



West Texas A&M University™

ACADEMIC RESEARCH ENVIRONMENTAL HEALTH AND SAFETY

STANDARD OPERATING PROCEDURES

SOP No. 24.01.01.W1.38AR WTAMU Emergency Eyewash and Shower Equipment Procedure

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Environmental Health and Safety at WTAMU is composed of two distinct but integrated environmental safety departments that report to the Vice President of Research and Compliance. Academic and Research Environmental Health and Safety (AR-EHS) is responsible for research and academic related compliance, which includes laboratory and academic research and the associated compliance committees. Fire and Life Safety (FLS-EHS) is responsible for fire related compliance and conducts fire and life safety inspections of campus buildings and assists with the testing of all fire detection and suppression systems.

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1. Purpose

This Standard Operating Procedure outlines the requirements for the installation, inspection, use, and maintenance of Emergency Eyewash and Emergency Shower Equipment.

2. Scope

Environmental Health and Safety (EHS) will provide emergency showers and/or eyewash stations wherever mandated by rule, regulation or consensus standards, or whenever a hazard assessment determines areas where corrosive materials or infectious agents are present, or where there is a reasonable probability of injury to the eyes or skin occurring as a result of exposure to hazardous chemicals or materials.

3. Operations/Departments Affected

This program applies to all plumbed and non-plumbed emergency eyewash and emergency shower equipment located in all academic and research facilities.

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 maintenance for immediate repair, modification, or installation of eyewash/shower equipment.
- Inform EHS before removing any emergency eyewash or shower equipment from the laboratory.
- Ensure that all personnel receive instruction regarding operation and maintenance of emergency eyewash and shower equipment which is included in the Hazard Communication Laboratory Safety Training.
- Notifying EHS staff of changes in work areas or work processes and practices that require a Hazard Assessment (**Appendix A**) to evaluate the need for new installations, or for the removal of existing emergency eyewashes or showers.

5.2 Environmental Health & Safety

- Ensure that supervisors, employees, and students are notified of their responsibilities as outlined in this Standard Operating Procedure.
- Coordinate with physical plant for inspection, modification, repair, maintenance, and installation of emergency shower and eyewash units, as necessary.
- Ensure that each department is aware of their responsibilities under this program.
- Maintain an updated inventory of emergency eyewash and safety shower units.
- 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 logs required to test emergency eyewash and shower equipment as required by the 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.
- Providing technical assistance to Physical Plant and other personnel in the selection, installation, maintenance, and testing of emergency eyewashes and showers.
- Conducting periodic reviews of all elements of the emergency eyewash and shower program.

5.3 Physical Plant Maintenance

- Perform immediate modifications, repairs, maintenance, and installation of emergency eyewash and shower equipment as required.
- Inform EHS after installation, repair, and modification of eyewash and/or shower equipment so that EHS can inspect/re-inspect the units.
- Executes all work orders for the installation or repair of emergency eyewash and shower equipment on a high priority basis.
- Testing 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 area supervisor must be notified and the unit must be tagged "DO NOT USE". The area supervisor must notify all affected employees and EHS when emergency equipment is out of service. A portable unit may be temporarily required to meet the need for an emergency eyewash and shower.

6. Selection Criteria

6.1 Hazard Assessment

- A hazard assessment (**Appendix A**) will be performed in areas of the facility when:
 - (1) An interpretation of code, guideline, or standard is needed;
 - (2) Reviewing project specifications for all new construction and renovation projects to determine the need for eyewash and shower units, including proper selection and installation;
 - ❖ All new laboratory facilities on campus must include eye wash and safety shower in the design.
 - (3) Workplace conditions change; **every time they change.**
- All unapproved eyewashes and showers must be replaced with ANSI-approved units during renovation projects.
- Only the American National Standards Institute (ANSI)-approved emergency eyewashes, showers, and drenching equipment may be purchased and installed in accordance with the manufacturer's specification to maintain the ANSI approval.
- Selection of the emergency eyewashes and equipment must be approved by EHS staff.

6.2 Safety Showers

- 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 (Figure 1).
- 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.
- 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.
- The spray pattern of the shower shall have a minimum diameter of at least 50.8 cm (20 in.) at 152.4 cm (60 in.) above the surface on which the user stands (Figure 2).
- The center of the spray pattern shall be located at least 40.6 cm (16 in.) from any obstruction.



Figure 1. Emergency Shower

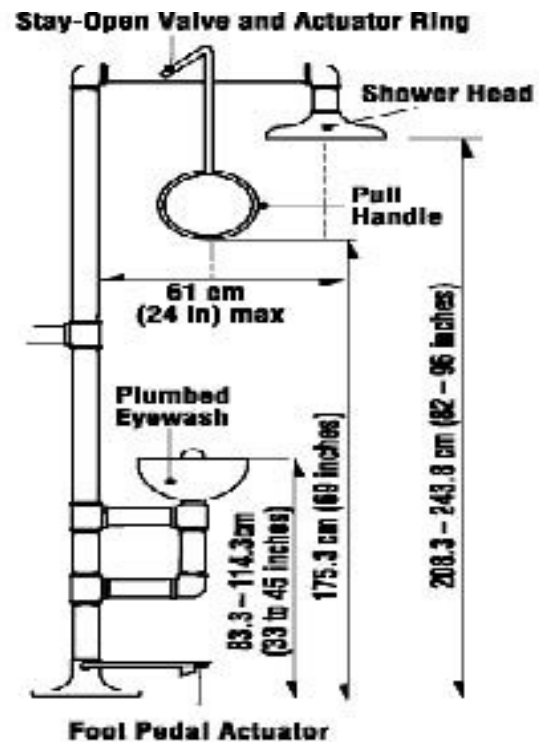
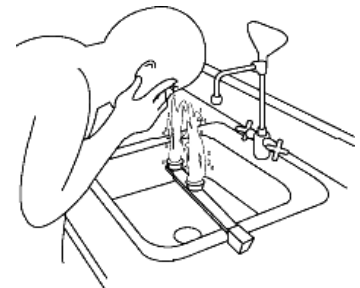


Figure 2. Plumbed eyewash and shower diagram

6.3 Emergency Eyewashes

- 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.
- 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.
- 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 a minimum of 15 minutes. (Figure 3 and 4)



Figures 3 and 4. Emergency Eyewash Unit

6.4 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 because they are not hands free. Therefore, having a drench hose does not replace the need for an emergency eyewash/safety shower (Figure 5).
- 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.



Figure 5. Hand Held Drench Hose

6.5 Gravity-Feed Eye Wash Stations

Devices which contain its own flushing liquid must be replaced or refilled after use and maintained according to the manufacturer's instructions. It should contain enough fluid for 15 minutes of continuous flow. Contact EHS to replenish any fluid lost in the test and replace any fluid which is beyond its expiration date (Figure 6).



Figure 6. Gravity-Feed Eyewash Unit

6.6 Water Temperature

The ANSI Z358.1-2009 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.

6.7 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

- It is the installer's responsibility to ensure that all safety shower units are assembled and installed in compliance with ANSI Z358.1-2009 and the manufacturer's instructions.
- 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.

- 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 so that all language speakers can understand (Figure 7).
- 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.
- The safety shower shall be in an 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.
- 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.
- The safety shower shall deliver tepid flushing fluid. The equipment shall be protected from freezing or freeze-protected equipment shall be installed, as necessary.
- If shut off valves are installed in the supply line for maintenance purposes, provisions shall be made to prevent unauthorized shutoff.



Figure 7. Safety Shower Sign

7.2 Emergency Eyewash

- It is the installer's responsibility to ensure that all emergency eyewash units are assembled and installed in compliance with ANSI Z358.1-2009 and the manufacturer's instructions.
- 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.
- 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.
- 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.
- The location area shall be well-lit and the walkway free of obstructions.
- 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 consist of symbols so that all language speakers can understand (Figure 8).
- The eyewash unit shall be located on the same level as the hazard. The ANSI Z358.1 requires that the eyewash unit should be located immediately adjacent to the hazard in case of handling strong acid or alkali.
- The eyewash unit shall deliver tepid flushing fluid. The equipment shall be protected from freezing or freeze-protected equipment shall be installed, as necessary.
- If shut off valves are installed in the supply line for maintenance purpose, provisions shall be made



Figure 8. Emergency Eyewash Sign

to prevent unauthorized shut off.

Inspection Procedures

8.1 Emergency Eyewash Equipment

Weekly flushing of emergency eyewash units in compliance with the ANSI Z358.1-2009 shall be conducted 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 regularly scheduled laboratory inspections. If units are not being checked weekly, EHS inspectors will record this as an unsatisfactory on the Laboratory Inspection Report.

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. The Safety office can provide any necessary testing equipment.

- (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.
- (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.
- (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.
- (4) Eyewash flushing for at least three minutes has been suggested to reduce bacterial and amoebic contamination. Acanthamoebae are commonly found in eyewashes and can cause severe eye infections when introduced into traumatized eyes.
- (5) Record the test as pass or fail, sign and date the inspection log. Dry the eyewash sink and floor using a sponge (**Appendix B**).

Performance Evaluation:

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

- 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.
- The valve shall be simple to operate and shall go from “off” to “on” position in 1 second or less.
- It shall not take more than 1 second to open the unit once the valve is full open.
- Operator shall not require a separate motion to remove the dust protection cover of the eyewash unit.
- The unit shall be capable of delivering a minimum of 1.5 liter/minute (0.4gpm) of flushing fluid for at least 15 minutes.
- The unit shall deliver flushing fluid to both eyes simultaneously at a velocity low enough to be non-injurious to the user.

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

8. Maintenance, Repair, and Training

- Emergency eyewash units 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.
- 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 Physical Plant or EHS.
- Whenever an emergency eyewash or safety shower is non-functional, immediately contact the EHS or Physical Plant to fix it. 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 EHS and 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.
- The ANSI Z358.1 requires that all emergency eyewash and safety shower equipment be inspected annually.

9. Training

West Texas A&M University Environmental Health and Safety will follow the Texas A&M University System Policy [33.05.02 Required Employee Training](#). Staff and faculty whose required training is delinquent more than 90 days will have their internet access terminated until all trainings are completed. Only Blackboard and Single Sign-on will be accessible. Internet access will be restored once training has been completed. Student workers whose required training is delinquent more than 90 days will need to be terminated by their manager through Student Employment.

10. Record Retention

No official state records may be destroyed without permission from the Texas State Library as outlined in [Texas Government Code, Section 441.187](#) and [13 Texas Administrative Code, Title 13, Part 1, Chapter 6, Subchapter A, Rule 6.7](#). The Texas State Library certifies Agency retention schedules as a means of granting permission to destroy official state records.

West Texas A&M University Records Retention Schedule is certified by the Texas State Library and Archives Commission. West Texas A&M University Environmental Health and Safety will follow [Texas A&M University Records Retention Schedule](#) as stated in the Standard Operating Procedure [61.99.01.W0.01 Records Management](#). All official state records (paper, microform, electronic, or any other media) must be retained for the minimum period designated.

11. References

- (1) American National Standard Institute, ANSI Z358.1-2009, American National Standard for Emergency Eyewash and Shower Equipment, September 14, 2009.
- (2) Occupational Safety & Health Administration [OSHA] 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemicals in Laboratories. (Recommended standard practices)
- (3) Department of Veterans Affairs, VHA Directive 2009-026, Location, Selection, Installation, Maintenance, and Testing of Emergency Eyewash and Shower Equipment.

EMERGENCY EYEWASH AND SAFETY SHOWER HAZARD ASSESSMENT FORM

IDENTIFICATION	
IDENTIFICATION NUMBER	PICTURE OR DIAGRAM (IF EXISTING)
LOCATION	
RESPONSIBLE SERVICE AREA	
ASSESSMENT DATE	
PRIMARY INVESTIGATION	

A. INVESTIGATION

1. CHEMICALS IN AREA	2. CONDITIONS OF USE
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B. RISK ASSESSMENT CODE (RAC)

<p>1. SEVERITY CLASSIFICATION</p> <p>Class I: Catastrophic-Marginal (may cause death or permanently disabling injury)</p> <p>Class II: Critical (may cause severe injury or severe occupational illness)</p> <p>Class III: Marginal (may cause minor occupational injury or illness)</p> <p>Class IV: Negligible (probably would not affect personal safety or health)</p>	<p>2. PROBABILITY ESTIMATE</p> <p>Estimate A: Likely to occur immediately</p> <p>Estimate B: Probably will occur in time</p> <p>Estimate C: May occur in time</p> <p>Estimate D: Unlikely to occur</p>
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3. RAC DETERMINATION		Probability Estimate			
		A	B	C	D
Severity Class	I	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	6

C. FINDING

REQUIRED	OPTIONAL	NOT REQUIRED
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IDENTIFICATION

Applicable Assessment Criteria Regulations/Consensus Standards/VA Directives/WTAMU Standard Operating Procedures

OSHA 1910.1048(i)(3): *If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, the employer shall provide acceptable eyewash facilities within the immediate work area for emergency use (Recommended Standard Practices).*

IDENTIFICATION

- OSHA 29 CFR 1910.151(c):** *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 providing within the work area for immediate emergency use (Recommended Standard Practices).*
- Center for Disease Control and Prevention, Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th Edition, 2007
- American National Standards Institute (ANSI) Z358.1-2009
- VA General Safety Guidebook
- VHA DIRECTIVE 2009-026, May 2009
- West Texas A&M University Standard Operating Procedure, Emergency Eyewash and Safety Shower, 03/2013

Surveyor Signature: _____

WTAMU ENVIRONMENTAL HEALTH AND SAFETY EMERGENCY EYEWASH INSPECTION LOG

Lab Name:				Primary Investigator:			
Lab Location:				Contact Number:			
Week	Date	Print Name	Signature	Week	Date	Print Name	Signature
1				21			
2				22			
3				23			
4				24			
5				25			
6				26			
7				27			
8				28			
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