire Management, and local municipalities constantly collaborate, evaluate and plan life safety improvements for existing facilities and new construction.

Occupants should be aware of the fire protection features of their building and ensure they do not undermine their purpose. Occupants should also practice fire safety by identifying hazards specific to their area and using the appropriate preventative measures. When a fire occurs, the campus fire emergency policy should be enacted. Life safety is the primary objective of all ASU fire protection programs.

### Applicable ASU policies

- [EHS 122: Compressed gases.](#)
- [EHS 201: Electrical safety.](#)
- [EHS 202: Decorations and displays.](#)
- [EHS 204: Facility safety and occupancy limits.](#)
- [EHS 205: Storage and hazardous chemicals.](#)



## Applicable ASU guidelines

- [EHS Chemical Hygiene Plan.](#)

## Applicable regulations

- [29 CFR 1910.101 — Hazardous Materials.](#)
- [29 CFR 1910.106 — Flammable and Combustible Liquids.](#)
- [29 CFR 1910.157 — Portable Fire Extinguishers.](#)
- [29 CFR 1910.159 — Automatic Sprinkler Systems.](#)
- [29 CFR 1910.37 — Means of Egress.](#)
- [29 CFR 1910.38 — Employee Emergency and Fire Prevention Plans.](#)
- [International Fire Code.](#)
- [National Fire Protection Association Standards.](#)

## Life safety features in campus buildings

Every building provides exits sufficient to permit the quick escape of occupants in case of a fire or other emergency. Exits are marked by visible signs and illuminated exit signs where required. Keep exit doors and signs clear of obstructions and maintain the minimum required width of 44 inches for public access to exit doors. The required exit access may be more than 44 inches depending on the occupant load and the space configuration. Enclosed stairways provide safe passage to the outside in an emergency. Keep stair doors closed to prevent the spread of fire and smoke, and keep stairwells clear of storage. The exit system, like corridors, passageways, stairways and exit doors, must be free of combustible or hazardous materials and maintained unobstructed.

Most campus buildings are equipped with a fire alarm that manual pull stations, smoke detectors, heat detectors, beam detectors, duct detectors and fire sprinklers can activate. Keep all fire alarm devices free of obstructions. When activated, the alarm sounds throughout the building to initiate the evacuation of building occupants. It will also send a message to a dispatch center via telephone or fiber optics — usually ASU Police Department dispatch. To provide the designed fire protection, occupants must ensure a minimum of 18 inches of space beneath the fire sprinkler's deflector. Seek advice from the Fire Safety and Prevention division when erecting partitions in a fire sprinkler or fire detection-protected space because the new wall may interfere with sprinkler or fire alarm coverage.





## Fire prevention measures

Electricity is the most common utility and energy source for heating, cooling, cooking and generating electrical power distribution in most buildings today. As the most common energy source, electricity became the most commonly encountered hazard to life and one of the most common causes of fire. Ensure that your area's electrical equipment and appliances are Underwriters Laboratory listed and are used following the manufacturers' recommendations and per fire and electrical code. The use of makeshift electrical equipment is not permitted except in experimental laboratories when its use is crucial to the research or work being conducted. Lab employees are qualified, and the laboratory is designed to prevent exposure or damage to life and property. All circuits should have over-current protection. Whenever a damaged appliance or power cord is found, it must be immediately placed out of service or repaired by qualified electricians.

Flammable liquids create severe fire and explosion hazards. Flammables must be kept in approved, sealed containers and stored in flammable liquid storage cabinets or approved storage rooms. Refrigerators used for flammable storage must be manufactured for that purpose and labeled as such on the front of the door. Take the amount out from storage needed for the day. Eliminate sources of ignition when using flammables, including static electricity, friction and heat exposure.

Open flames must always be attended to in a laboratory, kitchen or shop area. Keep open flames away from combustible and flammable materials. Comply with EHS hot work operation guidelines when working with open flames outside designated laboratories or shop areas.

Good housekeeping is always an important safety measure. Discard combustible waste as soon as possible. Accumulations of paper products and upholstered furnishings are attractive targets of malicious fire settings.

## Emergency procedures

A fire emergency exists when there is an uncontrolled fire, the presence or the odor of smoke or an uncontrolled release of a toxic gas or a flammable liquid spill. When such an emergency is discovered, the following must be ensured by the occupants:

1. Pull the building fire alarm unless the alarm is already sounding.
2. Shut off the equipment immediately and close each door exiting through if safe to do so.
3. Leave the building and assemble at a safe distance away from the building.
4. Call 911. Use any campus phone, pay phone or campus emergency phone to advise the ASU PD of the fire emergency and any pertinent information you can provide or questions the dispatcher may ask you. Inform the dispatcher of your location, including the campus.





Be available to assist emergency responders and provide information about operations in your area. Any building occupant or campus employee does not require fire extinguishers, and it is not recommended for those without training.

### **Recordkeeping**

EHS maintains records, requests for files and any documentation of all life safety inspections, building evacuation drills and training conducted by EHS or other organizations, vendors and consultants.

### **Reporting**

Call 911 to report all fires, even fires found extinguished.

Call the FDM Service Center at 480-965-3633 or EHS at 480-965-1823 to report life safety equipment that needs service. This includes the following:

- Damaged or malfunctioning fire alarms or sprinkler systems.
- Fire doors that do not entirely self-close and latch.
- Missing or burned-out exit signs.
- Missing or discharged fire extinguishers.

### **Training**

EHS provides fire safety, evacuation and emergency preparedness training to campus groups upon request. Call EHS at 480-965-1823 or [review our training webpage](#) to request brochures, training or borrow fire safety videos.

[Email EHS](#) or call 480-965-1823 for questions or more information.