

1. Introduction

The Environmental Health & Safety Program for Emergency Eyewash and Shower Equipment was developed by the Industrial Hygiene Group of the Environmental Health & Safety Department, Texas A&M University at College Station in compliance with the American National Standards Institute (ANSI), Z358.1-2004 to ensure proper operation in the event of an incident.

2. Purpose

The purpose of this program is to outline the requirements for the installation, inspection, use and maintenance of Emergency Eyewash and Emergency Shower Equipment.

3. Scope

This program applies to all laboratories and auxiliary spaces serving as laboratories that are on Texas A&M University's campus (throughout Brazos County)

4. 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.

5. Responsibilities

5.1 Laboratory Supervisor

- Ensure that the necessary emergency eyewash and shower equipment are located on the same level as the hazards.
- 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 physical plant/area maintenance for immediate repair, modification or installation of eyewash/shower equipment.
- Inform EH&S before removing any emergency eyewash/shower equipment from the laboratory.

5.2 Building Proctor / Safety Officer

- Ensure that pertinent supervisors, employees, and students are notified of their responsibilities as outlined in this Standard Operating Procedure.
- Ensure that all employees and students have received instruction regarding operation and maintenance of emergency eyewash and shower equipment.
- Coordinate with the physical plant and EH&S for inspection, modification, repair, maintenance, and installation of emergency shower and eyewash units, as necessary.

5.3 Area Maintenance / Physical Plant

- Perform immediate modifications, repair, maintenance, and installation of emergency eyewash and shower equipment as required.
- Assist EH&S in annual inspection of shower and eyewash equipment, as requested.
- Inform EH&S after installation, repair, and modification of eyewash and/or shower equipment so that EH&S can inspect/re-inspect the units in order to certify.

5.4 Environmental Health and Safety

- Ensure that each department is aware of their responsibilities under this program.
- Review this program periodically and amend as necessary.
- Maintain an updated inventory of emergency eyewash and safety shower units.

- Assist facilities planning and construction, physical plant, and departments with building plan review and selection from a list of recommended units during new construction or major renovation.
- Provide assistance, necessary equipments and inspection tags required to test emergency eyewash/shower equipment as required by departments.
- Conduct annual inspection to ensure that the emergency eyewash and shower equipment is functioning properly.
- Monitor that the provided emergency eyewash station weekly activation log is maintained by each laboratory.
- Provide a list of ANSI recommended emergency eyewash and safety shower equipment to the laboratory supervisor and/or building proctor in order to guide them in purchasing approved equipment.

6. Selection criteria

All emergency eyewash stations and safety showers must comply with American National Standard Institute (ANSI), Z358.1-2004.

6.1 Safety Shower

6.1.1 ANSI requires that a means shall be provided to ensure controlled flow of flushing fluid at a velocity low enough to be non-injurious to the user.

6.1.2 The safety shower equipment shall be designed so that it can be activated in 1 second or less, and it remains operational without user assistance (stay-open valve) until intentionally closed.

6.1.3 The shower equipment shall be capable of delivering flushing fluid at a minimum volume of 75.7 liters per minute (20 gpm) for at least 15 minutes.

6.1.4 The spray pattern of the shower shall have a minimum diameter of at least 50.8 cm (20 in.) at 152.4 cm (60 inches) above the surface on which the user stands.

6.1 Emergency Eyewash

6.1.1 ANSI requires that a means shall be provided to ensure controlled flow of flushing fluid at a velocity low enough to be non-injurious to the user.

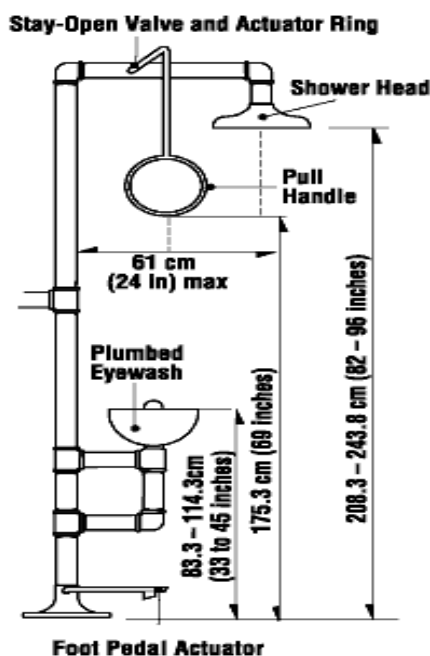


Fig. Plumbed eyewash and shower diagram



Fig. Emergency Eyewash Unit

6.1.2 The emergency eyewash unit shall be designed so that it can be activated in 1 second or less, and once activated; it remains operational without requiring the use of operator's hand until intentionally closed.



Fig. Emergency shower

6.1.5 The center of the spray pattern shall be located at least 40.6 cm (16 in.) from any obstruction.

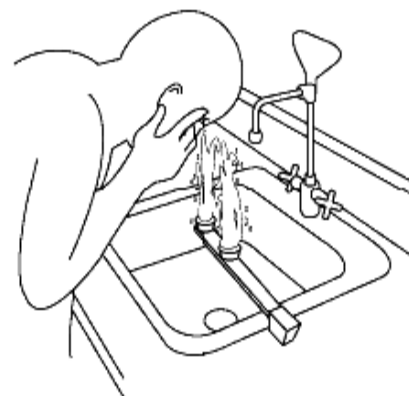


Fig. Emergency Eyewash Unit

6.1.3 The eyewash equipment shall be capable of delivering fluid to both eyes simultaneously at a volume of not less than 1.5 liters per minute (0.4 gpm) for minimum 15 minutes.

6.2 Drench Hose

Drench hoses are considered to be secondary to emergency eyewash and shower equipment. Monocular and dual-head drench hoses do not meet ANSI standards for emergency eyewash or safety shower as because they are not hands free. Therefore, having a drench hose does not replace the need for an emergency eyewash/safety shower.



Fig. Hand-held drench hose

Drench hoses may be used to "spot" rinse an area when a full shower is not required, to assist a victim when the victim is unable to stand or is unconscious, or to wash under a piece of clothing before the clothing is removed.

6.3 Water Temperature

The ANSI Z358.1-2004 recommends that the flushing fluid shall be "tepid". However, ANSI provides a guideline that the flushing fluid temperature in the range of 27°C-35°C (80°F - 95°F) is considered suitable.

6.5 Privacy consideration

Normal showers should not be used in-lieu of an emergency shower for drenching and removing chemicals. Shower enclosure, if used, shall provide at least 86.4 cm (34 in.) in diameter of unobstructed area inside.

7. Installation

7.1 Emergency Shower

7.1.1 It is the installer's responsibility to ensure that all safety shower units are assembled and installed in compliance with ANSI Z358.1-2004 and the manufacturer's instructions.

7.1.2 All laboratories, newly constructed or renovated, or any room used for similar purposes wherein corrosives, flammable liquids, toxins, bio-hazardous wastes, or radiological materials are handled as well as other work-areas where hazardous materials are used; such as mechanical rooms, pH neutralization systems, battery charging areas, spraying operations, and high dust areas shall have a safety shower for emergency use.

7.1.3 The shower location shall be identified with highly visible signs. The sign shall be visible within the area served by the shower and shall consist of symbols that require users to have any language skill to understand.



Fig. Safety Shower Sign

7.1.4 The shower shall be designed and installed so that the flushing fluid column is between 208.3 cm (82 in.) and 243.8 cm (96 in.) in height from the surface on which the user stands.

7.1.5 Safety shower shall be in accessible location requiring no more than 10 seconds to

reach. It shall be positioned no more than 55 feet from the furthest corner of the room.

7.1.6 The shower unit shall be located on the same level as the hazard. The location area shall be well-lit and the path shall be unobstructed.

7.1.7 Safety shower shall deliver tepid flushing fluid. The equipment shall be protected from freezing or freeze-protected equipment shall be installed, as necessary.

7.1.8 If shut off valves are installed in the supply line for maintenance purposes, provisions shall be made to prevent unauthorized shut off.

7.2 Emergency Eyewash

7.2.1 It is the installer's responsibility to ensure that all emergency eyewash units are assembled and installed in compliance with ANSI Z358.1-2004 and the manufacturer's instructions.

7.2.2 All laboratories, newly constructed or renovated, or any room used for similar purposes wherein corrosives, flammable liquids, toxins, bio-hazardous wastes, or radiological materials are handled as well as other work-areas where hazardous materials are used; such as mechanical rooms, pH neutralization systems, battery charging areas, spraying operations, and high dust areas must have a hands-free eyewash unit.

7.2.3 Emergency eyewash units shall be in accessible locations requiring no more than 10 seconds to reach. It shall be positioned no more than 55 feet from the furthest corner of the room.

7.2.4 The eyewash unit shall be positioned with the flushing fluid nozzle between 83.8 cm (33 in.) and 114.3 cm (45 in.) in height from the surface on which the user stands, and a minimum of 15.3 cm (6 in.) from the wall or nearest obstruction.

7.2.5 The location area shall be well-lit and the path shall be free of obstructions.

7.2.6 Emergency eyewash unit shall be located in an area identified with highly visible signs. The sign shall be visible within the area served by the

eyewash unit and shall consists of symbols that require users to have any language skill to understand.



Fig. Emergency Eyewash Sign

7.2.7 The eyewash unit shall be located on the same level as the hazard. The ANSI Z358.1-2004 requires that the eyewash unit should be located immediately adjacent to the hazard in case of handling strong acid or alkali.

7.2.8 The eyewash unit shall deliver tepid flushing fluid. The equipment shall be protected from freezing or freeze-protected equipment shall be installed, as necessary.

7.2.9 If shut off valves are installed in the supply line for maintenance purpose, provisions shall be made to prevent unauthorized shut off.

8. Inspection Procedure:

8.1 Emergency Eyewash Equipment

Environmental Health & Safety (EHS) expects weekly flushing of emergency eyewash units in compliance with the ANSI Z358.2004 by the laboratories. Weekly check cards will be provided to the laboratories (one card per eyewash). Verification of weekly flushing and distribution of a new annual check card will be conducted by EHS laboratory inspection staff during the annual laboratory inspection process. If units are not being checked weekly by laboratory staff, EHS inspectors will record this as a Deficiency on the Laboratory Inspection Report.

8.1.1 Method

Respective laboratory personnel shall follow the same method as outlined in this "Standard Operating Procedure" for weekly activation of emergency eyewash units situated in their laboratory.

Before activating the eyewash unit, check if the unit is connected to any types of drainage system. Apply appropriate water collection method as necessary. A plastic cup, a strong zip-lock bag, or a small bucket may be used depending on the design of the eyewash unit.

8.1.1.1 Turn the valve on to full open position (activation of the unit). The eyewash nozzles shall have a dust protecting cover, which shall be automatically removed upon activation of the unit.

8.1.1.2 Verify that the eyewash unit opens within one second of opening the valve and it remains open without operator's further assistance (stay-open valve) until intentionally closed.

8.1.1.3 The emergency eyewash unit shall provide flushing fluid to both eyes simultaneously. The flushing streams shall rise to approximately equal heights on both sides.

8.1.1.4 Record the test as passes or failed, sign and date the inspection tag. Dry the eyewash sink and floor using a sponge.

8.1.4 Performance Evaluation:

Emergency eyewash equipment will pass EHS's annual inspection, if all of the following criteria are met.

8.1.4.1 The unit shall be hands-free (stay-open valve); once activated; it can be used without the use of operator's hands until intentionally closed.

8.1.4.2 The valve shall be simple to operate and shall go from "off" to "on" position in 1 second or less.

8.1.4.3 It shall not take more than 1 second to open the unit once the valve is full open.

8.1.4.4 Operator shall not require a separate motion to remove the dust protection cover of the eyewash unit.

8.1.4.5 The unit shall be capable of delivering a minimum of 1.5 liter/minute (0.4 gpm) of flushing fluid for at least 15 minutes.

8.1.4.6 The unit shall deliver flushing fluid to both eyes simultaneously at a velocity low enough to be non-injurious to the user.

8.1.4.7 The flushing fluid temperature shall be tepid. Temperature in the range of 27-35°C (about 80-95°F) is considered suitable.

9. Maintenance, Repair and Training

9.1 Emergency eyewash unit shall be activated weekly for a period long enough to verify operation and ensure that flushing fluid is available. Weekly activation prevents sediment build-up within the eyewash unit and minimizes microbial contamination in the stagnant water.

9.2 It is department's responsibility to ensure that emergency eyewash and safety shower equipment that does not pass inspection is repaired immediately.

9.3 Whenever an emergency eyewash or safety shower is non-functional, immediately contact the physical plant to fix it. Do not handle hazardous materials in that work-area until the unit is returned to proper service.



TEXAS A&M UNIVERSITY
Environmental Health & Safety
EMERGENCY EYEWASH STATION
Weekly Activation Log

- ANSI Z358.1-2004 (American National Standard Institute) requires that all emergency eyewash stations should be activated weekly for at least 5 minutes.
- Ensure unobstructed access to the eyewash/safety shower so that it requires no more than 10 seconds to reach.
- Having a hand-held drench hose does not replace the need for an emergency eyewash station or safety shower.

Week	Date	Initial	Week	Date	Initial
Week 01			Week 27		
Week 02			Week 28		
Week 03			Week 29		
Week 04			Week 30		
Week 05			Week 31		
Week 06			Week 32		
Week 07			Week 33		
Week 08			Week 34		
Week 09			Week 35		
Week 10			Week 36		
Week 11			Week 37		
Week 12			Week 38		
Week 13			Week 39		
Week 14			Week 40		
Week 15			Week 41		
Week 16			Week 42		
Week 17			Week 43		
Week 18			Week 44		
Week 19			Week 45		
Week 20			Week 46		
Week 21			Week 47		
Week 22			Week 48		
Week 23			Week 49		
Week 24			Week 50		
Week 25			Week 51		
Week 26			Week 52		

Fig- Weekly Eyewash Activation log



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9.4 Any party removing emergency eyewash or safety shower equipment from service, must notify EH&S and the affected department beforehand.

9.5 Individuals who may be exposed to hazardous materials shall be instructed in the location and proper use of emergency eyewash and safety shower equipment.

9.6 The ANSI Z358.1-2004 requires that all emergency eyewash and safety shower equipments shall be inspected annually.

10. Reference:

- 1.American National Standard Institute, ANSI Z358.1-2004, American National Standard for Emergency Eyewash and Shower Equipment, January 8, 2004.
- 2.Occupational Safety & Health Administration [OSHA] 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories.