

Environmental Health and Safety

Emergency Eyewash and Safety Shower Equipment

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Scope

This document describes the minimum requirements for eyewash and shower equipment. Emergency eyewash and showers are for emergency treatment of the eyes or body of someone exposed to hazardous substances. It covers the following equipment:

- Combination shower and eyewash, or eye or face wash.
- Emergency showers.
- Eyewash or eye and facewash equipment.

All eyewash and shower equipment shall meet the installation, testing and performance requirements of the current American National Standards Institute, Z358.1, standard.

Environmental Health and Safety must review and approve deviations from the [ASU Design Guidelines](#). [Email EHS](#) to request approval for any proposed changes.

This document does not relinquish the owner or contractor from adhering to all applicable codes and standards for this project and EHS requirements, including those outlined in the design guidelines.

Application

Provisions for emergency eyewashes:

1. Emergency plumbed eyewash or eye and face wash equipment shall be provided for all work areas where, during routine operations or foreseeable emergencies, an employee's eyes may come into contact with a corrosive material that can cause severe irritation, permanent tissue damage or is toxic by absorption.
2. A strong corrosive is a liquid or solid that causes visible destruction or irreversible alterations in human skin tissue at the contact site, in cases of leakage from its packaging or a liquid with a severe corrosion rate on steel. Substances with a pH of ≤ 1 or ≥ 12 shall be considered corrosive and locations with these substances require an emergency eyewash. The eyewash location must be known by persons using the space.
3. EHS considers the following substances ones that can cause corrosion, severe irritation, permanent tissue damage or are toxic by absorption:
 - a. Substances classified by the Globally Harmonized System of Classification and Labelling of Chemicals as Category 1 — serious eye damage, or Category 2A — irritant eye hazards.
 - b. Substances the manufacturer or distributor identified as causing corrosion, severe irritation or permanent eye tissue damage.
 - c. Substances identified by the manufacturer or distributor as toxic by skin absorption.
 - d. Substances with a pH ≤ 1 or ≥ 12 .
 - e. All work areas where formaldehyde solution is handled in concentrations $\geq 0.1\%$.

Provisions for emergency showers:

1. A plumbed emergency shower shall be provided for all work areas where, during normal operations or foreseeable emergencies, areas of the body may come into contact with a

substance that is pyrophoric, corrosive, severely irritating to the skin or toxic by skin absorption.

2. EHS considers these substances to cause corrosion, severe skin irritation or be toxic by skin absorption:
 - a. Substances classified by the Globally Harmonized System of Classification and Labelling of Chemicals as Category 1 — skin corrosion or Category 2 — skin irritation hazards.
 - b. Substances the manufacturer or distributor identified as corrosive or severely irritating to the skin.
 - c. Substances the manufacturer or distributor identified as toxic by skin absorption.
 - d. Substances with a pH ≤ 1 or a pH ≥ 12 .
 - e. All work areas where formaldehyde solution is handled in concentrations $\geq 1\%$.
3. EHS presumes laboratory fume hoods contain hazardous substances and requires emergency eyewash and shower facilities in areas where they exist.
4. Laboratories and laboratory support facilities using and handling hazardous substances require eyewash and safety showers. Biological laboratories using bleach and other chemical disinfectants require eyewash and safety showers. [Email EHS](#) for any exceptions or if an evaluation is needed.

Careful consideration should be given to current and future laboratory use as research needs change for new construction and major renovations. Future hazardous material use in the space will be restricted or require potentially costly retrofitting without an emergency eyewash and safety shower.

Location

All work areas where strong corrosive chemicals, ≤ 1 pH or ≥ 12 pH, are stored and used shall have the eyewash station and safety shower immediately located adjacent to the hazard, such as in the same room as the work being performed.

All work areas not using strong corrosive chemicals shall have emergency eyewash and shower equipment on the same level as the hazards. It shall be accessible for immediate use in these locations and require no more than 10 seconds to reach. The path of travel must be free of obstructions. Eyewashes and showers are designed to be used simultaneously by one person, allowing both the eyewash and shower to operate at the same time.

The average person covers an approximate distance of 55 feet in 10 seconds at a normal walking pace. The victim's additional physical and emotional potential state must be accounted for. Victims are often visually impaired with some level of discomfort or pain and are likely to have personnel in the immediate area assist. Other potential hazards along the path should be considered to avoid further injury.

A door is considered an obstruction. An intervening door can be present with non-corrosive hazards if it opens in the same travel direction as the person attempting to reach the emergency eyewash and shower equipment. The door must have a non-locking closing mechanism that does not impede access to the equipment, such as a panic door.

Design, installation and maintenance

Emergency eyewash and shower equipment and control valves shall meet the requirements of ANSI Z358.1.

Signage and visibility

The travel path shall be clearly identified. Emergency eyewash and shower locations must be identified with a sign and be highly visible in the area the equipment serves. The areas around the eyewash and shower must be well-lit.

Prohibitions around equipment

No obstructions shall be located within 16 inches from the center of the shower spray pattern or six inches from the wall or the nearest obstruction on an eyewash unit. **Note:** The eyewash is not considered an obstruction.

No electrical apparatus or receptacles shall be located three feet horizontally or eight feet vertically of the eyewash stations or showers. 120-volt outlets within six feet of an eyewash or shower shall be equipped with a ground fault circuit interrupter.

Water supply

Emergency eyewash and shower equipment water supply flow rates shall not be limited. The flow rate and discharge pattern shall be provided per ANSI Z358.1.

Emergency eyewash and shower equipment shall deliver tepid water — 60 to 100 degrees Fahrenheit. Based on first aid recommendations for thermal burns, the optimal temperature range is 60 to 77 degrees Fahrenheit.

Plumbed emergency eyewash and shower equipment shall be connected to domestic potable water sources.

Installation

Emergency eyewash and shower equipment shall be installed per the manufacturer's instructions.

Design for maintenance and use

Shut-off valves: A ball-type shut-off valve should control the water supply to showers and shower and eyewash combination units. The valve should be visible and accessible to shower testing personnel in case of leaking or failed shower head valves. Provisions shall be made to prevent unauthorized shut-off if a supply line shut-off valve is installed.

Eyewash basins and showers should be plumbed to sanitary sewer drains where feasible.

Modesty curtains should be considered for emergency showers. A minimum unobstructed area of 34 inches shall be provided when installed.

Verification and testing

Verification upon installation: The contractor must verify proper equipment operation by installing the emergency eyewash or shower equipment before the project closeout and facility occupation. Verification procedures must follow ANSI Z358.1. Tags must be affixed to the showers and eyewash fountains to allow monthly testing records to be kept.

Annual testing: Eyewash and safety showers must be tested annually per ANSI 358.1 standards.

Monthly activation: Eyewash equipment should be inspected and activated. Eyewashes should be activated long enough to verify operation and ensure that flushing fluid is available. Guidance for routine testing is available from EHS.

Please [contact EHS](#) or your department's EHS compliance officer for questions about annual testing.

Eyewash and safety shower alarms

In some situations, it may be appropriate to install a local alarm to notify laboratory occupants that the unit is in use and that assistance may be needed. Local alarms are not required. When a local alarm is used, this guidance should be followed:

- Local alarms must be audibly different from the fire alarm system.
- Local alarms must not be tied into building automation or fire alarm systems.
- Noise levels should not exceed 85 dB(A) to ensure the use of the unit is not deterred.
- The alarm must be capable of being silenced or disabled for routine testing and by anyone assisting the injured party using the unit.

Self-contained units

Self-contained units shall be maintained per the manufacturer's instructions. EHS must approve self-contained emergency eyewash and shower equipment used instead of plumbed equipment. Equipment shall meet all applicable ANSI Z358.1 requirements.

Supplemental equipment

Supplemental equipment, including personal eyewash units or drench hoses that meet the requirements of ANSI Z358.1, may support plumbed or self-contained units but shall not be used in place of them. Water hoses, sink faucets, single-head drench hoses and showers are not acceptable emergency eyewash or shower equipment.

Americans with disabilities act compliance

[Contact the ASU Diversity and Access Office](#) for Americans with Disabilities Act compliance guidelines.

References

Regulations:

- Occupational Safety and Health Administration [29 CFR 1910.151\(c\)](#), Medical Services and First Aid.

Consensus standards and references:

- American National Standards Institute, Z358.1, Current version, Emergency eyewash and Shower Equipment.
- Guidelines for Laboratory Design: Health, Safety, and Environmental Consideration, Fourth Edition, Louis J DiBerardinis, Janet S. Baum, Melvin W. First, Gari T Gatwood, and Anand K. Seth, Johns Wiley & Sons, Inc., Hoboken, New Jersey, 2013.
- National Electrical Code.
- [Prudent Practices in the Laboratory](#): Handling and Management of Chemical Hazards, Current Version, The National Academies Press, Washington, D.C., 2011.