INDIANA UNIVERSITY

Laboratory Safety Guideline

Emergency Eyewash and Safety Showers

Introduction

The purpose of this program is to ensure that all safety eyewashes and showers supply clean, potable water and are in proper working order. This program describes procedures for emergency use; selection, installation and placement; guidelines for activation, inspection, testing and maintenance of emergency eyewash and shower equipment.

This program applies to all emergency eyewash and shower units in university buildings. Annual flow rate testing will be conducted by facility personnel or others and weekly sanitation testing is performed by the workplace personnel.

The Occupational Safety and Health Administration (OSHA) regulation that applies to emergency eyewashes and safety showers is applicable to all facilities that require this equipment as a form of first aid. This regulation (29 CFR 1910.151 (c), Medical Services and First Aid) states that:

> "Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use."

This regulation specifies where and when emergency eye wash and shower equipment must be available. These regulations do not specify minimum operating requirements, installation requirements, or maintenance requirements.

The American National Standards Institute (ANSI) standard Z358.1-1990 (revised in 2004), "Emergency Eye Wash and Shower Equipment" provides guidance for selecting, installation, operation and maintenance of this equipment to meet OSHA requirements.

Definitions

- Emergency Shower: a unit that cascades water over the whole body.
- Eyewash: A unit that flushes water specifically to the eyes.
- Eye/Face Wash: An eye/face wash is capable of flushing both the eyes and the face.
- Drench Hose: Hand-held units that are intended to supplement existing shower and eyewash units (but do not replace them).
- Combination Units or Safety Stations: Units that consist of both the emergency shower and an eye/face wash.
- Hands-Free or Stay-Open Valve: A valve that opens and closes the water supply to the emergency units and stays open until it is manually turned off.

Emergency Procedures

<u>Eyewashes, Drench Hoses, and Eyewash/Facewash Units</u>

- Assist the victim to get to the eyewash. Sight may be impaired.
- Activate the unit using the hands-free valve.
- Hold the eyelids open with the fingers if necessary.
- Place the eyes in the stream of water.
- Flush for 15 minutes.
- Get medical attention.

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Emergency Showers and Drench Hoses

- Assist the victim to the shower. Do not let them slip and fall.
- Activate the unit using the hands-free valve.
- Put modesty aside. Remove contaminated clothing first if possible. (Rinsing contaminated clothing will wash chemicals out of the clothing and onto the skin). If this is not possible, remove contaminated clothing during the flushing process.
- Flush for 15 minutes.
- Get medical attention.

Notes

1. Assist the victim with procedures. Shield them using fire blankets if necessary. Provide alternative clothing (lab coats, hospital scrubs, fire blankets can be used as necessary).
2. The contaminated water from a deluge shower or eyewash is very dilute. Use standard housekeeping precautions when cleaning the area.
3. Drains are not installed under emergency showers intentionally. Sanitary sewer drains from any fixture (floor drains, sinks, etc.) have an S-trap that contains a small amount of water to prevent sewer gas from entering the buildings. Because of the infrequent use of an emergency shower, drains under emergency showers will go dry and allow sewer gas into the building. If one is present, pour some water down the drain at regular intervals.

Application and Installation

Because the eyes provide a rapid route of entry into the body, emergency eyewash and shower units should be installed in work areas where there is a potential for exposure to the skin or eyes with any hazardous chemical (in addition to corrosives). The OSHA definition of a hazardous chemical includes:

- Carcinogens
- Toxic and highly toxic agents
- Reproductive toxins
- Irritants
- Corrosives
- Sensitizers
- Hepatotoxins
- Nephrotoxins
- Neurotoxins
- Agents which act on the hematopoietic system.
- Agents which damage the lungs, skin, eyes, or mucous membranes.

Equipment Selection

Equipment selection should be based upon the hazard. Consider the population, the frequency of activities, the nature of the activities, particulates, and the chemicals used. In general:

- Full sized showers and eyewash stations should be used in active workplaces with daily activities generating particulates or using high hazard chemicals (i.e. large quantities and concentrated hazardous chemicals).
- Dual purpose drench hose and eyewash installations should be used in moderately hazardous areas with daily or less frequent activities (i.e. smaller quantities and dilute solutions or less hazardous chemicals).
- Faucet mounted eyewashes and drench hoses should be used in low hazard workplaces with infrequent activities (i.e. small quantities or low hazard chemicals).

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- Single nozzle drench hoses are intended to supplement the exiting eyewash and shower facilities and are not considered a substitute in place of suitable eye and body wash equipment.

Gravity fed or squirt bottle eyewash stations should only be considered for field work or temporary installations where they will be replaced by plumbed fixtures. Eyewash solutions must be changed according to the manufacturers recommendations.

Location and Placement

The emergency eyewash and shower unit must be placed in a location no more than a maximum of 10 seconds travel time for an injured person through an unobstructed pathway. All safety equipment should be located in a low hazard area of the workplace typically near the exit away from higher hazard activities.

Specific placement requirements are listed below:

- **Eyewash and eye/face wash units:** Nozzles must be positioned between 33-45 inches from the floor. A minimum distance of 6 inches from the nearest obstruction is required.
- **Drench hose units:** The head of the hose must be placed 33-45 inches from the floor with a clearance of 6 inches from the wall.

  Dual purpose bench mounted eyewash/drench hose units should be positioned toward the front of the bench so that the user can bend over and place their eyes in the water stream in a hands-free fashion without straining to reach the back of the bench.
- **Emergency Showers:** The distance of showerhead to the floor must be between 82-96 inches. Activator handle height must be no higher than 69 inches from the floor. Also showers must have a clearance of 48 inches along the side and 30 inches across (creating a surface area of 10 square feet around the shower unit).
- **Combination Units or Safety Stations:** Refer to the dimensions above for distance and clearance of the eye/face wash and shower units.

Eye wash and shower units must be completely free from obstructions or other potential hazards such as chemical bottles that could be tipped over while locating the eyewash with impaired vision.

Do not place or store any items under or near eyewash and shower stations. No electrical devices may be placed or stored near emergency eye wash and shower locations. Use stenciled floor signs that state “Keep Area Clear” and warning tape to demarcate the area on the floor or bench top as necessary.

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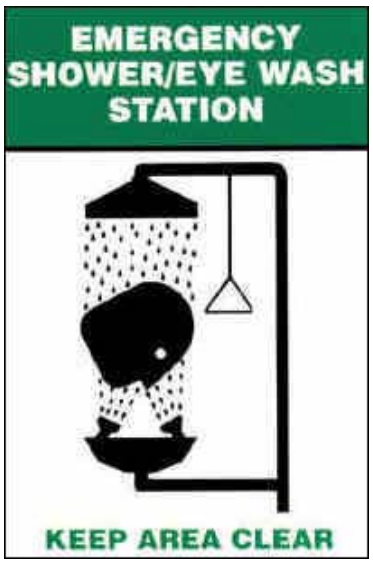
Signage

The location of all emergency equipment must be identified with a highly visible sign. Signs must be conspicuously posted using universal symbols or text that describes the installed equipment appropriately.



Activation and Test Procedures

It is important to understand that "testing" and "activation or flushing" are different procedures that occur at different intervals. The ANSI standard recommends weekly activations and annual flow testing for both eyewash and safety showers. Because of the difficulty of activating some installations weekly activations are sufficient however more frequent activations are recommended to maintain clean water in the units. Daily activations of some units are easy to perform upon entering the workplace each day.

Eyewashes and Dual-Purpose Eyewash/Drench Hoses

Weekly Activation:

Weekly flush tests are conducted by the laboratory or workplace personnel. Some equipment may require buckets or tubs necessary to collect the flushed water.

1. **Visual inspection of the unit:**
   a. Look for corrosion, leaks, or pipe damage and proper placement of protective covers. This should be done prior to activation in order to avoid risk of injury, damage to the unit, or creating a spill.
   b. Ensure that the unit is clean and free of any nearby obstructions.
   c. Verify that your eyewash has been tested annually on the log or hang tag on the unit, or with the building manager.
2. **Activate unit:** Ensure that the water flow is continuous, evaluate that the unit can maintain flow for 15 minutes, and is not injurious to the user's eye or face. Valve activator handle must activate water flow in one second or less.

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a. Valve activator must stay on unless manually turned off and must activate water flow in one second or less.
b. If the eye wash station has protective caps, make sure they pop off automatically when the eye wash is turned on. Return the caps to the proper position after flushing.
c. For eye and face wash units, controlled flow must be provided to both eyes simultaneously. Uneven flow to one eye or the other indicates a malfunction or simple blockage of the filters underneath the spray cap (remove and rinse filters or report malfunction for maintenance).
d. Observe the flow. The unit must be capable of delivering not less than 0.4 gallons per minute of flushing fluid for 15 minutes (report low or high flow for maintenance).

3. **Sanitize water supply through flushing:** Activate or flush the unit until the water runs clear to discharge rust, bacteria, or other contaminants.
4. **Documentation:** Keep an eye wash test record or log in your laboratory. Record the activation flushings in your record book or posted on the wall near the eyewash.

Annual Flow Test:

Annual flow tests will be conducted by facility or safety personnel depending on the department policy and requires specialized equipment to conduct the test.

1. **Flow rate of the device will be conducted *annually:*** Following established procedures let the water run for one minute to collect at least 1.5 liters (0.4 gallon) of water.
2. **Documentation:** Ensure an appropriate tag is on unit and document test with dates and initials on the unit tag after test.

<u>Eyewash/Facewash Units & Single Nozzle Drench Hoses</u>

Weekly Activation:

Weekly flush tests are conducted by the laboratory or workplace personnel. Some equipment may require buckets or tubs necessary to collect the flushed water.

5. **Visual inspection of the unit:**
   d. Look for corrosion, leaks, or pipe damage and proper placement of protective covers. This should be done prior to activation in order to avoid risk of injury, damage to the unit, or creating a spill.
   e. Ensure that the unit is clean and free of any nearby obstructions.
   f. Verify that your eyewash has been tested annually on the log or hang tag on the unit, or with the building manager.
6. **Activate unit:** Ensure that the water flow is continuous, evaluate that the unit can maintain flow for 15 minutes, and is not injurious to the user's eye or face. Valve activator handle must activate water flow in one second or less.
   e. Valve activator must stay on unless manually turned off and must activate water flow in one second or less.

Emergency Eyewash and Safety Showers

f. If the eye wash station has protective caps, make sure they pop off automatically when the eye wash is turned on. Return the caps to the proper position after flushing.

g. For eye and face wash units, controlled flow must be provided to both eyes simultaneously. Uneven flow to one eye or the other indicates a malfunction or simple blockage of the filters underneath the spray cap (remove and rinse filters or report malfunction for maintenance).

h. Observe the flow. The unit must be capable of delivering not less than 0.4 gallons per minute of flushing fluid for 15 minutes (report low or high flow for maintenance).

7. **Sanitize water supply through flushing:** Activate or flush the unit until the water runs clear to discharge rust, bacteria, or other contaminants.

8. **Documentation:** Keep an eye wash test record or log in your laboratory. Record the activation flushings in your record book or posted on the wall near the eyewash.

Annual Flow Test:

Annual flow tests will be conducted by facility or safety personnel depending on the department policy and requires specialized equipment to conduct the test.

3. **Flow rate of the device will be conducted *annually:*** Following established procedures let the water run for one minute to collect at least 11.4 liters (3.0 gallons) for an eye/face wash unit or single nozzle drench hose.

4. **Documentation:** Ensure an appropriate tag is on unit and document test with dates and initials on the unit tag after test.

Emergency Showers

Weekly Activation:

Weekly flush tests can be conducted by the laboratory or workplace occupants. Some equipment may require buckets or tubs necessary to collect the flushed water.

1. **Visual inspection of the unit:**
   a. Look for corrosion, leaks, or pipe damage and proper placement of protective covers. This should be done prior to activation in order to avoid risk of injury, damage to the unit, or creating a spill.
   b. Ensure that the unit is clean and free of any nearby obstructions.
   c. Verify that your eyewash has been tested annually on the log or hang tag on the unit, or with the building manager.

2. **Activate unit:** Ensure that the water flow is continuous, evaluate that the unit can maintain flow for 15 minutes.
   a. Valve activator must stay on unless manually turned off and must activate water flow in one second or less.
   b. Observe the flow. The unit must be capable of delivering not less than 20 gallons per minute (report low or high flow for maintenance).

3. **Sanitize water supply through flushing:** Activate or flush the unit until the water runs clear to discharge rust, bacteria, or other contaminants.

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4. **Documentation:** Keep an emergency shower test record or log in your laboratory. Record the activation flushings in your record book or posted on the wall.

Annual Flow Test:

Annual flow tests will be conducted by facility or safety personnel depending on the department policy and requires specialized equipment to conduct the test.

1. **Flow rate of the device will be conducted *annually:*** Following established procedures let the water run for one minute to collect at least 75.5 liters (20 gallon) of water.
2. **Documentation:** Ensure an appropriate tag is on all units and document test with dates and initials on unit tag after test.

Eyewash & Shower Safety Stations

1. **Visual inspection of the unit:** Conduct a separate inspection of the emergency shower and the eye/face wash units.
2. **Weekly activation and annual flow testing:** To activate and test safety stations apply procedures above for each component (eyewash and shower) of the safety station separately.
3. **Documentation:** Single documentation will apply to the eyewash and shower combination units.

Test Failures, Malfunctions, and Deficiencies

Corrective actions must be performed when deficiencies are noted by any personnel at any time.

Malfunctions or deficiencies noted during weekly activations, inspections, or normal daily activities must be reported immediately. Inform the supervisor. They will notify the facility manager to initiate the repair work order.

If use of the equipment is not possible tag the unit “DO NOT USE”. The supervisor must notify the facility manager for repair or replacement.

Annual test failures must be corrected immediately. Malfunctions will be reported to supervisors and facility managers who will submit a work order for repair.

Training

Employees receive training during laboratory and chemical safety training on the proper procedure for eyewash and shower use during an emergency.

Training to perform weekly activations and maintain minimum performance requirements for eyewash and shower equipments is provided during annual testing or safety inspections in the lab or workplace.

References

Medical Services and First Aid, Title 29, Code of Federal Regulations, Part 1910.151 (c), (29 CFR 1910.151(c)).

Emergency Eye Wash and Shower Equipment, American National Standards Institute (ANSI) standard Z358.1-1990 (revised in 2004).

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