

# Section 4

## EMERGENCY EYEWASH AND SAFETY SHOWER EQUIPMENT

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## A. Scope

This guide presents the minimum performance requirements for emergency washing equipment. It covers the following types of equipment: emergency showers, eyewash equipment, and combination shower and eyewash or eye/face wash. Most of the requirements were taken directly from the Washington Administrative Code (WAC) 296-800-150 with supporting information from American National Standards Institute (ANSI) Z358.1-2009 and a directive from the Washington State Department of Labor & Industries (L&I); these references are provided at the end of this chapter.

## B. Applications

1. Emergency washing equipment (EWE) is required to provide an immediate and local method of decontamination following an exposure to exposure to a hazardous chemical. Emergency showers can also be used to effectively extinguish clothing fires and flush contaminants off clothing.
2. EWE is required in areas where the following types of chemicals are used:
  - a. Corrosives, including acids and caustics, with a pH less than 2.5 or greater than 11.
  - b. Strong irritants that cause inflammatory effects at point of contact.
  - c. Toxic chemicals that can be absorbed through the skin and cause ill health effects.
3. EWE is also required in BSL-2 and BSL-3 biological laboratories per the CDC/NIH publication *Biosafety in Microbiological and Biomedical Laboratories* (BMBL), 5<sup>th</sup> edition.
4. EWE should also be installed where particulate is common that can injure the eyes.
5. Eyewash equipment is required wherever eyes may be exposed to the agents noted above. Use of personal protective equipment (PPE) such as safety glasses or face shields, though an important safeguard, does not substitute for the eyewash requirement.
6. Emergency showers are required if there is a potential for substantial portions of the body to come into contact with the types of chemicals noted above. UW EH&S interprets this to mean areas where the container size is greater than 1 gallon and chemical transfer, mixing, or spraying takes place. PPE such as aprons and gloves, though an important safeguard, does not substitute for the shower requirement.

7. Typical areas on the University campus where EWE is needed include the following:
  - a. Laboratories where chemicals or infectious biological agents are used.
  - b. Areas where chemical transfer or mixing take place, including laboratory support spaces, shops, janitor's closets, the power plant, and mechanical rooms
  - c. Areas with closed systems, particularly those under pressure, that can catastrophically fail and cause the chemicals to leak including the power plant, shops, and mechanical rooms.
  - d. Waste accumulation areas.
  - e. Areas where there is a potential for the eyes to be exposed to physical hazards such as chips or dust from sanding or grinding processes including shops and mechanical spaces.
  
8. Location requirements of EWE
  - a. The travel time required from potential exposure sites to EWE must be within 10 seconds. UW EH&S uses a requirement of not more than 50 feet walking distance for design review purposes.
  - b. The pathway from potential exposure sites to EWE must be free from obstructions. UW EH&S interprets this to be a clear path without physical obstacles; the need to pass through one door that does not require a key to pass through, swings in the direction of travel, and is equipped with a panic bar is acceptable.
  - c. Locating showers in the hallway has the advantage of serving multiple labs as long as the requirements of 8b are met.
  - d. If there is a potential for showers to be activated maliciously, locate them within the security of a laboratory room or, if located in the hallway, provide shower stall units complete with sloped floor or pan, plumbed drain and privacy curtain.
  - e. Avoid installing telephones, thermostats, or power receptacles within six feet of the shower. If receptacles are necessary within six feet, they should be equipped with ground fault circuit interruption (GFCI).

## C. Equipment Requirements

1. A plumbed eyewash, shower, or combination unit, meeting the specifications of ANSI Z358.1-2004 shall be provided. Drench hoses may be useful in some applications but do not substitute for showers or eyewashes. A portable non-plumbed eyewash unit may be approved if the location does not have plumbing.
2. Eyewashes shall be equipped with a drain to facilitate use during an emergency and complying with the weekly testing requirement.
3. EWE must be connected to potable water (PW) per Section 416.2 of the 2012 Uniform Plumbing Code. Verify through the choice of the unit that the PW supply cannot be contaminated through back pressure. For purposes of this chapter, the water source is considered to be potable water if it is served by the

- building domestic water or by a separate line connected directly to the city supply into the building. This is in contrast to lab water or industrial water that serves the laboratory sinks or utility equipment.
4. Showers and eyewash units must be plumbed with tempered water per Section 416.2 of the 2012 Uniform Plumbing Code. Choose mixing valves specifically designed for EWE and set them to 90° F. Minimize the length of tempered water lines where reasonable to do so.
  5. To encourage shower use and prevent flooding, EH&S strongly recommends selecting showers with stalls equipped with sloped floor or shower pan, plumbed drain, and privacy curtain; this is particularly critical in corridors or other public or common areas where malicious activation of the shower has caused significant flood damage.
  6. Consider installing opaque modesty curtains for all safety showers to facilitate removal of contaminated clothing during the shower.
  7. Swing-down or swing-over eyewashes that drain into a sink are preferred. Hose units are allowed but the pedestal location must be within 12 inches of the front edge of the bench or sink to facilitate hands-free use while the eyewash remains in the pedestal, AND contamination through back pressure must be prevented if connected to PW.
  8. If the eyewash is mounted near a sink, detail the eyewash placement and connection to verify that it will drain into the sink. This is not an issue if specifying a faucet that has an integrated eyewash unit, but be aware that some of these units do not meet ANSI Z358.1-2004 requirements and will not be approved; the Speakman SEF-1800 Eyesaver Faucet is one unit that does meet the ANSI requirements.
  9. For BSL-3 applications, locate the eyewash in the BSL-3 laboratory.
  10. Specify equipment that meets ANSI Z358.1-2004
  11. Specify performance requirements, including those in ANSI Z38.1-2009 pertaining to flow rate etc., as necessary to ensure that the contractor understands the requirements for conditions they will be responsible to provide.

## **D. Testing and Commissioning**

1. The contractor to confirm units perform per ANSI A358.1-2009 for conditions they are responsible to provide. Most manufacturers can provide a checklist of these requirements.
2. Provide a report to the owner as a condition of substantial completion that documents all units have been tested and perform per ANSI A358.1-2009.

3. Provide a service label on all units for use by University Facilities when completing scheduled testing and service.

## **E. References**

1. WAC 296-800-15030: *Make sure emergency washing facilities are functional and readily accessible*
2. ANSI Z358.1-2009: *American National Standard for Emergency Eyewash and Shower Equipment*
3. *DOSH Directive 13.00: Emergency Washing Facilities, July 15, 2011.*  
Washington State Department of Labor and Industries (L&I) Division of Occupational Safety and Health.