



## Environmental Health & Safety Policy & Procedure #35

**TITLE:** **EMERGENCY EYEWASH AND SHOWER EQUIPMENT**

**PURPOSE:** The purpose of this policy is to establish minimum requirements regarding the design, use, and periodic testing of emergency eyewash and shower equipment located at FAU facilities, and to provide for the training of potential users of this equipment.

**SCOPE:** This policy establishes the minimum performance requirements for eye wash and shower equipment for the emergency treatment of the eyes or body of any employee, student, or visitor who has been exposed to injurious materials. It covers the following types of equipment: emergency showers, combination showers and eyewashes, and eye/face washes.

- Plumbed eyewash units shall be provided for all work areas or classroom settings where, during normal operations or foreseeable emergencies, the eyes of an employee, student or visitor may come into contact with any substance which can cause corrosion, severe irritation, or permanent tissue damage or which is toxic by absorption. Drench and water hoses; sink faucets, or showers are not acceptable eyewash facilities.
- Emergency shower shall be provided for all work areas or classroom settings where, during normal operations or foreseeable emergencies, areas of the body may come into contact with any substance which can cause corrosion, severe irritation, or permanent tissue damage or which is toxic by absorption.
- Self-contained or bottled eyewash stations may be provided in lieu of plumbed eyewash stations in locations with inadequate potable water sources, or in locations with only biological splash hazards. These stations require no special testing requirements and only require inspection/replacement of the water/solution.

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## DEFINITIONS:

- **American National Standards Institute (ANSI):** A non-profit organization that coordinates the standardization and conformity assessment systems in the United States.
- **Combination Units:** An interconnected assembly of emergency equipment supplied by a single source of flushing fluid. The unit consists of both the emergency shower and an eye/face wash.
- **Drench Hose Units:** A supplemental, hand-held device consisting of a flexible hose connected to a flushing supply and used to provide fluid to irrigate and flush face and body areas.
- **Emergency Shower:** A device which delivers flushing fluid that utilizes a valve which remains open during use to enable the user to have water cascading over the entire body while the hands are free.
- **Emergency Units or Equipment:** General term for emergency eyewash, eye/face wash, shower, drench hose and combination units.
- **Eyewash:** A unit that flushes water specifically to the eyes.
- **Eye/Face Wash:** Device that flushes both eyes and face.
- **Hazardous/Injurious Material:** Any substance that could cause corrosion, severe irritation, or permanent tissue damage or is toxic by absorption.
- **Plumbed Eyewash:** Eyewash unit permanently connected to a source of potable water.
- **Potable Water:** Water that is suitable for drinking.
- **Stay-Open Valve:** A valve that manually opens and closes the emergency units.
- **Tepid:** A flushing temperature conducive to promoting a minimum 15-minute irrigation period. A suitable range of 16°-38°C (60-100°F)
- **Valve Actuator:** A device connected to the valve to facilitate its operation.

## RESPONSIBILITIES

### Principal Investigators (PI's)/Area Supervisors/Building Owners

- Perform or delegate the performance of weekly eyewash station testing.
- Building owners will need to designate those that will perform the weekly eyewash check in common areas of the facility.
- Ensure that any individual under the supervisor's purview understands his/her responsibilities and complies with this policy.
- Ensure that all employees, students and volunteers have received instruction in the proper use and operation of the emergency unit/equipment provided for the area.
- Ensure that procedures, equipment and materials appropriate for the specific work locations are provided to protect the health and safety of all employees, students volunteers, and visitors.
- Prior to assigning work involving the potential for hazardous materials to splash onto the skin or into the eyes, PI's/Supervisors must verify that:
  - Emergency showers, eyewash equipment, eye/face wash equipment, combination shower-eyewash equipment, or combination shower-eye/face wash equipment appropriate for the potential hazard are provided in the work place, and are operable.
  - All shut-off valves between the sanitary water supply and the eyewash and/or safety shower are secured in the open position.
  - At least one individual working in the area has been trained on their use.

- Ensure that routes to the shower/eyewash station and the area around the equipment are kept clear.
- Ensure prompt submission of a work order to Facilities Management when any unit is not functioning properly. Clearly tag the unit- "DO NOT USE"-Out of Service.

#### Physical Plant/Outside Contractor

- Performs inspections, annual flow test of emergency eye/face wash and safety shower equipment.
- Installs tags and provides replacement tags as needed.
- Maintains accurate record of locations of all emergency eyewash and shower stations.
- Provides equipment and protocols required to perform testing and flushing of eyewash, shower, combination eyewash shower units.
- Ensures that inspections and activations are recorded on inspection tags.
- Coordinates immediate modifications, maintenance, repair and replacement of equipment as deemed necessary to meet current standards.
- Supplies all necessary materials and equipment to perform annual eyewash testing and maintenance activities.
- Informs Environmental Health and Safety of any new installations and current repair status of existing equipment.

#### Environmental, Health & Safety

- Ensures that each department is aware of their responsibilities under this policy.
- Reviews the policy periodically and updates as necessary.
- Verifies inspection records and locations of emergency units/equipment.
- Assists with plan review and placement of new equipment during new construction or major renovation.
- Provides consultation and guidance concerning the operations and testing of eyewash units to Principal Investigators and Supervisors.

#### Employees, Students and Volunteers

- Know the location of the nearest emergency units/equipment.
- Ensure that routes to the emergency units/equipment and the area around them are kept clear of obstructions at all times.
- Ensure they know how to properly use emergency units/equipment.
- Immediately notify PI or supervisor if any unit is found to be not functioning properly, and clearly tag the unit-"DO NOT USE"-Out of Service

## APPLICATIONS

Where the eyes or body of any person may be exposed to hazardous, injurious or corrosive materials, suitable emergency units or equipment for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Some area examples would be:

Areas where corrosive or injurious chemicals are used, handled, or stored.

Common examples include solutions of inorganic/organic acids or bases with  $\text{pH} \leq 2.0$  or  $\geq 12.5$ ;

organic or inorganic materials that are corrosive or irritating to eyes or skin such as methylene chloride and phenol; organic or inorganic materials that are significantly

toxic by skin absorption (e.g. phenol); and formaldehyde solutions in concentrations  $\geq 0.1\%$

- Areas where operations involve the use of air or water reactive liquids or solids.
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- Areas where operations involve the use of other materials to include irritants, sensitizers, carcinogens, highly toxic materials (neurotoxins, hepatotoxins, nephrotoxins), biological and radioactive materials.
- Storage areas where breakable containers of injurious or corrosive materials (1 gal or more) are handled outside their original shipping cartons.
- Waste accumulation areas that could contain corrosive waste materials.
- Where cryogenic materials are dispensed.
- Areas where corrosive chemicals are used in a closed or pressurized system that can catastrophically fail and cause the chemicals to leak.

## GENERAL REQUIREMENTS

- Wherever possible, emergency units shall be located in immediately accessible locations that require no more than 10 seconds (approximately 25 feet) for the injured person to reach along unobstructed pathways within the laboratory or work area and where the user shall not have to pass through a door to reach the unit.
- Emergency unit shall be identified with a highly visible sign in well lighted area.
- The area around the emergency units shall be clear, unobstructed and have no items hanging on them.
- There shall be no sharp projections anywhere in the operating area of the unit.
- The valve actuator shall be designed so that the water flow remains in the on position without the use of the operator's hands and must remain open until manually shut off. The valve shall be large enough to be easily located and operated by the user.
- Any electrical apparatus, telephone and thermostats should not be located within 18 inches of the units. Where electrical outlets are necessary, they must be protected by ground fault interrupters.
- The eyewash and eyewash/face equipment shall be located to provide enough room to allow the eyelids to be held open with the hands while the eyes are in the water stream.
- Emergency eyewash equipment shall ensure that a controlled flow of potable tepid water is provided to both eyes simultaneously at a velocity low enough not to be injurious to the user.

## OPERATIONS AND PROCEDURES

The American National Standards Institute (ANSI) Standard for Emergency Eyewash and Shower Equipment (ANSI Z358.1-2014) recommends that the affected body part must be flushed immediately and thoroughly for at least 15 minutes using a large supply of clean fluid under low pressure. Water does not neutralize contaminants -- it only dilutes and washes them away.

Begin flushing as quickly as possible after the eye comes in contact with a harmful substance as the first 10 seconds are critical. Toxic substances, when coming in contact with the eye, immediately begin to damage sensitive eye tissues. The longer they remain in contact, the greater the damage to the eye. Besides tissue damage, acids and alkali can change the pH in the eye itself. When the pH of the eye begins to get out of the narrow tolerable range, severe eye damage, including blindness, may result.

However, other references recommend a minimum 20-minute flushing period if the nature of the contaminant is not known. The flushing or rinsing time can be modified if the identity and properties of the chemical are known. For example:

- A minimum 5-minute flushing time is recommended for mildly irritating chemicals,
- At least 20 minutes for moderate-to-severe irritants,
- 20 minutes for non-penetrating corrosives, and
- At least 60 minutes for penetrating corrosives.

Non-penetrating corrosives are chemicals which react with human tissue to form a protective layer which limits the extent of damage. Most acids are non-penetrating corrosives. Penetrating corrosives, such as most alkalis, hydrofluoric acid and phenol, enter the skin or eyes deeply. Penetrating corrosives require longer water flushing (a minimum of 60 minutes) than non-penetrating corrosives (a minimum of 20 minutes). In all cases, if irritation persists, repeat the flushing procedure. It is important to get medical attention as soon as possible after first aid has been given. A physician familiar with procedures for treating chemical contamination of the eyes and body should be consulted.

#### General checklist to use for chemical exposures

- In case of chemical exposure, flush skin or eyes with cool water for at least 15 minutes-or more and if possible until medical assistance arrives. **DO NOT RUB!**
- Contact 911 for medical assistance as soon as possible. Provide Safety Data Sheets (SDSs) to medical personnel.
- Know the effects of chemicals with which you are working. Read, ask questions about, and understand SDSs for each chemical with which you work.
- Always wear personal protective equipment to include eye, face, body and foot protection.
- Learn the location and use of all emergency equipment, even if you are working in a new area for only a brief time.
- Know how to help others reach showers or eyewashes and how to help them get medical assistance.

- Hold your eyes open with your hands while using eyewash to be sure water reaches the eyes.
- While assisting injured person provide clean cover for privacy while removing contaminated clothing after the shower has been activated.
- Immediately wash off even small amounts of chemicals.
- Notify supervisor as soon as emergency has subsided.
- Supervisor should immediately notify the Risk Manager and EH&S

## TESTING

### Eyewashes and Combination Eyewash/Shower Units

#### Weekly – Laboratory

- Visually inspect the unit for leaks or pipe damage and proper placement of protective covers. This should be done prior to testing in order to avoid further damage to the unit and risk of injury to users. Ensure that the unit is free of any obstructions.
- When labs are in use, plumbed eyewashes shall be activated for a period long enough to verify operation and ensure flushing is available. Document the test on the tag provided.
- For eyewashes and showers that drain to the floor, utilize a bucket to capture the effluent and pour to a drain after testing is complete.
- If a laboratory area is inactive, the weekly flushing may be unnecessary, but must be documented on the tag provided.

#### Annual – Physical Plant or Outside Contractor

- Activate unit and measure per specifications of ANSI 358.1 and adjust accordingly:
  - Flow rate
  - Temperature
  - Flow pattern
  - Actuation speed
  - Valve positions (before and during actuation)
- Evaluate condition of all portions of the unit.
- Replace any damaged or missing pieces.
- Document test with dates and initials on unit tag.