EMERGENCY EYEWASH AND SAFETY SHOWER POLICY

National Institutes of Health (NIH) • Office of Research Services (ORS) • Division of Safety (DS)

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A. INTRODUCTION

Emergency eyewash and safety shower units are designed to deliver water to rinse contaminants from a user's eyes, face or body. As such, they are a form of safety equipment to be used in the event of an accident. They are not a substitute for personal protective equipment (including eye and face protection and protective clothing) or established safe procedures for handling hazardous materials.

B. PURPOSE

The standard operating procedure establishes NIH policy and prescribed procedures to comply with OSHA and ANSI Z358.1-2014 requirements associated with the installation, maintenance and use of emergency eye wash stations, drench units and safety shower operations. NIH employees should be familiar with the location and the use of the safety equipment.

C. SCOPE

It is the duty of each employee that uses hazardous materials to become familiar with the contents of this policy and use the appropriate personal protective equipment. Eyewash stations, and safety showers where appropriate, shall be provided in areas where employees may be exposed to hazardous materials that could cause injury. Employees should consult with the hazardous material's Safety Data Sheet (SDS) to determine if eyewash and safety showers are necessary.

OSHA 1910.151(c), states: *"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."*

Under ANSI Z358.1-2014, hazardous materials include caustics, as well as additional substances and compounds that have the capability of producing adverse effects on the health and safety of humans. This standard details more specific emergency equipment requirements and provides enforceable guidelines for OSHA to mandate upon inspection.

Per the ANSI standard, eyewash stations should be located on the same level as the hazard, in a well-lit area, properly marked as an emergency eyewash station. It must be positioned within 10 seconds (about 55 feet) of the hazard along a path that is free of obstructions. For guidance, acids with a pH less than 2.5 and alkalis with a pH greater than 11.0 require immediate flushing to prevent damage; emergency eyewash stations should be placed *adjacent* to the area where these strong caustics are being handled.

Drench hose units that are being used as eyewash/face wash units shall meet the requirements for eyewash/face wash units as established by the Standard.

All employees who may be exposed to hazardous, particulate, or corrosive materials shall be instructed by their supervisor(s) on the proper operation of eyewash, drench and emergency shower equipment, including awareness of the location(s) of flushing stations under their cognizance. Supervisors shall ensure site specific employee training includes awareness of safety and health hazards and measures to prevent injury or illness. Site-specific training should also include having employees "practice" walking to the eyewash station with the eyes covered.

Refer to NIH Policy 1407 for the use of emergency eyewash and safety shower equipment in classified areas of aseptic processing facilities.

D. RESPONSIBILITIES

Office of Research Facilities Development and Operations (ORF)

1. ORF shall be responsible for ensuring all facilities that require safety showers and eyewashes are maintained and supplied appropriately. Upon request, ORF shall ensure that plumbing (supply and drainage) for installed showers and eyewashes are maintained and properly functioning. Damaged or dysfunctional plumbing shall be repaired in a timely fashion to minimize impact on operations. As repairs and space renovations are made, safety showers and eyewashes will be brought into compliance with the most recent ANSI standard.

2. ORF shall be responsible for annual testing of showers and eyewashes; and weekly flushing of eyewashes and drench hoses, in ORF controlled spaces (*e.g.,* hallways, mechanical rooms, and spaces not leased to Institutes/Centers). Additionally, ORF shall provide support to the Institutes/Centers (ICs) to ensure that safety showers and eyewashes within IC controlled areas are flushed and inspected annually.

3. ORF shall address any maintenance requests related to the function of emergency flushing equipment in a timely manner.

Institutes/Centers

1. ICs shall be responsible for conducting weekly flushing of all eyewash stations and drench hose units within areas that they lease or control.

2. ICs shall be responsible for verifying that all annual testing of showers and eyewashes/drench hoses in areas under their control has been performed. When an IC representative determines that it has been more than one year since the last testing and inspection of a safety shower, they shall submit a maintenance request with ORF online or by calling the maintenance desk at 301-435-8000.

3. The ICs shall ensure that areas around safety shower, drench hoses and eyewash units are clear of laboratory hazards (i.e., chemical, radiological, or biological materials) that

could affect the person conducting the flushing or testing operation. The ICs shall also ensure that pathways to the eyewash station, drench hose and safety shower remain free of obstruction.

4. The ICs must inform maintenance personnel of known hazards that exist in the lab and proper safety precautions required to mitigate these hazards.

5. Eyewash stations, drench hoses, and safety showers shall be tested/flushed according to the schedule in the table below:

OPERATION	EYEWASH	DRENCH HOSE	SAFETY SHOWER
Annual Test	X	X	X
Weekly Flush	X	X	

ORF and Institutes/Centers

1. Responsibilities regarding the repair of existing, or placement of new/upgraded systems shall be as follows:
    a. The institute will provide the materials to repair or replace its system.
    b. ORF will provide the labor to affect the repairs or replacement.
2. Prior to procurement, the institute shall consult with ORF to ensure that repair equipment is compatible with the existing system; and that repair parts and replacement systems meet the current NIH Eyewash and Safety Shower Policy.

E. FLUSHING AND TESTING PROCEDURES

Eyewash, drench hose, and safety shower flushing/testing shall be conducted in accordance with the guidelines established in the Appendices.

F. RECORDKEEPING

The user (e.g. IC or ORF) shall maintain records of weekly flushing and annual testing conducted on eyewash stations, drench hose units, and safety showers. Recordkeeping shall include the initials of the person conducting the operation and date. Records shall include tags or an equivalent recordkeeping system (e.g., a logbook stored near the unit or a log sheet attached to the wall). Here is an example for the eye wash weekly inspection log.

G. REFERENCES

1. Occupational Safety and Health Administration- 29 CFR Part 1910.151(c), Medical services and first aid.

2. American National Standards Institute, Inc. ANSI Z358.1-2014. American National Standard for Emergency Eyewash and Shower Equipment.

APPENDIX A: WEEKLY EYEWASH/DRENCH HOSE INSPECTION PROCEDURES

1. Each eyewash and drench hose shall be activated to ensure proper operation of equipment and to flush standing water from within the system.

2. Activation should take enough time to ensure that the unit operates as designed, and flushing water is clear. Usually 3-5 minutes.

3. Inspect screens within spray heads and the caps on top of the heads to ensure no particulate has built up on the screens. Clean or replace screens as necessary.

4. During activation, check for leaks, obstruction of flow or any damaged parts. Replace parts as needed or contact manufacturer if equipment is not functioning properly.

5. If water is discolored, it shall be allowed to run until it flushes clean and there is no discoloration.

Eyewash units or drench hoses that do not function as designed shall be repaired as soon as possible or an alternate eyewash station shall be identified. Affected personnel shall be informed of the alternative location. Work with hazardous chemicals shall be halted until an alternate eyewash station is identified, the non-functioning eyewash has been repaired, or an interim measure (portable eyewash units) has been identified. Should this situation arise, consult with a representative from the Division of Safety.

6. Periodic inspection of eyewash units and drench hoses shall be recorded on tags attached to the unit. The tag shall indicate the date of the inspection and the initials of the individual conducting the inspection.

7. Periodic inspection is not to take the place of annual testing of units. See APPENDIX B for Annual testing procedures for eyewashes/drench hoses.

APPENDIX B. ANNUAL EMERGENCY EYEWASH/DRENCH HOSE TESTING

1. Annual testing of eyewash stations and drench hose units shall include all of the elements of the periodic flushing process.

2. Annual eyewash/drench hose testing shall ensure that the equipment meets the requirements set forth in APPENDIX D of this policy. Flow rate shall be measured to ensure that the unit provides 0.4 gallons per minute (at a minimum 30 psi) of flushing solution for a full 15 minutes. Drench hoses shall flow at a rate of 3.0 gallons per minute (GPM).

3. Testing should be conducted in compliance with protocols established by the equipment manufacturer.

4. Results of annual testing shall be recorded on the tag attached to the unit. The entry on the tag should indicate that the annual testing was performed. This marking should distinguish the testing from the periodic inspection. Additionally, a log of the test results should be maintained for one year or until the unit has been retested.

5. Eyewash stations and drench hose units that are not currently ANSI compliant should be inventoried. It is recommended that units that are determined to not meet the requirements of ANSI Z358.1-2014 be replaced as soon as reasonably feasible (e.g., during renovations to the lab space, or repairs to the eyewash station/drench hose).

6. ANSI compliant eyewash and/or drench hose units that do not pass an annual test shall be repaired as soon as possible or an alternate station shall be identified.

APPENDIX C: ANNUAL SAFETY SHOWER TESTING

1. Each safety shower shall be activated to ensure proper operation of equipment and to flush standing water from the system. If the water is discolored, it shall be allowed to run until it flushes clean and there is no discoloration.

2. During activation, check for leaks, obstruction of flow or any damaged parts. Replace parts as needed or contact manufacturer if equipment is not functioning properly.

3. Shower heads shall be checked to ensure water flow is uniform and there are no obstructions. If parts of the shower head are obstructed the head shall be cleaned or replaced as necessary to ensure proper flow.

4. Annual safety shower testing shall ensure that the equipment meets the requirements set forth in APPENDIX E of this policy. Flow rate shall be measured using a flow meter or other method to ensure a 20 GPM (at a minimum 30 psi) flow rate for 15 minutes.

5. Units that are determined to not meet the requirements of ANSI Z358.1-2014 shall be inventoried. It is recommended that these units be replaced or repaired as soon as feasible. If a shower is determined to be nonfunctional no work using corrosive or tissue damaging chemicals shall be conducted in the area until the unit has been repaired, replaced, or an alternate safety shower that complies with ANSI Z358.1-2014 has been identified and installed.

6. Testing should be conducted in compliance with protocols established by the equipment manufacturer.

7. Results of annual testing shall be recorded on the tag attached to the unit or in a similar log. The entry on the tag should indicate that the annual testing was performed. Additionally, a log of the test results should be maintained for one year or until the unit has been retested.

APPENDIX D: EMERGENCY EYEWASH/DRENCH HOSE INSTALLATION GUIDELINES

1. Eyewashes and drench hoses should be installed in accessible locations that require no more than 10 seconds to reach (equating to about 55 feet from the location of the hazardous area). In areas where highly hazardous material is present (e.g., strong acids), the eyewash should be placed immediately adjacent to the hazard.

2. Where the possibility of freezing conditions exists, equipment shall be protected from freezing or freeze-protected equipment shall be installed.

3. When possible, the unit should be connected to drain piping.

4. The eyewash station shall be well lit and have a highly visible sign positioned so it is identifiable in the area it serves.

5. Eyewashes and drench hoses (plumbed) should be positioned with the spray fluid pattern between 33 inches and 53 inches from the surface in which the user stands and minimum of 6 inches from the wall (this is in conjunction with the present plumbed laboratory eyewashes to faucet-mounted applications) or nearest obstruction. Ensure that user will have enough room to use hands to prop open eyelids during flushing operation.

6. Flushing outlets shall be protected from airborne contaminants.

7. Upon activation the water flow shall be adequate to flush both eyes/face. The velocity shall be low enough to be non-injurious to the user.

8. The water delivered through the outlets should be tepid. "Tepid" water is described in the ANSI standard as between 60 and 100°F. If an emergency wash provides water that is too hot or too cold, an injured worker may be exposed to additional serious injury:

    - If the water is too hot, the biological response is for pores in the skin to open, potentially causing increased contaminant absorption. Excessively hot water may also cause severe scalding and trigger an increased chemical reaction.
    - If the water is too cold, a worker exposed to hazardous material is unlikely to stay in the stream long enough for medically effective decontamination or may compound their chemical exposure with hypothermia.

9. The eyewash valve, upon activation, shall remain open without the use of the operator's hands until intentionally shut off. The valve mechanism must be fully operational within 1 second of activation.

10. Minimum flow requirement for eyewashes is 0.4 GPM for 15 minutes. For drench hose systems, the minimum flow rate is 3.0 GPM for 15 minutes.

11. Eyewash should activate in one second or less using a one-step activation process, and the flushing flow remains on without the use of the operator's hand. If drench hose units are going to be used for eye/face wash, they must meet the minimum standards for these devices set forth in the ANSI Standard.

APPENDIX E. SAFETY SHOWER INSTALLION GUIDELINES

1. Safety Showers should be installed in accessible locations that require no more than 10 seconds to reach (equating to about 55 feet from the location of the hazardous area).

2. Where the possibility of freezing conditions exists, equipment shall be protected from freezing or freeze-protected equipment shall be installed.

3. When possible, the unit should be connected to drain piping.

4. The emergency shower shall be well lit and have a highly visible sign positioned so it is identifiable in the area it serves

5. The face of the shower head shall not be less than 82" or more than 96" from the surface on which the user stands.

6. The spray pattern shall provide a column of water 20” wide at 60” above the surface on which the user stands.

7. The center of the spray pattern shall be at least 16 inches from any obstruction.

8. Shower pull-rod handle should be no more than 69 inches above the floor.

9. The water delivered through the outlets should be tepid. “Tepid” water is described in the ANSI standard as between 60 and 100°F. If an emergency wash provides water that is too hot or too cold, an injured worker may be exposed to additional serious injury:

    - If the water is too hot, the biological response is for pores in the skin to open, potentially causing increased contaminant absorption. Excessively hot water may also cause severe scalding and trigger an increased chemical reaction.
    - If the water is too cold, a worker exposed to hazardous material is unlikely to stay in the stream long enough for medically effective decontamination or may compound their chemical exposure with hypothermia.

10. Minimum flow requirement for a safety shower if plumbed is 20 GPM at 30 psi.

11. Shower should activate in one second or less using a one-step activation process, and the flushing flow remains on without the use of the operator’s hand.