



Tech Guide for Emergency Eye/Face Wash and Safety Shower Equipment

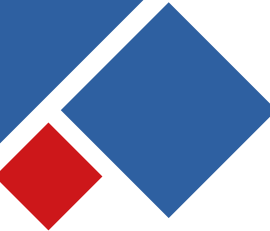
Includes key excerpts from the
ANSI/ISEA Z358.1-2014
International Standard

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Emergency safety showers and eye/face wash units provide the first line of defense in the event of a chemical splash or spillage. Any delay in treating a casualty can result in more serious injury with long-term consequences. Choosing the right emergency safety shower is essential and there are many fundamental points to consider.

The internationally recognized American National Standard, ANSI/ISEA Z358.1-2014 provides uniform minimum requirements for the performance, use, installation, testing, maintenance and training of emergency safety shower and eyewash equipment.

This guide offers an overview of the types of emergency response products to help you choose the equipment best suited to your needs. It also includes a summary of the main points for consideration to assist health and safety specifiers in understanding the ANSI/ISEA Z358.1-2014 standard.

Emergency safety showers and eye/face wash units provide the first line of defense against potential workplace hazards such as a chemical splash, welding sparks, metal shavings, or fine particulates like dust, dirt and sand. When workers get potentially dangerous substances on their clothing or bodies, they need to be able to wash it off as quickly as possible. Any delay can worsen the situation resulting in more serious injury with possible long-term consequences, permanent disability and even death.

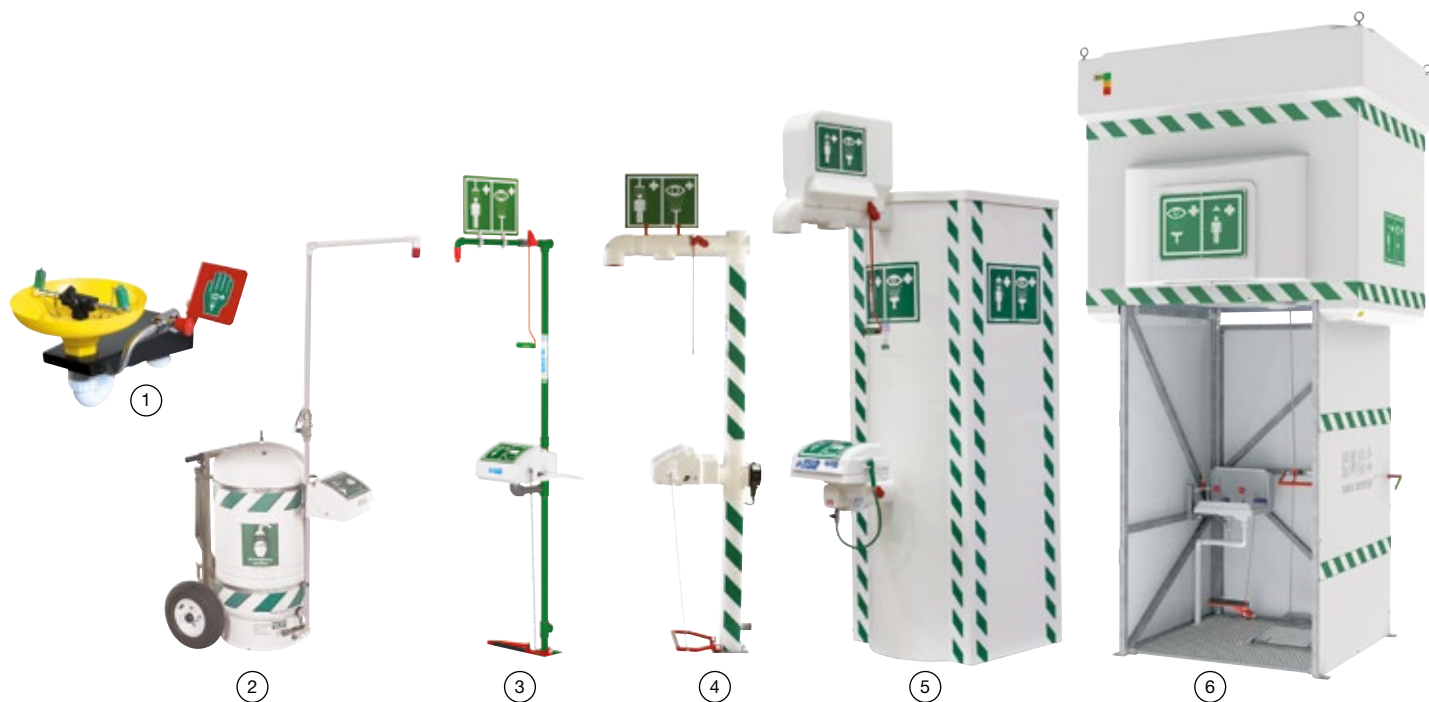
Many companies operate at the extremes, from desert to arctic conditions, and such challenging environments inevitably place harsh demands on safety equipment. There are fundamental points to consider when choosing emergency safety showers, irrespective of the industry or the location.

Compliance with Recognized Standards

It is important to meet the minimum requirements, which may be mandatory on some sites, of International and European standards. The American National ANSI Z358.1-2014 standard is recognized worldwide and considered to be the most comprehensive. It provides guidance for determining the flow rate, duration of operation, and water temperatures necessary for safe and effective use of any emergency safety shower and eye wash unit.

Types of Emergency Response Equipment

1. Emergency Eye/Face Wash Equipment
2. Mobile Emergency Safety Showers
3. Indoor Emergency Safety Showers
4. Outdoor Emergency Safety Showers
5. Temperature Controlled Emergency Safety Showers
6. Emergency Tank Showers



Considerations

- Emergency safety showers can be floor standing, or where space is restricted, mounted on walls or ceiling. Similarly, eye and eye/face wash units can be mounted on walls, pedestals or work surfaces depending on the type of hazard or working environment.
- Most emergency safety showers and eye and eye/face wash units can be supplied with a wide range of optional fittings to make them easier to use and to alert co-workers and first aiders. These include local and remote alarms, lighting and a choice of devices to activate the shower such as pull rods, panic bars and foot plates.
- Emergency safety showers and eye and eye/face wash units are either supplied alone or as a combined unit. Limited space or the nature of the hazard may mean separate units are the preferred option. However, combined safety showers and eye/face wash units cover all potential accidents.
- Plumbed in emergency safety showers and eye/face wash units are designed for indoor or outdoor applications, and can be supplied with jacketed and insulated pipes complete with trace heating for frost protection on those units exposed to low outdoor temperatures. Self-draining showers offer a solution for warmer climates by preventing stagnant water in the stand pipe from overheating.
- Tank showers are ideal where tepid water or a constant supply of water cannot be guaranteed. Optional heaters or chillers can be fitted depending on the climate to provide tepid water between 16°-38°C (60°-100°F) as specified in the ANSI standard.

Hot Climates

In high ambient temperatures, the water in safety showers may become overheated from the mains supply or from solar radiation resulting in the possibility of scalding to the user upon operation.

The most effective solution in hot climates for the provision of tepid water is a tank shower fitted with a chiller unit system. Water constantly circulates through the chiller system and when the temperature starts to rise the unit switches on to keep the water within the safe limits.

Where high temperatures during the day are followed by cold nights, it may also be necessary to fit an immersion heater in the tank to maintain a minimum water temperature.

Alternatively, the use of self-draining emergency safety showers ensures that water automatically drains from the standpipe when not in use to prevent it from being heated by solar radiation, which could result in further injury to the user.

Cold Climates

Preventing the water in emergency safety showers from freezing in sub-zero conditions is essential, and protecting casualties from thermal shock or hypothermia in such harsh conditions during and after showering is equally important.

One solution is to use a temperature controlled shower, such as a modular polar cubicle shower. When fitted with a heated water tank, mains water is mixed with heated water from a thermostatically controlled cylinder to give the correct temperature at the shower head. The shower, invariably supplied with an integral eye/face unit, is enclosed within a heated booth, while the double-skinned insulated doors and a space heater keep casualties warm and protect them from the elements until help arrives.

Alternatively, polar tank showers contain an insulated tank and are fitted with insulated double swing opening doors. An integral immersion heater, controlled by a dual safety thermostat, maintains the water in the insulated tank at a constant, acceptable temperature in severely cold climates.

Selecting a safety shower for your application that complies with the ANSI standard regarding tepid water is the only way to ensure effective first aid in the event of an accident. By discussing your site requirements early with the Hughes team, we will ensure you get the most effective and cost-efficient solution.

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Water Temperature

- Water delivered by the emergency safety equipment should be tepid, between 16-38°C (60-100°F).

At temperatures above 38°C (100°F) there is the added danger of scalding and increased absorption of harmful chemicals into the skin. Prolonged exposure to water below 16°C (60°F) increases the risk of thermal shock or hypothermia and prevents the casualty using the shower to decontaminate effectively for the full 15 minutes.

Location

- Emergency safety equipment should be installed within 10 seconds reach and on the same level (i.e. not up or downstairs) as a potential hazard.
- They must be situated in a prominent position, clearly visible, well-lit and free from any obstructions.

Water Flow

- Emergency safety showers should deliver a minimum of 76 liters (20 US gallons) per minute of potable water for up to 15 minutes in the required spray pattern.
- Eye/face wash units should deliver 11.4 liters (3 US gallons) per minute for up to 15 minutes to ensure a thorough decontamination.

Operation

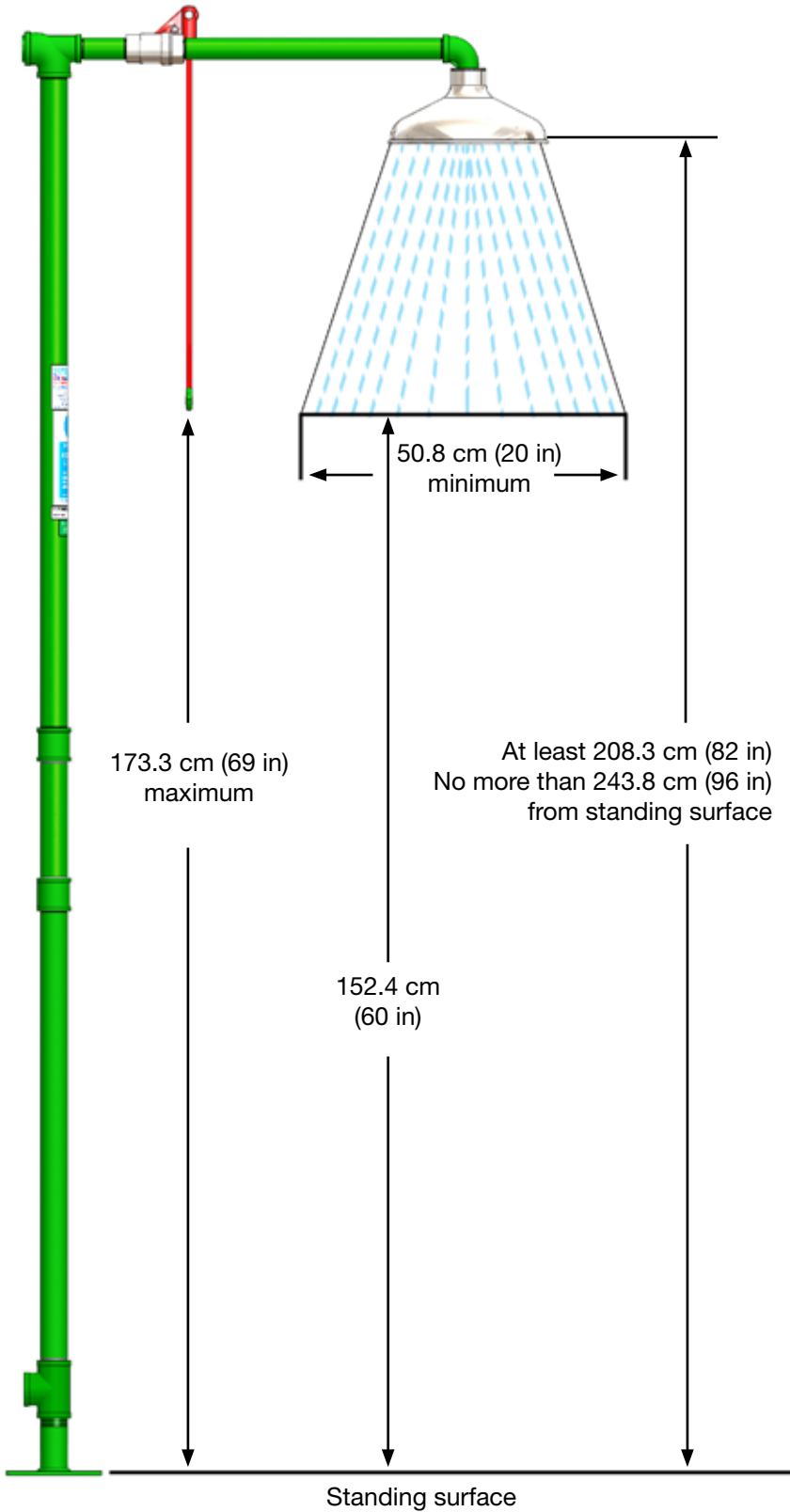
- Equipment must be both accessible and easy to operate, even if the victim has impaired vision. Both emergency safety showers and eyewashes must be designed so that the valves remain open (flushing flow remains on) without the use of the operator's hands until intentionally closed.
- The control valve must be simple to operate and go from 'off' to 'on' in 1 second or less.

Maintenance

- Emergency safety equipment must be visually inspected and activated weekly along with an annual service to guarantee reliable and effective operation and conformance with the standard.

Training

- Personnel who may be exposed to hazardous materials should be instructed on the safe and proper use of the emergency safety equipment and be advised of its location.

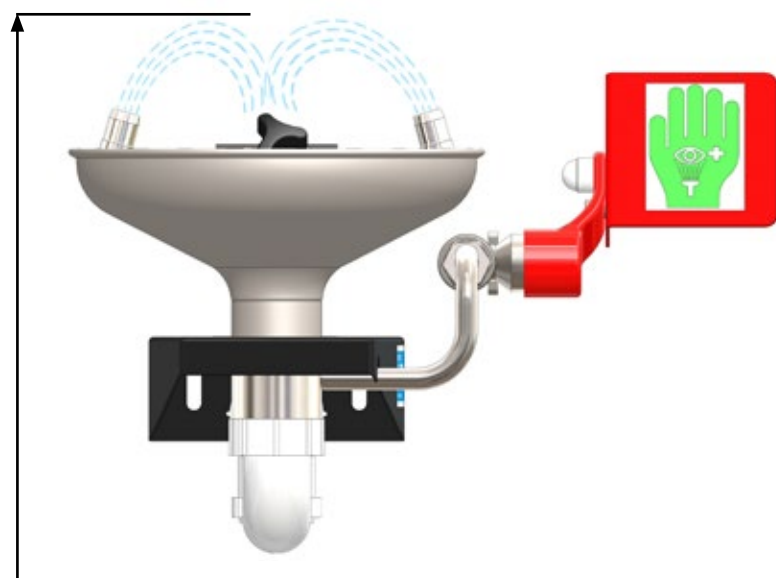


Emergency Showers* shall:

- Deliver tepid water at a minimum of 76 liters per minute (20 gpm) for a minimum of 15 minutes in the required pattern. (Section 4.1.2, 4.5.5)
- Provide a spray pattern with a minimum diameter of 50.8 cm (20 in) at 152.4 cm (60 in) from the floor. (Section 4.4.1, 4.4.2)
- Ensure the center of the spray pattern is located at least 40.6 cm (16 in) from any obstruction. (Section 4.1.4, 4.5.4, 4.5.7)
- Provide a flushing column of at least 208.3 cm (82 in) and no more than 243.8 cm (96 in) from the standing surface. (Section 4.1.3, 4.4.1, 4.5.4)
- Offer hands-free valve activation which should go from 'off' to 'on' in 1 second or less. (Section 4.1.5, 4.2)
- Incorporate easily located and simple to operate manual or automatic actuators, which should be positioned no more than 173.3 cm (69 in) above the floor. (Section 4.1.4, 4.2)

* applicable to Emergency Tank Showers

Eye Washes, Eye/Face Washes and Drench Hose Units shall:



83.8 cm - 134.62 cm
(33-53 in) above floor

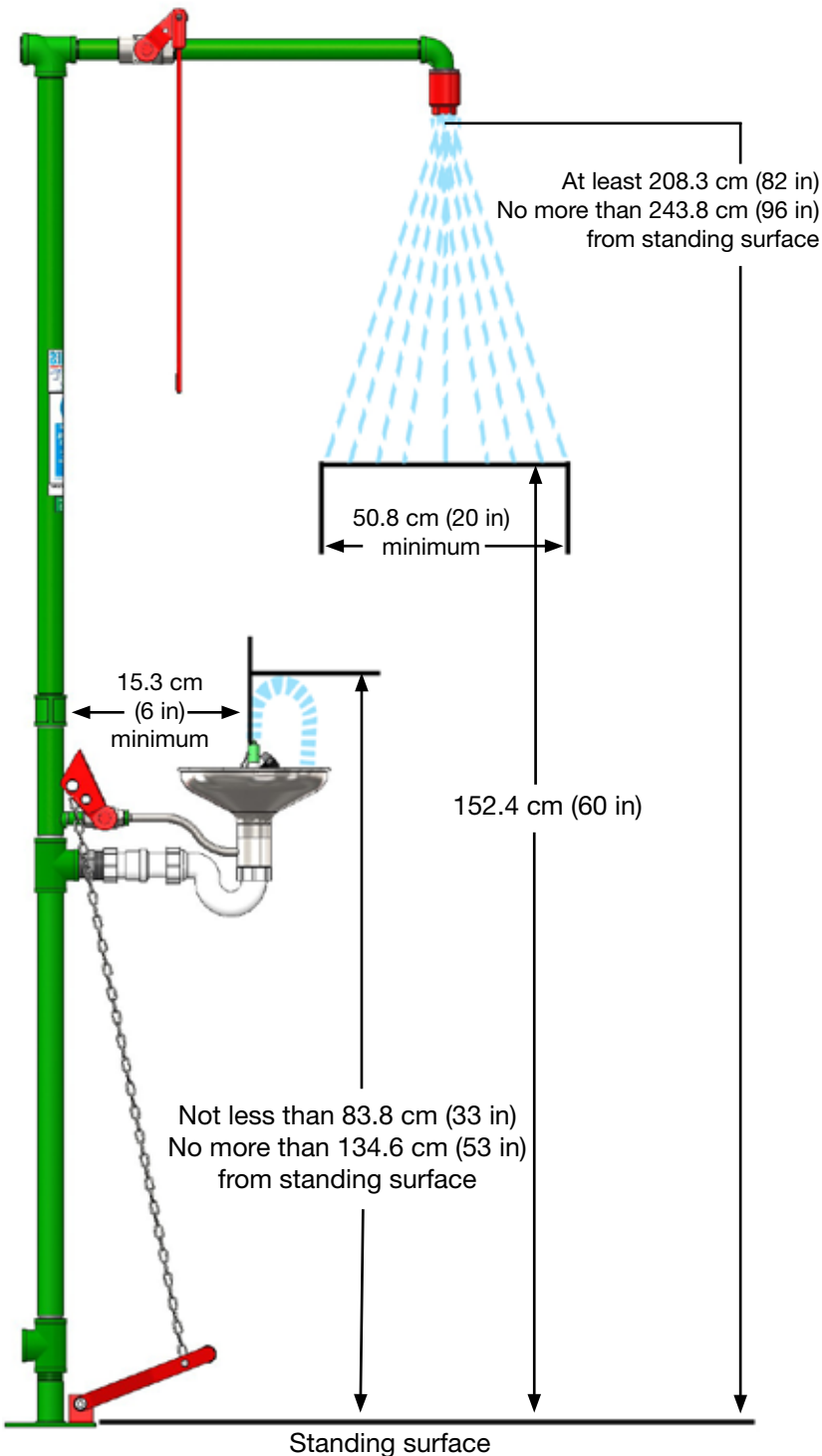


83.8 cm - 134.62 cm
(33-53 in) above floor

- Deliver a controlled flow of tepid water to both eyes simultaneously at a velocity that is non-injurious to the eyes. (Section 5.1.1, 6.1.1, 8.2.1)
- Eye washes shall deliver at least 1.5 liters of flushing fluid per minute (0.4 gpm) for 15 minutes. Eye/face washes should deliver at least 11.4 liters per minute (3 gpm) of flushing fluid for 15 minutes. (Section 5.1.6, 5.4.5, 6.1.6, 6.4.5)
- Provide an eyewash pattern positioned between 83.8 cm (33 in) and 134.6 cm (53 in) from the floor and at least 15.3 cm (6 in) from the wall or nearest obstruction. (Section 5.4.4, 6.4.4)
- Be designed to ensure the nozzles and eye wash equipment are protected from airborne contaminants. (Section 5.1.3, 6.1.3)
- Provide enough space to allow the eyelids to be held open with the hands while the eyes are being rinsed. (Section 5.1.4, 5.1.7, 6.1.4, 6.1.7)
- Offer hands-free valve activation, which should go from 'off' to 'on' in 1 second or less, and simple to operate manual or automatic actuators. (Section 5.1.4, 5.2, 6.1.4, 6.2, 8.2.2)

Combination Emergency Showers (shower with eye/face wash) shall:

- Be designed to allow all components to be used simultaneously by the same user. (Section 7.4.4)
- Ensure the nozzles and eye wash equipment are protected from airborne contaminants. (Section 5.1.3, 6.1.3)
- Deliver tepid water from the shower at a minimum of 76 liters per minute (20 gpm) for a minimum of 15 minutes in the required pattern. (Section 4.1.2, 4.5.5)
- Deliver flushing fluid to the eyes for not less than 1.5 litres per minute (0.4 gpm) for 15 minutes. Eye/face washes should deliver at least 11.4 liters per minute (3 gpm) of flushing fluid for 15 minutes. (Section 5.1.6, 5.4.5, 6.1.6, 6.4.5)
- Provide a spray pattern with a minimum diameter of 50.8 cm (20 in) at 152.4 cm (60 in) from the standing surface. (Section 4.4.1, 4.4.2)
- Ensure the center of the spray pattern is located at least 40.6 cm (16 in) from any obstruction. (Section 4.1.4, 4.5.4, 4.5.7)
- Provide a flushing column of at least 208.3 cm (82 in) and no more than 243.8 cm (96 in) from the standing surface. (Section 4.1.3, 4.4.1, 4.5.4)
- Offer hands-free valve activation which should go from 'off' to 'on' in 1 second or less. (Section 4.1.5, 4.2)
- Incorporate easily located and simple to operate manual or automatic actuators, positioned no more than 173.3 cm (69 in) above the standing surface. (Section 4.1.4, 4.2)



It is important to meet the minimum requirements, which may be mandatory on some sites, of International and European standards.

The U.S. Code of Federal Regulations 29 CFR 1910.151 Medical Services and First Aid indicates:

OSHA 1910.151 (c) 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.

In North America, the Occupational Safety and Health Administration (OSHA) and the Canadian Centre for Occupational Health and Safety (CCOHS) commonly refer to ANSI/ISEA Z358.1-2014.

This summary should act as an overview to assist specifiers in understanding the guidelines, please consult the complete ANSI/ISEA Z358.1-2014 standard before purchasing or installing emergency safety equipment.

If you need any help or advice on meeting world standards, please contact us:

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