



University of Toronto Safety Eyewash and Shower Standard

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1.0 Purpose of Standard

This standard is required to help the University of Toronto fully comply with sections 124 and 125 of *Ontario Regulation 851: Industrial Establishments* (the Regulation), made under the *Occupational Health and Safety Act* (OHSA).

According to section 124 of the Regulation:

Where a worker is exposed to a potential hazard of injury to the eye due to contact with a biological or chemical substance, an eyewash fountain shall be provided. R.R.O. 1990, Reg. 851, s. 124.

According to section 125 of the Regulation:

Where a worker is exposed to a potential hazard of injury to the skin due to contact with a substance, a quick-acting deluge shower shall be provided. R.R.O. 1990, Reg. 851, s. 125.

This standard outlines the requirements for the installation, use and maintenance of emergency eyewash and safety shower equipment at the University of Toronto. This standard is based on the *American National Standards Institute's (ANSI) standard for eyewash and shower equipment, Z358.1-2014*.

2.0 Application of Standard

This standard applies to various locations and individuals at the University of Toronto, described below.

2.1 *Applicable Locations*

In many University of Toronto workplaces, there is the potential for accidental exposure to chemicals that may cause severe injury to the eyes and/or other parts of the body. Per the Regulation eyewashes and/or showers are required in such spaces.

Plumbed Eyewash Stations must be installed in every lab or room where a MSDS or SDS for the materials used specifies the use of an eyewash station in case of eye contact and there is a reasonably foreseeable potential for eye contact.

Plumbed Emergency Shower Equipment shall be installed within 10 unobstructed seconds walking distance from every location in a lab or room where an MSDS for the materials used specifies the use of a deluge shower in case of skin contact and there is a reasonably foreseeable potential for skin contact.

There may be cases where a local risk assessment conducted by or approved by EHS will allow for a reduced level of provided safety equipment despite statements on the M/SDS.



2.2 Applicable Individuals

This standard applies to any University of Toronto staff, students or faculty that, as part of their function at the University, may:

- Encounter or handle materials that may result in eye or skin injury through exposure;
- Conduct work (including academic work) in a location that contains materials that may result in eye or skin injury through exposure;
- Supervise a workspace that uses materials that may result in eye or skin injury through exposure;
- Manage a building which contains emergency eyewashes or showers or materials that may result in eye or skin injury through exposure;
- Manage a laboratory construction or renovation project, particularly if, at the conclusion of the project, it is expected that materials with the potential to cause eye or skin injury through exposure will be used in the location.

2.3 Responsibilities

Lab Directors, Principal Investigators, Managers, and Supervisors shall:

- Conduct hazard assessments to identify areas / situations where emergency eyewash and safety shower stations are required.
- Ensure that eyewash and safety shower units are installed or are available in the areas identified.
- Have eyewash and safety shower units repaired as required.
- Ensure that each unit is tagged so that annual and weekly bump testing can be documented, and ensure that any testing conducted is recorded.
- Ensure that workers are informed and trained in the proper procedure of using an eyewash and safety shower in case of an emergency.
- Ensure that eyewash stations are inspected and flushed weekly.
- Submit work orders for eyewash stations not operating properly, and ensure all deficiencies are fixed.
- Work with the office of Environmental Health & Safety to maintain an accurate inventory of these units.

Workers shall:

- Be informed of the eye/skin hazards in their workplace.
- Know the location of emergency eyewash and safety shower stations.
- Be familiar with the procedure of using eyewash and safety shower.



Departments or Property Managers shall:

- Departments shall inspect and flush eyewash stations weekly for shared eyewash stations located in their departments. When an eyewash is shared between departments, the Property Managers shall ensure flushing and inspections are carried out.
- Ensure that an inspection log for weekly testing of units for which they are responsible is maintained.
- Submit work orders for eyewash stations found to not be operating properly during weekly testing.

Office of Environmental Health and Safety shall:

- Endeavour to maintain an accurate inventory of the safety shower units, in consultation with the departments.
- Ensure that the annual inspection of safety showers is conducted, where possible.
- Update and maintain this standard as new developments arise.

3.0 Eyewashes

3.1 Design Standards

- The number of eyewashes required in a laboratory space depends on the size and the layout of the lab:
 - At the minimum, an individual working in the lab must be able to reach any single eyewash in under 10 seconds via walking, no matter their location within the lab;
 - Larger labs may require multiple eyewash installations in order to fulfill this requirement;
 - The path to the eyewash station should be free of obstructions, and should be mounted in such a way such that it can be accessed by people of all physical sizes;
 - One (1) intervening door can be present between the location and eyewash so long as the door opens in the same direction of travel as the person attempting to reach the emergency equipment and the door does not lock to impede access to eyewash station.
 - The unit should be located on the same level as the hazard;
- The area of the eyewash should be highly visible and easily accessible:
 - The eyewash must be, at least, 0.15 m (6 inches) away from the wall or any other obstruction.
 - The area should be well lit, which may require additional design considerations;
 - A sign indicating the presence of the eyewash must be installed with the eyewash.
 - If feasible, the units should be located so one person can use both the eyewash and shower at the same time.



- Eyewashes should be mounted so that water nozzles are not less than 0.84 m (33 inches) and no greater than 1.15 m (45 inches) from the surface/ floor on which the user stands.
- The unit should be located to allow the eyelids to be held open with the hands while the eyes are in the water stream.
- New installations of eyewash stations should be installed with plumbing for tepid water:
 - The temperature of water should at least be 15.5°C (60°F) to prevent causing hypothermia or early cessation of flushing;
 - Existing stations can remain cold water only, but it is strongly recommended that a tepid eyewash and shower should be available in the hallway of every floor within 150 feet of any non-tempered eyewashes.
- There must be a plumbed drainage system near or as part of the eyewash unit that meets the following criteria.
 - Testing of the eyewash should not result in water escaping over the bench top or onto the floor;
 - A drench hose/eyewash should be mounted near enough to a sink that the water stream can be directly guided into the sink;
 - A standalone eyewash unit or a combination unit must have a connection between the bowl and the drain.
 - A pull down or swing out unit should have a sink or equivalent that captures all of the water from the head(s).
- Pull out combination drench hose/eyewash units must be mounted in such a way that a shorter person or a person in a wheelchair would be able to reach the eyewash and be able to use it with both hands on their eyelids. Typically this means it needs to be mounted near the front of the bench and near the sink or in an accessible area to the side of the sink.
- The eyewash units should have dual nozzle sprays, or have a spray head that has been proven through testing to provide equivalent or better irrigation of the eyes.
- The plumbed eyewash unit should be capable of delivering 1.5 L of water per minute (0.4 gallons per minute) for at least 15 minutes continuously.
 - In accordance with the guidelines of ANSI Z358.1, eyewash equipment should ensure that a controlled flow of potable water is provided to both eyes simultaneously at a velocity low enough not to injure the user.
- The control valve should be large enough to be easily located and operated by the user; it shall go 'off' to 'on' in less than one second.
- Control valves shall be resistant to corrosion from potable water.



- Manual or automatic actuators should be easy to locate and operate by touch.
- The eyewash units should be installed and designed in such a manner that they do not require users' hands to operate upon activation, and allow both eyelids to be opened using both hands.
- Dust covers or protection devices should protect the nozzles that are supplied with the eyewash in place. The dust covers should be automatically removed by actuation of the valve.
- Dedicated drench hoses may supplement, but cannot replace the eyewash unit. Note this does not apply to combined eyewash/drench hose units.
- Equipment piping that is located in areas exposed to potential freezing temperatures should be insulated or protected with appropriate material(s).
- Upon installation, equipment shall be tested for leaks.

3.2 Supervisor Considerations

- Employees and students who might be exposed to splashes of hazardous materials have to be instructed by their supervisors in the proper use of personal protective equipment, emergency showers, and eyewash equipment.
- Dedicated drench hoses may supplement, but cannot replace the eyewash unit. Note this does not apply to combined eyewash/drench hose units.
- Personal or portable eyewash equipment should only be used where there is no access to plumbing, or where a personal eyewash unit is to be used as a first wash before proceeding to the eyewash station.
- For labs that use strong acids and caustics, the eyewash should be no more than 10 unobstructed feet away from the work area, thus it may be useful to designate specific areas in the lab for the handling of such materials.
- All lab users should be informed by their supervisors of all eyewash locations within the lab and in the hallway and whether or not they are tepid.

3.3 Accessibility and Testing

Eyewashes must be accessible at all times:

- The emergency eyewash station shall be identified with a highly visible sign. If a sign is not present, one should be obtained by the lab supervisor or a designated lab worker.
- It should be ensured by the lab supervisor or designated lab workers that the path leading to the emergency eyewash is clear of obstruction and that the immediate area is neat and easily accessible.
- There should be no sharp projections or electrical hazards anywhere in the operating area of the unit.



All eyewashes must be tested weekly by the lab supervisor or designated lab workers. The following is a guideline procedure for testing:

- Ensure that the path to the eyewash is easily accessible and is not obstructed. Keep in mind that the injured worker would be in distress, and may have to rush to the emergency unit with eyes closed.
- Verify that nozzle caps on the eyewash units are in place to prevent contamination and that the nozzles, nozzle caps, and bowl/sink are clean and sanitary.
- Actuate the valve to full open position. Water must flow within 1 second.
- Verify that nozzle caps come off when the eyewash is activated.
- Verify that water continues to flow until manually turned off and that the flow stays on without requiring the use of the operator's hands.
- For a tepid eyewash put your hand in the stream of the water to ensure that it is tepid; not too cold or too hot.
- Look at the flow pattern of the eyewash. It should provide a gentle non-injurious flow. Water streams should flush both eyes simultaneously.
- Flushing of the system should be conducted for as long as is needed to empty the pipe of stagnant water. The time required could be as little as 10 seconds or as much as three minutes (the ANSI specified time). Wipe up any water left on the floor.
- If the eyewash is working as necessary then log the date of the test and the initials of the tester.
- Report problems to your building maintenance provider, typically this would be the Property Manager or call 8-3000 on the St. George Campus. For UTM and UTSC contact the appropriate Facilities department.

3.4 Using the Eyewash

To use an eyewash during an emergency:

1. Open water supply fully.
2. Place eyes in water stream.
3. Hold both eyelids open with your fingers.
4. Have a co-worker call for appropriate medical attention.
5. Rinse until the time specified on the MSDS has been reached (if necessary, have a co-worker look up the appropriate time and then time you).
6. If using an older eyewash and the temperature becomes unbearable, the individual should move to the nearest tepid eyewash to ensure the appropriate flushing period was completed.

4.0 Showers

4.1 Design Standards



- The emergency shower should be installed in compliance with ANSI standard Z 358.1-2014, and the manufacturer's instructions. Upon installation, equipment must be tested per the ANSI installation section.
- A drench hose is considered a "supplemental device" under ANSI Z358, and is thus not a substitute for a shower.
- At the minimum, an individual working in the lab should be able to reach any single shower in under 10 seconds via walking, no matter their location within the lab;
 - The path to the shower should be free of obstructions, and should be mounted in such a way such that it can be accessed by people of all physical sizes;
 - One (1) intervening door can be present between the work location and shower as long as the door opens in the same direction of travel as the person attempting to reach the emergency equipment, and the door does not lock to impede access to the shower.
 - The shower should be located on the same level as the hazard;
- The area of the shower should be highly visible and easily accessible:
 - The area should be well lit, which may require additional design considerations;
 - A sign indicating the presence of the shower must be installed with the shower.
 - If feasible, the shower should be located so one person can use both the eyewash and shower at the same time.
- In accordance with the guidelines of ANSI Z358.1, the safety shower should be able to supply a controlled flow of potable water, delivering 75.7 litres per minute (20 gallons per minute).
- The shower unit should deliver water tepid (lukewarm) water upon activation:
 - The temperature of water should at least be 15.5°C (60°F) to avoid causing hypothermia to the user.
 - New installations should be installed with plumbing for tepid water.
 - Existing showers can remain cold water only, but it is strongly recommended that a tepid shower should be available in the hallway of every floor within 150 feet of the any non-tempered shower.
- The control valve should operate in less than one second upon its activation and must remain 'on' without the use of worker's hand, until it is intentionally shut off. This allows the injured worker to remove the contaminated clothing.
- The valve shall be large enough to be easily located and operated by the user; the actuators must not be located more than 1.7 m (69 inches) above the surface where user stands.
- The spray pattern of shower should have a diameter of 0.51 m (20 inches) at 1.53 m (60 inches) above the surface on which the injured worker stands.



- The centre of the shower spray pattern should be located at least 0.41 m (16 inches) from any obstructions, protrusions, or sharp objects.
- The emergency shower must be installed with the showerhead not less than 2.08 m (82 inches) or more than 2.44 m (96 inches) from the surface on which the user stands. If a shower enclosure is used, it shall provide a minimum unobstructed area of 0.87 m (34 inches) in diameter.
- For new installations there must be a plumbed drainage system present near the shower:
 - The drain should have a dyke around it or a removable cover to prevent spills from accidentally leaking down the drain.
 - The shower must be located such that any dyke will not present a tripping hazard in everyday use.
 - For new installs the floor under the shower should be non-slip.
- For new installations there must be a privacy screen such as a shower curtain or equivalent around the shower.
- Equipment should be located away from electric outlets and appliances so there is no possibility of an electrical shock.
- If the equipment piping is located in areas which are exposed to potential freezing temperatures, then it should be insulated or protected with appropriate material(s).
- Combination units with showers and eye or face wash may be installed where feasible:
 - The combination units shall be connected to a system capable of supplying adequate flushing fluid to meet the requirements of each component when all components are operated simultaneously.
 - Combination units will be positioned so they can be used simultaneously by the user under the shower.

4.2 Supervisor Considerations

- Employees and students who might be exposed to splashes of hazardous materials should be instructed by their supervisors in the proper use of personal protective equipment, emergency showers, and eyewash equipment.
- For labs that use strong acids and caustics, the shower should be no more than 10 unobstructed feet away from the work area, thus it may be useful to designate specific areas in the lab for the handling of such materials.
- All lab users should be informed by their supervisors of all eyewash locations within the lab and in the hallway and whether or not they are tepid.

4.3 Accessibility and Testing



Emergency showers must be accessible at all times:

- The emergency eyewash station shall be identified with a highly visible sign. If a sign is not present, one should be obtained by the lab supervisor or a designated lab worker.
- It should be ensured by the lab supervisor or designated lab workers that the path leading to the emergency eyewash is clear of obstruction and that the immediate area is neat and easily accessible.
- There should be no sharp projections or electrical hazards anywhere in the operating area of the unit.

Emergency showers are tested annually. The University of Toronto Office of Environmental Health and Safety coordinates this testing:

- Using a flow meter the shower must be tested to ensure it is maintaining a flow of 75.7 litres per minute.
- Primary components such as the valve are inspected for damage, corrosion and functionality
- Results are logged.
- Deficiencies are reported to the property manager.

4.4 Using the Shower

To operate the shower during an emergency:

- Open water supply fully.
- Stand in the water stream.
- Remove all contaminated clothing. Typically undergarments would not be contaminated.
- Have a co-worker call for appropriate medical attention.
- Rinse until the time specified on the MSDS has been reached (if necessary, have a co-worker look up the appropriate time and then time you).