

# Common Eye and Skin Hazardous Chemicals Can Require Emergency Eyewash or Eyewash and Showers

Several OSHA standards require an Emergency eyewash or eyewash and shower unit be provided whenever employees are exposed to corrosive materials.

The first step a person should take when deciding whether an eyewash or eyewash and shower are needed is to determine if a material is hazardous to the eyes or skin. Liquids present the most common hazards, but solids, gases, vapors and mists also may be present. A material may be considered hazardous if it can damage the skin or eyes or if it is readily absorbed through, the skin.

## Determination of Exposure

The second Step in deciding whether an eyewash or eyewash and shower are required is to determine whether the hazardous material can contact the eyes or skin. To determine exposure, a person should look at the potential for the material to be splashed or get into the eyes or on the skin. If there is skin exposure, it should be determined how much could splash on the skin. If the material is hazardous and capable of contacting the eyes, quantity is *not* a consideration.

All determinations of exposure should be made without regard to the use of personal protection equipment, such as goggles, face shields, gloves or aprons. In general, adequate-eye and face protection and protective clothing must be provided if an eyewash or eyewash and shower is required. The use of personal protective equipment does not change the requirement for an eyewash or shower. Note that, in general, tight fitting goggles should be worn if eye protection is required against liquid splashes, sprays mists or vapors. Shields or safety glasses do not provide adequate splash protection unless the face shield meets the requirements under ANSI Z87.1-2015 and is marked "D3".

## Eyewash and Shower Requirements

Eyewashes and showers should be in compliance with ANSI Z358.1-2014.

Construction, installation and location of the eyewash or eyewash and shower should meet the ANSI requirements. Refer to the complete text or ANSI Z358.1-2014 if more information is needed for a particular situation. Also consider the following.

1. Most faucet-mounted (gooseneck) "eyewashes" do not meet the requirements, principally because they lack quick opening valves and have the potential for high water temperatures. The one second activation requirement must be met for these units to be used. Special attention must be paid to temperature control, because a faucet can deliver water greater than 100° F, further injuring the eye. Faucet-mounted eyewashes are not addressed specifically by ANSI.
2. Eyewashes and showers should be located as close as possible to the hazard and on the same level. The more hazardous the material, the closer in time and distance the unit should be. ANSI requires that an eyewash and shower be no farther than a 10-seconds travel time from the hazard. Appendix B of ANSI 358.1-2014 states that

an average person covers a distance of approximately 55 feet in 10 seconds when walking at a normal pace. ANSI also recommends that for highly corrosive chemicals such as strong acids ( $\text{pH} \leq 1$ ) or bases ( $\text{pH} \leq 12$ ), the eyewash and shower unit be immediately adjacent to the hazard.

3. Flushing-fluid temperature for eyewashes and showers must be tepid or lukewarm (between  $60^\circ$  and  $100^\circ\text{F}$ ). Temperatures outside this range are likely to discourage use of the equipment. For showers, there is the additional concern that shock may occur. Temperatures greater than  $100^\circ\text{F}$  have been shown to be harmful to the eyes and can enhance chemical interaction. Where chemical reactions present special hazards (the material reacts with water or the water temperature accelerates the reaction), a medical advisor should be consulted.

4. Plumbed eyewashes and showers should be flushed weekly to ensure proper operation, remove any sedimentation and minimize microbial contamination. Eyewash flushing for at least three minutes has been suggested to reduce amoebic and bacterial growth. Ideally, the units should be flushed for the length of time it takes to replace the water in the unit and the piping from the unit to continuously running water.

Acanthamoebae are commonly found in eyewashes and can cause severe eye infections when introduced into traumatized eyes. Pseudomonas (which can cause septicemia or "blood poisoning") and Legionella (which can cause Legionnaires' disease, a severe form of pneumonia) bacteria may also present.

5. Units should also be inspected on an annual basis to assure conformance with ANSI Z358.1.

6. There should be regular maintenance of self-contained eyewash units to ensure the units are full and operational; the flushing solution is changed according to manufacturer's instructions and access to the units is not blocked. Only commercially available solutions intended for eye flushing should be used. FSM

## References:

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*For more information, visit Minnesota Department of Labor and Industry Occupational Safety and Health Division at [www.dli.mn.gov](http://www.dli.mn.gov)*

*ANSI 117.1-1-1992, ANSI Z358.1, ANSI 535.1, ANSI Z358.1-2004,*