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1. Introduction

The Environmental Health & Safety Standard Operating Procedure for Emergency Eyewash Stations and Safety Showers was developed in accordance with the University's Policy Statement on Health and Safety and to ensure compliance with the Ontario Occupational Health & Safety Act and Regulations.

The purpose of this Standard Operating Procedure (SOP) is to outline the requirements for the installation, inspection, use and repair of emergency Eyewash stations and Safety Showers.

2. Scope

This SOP applies to all faculty, staff, and students who are undertaking studies, doing research, or carrying out any other work that takes place on or off campus and is under the purview of the University.

3. Applicable Legislation

- Occupational Health and Safety Act, Industrial Establishments (Reg. 851)
- ANSI/ISEA Standard, Z358.1-2014, American National Standard for Emergency Eyewash and Shower Equipment

4. Responsibilities

4.1 Department of Environmental Health and Safety

Responsibilities of the Department of Environmental Health & Safety will include the following:

- Ensure that each department is aware of their responsibilities under this SOP.
- Review this SOP periodically and amend as necessary.
- Assist Facilities and departments with plan review and placement of new equipment during new construction or major renovation.
- Maintain accurate record of location of all emergency Eyewash stations and Safety Showers through the cooperation of the university departments.



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- Provide equipment required to perform annual testing and flushing.
- Conduct periodic audits to ensure that emergency Eyewash stations, Safety Showers, flushing fluids and/or washes are being inspected and that activations are occurring at the frequency required by this SOP.
- Provide inspection tags to record flushing/testing activities for emergency Eyewash and Safety Shower equipment.
- Assist with the annual flushing and testing of emergency Eyewash station and Safety Shower equipment – as required by the department.

4.2 Directors, Department Heads & Managers

Each has the following responsibilities under this SOP:

- Ensure that pertinent supervisors, employees, and students are notified of their responsibilities as outlined in this SOP.
- Ensure that all employees and students (if applicable) have received instruction in the operation of emergency Eyewash stations, Safety Showers, flushing fluids and washes.
- Ensure that the Department of Environmental Health & Safety are notified of the addition or removal of any Eyewash or shower stations.
- Ensure that procedures, equipment, and materials appropriate for the specific work locations under his/her authority are provided to protect the health and safety of all employees and students.

4.3 Supervisors

Supervisors have the following responsibilities under this SOP:

- Ensure that the necessary emergency Eyewash and Safety Shower equipment called for in this SOP is provided or, if such equipment is not available, that any work requiring the availability of the equipment is not performed until the equipment is available.
- Ensure that all employees and students who may need to use the emergency Eyewashes, Safety Showers, flushing fluids and/or washes are trained on the location and use.
- Ensure that emergency Eyewash stations, Safety Shower stations, flushing fluids, and washes within laboratories are inspected and that activations are occurring at the frequency required by this SOP.
- Ensure that inspections and activations are recorded on the inspection tags.



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- Request immediate repair for malfunctioning emergency Eyewash and Safety Shower equipment.

4.4 Employees and Students

Employees and students have the following responsibilities under this SOP:

- Follow the requirements of this SOP.
- Becoming familiar with the location and operation of the nearest emergency Eyewash, Safety Shower, flushing fluid and/or washes.
- Use the emergency Eyewash, Safety Shower, flushing fluid and/or washes as trained.
- Report incidents that require the use of an emergency Eyewash, Safety Shower, flushing fluid and/or washes to supervisory personnel as soon as the emergency has been brought under control.

4.5 Departmental Safety Officer

Departmental Safety Officers have the following responsibilities under this SOP:

- Ensure that emergency Eyewashes, Safety Showers, flushing fluids and/or washes are inspected and that activations are occurring at the frequency required by this SOP.
- Establish department-specific policies, as necessary.
- Ensure that inspections and activations are recorded on the inspection tags.
- Coordinate immediate modifications, maintenance, repairs, and new equipment needs with Facilities and/or the Department of Environmental Health & Safety.
- Conduct annual testing and flushing of emergency Safety Showers and Eyewashes within their department with the assistance of the Department of Environmental Health & Safety, if required.

5. Definitions

Combination Unit: An interconnected assembly of emergency equipment that is supplied by a single source of flushing fluid.

Safety Shower: A device specifically designed and intended to deliver flushing fluid in sufficient volume to cause the fluid to cascade over the entire body while the hands are free.

Eye/Face Wash: A device used to provide fluid to irrigate and flush both the face and the eyes simultaneously.



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Eyewash: A device used to provide Tepid fluid to irrigate and flush both eyes simultaneously at a velocity low enough not to be injurious to the user.

Hand-Held Drench Hose: A flexible hose connected to a water supply that is used to provide fluid to irrigate eyes, face and body area.

Hazardous Material: Any substance or compound that has the capability of producing adverse effects on the health and safety of humans.

Personal Eyewash: A supplementary Eyewash that supports Plumbed or self-contained Eyewash equipment by delivering immediate flushing to the eyes or body.

Plumbed: A permanently connected continual source of potable water.

Tepid: A flushing fluid temperature conducive to promoting a minimum of 15 minute irrigation period. A suitable range is 16 – 38°C (60 - 100°F).

6. Installation / Location Requirements

Where an employee is required to work with, or is likely to be exposed to, a hazardous biological or chemical agent that could cause injury to the eye or skin, the university shall provide as many Eyewash stations, emergency Safety Showers, flushing fluids and/or Eye/Face Washes as are needed to for emergency treatment. The emergency equipment and/or treatments must be clearly marked with a sign or label, be located, or installed in a conspicuous place near where the hazardous biological or chemical agent is kept or used, be readily accessible, and must have instructions for its use displayed on the equipment or treatment or as near to it as is practical.

Each new university facility must have emergency Eyewash and Safety Shower equipment incorporated into the design whenever there is a reasonable potential for injury due to contact with a Hazardous Material. A job hazard analysis shall be conducted, if required, to determine if the potential for an injury exists. Installation of such equipment must be as specified in ANSI Z358.1-2014. Only equipment that is certified by the manufacturer as meeting the performance specifications contained in ANSI Z358.1-2014 may be placed in new facilities.

Existing university facilities must be equipped as necessary to include emergency drenching and/or flushing equipment that is readily accessible and can be reached within 10 seconds

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from the area(s) where there is a reasonable potential for injury due to contact with a Hazardous Material. The safety equipment shall be located on the same level as the hazard and the path of travel shall be free of obstructions that may inhibit the immediate use of the equipment. A job hazard analysis shall be conducted, if required, to determine if potential for an injury exists. Equipment performance specifications, height, and clearance distances should be as stated in ANSI Z358.1-2014.

Off-site/remote locations must have drenching/flushing equipment available whenever work involves the use of Hazardous Materials and where there is a reasonable potential for injury due to contact. Plumbed units that are maintained by the owner/controller of an off-site facility may be used or self-contained units can be purchased. A water hose supplying potable water and equipped with a proper face and body wash nozzle can be used at off-site locations where the possibility of exposure to injurious Hazardous Materials is very low and when proper personal protective equipment is used. When a self-contained emergency Safety Shower or Eye/Face Wash is installed, its installation shall be verified in accordance with manufacturer's instructions.

The temperature of the flushing fluid for emergency drenching and flushing equipment should be Tepid (lukewarm). A means of controlling the temperature to less than 38⁰C (100⁰ F) must be included in tempered flushing fluid systems. Protection from freezing or freeze protected equipment is required where the possibility of freezing exists. Flushing fluid shut off valves located within branch lines serving emergency Eyewash and Safety Shower equipment should be tagged to indicate that turning off the valve would turn off the supply to the emergency equipment.

Drainage shall be provided for new installations of both emergency Eyewashes and Safety Showers where feasible and/or required. Existing emergency Eyewash and Safety Shower units may have drains installed but it will be up to the individual departments to coordinate and pay for any installations. If drainage is provided, it can be connected to the building's sewer system.

Emergency Safety Showers and Eye/Face Wash stations shall be constructed of materials that will not corrode in the presence of the flushing fluid and must be in a well-lit area that is identified by highly visible signage.

The installation of benchtop emergency Eyewash stations must not be recessed too far back from the edge of the counter to impede hands free operation of the unit. Users must be able to flush their eyes without difficulty while standing in front of the counter.



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The following are the key specifications from ANSI Z358.1-2014.

Plumbed and self-contained emergency Safety Showers:

- Plumbed and self-contained emergency Safety Showers must supply at least 75.7 litres per minute (20 gpm) of flushing fluid at a velocity low enough to be non-injurious to the user.
- At least a 15-minute supply of flushing fluid must be available.
- The flushing fluid supply valve must stay open without the use of the operator's hands and should operate in less than one second upon its activation.
- Shower head height must be between 208.3 cm (82 in) and 243.8 cm (96 in) from the user's standing surface.
- With the valve in the fully opened position the diameter of the spray pattern shall be a minimum of 50.8 cm (20 in) at 152.4cm (60 in) above the standing surface. The flushing fluid shall be substantially dispersed throughout the pattern.
- The center of the shower spray pattern should be located at least 40.6 cm (16 in) from any obstructions, protrusions, or sharp objects.
- Shower enclosures (if used) require a minimum unobstructed diameter of 86.4 cm (34 in) to provide adequate space for the user.

Plumbed and self-contained Eyewash:

- Plumbed and self-contained Eyewash units must supply at least 1.5 litres (0.4 gpm) of flushing fluid and at a velocity low enough to be non-injurious to the user.
- At least a 15-minute supply of flushing fluid must be available.
- Eyewash units must supply flushing fluid to both eyes simultaneously.
- The flushing fluid supply valve must stay open without the use of the operator's hands.
- Nozzles must be protected from airborne contaminants. Nozzle protective device removal must be automatic (not require a separate motion by the user) when the unit is turned on.
- Eyewash units must be placed between 83.8 cm (33 in) and 134.6 cm (53 in) from the user's standing surface and at least 15.3 cm (6 in) from the nearest wall or other obstruction.
- Benchtop installations must be easily accessible while standing in front of the bench. Users must be able to flush their eyes without difficulty while standing in front of the counter.

Eye/Face Wash equipment:



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- Plumbed and self-contained Eye/Face Wash units must supply at least 11.4 litres (3.0 gpm) of flushing fluid and at a velocity low enough to be non-injurious to the user.
- At least a 15-minute supply of flushing fluid must be available.
- Eye/Face Wash units must supply flushing fluid to both eyes simultaneously.
- The flushing fluid supply valve must stay open without the use of the operator's hands.
- Nozzles must be protected from airborne contaminants. Nozzle protective device removal must be automatic (not require a separate motion by the user) when the unit is turned on.
- Eyewash units must be placed between 83.8 cm (33 in) and 134.6 cm (53 in) from the user's standing surface and at least 15.3 cm (6 in) from the nearest wall or other obstruction.
- Benchtop installations must be easily accessible while standing in front of the bench.

Hand-Held Drench Hoses:

- Shall be designed to provide a controlled flow of flushing fluid to a portion of the body at a velocity low enough to be non-injurious to the user.
- Hand-Held Drench Hoses provide support for emergency Safety Shower and Eyewash units but they are not intended to replace them.
- A drench hose may be considered an Eyewash or Eye/Face Wash if the device meets or performance requirements of Section 5 and/or Section 6 of ANSI Z358.1-2014.
- Benchtop installations must be easily accessible while standing in front of the bench.

Combination Units:

- Connected to a system capable of supplying adequate flushing fluid to meet the requirements of each component as outlined in Sections 4, 5 and 6 of ANSI Z358.1-2014 when all components are operated simultaneously.
- Combination Unit components shall be positioned so that the components may be used simultaneously by the same user.

Personal Eyewash equipment:

- Personal Eyewash equipment, such as bottles and small portable units, are designed for immediate flushing of the eyes without being injurious to the user. Personal Eyewash equipment supports Plumbed and self-contained units, but it does not provide adequate replacement.
- Operator instructions must be maintained on Personal Eyewash equipment.



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7. Use

Immediate and proper use of emergency Eyewash and Safety Showers is essential to minimizing injury. The following guidelines should aid in minimizing injury due to contact with Hazardous Materials:

- Flush eyes and/or skin for at least 15 minutes. Never use home-made neutralizing solutions to flush chemicals from the body.
- Immediately remove contaminated clothing. Do this while under the Safety Shower when gross contamination has occurred. Have someone assist with clothing removal when possible.
- Hold eyelids open with fingers so flushing fluid can fully irrigate the eyes. Note: People may not always be able to flush their eyes on their own because of intense pain. Nearby helpers should be prepared to assist with holding the eyelids open. Other helpers may need to assist with keeping the person under the flushing fluid for at least 15 minutes.
- Seek medical attention after flushing the areas of contact for at least 15 minutes.
- Notify supervisor as soon as the emergency has subsided.
- An assistant may use a blanket or uncontaminated article of clothing as a shield to provide privacy for someone who needs to remove their clothes while under an emergency Safety Shower, and for body coverage while seeking medical attention.

8. Flushing and Inspection

Emergency Eyewash station and Eye/Face Wash stations must be activated weekly to ensure flushing fluid is available, to clear the supply line of any sediment build-up and to minimize microbial contamination due to stagnant water. Inspect Eyewash and Eye/Face Wash stations while flushing to make sure that water rises to approximately equal heights no more than 20 cm (8 in) from the top of the spray heads and that fluid flow is sufficient to flush both eyes simultaneously while at a velocity low enough to be non-injurious to the user. Self-contained units shall be visually checked weekly, or in the period specified by the manufacturer's instructions, to determine if flushing fluid needs to be changed or supplemented.

Each Personal Eyewash station, flushing fluid, and wash must be reviewed regularly to make sure components are in place, the station/unit is readily accessible, and that flushing solution has not passed its expiration date. Also verify that bottles with seals/tamper indicators are sealed, replacing those that are not. Water in self-contained Eyewash and Eye/Face Wash stations must be replaced with fresh potable water regularly. Follow the manufacturer's

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recommendations for functionality tests and solution replacement when a preserved solution is used in these units.

Emergency Safety Shower stations must be activated at least monthly to ensure flushing fluid is available, to clear the supply line of any sediment build-up, and to minimize microbial contamination due to stagnant water. When performing weekly activations on the Eyewash component of Combination Units you can limit the testing to the Eyewash so long as they are fed off the same water supply source and there isn't a shut off valve between the Eyewash and the Safety Shower.

The date of the flushing/inspection must be recorded on an inspection tag attached to the units, for Combination Units, you need to have a separate tag for both the Eyewash and Safety Shower components. Inspection tags are available from the Department of Environmental Health & Safety.

Annual flushing and inspections shall be conducted on emergency Eyewashes, Safety Showers, flushing fluids, and Eye/Face Washes on campus to ensure that they are in proper working condition, follow current ANSI standards, and to identify areas for improvement. Annual flushing and inspections shall be conducted by the Safety Officer with the assistance of the Department of Environmental Health and Safety if needed. The equipment and procedure for conducting the annual flushing and inspection shall be as follows:

Equipment

- Barrel or wheeled water collection container with drainage valve or pump.
- Water collection cone on a pole.
- Tray with wheels and handle to transport barrel.

Procedure

- Align barrel or water collection container under emergency Safety Shower.
- Drape water collection cone over the top of the Safety Shower head.
- Engage Safety Shower by pulling handle.
- To stop flow of water, push handle back to the upward position.
- Record testing and flushing on the inspection tag located on the emergency Safety Shower. Record must include the date and initials of the person who performed the inspection.
- Any problems noted during the weekly, monthly, or annual inspection (ex: improper water temperature, improper water flow, leaking water, damaged equipment), requires the generation of a work order by calling Fix-It at Ext. 77301.

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9. Repairs

Whenever an Eyewash station is non-functional, a portable Eyewash station or equivalent must be available if work with injurious Hazardous Materials cannot be delayed.

Each department is responsible for ensuring that Eyewash and Safety Shower equipment not passing inspection is repaired in a priority manner. When emergency Eyewash and Safety Shower equipment is non-functional, it must be clearly tagged/signed as being out-of-service.

Anyone who wants to remove an emergency Eyewash and Safety Shower equipment from service must notify the Department of Environmental Health & Safety and the affected department beforehand. This requirement includes those periods when main or branch water lines that serve drenching and flushing equipment are turned off.

Revision History:

Version 1.0: April 2006 – Initial Release

Revision 2.0: August 2015 – Permission for drains added.

Revision 3.0: June 2017 – Minor changes to wording.

Revision 4.0: October 2018 – Minor changes to wording.

Revision 4.1: May 2021 – Allowance for weekly inspections of Combination Units to be limited to the Eyewash so long as both the Eyewash and shower are supplied by the same water source.

Revision 5.0: February 2023 – Changes shower inspection frequency to monthly to match standard practice in the Ontario university sector.