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Environmental Health & Safety

Emergency Washing Equipment (EWE) Requirements

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.

1. Applications

Emergency washing equipment (EWE) is required to provide an immediate and local method of decontamination following an exposure to a hazardous chemical. Emergency showers can also be used to effectively extinguish clothing fires and flush contaminants off clothing.

EWE is required in areas where the following types of chemicals are used:

- a. Corrosives, including acids and caustics, with a pH equal to or less than 2.5 or equal to 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.

EWE is also required in BSL-1, 2 and 3 biological laboratories per the CDC/NIH publication Biosafety in Microbiological and Biomedical Laboratories (BMBL), 6th edition.

EWE should also be installed where particulate is common that can injure the eyes.

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.

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.

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.

- 1) For closed-loop hydronic systems and cooling towers, EWE is required at the location of the chemical pot feeders or chemical feed tanks. For new installations, provide utility sink at eyewash location.
- 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.

Location requirements of EWE:

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.

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 or similar emergency egress hardware is acceptable.

Locating showers in the hallway has the advantage of serving multiple labs if the access requirements listed above are met.

If there is a potential for showers to be activated maliciously, locate them within the security of a laboratory room.

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).

2. Equipment

A plumbed eyewash, shower, or combination unit, meeting the specifications of the current edition of ANSI Z358.1 shall be provided. Activation of an emergency washing device shall be simple (one action) and not take longer than one second to activate. 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.

Eyewashes shall be equipped with a drain to facilitate use during an emergency and complying with the weekly testing requirement.

EWE must be connected to potable water (PW) per the Seattle 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 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 contrasts with lab water or industrial water that serves the laboratory sinks or utility equipment.

Showers and eyewash units must be plumbed with tempered water per the Seattle 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.

When emergency showers are located in a corridor, other public spaces, or near sensitive equipment, provide showers with stalls equipped with a sloped floor or shower pan, plumbed floor drain, and privacy curtain. This is to encourage shower use and prevent flooding, as it can mitigate the damage from malicious activation of the showers in corridors or other public areas. Verify all floor drain requirements with EH&S.

Consider installing opaque modesty curtains for all safety showers to facilitate removal of contaminated clothing during the shower.

Emergency washing devices located exterior to the building shall be insulated and heat-traced when subjected to freezing.

If shut-off valves are accessible to personnel other than maintenance and testing personnel, such valving shall be locked open in accordance with site procedures.

Connection to drain outlets to sanitary or storm sewer systems is prohibited, unless required by local authority. Follow local authority regulations for design of drain system.

Emergency washing devices on a loop system shall be designed so more than one device can be operated at a time with flow rates meeting ANSI requirements.

Flow alarms shall be installed on emergency showers located in hazardous occupancies locations (defined by the Building Code) or remote locations, as advised by EH&S. A local visual and audible alarm shall be installed and monitored 24 hours a day, seven days a week by security or personnel responsible for initiating emergency response procedures.

Swing-down or swing-over eyewashes that drain into a sink are preferred. Hose units are not allowed due to increased risk of backflow into the potable water system and difficulty of installing them at sinks while meeting ANSI Z358.1 requirements.

If the eyewash is mounted at a sink, detail the eyewash placement and connection to verify that it will drain into the sink.

For BSL-3 applications, locate the eyewash in the BSL-3 laboratory.

Specify equipment that meets the current edition of ANSI Z358.1

Emergency washing devices shall be identified with a highly visible sign. The area around the device shall be clear, unobstructed (does not block or interfere with activation of the device), and well-lighted.

3. Testing and Commissioning

The EWE units must be tested to confirm that they meet the performance requirements per the current edition of ANSI Z358.1. Testing shall be performed as part of commissioning by the commissioning agent.

Provide a signed service label on all units when testing is completed.

Provide a report to the owner as a condition of substantial completion that documents all units have been tested and perform per current edition of ANSI Z358.1.

4. References

- a. WAC 296-800-15030: Make sure emergency washing facilities are functional and readily accessible
- b. ISEA ANSI Z358.1-2014: International Safety Equipment Association / American National Standard for Emergency Eyewash and Shower Equipment
- c. 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.