

Emergency Eyewash and Drench Shower Program

1. Program 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 applies to all emergency eyewash and shower units in university buildings. Annual flow rate testing will be conducted by Environmental Health & Safety (EH&S) personnel or others.

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.

Massachusetts Uniform State Plumbing Code 248 CMR 10.00 states that: "The systems shall be required in every school, college, university, or building laboratory newly constructed or renovated, or any room used for similar purposes wherein: a. corrosive or flammable liquids are handled; b. chemicals are stored or used; or c. where open flame devices are used."

The American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) standard Z358.1-2009, "American National Standard for Emergency Eye Wash and Shower Equipment" provides guidance for selecting, installation, operation and maintenance of this equipment to meet OSHA requirements.

All reasonable efforts shall be made to meet the requirements specified in the most recent edition of the American National Standard for Emergency Eyewash and Shower Equipment (ANSI/ISEA, Z358.1) which is the widely accepted guideline for the design, performance, installation, use, and maintenance of emergency eyewashes and showers.

Emergency eyewashes and showers are not a substitute for the use of personal protective equipment (glasses, goggles, gloves, lab coats, etc.). Contact Environmental Health and Safety (EH&S) at: (413)545-2682, for additional information or assistance in determining areas where emergency eyewashes and showers are required.

2. Emergency Eyewash and Drench Shower Testing

EH&S assists in the development and maintenance of the campus program for emergency eyewashes and showers. EH&S assists campus personnel or units with the selection of emergency eyewashes and showers that meet the requirements of the campus program. EH&S verifies that emergency eyewashes and showers in a given area meet the requirements of this campus program during EH&S inspections. EH&S will be responsible for the testing of all drench showers

and eye washes on a semi-annual basis, submitting work orders to Physical Plant for drench showers and eye washes that need repair and for following up on all repairs. Section 4 describes EH&S testing procedure.

Emergency eyewashes should be activated weekly for a period long enough to verify operation and ensure that flushing fluid is available. Principal investigators are responsible for ensuring emergency eyewashes installed in their areas are flushed weekly by lab personnel. This helps clean out any rust, scale deposits, or bacteria that may accumulate. At a minimum, the weekly inspections should include the following:

- i) Water is clear;
- ii) The jets are working properly;
- iii) The area around the station is clear of obstruction;
- iv) There is a bucket located under the eyewash to collect the run off if necessary;
- v) No leaks.

The emergency eyewash station weekly inspection checklist is available online: <https://ehs.umass.edu/emergency-eyewash-station-weekly-inspection-checklist>. It should be indicated on the eyewash checklist with date and initials after weekly flushing,

3. Acceptable Parameters and Maintenance

All the following parameters are according to Massachusetts State Plumbing Code 248 CMR 10.00 and ANSI/ISEA Z358.1-2009.

Emergency Drench Shower:

- Minimum flow for Drench Showers is 20 GPM at 30 PSI
- Water temperature is in the range of 60-90 °F
- Units must be capable of delivering a minimum of 15 minutes of flushing fluid
- Drench Showers shall be capable of being activated in 1 second or less
- Stay open ball valves must be used to accommodate for hands-free rinsing
- Drench Shower pull-rod must be installed no more than 69" from the floor
- Drench Shower sprayhead must be positioned between 82"-96" from the floor
- Spray-pattern must be 20" in diameter at 60" above the floor.
- Center of spray pattern must be at least 16" away from any obstruction
- Combination Units must meet both criteria for Drench Showers & Eyewash

Emergency Eyewash Station:

- Minimum flow for plumbed and portable Eyewash units is 0.4 GPM at 30 PSI
- Water temperature is in the range of 60-90 °F
- Units must be capable of delivering a minimum of 15 minutes of flushing fluid
- Eyewash units shall be capable of being activated in 1 second or less
- Stay open ball valves must be used to accommodate for hands-free rinsing
- Flushing fluid must be provided to both eyes simultaneously

- Dust caps or dust covers must be installed to protect the unit from contaminants
- Sprayheads must be positioned between 33" and 45" from the floor
- Sprayheads must be positioned at least 6" from the wall or nearest obstruction
- Flow maintained when shower activated in combination units

Physical Plant will be responsible for the proper installation and repair of existing drench showers and eye washes. A work order should be submitted to Physical Plant for repair when any of the parameters above are not met during EH&S bi-annual testing or weekly flushing by lab personnel. A work order can be submitted online (<https://www.umass.edu/facilities/requests>) or at (413)-545-6401.

4. EH&S Emergency Eyewash and Drench Shower Testing Procedure

Procedure for Testing Drench Showers

- Place the sock over the head of the drench shower and direct it to the bucket.
- Activate the drench shower and allow it to run for approximately 6 seconds, or until the 2 gallon mark on the bucket is reached. Empty the bucket.
- Get the timer ready. Activate the drench shower and time how long it takes to reach the 2 gallon mark. Enter the time, indicate if water does or does not flow within 1 second of activation, date of testing, and functioning of the valve on the spreadsheet.
- Measure the temperature of the water in the bucket. Allow the thermometer to remain immersed until a steady temperature reading is obtained. Note this value on the spreadsheet.
- Indicate the testing date on the tag attached to the shower.
- If there is a problem with the drench shower, note this in the comments column and put in a work order by calling the solutions center, (413)-545-6401 or submit online (<https://www.umass.edu/facilities/requests>), to have the issue corrected.
- If there is an emergency, such as the water will not shut off, contact the solutions center immediately and ask for custodial to clean the water and a plumber to stop the water flow.

Procedure for Testing Eyewashes

- Answer the relevant questions on the spreadsheet for the eyewash regarding if dust covers are present.
- For eyewashes that are not over sinks, position the bucket under the drain for the eyewash.

- Activate the eyewash and hold the gauge over the spray pattern. Water should flow within 1 second of the eyewash being activated. The spray should cover the areas between the interior and exterior lines of the gauge at some point less than 8 inches above the eyewash nozzle. Indicate this on the spreadsheet.
- Collect some water from the eyewash in the bucket and measure the temperature with the thermometer. Report this on the spreadsheet.
- If there are any problems with an eyewash, note this in the comments column and put in a work order by calling the solutions center, (413)-545-6401, or submit online (<https://www.umass.edu/facilities/requests>), to have the issue corrected.

Data Entry and Recordkeeping

EH&S personnel will complete data entry from spread sheet into BioRAFT (<https://umass.bioraft.com/>). All emergency drench showers and eyewash stations data are kept in BioRAFT under Equipment Module - Eyewash/Showers. All testing records are kept in BioRAFT as equipment audits.

5. References

- American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) Z358.1-2009). American National Standard for Emergency Eyewash and Shower Equipment.
- Occupational Safety and Health Administration (OSHA) 29 CFR 1910.151 (c), Medical Services and First Aid.
- National Research Council. Prudent Practices in the Laboratory. National Academy Press, 1995.
- Regulations, Consensus Standards and References. Massachusetts State Plumbing Code 248 CMR 1.00-10.00. General Provisions Governing the Conduct of Plumbing and Gas Work Performed in the Commonwealth. Introduction and Massachusetts Modifications.