

# Safety Showers and Eyewashes

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## University of Tennessee Safety Guide HM-020

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### Purpose

It shall be the policy of the University of Tennessee to provide safety showers and/or eyewash stations in areas where there is a possibility of splash to the body or eyes of acids, caustics, or chemicals or pathogens that are injurious to the eyes or present a skin absorption or burn hazard. Safety showers and eyewash stations shall be inspected/tested and shall receive scheduled maintenance.

### Scope and Applicability

These guidelines apply to the UTK campus-wide laboratories (academic and research) and non-laboratory areas, such as (but not limited to: art studios, maintenance areas, and shops).

### Abbreviations and Definitions

#### Abbreviations

**ANSI:** American National Standard Institute

**EHS:** Environmental Health and Safety

**GPM:** Gallons per minute

**OSHA:** Occupational Safety and Health Administration

#### Definitions

**Emergency Shower:** A device designed to deliver flushing fluid in sufficient volume in order to enable the user to have water cascading over the entire body while the hands are free.

**Emergency Eyewash:** A device used to provide fluid to irrigate and flush both eyes simultaneously at a velocity low enough to be non-injurious to the user.

**Eye/Face Wash:** A device used to provide fluid to irrigate and flush both the face and the eyes simultaneously.

**Combination Unit:** An interconnected assembly of drenching and flushing equipment that is supplied by a single flushing fluid source.

**Drench Hose:** A supplemental device consisting of a flexible hose connected to a flushing fluid supply that is used to provide fluid to irrigate face and body areas.

**Personal Eyewash:** A supplementary device that supports plumbed or self-contained eyewash units, by delivering immediate flushing fluid to the eyes or body.



**Plumbed Eyewash:** An eyewash unit that is permanently connected to a source of potable water in order to irrigate both eyes

**Potable water:** Water that is suitable for drinking

**Flushing fluid:** Potable water, preserved water, preserved buffered saline solution or other medically acceptable solutions manufactured and labeled in accordance with applicable federal regulations.

**Flow Pressure:** The pressure of the flushing fluid exerted in the wall of the pipe near the outlet while the faucet/outlet is fully open and flowing.

**Flow Regulator:** A mechanical device intended to control the flow of flushing fluid through the pipe.

**Stay-open valve:** A valve that, once activated, must be closed manually by the user.

**Tepid:** Moderately warm; lukewarm

**Hazardous Material:** Any substance or compound that has the capability of producing adverse effects on human health and safety.

## Roles and Responsibilities

### Laboratory Supervisors/and or Principal Investigators shall:

- Request installation of emergency eyewash and shower equipment when necessary.
- Ensure unobstructed access to the safety shower/eyewash equipment so that it requires no more than 10 seconds to reach (no more than 55 feet walking distance).
- Ensure that all employees and students who may need the emergency eyewash and shower equipment are trained on their location and use.
- Ensure that emergency eyewash stations within the laboratory are activated weekly and a weekly activation log is maintained.
- Request maintenance for immediate repair, modification or installation of eyewash/shower equipment.
- Inform Environmental Health & Safety (EHS) before removing any emergency eyewash/shower equipment from the laboratory.

### Environmental Health & Safety shall:

- Coordinate with Facilities Services for inspection, modification, repair, maintenance, and installation of emergency shower and eyewash units, as necessary.
- Assist with building plan review and selection from a list of recommended units during new construction or major renovation.
- Provide assistance, necessary equipment and inspection tags required to test emergency eyewash/shower equipment as required by departments.
- Conduct an annual review of all elements of the emergency eyewash and shower program.

### Facilities Services shall:

- Perform immediate modifications, repair, maintenance, and installation of emergency eyewash and shower equipment as required.
- Execute all work orders for the installation or repair of emergency eyewash and shower equipment on a high priority basis.

- Conduct annual flow rate testing and compliance assessments.
- Maintain written records of flow rate testing and compliance assessment.
- Notify EHS of changes in work areas or work processes and practices to evaluate the need for new installations, or for the removal of existing emergency eyewashes or showers.
- Test all emergency equipment after installation to ensure that it meets the manufacturer's installation requirements. Units that fail testing must be repaired immediately. If deficiencies cannot be immediately corrected, the lab supervisor or principal investigator (PI) must be notified and the unit must be tagged "DO NOT USE". The lab supervisor or PI must notify all affected employees when emergency equipment is out of service. A portable unit may be temporarily required to meet the need for an emergency eyewash and shower.
- Test eyewashes located in hallways weekly and perform annual tests on safety showers.

## Procedures

Emergency eyewashes, showers, drench hoses and combination units are not substitutes for proper primary protective devices. As a defense against flying solid particles and splashing injurious liquids, workers must wear personal protective equipment as needed, including eye protection, face protection and protective clothing.

The first seconds following an incident involving the eyes are often most critical to keeping injury to a minimum. A personal eyewash may be kept in the immediate vicinity of employees working in a potentially hazardous area. The main purpose of these units is to supply immediate flushing. Note that a personal eyewash is not a substitute for a code compliant eyewash. With this accomplished, the injured individual should then proceed to a plumbed or self-contained eyewash and flush the eyes for the required minimum 15-minute period.

## General Installation

- Safety showers and eyewashes shall be installed and maintained in compliance with applicable engineering standards and shall be supplied from potable water.
- Pipelines and other parts of safety showers and eyewash stations shall not be used as supports for other types of equipment or fixtures.
- The access routes to safety showers and eyewash stations shall not be blocked. The location of safety showers and eyewash stations may need to be identified with signs that are prominently displayed for immediate recognition if the location is not evident.
- Safety showers and eyewash stations shall be in accessible locations that require no more than 10 seconds for the exposed person to reach along an unobstructed pathway (i.e., no doors which don't swing open when pushed).
- No obstructions, protrusions, or sharp objects shall be located within 16 inches from the center of the spray pattern of the emergency shower facility.
- Electrical apparatus, telephones, thermostats, or power outlets should not be located within 18 inches of either side of the emergency shower or emergency eyewash facility (i.e., a 36-inch clearance zone).
- Provisions should be made for wastewater disposal for new installations.

## Maintenance

- Fixed eyewash stations shall be activated weekly to flush the line for a minimum of three minutes and verify proper operation. ANSI standard Z358.1 requires that emergency showers and eyewashes be tested weekly. This involves opening flow through the nozzles to verify that sufficient fluid is available

to neutralize and wash away any corrosive material from a user. In addition, the eyewash fluid should be checked for debris and foreign objects that might cause injury to the eyes. This weekly testing must be documented and should be performed by the department that controls the eyewash.

- An eyewash test log shall be kept near the eyewash. Appendix A is a test log that can be used to document the weekly test. For portable units the duration of flushing will be dependent upon the specified maintenance criteria. Eyewashes will be flushed by Environmental Health and Safety (EHS) during the annual safety inspection if this activity can be performed safely or without damaging equipment.
- Personal eyewash units shall be replaced upon expiration of the container.
- Safety showers shall be activated annually by Facilities Services to flush the line and verify proper operation. Documentation of this activity shall be documented on a tag attached to the shower.
- It is the department's responsibility to ensure that emergency eyewash and safety shower equipment that does not pass inspection is repaired immediately by contacting Facilities or EHS.
- Whenever an emergency eyewash or safety shower is non-functional, immediately contact Facilities Services to make repairs. Do not handle hazardous materials in that work-area until the unit is returned to proper service.
- Any party removing emergency eyewash or safety shower equipment from service, must notify the affected department beforehand.
- Individuals who may be exposed to hazardous materials shall be instructed in the location and proper use of emergency eyewash and safety shower equipment.

### Portable Eyewash Stations

- Self-contained (portable) eyewash stations are used only as a temporary measure or in areas where it is not feasible to install a fixed eyewash station. The water in these units shall be changed as recommended by the manufacturer.

### Specifications

- Listed below are recommended standards for installation of safety showers, eye/face and drench hoses. Note that the water temperature should not exceed 100 degrees F and should not be lower than 60 degrees F.

#### **Plumbed Safety Showers**

- Heads shall be positioned no less than 82" from floor and have a spray pattern with a minimum diameter of 20" at 60" above the floor.
- The flow rate shall be at least 20 gallons per minute (GPM) at a velocity low enough to be non-injurious to the user. The center of spray pattern shall be located at least 16" from any obstruction.
- The valve shall activate in one second or less, have a stay-on feature and stay on until manual reset.
- The handle should be placed a maximum of 69" from the standing surface.
- The valve should be simple to operate and shall go from "off" to "on" in one second or less.

#### **Eyewash Stations: An eye wash unit permanently connected to a source of potable water.**

- Heads must be protected from airborne contaminants and positioned six inches from the wall or nearest obstruction.
- The flow rate shall be at least 0.4 gpm for 15 minutes for plumbed units with the valve activating in one second or less.
- The unit shall have a stay-open valve (leaving hands free) feature.

***Eye/Face Wash: A device used to irrigate and flush both the face and eyes.***

- Heads shall be positioned 33” to 45” from the floor and no closer than six inches from the wall or nearest obstruction.
- Large heads to cover both eyes and face or regular size eyewash heads plus a face spray ring.
- Flow rate should not be less than 0.4 GPM for 15 minutes. The valve shall activate in one second or less and shall have a stay-open valve (leaving hands free) feature.

***Drench Hoses: A flexible hose connected to a water supply and used to irrigate and flush eyes, face and body areas.***

- Hand-held drench hoses support shower and eyewash units but shall not replace them.
- Heads shall have a flow rate of at least 0.4 gpm for 15 minutes. The valve shall activate in one second or less

**Training and Information**

- All employees working with hazardous chemicals/materials who may have to use an eyewash or a safety shower shall be trained in the use of the equipment before use.
- Employees should also be made aware of the location of eyewash stations and safety showers before working with hazardous chemicals in their work areas.
- This information may be included in the department-specific Hazard Communication training or in the department’s chemical hygiene plan.

**References**

American National Standards Institute (ANSI) Z358.1, “Emergency Eyewash and Shower Equipment,” (ANSI [Z] 358.1-2004)

**Appendices**

Appendix A: Emergency Eyewash Test Log

Appendix B: Safety Shower Testing Guidelines

**Disclaimer**

The information provided in these guidelines is designed for educational use only and is not a substitute for specific training or experience.

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# Safety Shower Testing Guidelines

## A Short Guide for Zone Maintenance (Facilities Services)

(Refer to the Safety Manual document "Safety Showers and Eye Washes" at <http://ehs.utk.edu/>. American National Standards Institute (ANSI) Z358.1, "Emergency Eyewash and Shower Equipment," (ANSI [Z]358.1-2014) OSHA General Industry 29 CFR 1910.151(c), for more info)



### Annual Safety Shower Inspection

**Purpose:** To flush the line and verify proper operation.

- Using a tape measure, measure the distance from the floor to the shower head. The distance should be at least 82". Then measure the distance from the floor to the handle/actuator. This distance should not be more than 69". If the handle is too high and cannot be adjusted lower, a strap, string or some other item can be tied to the handle to make it reachable.
- A large trash can on wheels, with marks for every 10 gallons is recommended for collecting water. Place a sleeve over the shower head to minimize water spray to surrounding area and turn on the water. Let water run for 30 seconds then turn it off. You should have at least 10 gallons of water collected. If you have more than 15 gallons of water, the water flow may be too high and should be adjusted. The force of the water should not cause injury.
- The center of spray pattern should be located at least 16" from any obstruction. (A stick measuring 32" could be used, hold center of stick at center of sleeve and make sure nothing is within that diameter).
- The valve should activate in one second or less, have a stay-on feature and stay on until turned off.
- Water temperature should not exceed 100°F and should not be lower than 60°F. (recommend a thermometer that does not contain mercury, collect a small amount of the water as it comes from the sleeve to measure temperature)
- The date of testing (month and year) and initials of person performing the test should be documented on a tag attached to the shower.

EMERGENCY SHOWER & EYE WASH TEST RECORD			
INSPECT THIS UNIT CAREFULLY BEFORE SIGNING INSPECTION CARD			
DATE	BY	DATE	BY

### If Maintenance Is Required

- Immediately report any safety shower that does not meet the above standards to your supervisor.
- Any required modifications, repair, and/or maintenance on shower equipment should be on a high priority basis.
- Following repairs or modifications, recertify the safety shower by following the above steps for annual inspection.
- Units that fail testing must be repaired immediately. If deficiencies cannot be immediately corrected, the lab supervisor or principal investigator (PI) must be notified and the unit must be tagged "DO NOT USE."

