Safety Standards

This document is produced by the Oklahoma Department of Career and Technology Education (ODCTE)-STEM Division as a reference document to aid instructors and administrators with making the educational environment a safe and engaging place to learn. It is a document that is not all-inclusive and will be updated as new information is available and where applicable, exact text has been used from reference materials. Please refer to the ODCTE's Rules and Regulations document and the area specific evaluation tools for assessment measures. Oklahoma CareerTech instructors are expected to comply with all local fire and safety rules and regulations.

The Public Employees Occupational Safety & Health Division (**PEOSH**) is responsible for the enforcement of workplace safety and health regulations in the public sector, including city, county, state, public schools and universities, as well as public trusts. These employers do not fall under the jurisdiction of Federal OSHA standards.

PEOSH Inspections
PEOSH has the authority to enter Public Sector work- places without delay and at reasonable times to conduct an enforcement inspection without prior notice. Employers are obligated by law to cooperate with the Department of Labor.

Applicable Standards
The **Oklahoma Occupational Health & Safety Act** - 40 O.S. § 401, et seq.- OAC 380:40 adopts most of the Federal OSHA (29 CFR 1904, 1910, and 1926) standards, with a few minor exceptions.
The Act establishes the requirements for each employer to provide a place of employment which is free from recognized hazards that are causing or likely to cause death or serious physical harm to employees.

"Duty or Standard of Care" is defined as an obligation, recognized by law, requiring conformance to a certain standard of conduct to protect others against unreasonable risk (Prosser et al., 1984). "The breach of a particular duty owed to a student or others may lead to liability for both the teacher and the school district that employs that teacher" (Ryan, 2001).
The legal definition of "negligence" is important for every teacher to know. Negligence, as defined by the courts today, is conduct that falls below a standard of care established by law or profession to protect others from an unreasonable risk of harm, or the failure to exercise due care. It should be noted that in the absence of specific laws or local policies, the standard of care expected of those having a duty of care is measured against any standards adopted by the profession, e.g., position statements adopted by the National Science Teachers Association (NSTA), the National Association of Biology Teachers (NABT), the American Chemical Society (ACS), the Council of State Science Supervisors (CSSS) or the National Science Education Leadership Association (NSELA).

Appropriate lab attire

- Wear shoes that adequately cover the whole foot; low-heeled shoes with non-slip soles are preferable. Do not wear sandals, open-toed shoes, open-backed shoes, or high-heeled shoes in the laboratory.
- Avoid wearing shirts exposing the torso, shorts, or short skirts; long pants that completely cover the legs are preferable.
- Secure long hair, jewelry and loose clothing (especially loose long sleeves, neck ties, or scarves).
- Always wear appropriate eye protection (i.e., chemical splash goggles) in the laboratory/shop area.
- Wear a full-length, long-sleeved laboratory coat, lab/shop apron, or appropriate safety attire for machinery being operated.

Proper storage of chemicals, supplies or cleaning materials

- Keep chemical storage areas off limits to all students.
- No unlabeled substance should be present in the laboratory at any time.
- Ensure that all storage areas have doors with locks.
- Secure shelving to the wall or floor.
- Store chemicals inside a closeable cabinet or on a sturdy shelf with a front-edge lip to prevent accidents and chemical spills; a ¾-inch front edge lip is recommended.
- Store acids in a dedicated acid cabinet. Nitric acid should be stored alone unless the cabinet provides a separate compartment for nitric acid storage.
- Store highly toxic chemicals in a dedicated, lockable poison cabinet that has been labeled with a highly visible sign.
- Store volatile and odoriferous chemicals in a ventilated cabinet.
- Store flammables in an approved flammable liquid storage cabinet
- Store water sensitive chemicals in a water-tight cabinet in a cool and dry location segregated from all other chemicals in the laboratory.
- There should be a yearly purging of outdated, dangerous or unnecessary substances.
- Chemical waste should be stored and disposed of properly.

Proper ventilation for program type

Maintain a safe learning environment by ensuring that the classroom, storage/preparatory and laboratory/shop area is properly and adequately ventilated.

- Laboratory chemical hood (80-120 feet per minute capture velocity, vented outside)
- Instructional areas should have proper heat or cooling ventilation.
- Machinery should have an adequate dust and debris exhaust system.

Power Requirements

- All classrooms need to have Emergency disconnection of power and gas supplies. There should be Emergency Stop buttons in key areas of work. It should be highly visible to instructors and students.
- Emergency Stop buttons should have proper signage.
- There should be sufficient electrical outlets located at intervals of 6–8 feet (1.8–2.4 meters) that make extension cords unnecessary.
- Outlets should be equipped with Ground-Fault Interrupters (GFIs).
- All electrical cords must be in safe condition.

Fire extinguisher

Recommended for classroom or laboratory/shop areas- Fire Extinguisher, Dry Chemical, ABC

- Monthly inspection of extinguisher.
- Extinguisher is not blocked by equipment, coats or other objects that could interfere with access in an emergency.
- Extinguisher nozzle or other parts are not obstructed.
- Extinguisher pin and tamper seal (if it has one) are intact.
- Extinguisher has no dents, leaks, rust, chemical deposits and other signs of abuse/wear.
- If the extinguisher is damaged or needs recharging, get it replaced immediately

Fire blanket

- Woolen blanket.
- Blanket dimensions are 62" x 70".
- Uses: smothering fires, controlling chemical spills, privacy/cover for safety shower user, etc.

Safety Tests

- Students are required to pass a safety test with 100% accuracy specific to the program.
- Safety tests should be maintained on file for the duration of the program.
- Safety should be taught and practiced in instructional activities.
- Safety tests for specific pieces of equipment must be passed with 100% accuracy and kept on file for the duration of the program.

Eye protection

Eye protection must be worn when around chemicals, power equipment or other environment that would mandate eye protection.

Lenses of safety eye wear must be kept clean and sanitized. Restricted vision due to dirty lenses is sometimes a contributing factor to accidents. Eye protective devices that are shared shall be disinfected between uses.

OSHA

1910.132(a)

Application. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

1910.132(d)(1)

The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

1910.132(d)(1)(i)

Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;

1910.132(d)(1)(ii)

Communicate selection decisions to each affected employee; and,

1910.132(d)(1)(iii)

Select PPE that properly fits each affected employee. Note: Non-mandatory Appendix B contains an example of procedures that would comply with the requirement for a hazard assessment.

Proper signage

- International safety symbols should be used to denote areas or chemicals in the classroom, storage room, and laboratory or shop area.
- All safety signage is in place.

Posting of Eye Protection Areas

The entrance to all shops, laboratories or other areas that require eye protection should be posted with a sign indicating the requirements. In addition, machines, equipment or process areas and laboratories requiring operators to wear specific eye and face protection should be posted with warning signs.

Visitors must wear eye protection in the area. Extra eye protection should be available at all times to lend to visitors.

Adequate space to ensure safe instruction

- Keep work area neat, clean and free of any unnecessary objects.
- Never block access to exits or emergency equipment.
- Do not block the sink drains with debris.
- Inspect all equipment for damage (cracks, defects, etc.) prior to use; do not use damaged equipment.
- Place chemical waste in appropriately labeled waste containers.
- Properly dispose of broken glassware and other sharp objects immediately in designated containers.

Eye wash & Safety Shower

Emergency Eye Wash Regulations
OSHA regulations at 29 CFR 1910.151 (c) specify the use of eyewash and/or shower facilities:
"*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."*
ANSI Z358.1-1990, revised in 2014. This "Emergency Eye Wash and Shower Equipment" standard helps the user in selecting and installing emergency equipment that meet OSHA requirements.

When discussing Eye Wash and Shower Equipment the following categories are common:
· **Plumbed Shower** - A shower permanently connected to a source of potable water.
· **Self-Contained Shower** – A shower that contains it own its own flushing fluid and must be refilled or replaced after use.
· **Plumbed Eye Wash** - An eye wash unit permanently connected to a source of potable water.
· **Gravity-Feed Eye Wash** - An eye wash device that contains its own flushing fluid and must be refilled or replaced after use.
· **Eye & Face Wash**: A device used to irrigate and flush both the face and the eyes.
· **Hand-Held Drench Hose:** A flexible hose connected to a water supply and used to irrigate and flush eyes, face and body areas.
· **Personal Eye Wash** - A supplementary eye wash that supports plumbed units, gravity-feed units, or both by delivering immediate flushing fluid. Typically found in a small bottle (pint or two). Personal eye wash units can provide immediate flushing when they are located near the workstations. Personal eye wash equipment does not meet the requirements of plumbed or gravity-feed eye wash equipment. Personal eye wash units can support plumbed or gravity-feed eye wash units, but cannot be a substitute.

The following specifications are taken from the ANSI Z358.1-2004 standard.
Plumbed Shower
1. Heads
A. Positioned 82"--96" from floor.
B. The shower must provide tepid flushing fluid (15.6-37.8°C or 60-100°F).
C. Spray pattern will have a minimum diameter of 20" at 60" above the floor.
D. Flow Rate=20 gallons per minute (GPM) at 30 pounds per square inch (PSI).
E. The center of the spray pattern shall be located at least 16 inches from any obstruction.

2. Valves
A. Activate in 1 second or less.
B. Stay-open valve (no use of hands).
C. Valve remains on until the user shuts it off.

3. Installation
A. Shower shall be located in an area that requires no more than 10 seconds to reach.
B. Shower location shall be in a well-lit area and identified with a sign.
C. Shower shall be located on the same level as the hazard.

4. Maintenance and Training

A. Plumbed showers will be activated weekly to verify correct operation.

- Activation ensure flow of water to the head(s) of the device.
- Duration of the activation shall be sufficient to ensure all stagnant water is flushed from the unit itself and all sections of the piping that do not form part of a constant circulation system, also known as “dead leg” portions. (The duration is determined by the length of piping where stagnant water could be sitting before it reaches the head(s) of the unit.)

B. All employees who might be exposed to a chemical splash shall be trained in the use of the equipment.
C. All showers shall be inspected annually to make sure they meet with ANSI Z358.1 requirements.
D. Showers must have tags identifying the date of the last inspection and the inspector’s name printed on them.

Plumbed and Gravity-Feed Eye Wash

1. Heads
A. Eyewash stations must provide tepid flushing fluid (15.6-37.8°C or 60-100°F).
B. Positioned 33"-45" from floor.
C. Positioned 6" from wall or nearest obstruction.
D. 0.4 gallons per minute (GPM) for 15 minutes for plumbed units shall provide flushing fluid at 30 PSI.
E. 0.4 gallons per minute (GPM) for 15 minutes for gravity-feed units.
F. Shower heads and flushing fluid units must be covered with plastic caps to protect them from airborne contaminants.

2. Valves
A. Activate in 1 second or less.
B. Stay-open valve (leaving hands free).

3. Installation
A. Eyewash equipment shall be located in an area that requires no more than 10 seconds to reach. (approximately 55 feet)
B. The location of the eye wash unit shall be in a well-lit area and identified with a sign.
C. Eyewash equipment shall be on the same level as the hazard.

4. Maintenance and Training
A. Plumbed eye wash units shall be activated weekly to verify proper operation.
B. Gravity-feed units shall be maintained according to the manufacturer's instructions.
C. All employees who might be exposed to a chemical splash shall be trained in the use of the equipment.
D. All eyewash equipment shall be inspected annually to make sure they meet ANSI Z358.1 requirements.

Eye & Face Wash:

1. Heads
A. Eyewash stations must provide tepid flushing fluid (15.6-37.8°C or 60-100°F).
B. Positioned 33"--45" from floor.
C. 6" from wall or nearest obstruction.
D. Large heads to cover both eyes and face or regular size eye wash heads plus a face spray ring.
E. 3 gallons per minute (GPM) for 15 minutes.

2. Valve
A. Same as eye wash.

3. Installation
A. Same as eye wash.

4. Maintenance and Training
A. Same as eye wash

Hand-Held Drench Hose:
1. Heads
A. 3 gallons per minute (GPM).

2. Valve
A. Activate in 1 second or less.

3. Installation
A. Assemble per the manufacturer's instructions.
B. The location of the drench hose shall be in a well-lit area and identified with a sign.

4. Maintenance and Training
A. Activate weekly to verify proper operation.
B. All employees who might be exposed to a chemical splash shall be trained in the use of the equipment.
C. All drench hose equipment shall be inspected annually to make sure they meet ANSI Z358.1 requirements.
Note: *Hand-held drench hoses support shower and eyewash units but shall not replace them.*

Personal Eye Wash:
Personal eye wash units can provide immediate flushing when they are located near the workstations. Personal eye wash equipment does not meet the requirements of plumbed or gravity-feed eye wash equipment. Personal eye wash units can support plumbed or gravity-feed eye wash units, but cannot be a substitute.
Portable eyewashes do not meet ANSI or OSHA standards of a 15-minute continuous delivery of aerated water. The water in a portable eyewash can become contaminated.

Safety shower
29 CFR §1910.1450(c)(1)(d)-shower
Chemical Hygiene Plan
A chemical hygiene plan (CHP) is a written program stating the policies, procedures, and responsibilities that serve to protect employees from the health hazards associated with the hazardous chemicals used in that particular work-place.
OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories Standard (Title 29, Code of Federal Regulations, Part 1910.1450, specifies the mandatory requirements of a CHP to protect persons from harm due to hazardous chemicals. The Standard can be viewed on the OSHA Web site at www.osha.gov. It applies to school employees who work in laboratory settings (i.e., science teachers and lab assistants); indirectly it may serve to protect students. The school superintendent, science department chairperson, and/or chemistry teacher(s) are typically responsible for developing the CHP for the school. Appendix A of 29 Code of Federal Regulations 1910.1450 provides non-mandatory recommendations to assist in the development of a CHP.

Chemical Hygiene Plan Required Elements
Defined standard operating procedures relevant to safety and health considerations for each activity involving the use of hazardous chemicals.

- Criteria to use to determine and implement control measures to reduce exposure to hazardous materials (i.e., engineering controls, the use of personal protective equipment, administrative controls, and hygiene

practices) with particular attention given to the selection of control mea -sures for extremely hazardous materials. A requirement to ensure laboratory chemical hoods and other protective equipment are installed and functioning properly.

- Information for persons working with hazardous substances specifying the hazards of the chemicals in the work area, the location of the CHP, signs and symptoms associated with hazardous chemical exposures, the permissible or recommended exposure limits of the chemicals, and the location and availability of information on the hazards, safe handling, storage, and disposal of hazardous chemicals [not limited to Material Safety Data Sheets (MSDSs)].
- Training for persons working with hazardous substances that includes methods and observations to detect the presence or release of a hazard -ous chemical, the physical and health hazards of the chemicals used, the measures to be taken to protect against these hazards (i.e., personal protective equipment, appropriate work practices, emergency response actions), and applicable details of the CHP.
- The circumstances under which a particular laboratory operation or procedure requires prior approval from the appropriate administrator.
- Requirements for medical consultation and medical examination when -ever (1) a person develops signs or symptoms associated with a hazard -ous chemical, (2) exposure monitoring reveals an exposure level routine -ly above the action level, or (3) an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure.
- Designation of personnel responsible for the implementation of the CHP, including the assignment of a Chemical Hygiene Officer.
- Requirements for additional protection when working with particularly hazardous substances including “select carcinogens,” reproductive toxins, and substances with a high degree of acute toxicity.
- Provisions for yearly re-evaluation of the CHP

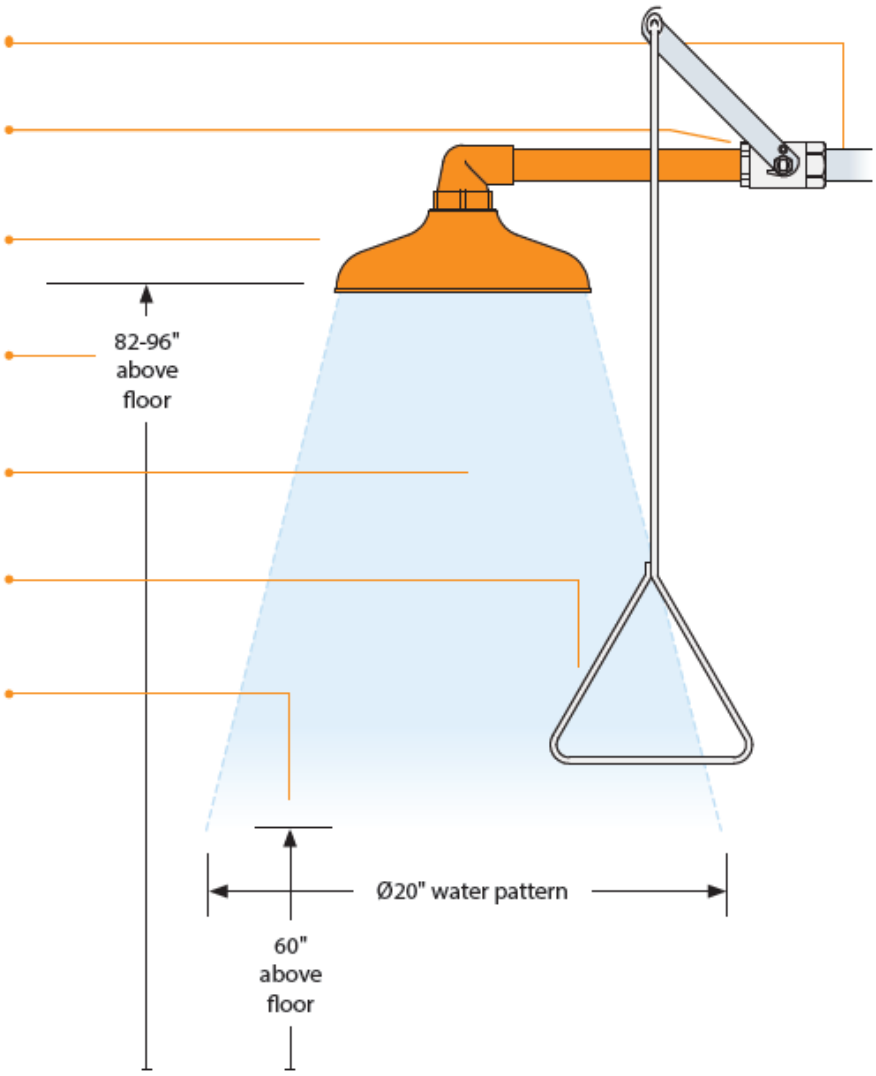
Checklist for Safety Equipment: (http://www.gesafety.com/downloads/ANSIGuide.pdf)

Emergency Showers

All Guardian emergency showers are third-party certified to meet or exceed the provisions of ANSI Z358.1-2014.

This checklist is a summary of the provisions of ANSI Z358.1-2014 relating to emergency showers. Please refer to the standard for a complete listing of these provisions.

- ☐ **Water supply is sufficient to provide at least 20 GPM for 15 minutes. (Section 4.1.2, 4.5.5)**
- ☐ **Hands-free valve activates in one second or less and remains open until manually closed. (Section 4.2, 4.1.5)**
- ☐ **Shower delivers 20 gallons (75.7 liters) of water per minute for 15 minutes in the required pattern. (Section 4.1.2, 4.5.5)**
- ☐ **Height of water column is between 82" (208.3 cm) and 96" (243.8 cm) above the floor. (Section 4.1.3, 4.5.4)**
- ☐ **Center of the water pattern is at least 16" (40.6 cm) from any obstruction. (Section 4.1.4, 4.5.4)**
- ☐ **Easily located, accessible actuator is no more than 69" (173.3 cm) above floor. (Section 4.2)**
- ☐ **At 60" (152.4 cm) above the floor, the water pattern is at least 20" (50.8 cm) in diameter. (Section 4.1.4)**
- ☐ **If provided, shower enclosure has a minimum diameter of 34" (86.4 cm). (Section 4.3)**



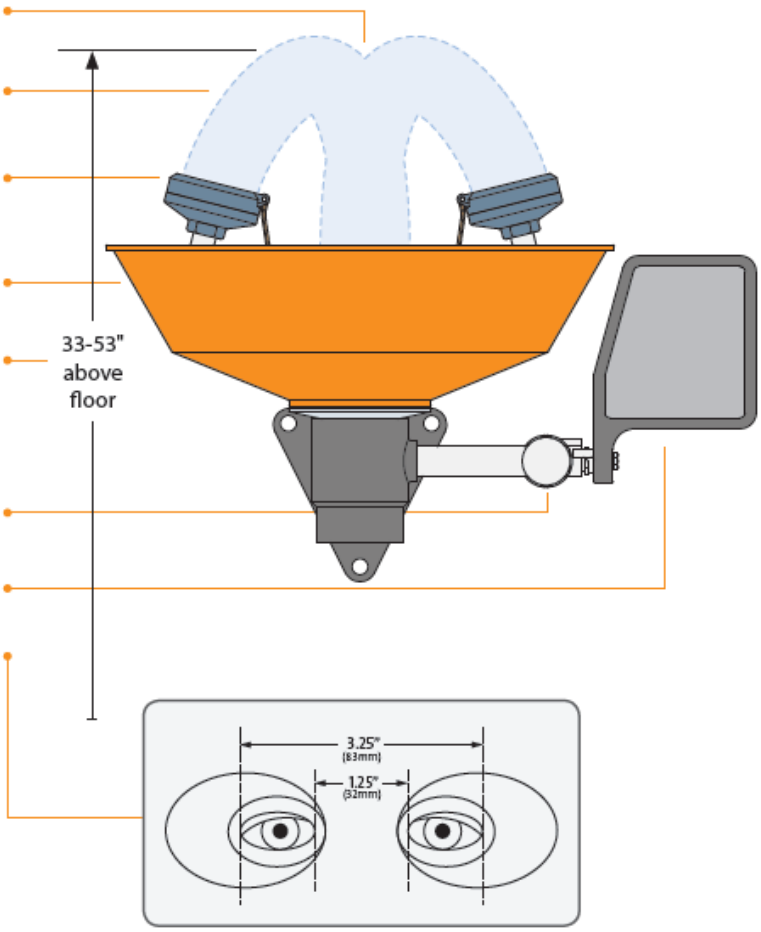
- ☐ **Location:** Install shower within 10 seconds (approximately 55 feet) of hazard, on the same level as hazard and with unobstructed travel path. Where strong acids or caustics are being handled, emergency showers should be located adjacent to the hazard, and an appropriate professional should be consulted for advice on the proper distance. (Section 4.5.2; B5)
- ☐ **Identification:** Identify shower location with highly visible sign. Area around shower shall be well-lit. (Section 4.5.3)
- ☐ **Water Temperature:** Water delivered by shower shall be tepid (60-100°F). (Section 4.5.6; B6)
- ☐ **Training:** Instruct all employees in the location and proper use of emergency showers. (Section 4.6.4)
- ☐ **Maintenance/Inspection:** Activate plumbed shower at least weekly. (Section 4.6.2) Inspect all emergency showers annually for compliance with standard. (Section 4.6.5)

Eye/Face Washes

This checklist is a summary of the provisions of ANSI Z358.1-2014 relating to emergency eye/face washes. Please refer to the standard for a complete listing of these provisions.

All Guardian eye/face wash units are third-party certified to meet or exceed the provisions of ANSI Z358.1-2014.

- ☐ **Controlled, low velocity flow completely rinses eyes and face and is not injurious to user. (Section 6.1.1)**
- ☐ **Water flow is sufficiently high to allow user to hold eyes open while rinsing. (Section 6.1.7)**
- ☐ **Spray heads are protected from airborne contaminants. Covers are removed by water flow. (Section 6.1.3)**
- ☐ **Unit delivers at least 3.0 gallons (11.4 liters) of water per minute for 15 minutes. (Section 6.1.6, 6.4.5)**
- ☐ **Water flow pattern is positioned between 33" (83.8 cm) and 53" (134.6 cm) from the floor and at least 6" (15.3 cm) from the wall or nearest obstruction. (Section 6.4.4)**
- ☐ **Hands-free stay-open valve activates in one second or less. (Section 6.1.4, 6.2)**
- ☐ **Valve actuator is easy to locate and readily accessible to user. (Section 6.2)**
- ☐ **Unit washes both eyes simultaneously. Water flow covers area indicated on Guardian test gauge at no more than 8" above spray heads. (Section 6.1.8)**



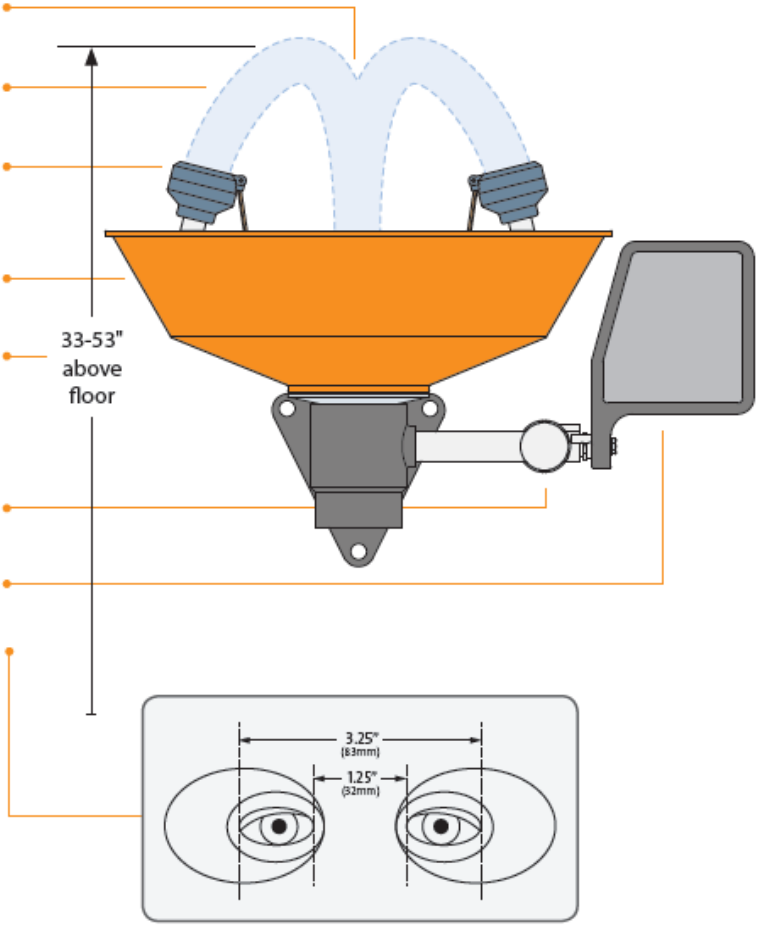
- ☐ **Location:** Install eye/face wash unit within 10 seconds (approximately 55 feet) of hazard, on the same level as hazard and with unobstructed travel path. Where strong acids or caustics are being handled, emergency eye/face wash units should be located adjacent to the hazard, and an appropriate professional should be consulted for advice on the proper distance. (Section 6.4.2; B5)
- ☐ **Identification:** Identify eye/face wash location with highly visible sign. Area around eye/face wash unit shall be well-lit. (Section 6.4.3)
- ☐ **Water Temperature:** Water delivered by eye/face wash shall be tepid (60-100°F). (Section 6.4.6; B6)
- ☐ **Training:** Instruct all employees in the location and proper use of eye/face wash units. (Section 6.5.4)
- ☐ **Maintenance/Inspection:** Activate plumbed eye/face wash units at least weekly. (Section 6.5.2) Inspect all eye/face wash units annually for compliance with standard. (Section 6.5.5)

Eyewashes

This checklist is a summary of the provisions of ANSI Z358.1-2014 relating to emergency eyewashes. Please refer to the standard for a complete listing of these provisions.

All Guardian eyewash units are third-party certified to meet or exceed the provisions of ANSI Z358.1-2014.

- ☐ **Controlled, low velocity flow rinses both eyes and is not injurious to user. (Section 5.1.1)**
- ☐ **Water flow is sufficiently high to allow user to hold eyes open while rinsing. (Section 5.1.7)**
- ☐ **Spray heads are protected from airborne contaminants. Covers are removed by water flow. (Section 5.1.3)**
- ☐ **Unit delivers at least 0.4 gallons (1.5 liters) of water per minute for 15 minutes. (Section 5.1.6, 5.4.5)**
- ☐ **Water flow pattern is positioned between 33" (83.8 cm) and 53" (134.6 cm) from the floor and at least 6" (15.3 cm) from the wall or nearest obstruction. (Section 5.4.4)**
- ☐ **Hands-free stay-open valve activates in one second or less. (Section 5.1.4, 5.2)**
- ☐ **Valve actuator is easy to locate and readily accessible to user. (Section 5.2)**
- ☐ **Unit washes both eyes simultaneously. Water flow covers area indicated on Guardian test gauge at no more than 8" above spray heads. (Section 5.1.8)**



- ☐ **Location:** Install eyewash unit within 10 seconds (approximately 55 feet) of hazard, on the same level as hazard and with unobstructed travel path. Where strong acids or caustics are being handled, emergency eyewash unit should be located adjacent to the hazard, and an appropriate professional should be consulted for advice on the proper distance. (Section 5.4.2; B5)
- ☐ **Identification:** Identify eyewash location with highly visible sign. Area around eyewash unit shall be well-lit. (Section 5.4.3)
- ☐ **Water Temperature:** Water delivered by eyewash shall be tepid (60-100°F). (Section 5.4.6; B6)
- ☐ **Training:** Instruct all employees in the location and proper use of eyewash units. (Section 5.5.4)
- ☐ **Maintenance/Inspection:** Activate plumbed eyewash units at least weekly. (Section 5.5.2) Inspect all eyewash units annually for compliance with standard. (Section 5.5.5)

Eyewash/Drench Hose Units

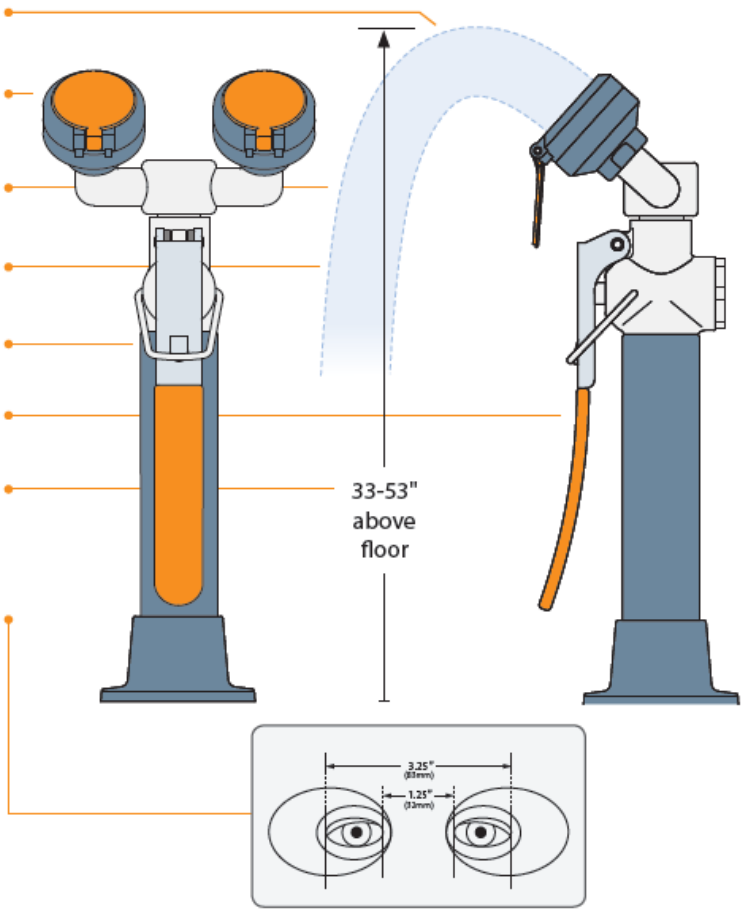
ANSI Standard Z358.1-2014 states that drench hose units may supplement, but may not be used in place of dedicated eyewash units. Guardian offers a series of units that meet the provisions of the ANSI standard as both an eyewash and a drench hose.

These dual purpose units can be used to combine an eyewash and a drench hose into a single versatile, economic unit.

This checklist summarizes the provisions of ANSI Z358.1-2014 for both eyewashes and drench hoses. Please refer to the standard for a complete listing of these provisions.

All Guardian eyewash/drench hose units are third-party certified to meet or exceed the provisions of ANSI Z358.1-2014.

- ☐ **Water flow is sufficiently high to allow user to hold eyes open while rinsing. (Section 5.1.7)**
- ☐ **Spray heads are protected from airborne contaminants. Covers are removed by water flow. (Section 5.1.3)**
- ☐ **Controlled, low velocity flow rinses both eyes and is not injurious to user. (Section 5.1.1, 8.2.1)**
- ☐ **Unit delivers at least 0.4 gallons (1.5 liters) of water per minute for 15 minutes. (Section 5.1.6)**
- ☐ **Hands-free stay-open valve activates in one second or less. (Section 5.2, 8.2.2)**
- ☐ **Valve actuator is easy to locate and readily accessible to user. (Section 5.2, 8.2.2)**
- ☐ **Water flow pattern is positioned between 33" (83.8 cm) and 53" (134.6 cm) from the floor and at least 6" (15.3 cm) from the wall or nearest obstruction. (Section 5.4.4)**
- ☐ **Unit washes both eyes simultaneously. Water flow covers area indicated on Guardian test gauge at no more than 8" above spray heads. (Section 5.1.8)**



- ☐ **Location:** Install eyewash/drench hose unit within 10 seconds (approximately 55 feet) of hazard, on the same level as hazard and with unobstructed travel path. Where strong acids or caustics are being handled, emergency eyewash/drench hose unit should be located adjacent to the hazard, and an appropriate professional should be consulted for advice on the proper distance. (Section 5.4.2; B5)
- ☐ **Identification:** Identify eyewash/drench hose location with highly visible sign. Area around eyewash/drench hose unit shall be well-lit. (Section 5.4.3, 8.2.3.2)
- ☐ **Water Temperature:** Water delivered by eyewash/drench hose unit shall be tepid (60-100°F). (Section 5.4.6, 8.2.3.4; B6)
- ☐ **Training:** Instruct all employees in the location and proper use of eyewash/drench hose units. (Section 5.5.4, 8.2.4.4)
- ☐ **Maintenance/Inspection:** Activate eyewash/drench hose units at least weekly. (Section 5.5.2, 8.2.4.2) Inspect all eyewash/drench hose units annually for compliance with standard. (Section 5.5.5, 8.2.4.5)

Guardian Equipment
1140 N North Branch St
Chicago, IL 60642

312 447 8100 telephone
312 447 8101 facsimile
gesafety.com

Listed 8116. Units have been tested to and comply with ANSI Z358.1-2014 and the Uniform Plumbing Code.

Drench Hose Units

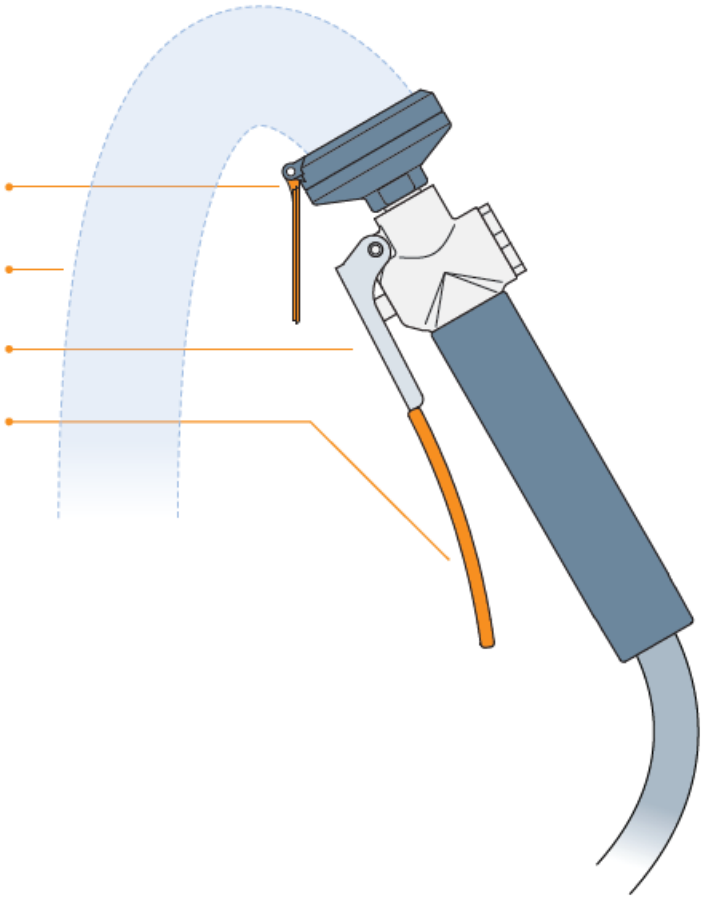
Under ANSI Z358.1-2014, drench hose units support plumbed and self-contained emergency eyewash and shower units, but cannot replace them. In other words, drench hoses are intended solely as supplemental equipment providing additional protection to personnel.

Drench hoses are useful in cases where the user is in a prone position or where it is necessary to reach areas of the face and body inaccessible to the fixed stream of a shower or eyewash unit. They are also advantageous in areas (such as laboratories) where they can be installed close to where accidents might occur.

This checklist summarizes the provisions of ANSI Z358.1-2014 relating to drench hoses. Please refer to the standard for a complete listing of these provisions.

All Guardian drench hose units are third-party certified to meet or exceed the provisions of ANSI Z358.1-2014.

- ☐ **Drench hose unit supplements shower and eyewash units installed in vicinity. (Section 8)**
- ☐ **Controlled, low velocity flow is not injurious to user. (Section 8.2.1)**
- ☐ **Valve goes from 'off' to 'on' in one second or less. (Section 8.2.2)**
- ☐ **Valve actuator is easy to locate and readily accessible to the user. (Section 8.2.2)**



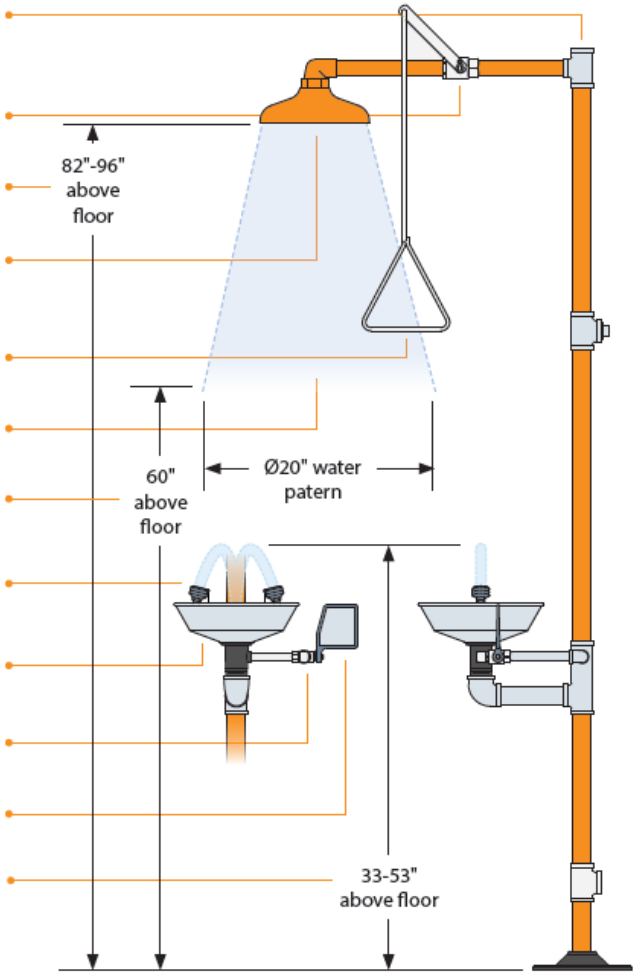
- ☐ **Location:** Install drench hose unit in area free of debris or obstructions. (Section 8.2.3.2)
- ☐ **Identification:** Identify drench hose unit with highly visible sign. Area around drench hose unit shall be well-lit. (Section 8.2.3.2)
- ☐ **Water Temperature:** Water delivered by drench hose unit shall be tepid (60-100°F). (Section 8.2.3.4)
- ☐ **Training:** Instruct all employees in the location and proper use of drench hose units. (Section 8.2.4.4)
- ☐ **Maintenance/Inspection:** Activate drench hose units at least weekly. (Section 8.2.4.2) Inspect all drench hose units annually for compliance with standard. (Section 8.2.4.5)

Safety Stations

This checklist is a summary of the provisions of ANSI Z358.1-2014 relating to eye or eye/face wash and shower combination stations. Please refer to the standard for a complete listing of these provisions.

All Guardian safety stations are third-party certified to meet or exceed the provisions of ANSI Z358.1-2014.

- ☐ **Water supply delivers required flow when shower and eye or eye/face wash are operated simultaneously. (Section 4.5.5, 7.4.4)**
- ☐ **Hands-free stay-open valve activates in one second or less. (Section 4.2)**
- ☐ **Height of water column is between 82" (208.3 cm) and 96" (243.8 cm) above the floor. (Section 4.1.3, 4.5.4)**
- ☐ **Shower delivers 20 gallons (75.7 liters) of water per minute for 15 minutes in the required pattern. (Section 4.1.2, 4.5.5)**
- ☐ **Easily located, accessible actuator is no more than 69" (173.3 cm) above floor. (Section 4.2)**
- ☐ **Center of the water pattern is at least 16" (40.6 cm) from any obstruction. (Section 4.1.4, 4.5.4)**
- ☐ **At 60" (152.4 cm) above the floor, the water pattern is at least 20" (50.8 cm) in diameter. (Section 4.1.4)**
- ☐ **Spray heads are protected from airborne contaminants. Covers are removed by water flow. (Section 5.1.3, 6.1.3)**
- ☐ **Unit delivers at least 3.0 GPM (11.4 liters) (for eye/face wash) or 0.4 GPM (1.5 liters) (for eyewash) for 15 minutes. (Section 5.1.6, 6.1.6, 6.4.5)**
- ☐ **Hands-free stay-open valve activates in one second or less. (Section 5.2, 6.1.4, 6.2)**
- ☐ **Valve actuator is easy to locate and readily accessible to user. (Section 5.2, 6.2)**
- ☐ **Water flow pattern is positioned between 33" (83.8 cm) and 53" (134.6 cm) from the floor and at least 6" (15.3 cm) from the wall or nearest obstruction. (Section 5.4.4, 6.4.4)**



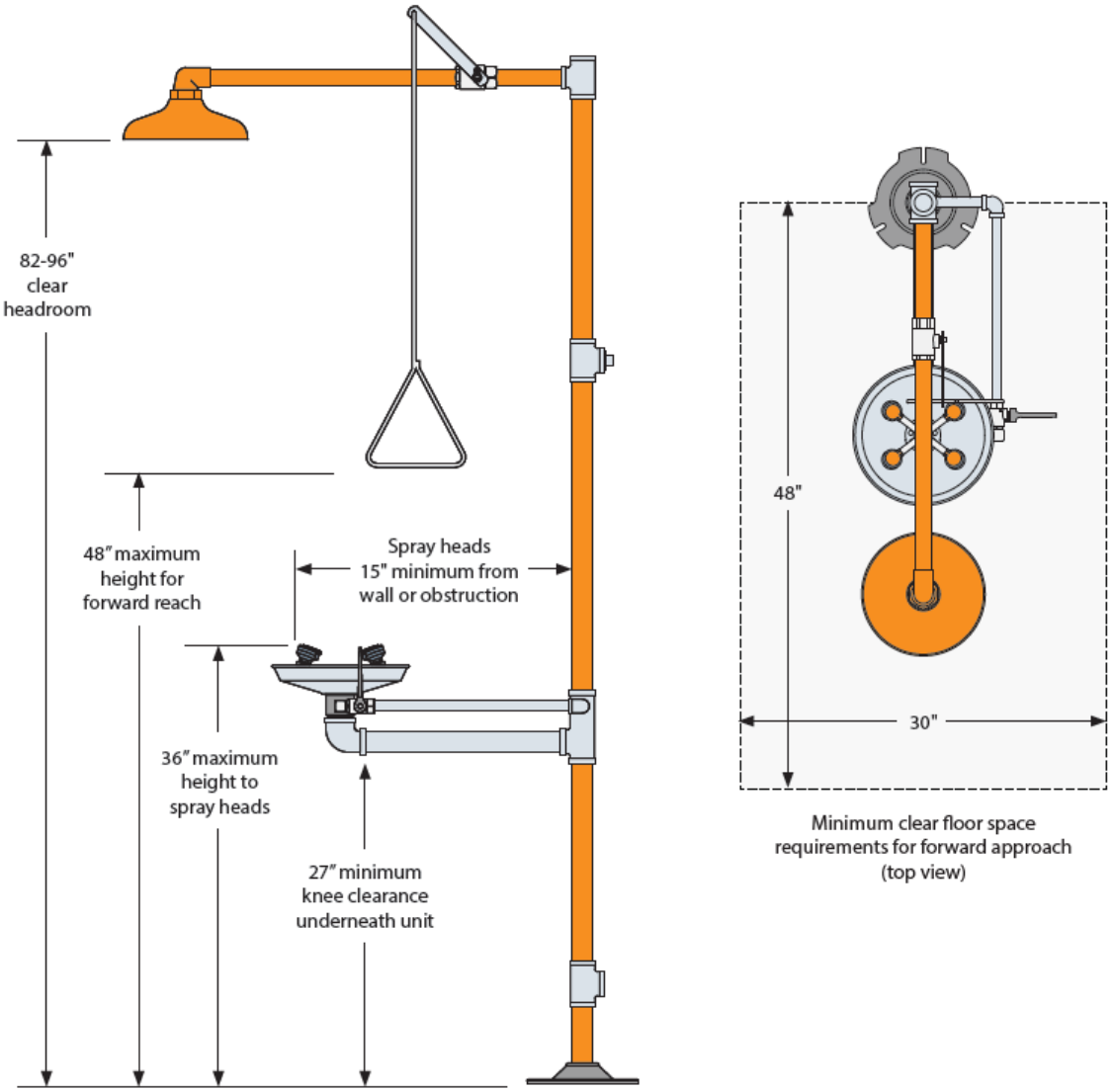
- ☐ **Location:** Install safety station within 10 seconds (approximately 55 feet) of hazard, on the same level as hazard and with unobstructed travel path. Where strong acids or caustics are being handled, safety station should be located adjacent to the hazard, and an appropriate professional should be consulted for advice on the proper distance. (Section 7.4.2; B5)
- ☐ **Identification:** Identify safety station location with highly visible sign. Area around safety station shall be well-lit. (Section 7.4.3)
- ☐ **Water Temperature:** Water delivered by safety station shall be tepid (60-100°F). (Section 7.4.5; B6)
- ☐ **Training:** Instruct all employees in the location and proper use of safety station. (Section 7.5.4)
- ☐ **Maintenance/Inspection:** Activate safety station at least weekly. (Section 7.5.2) Inspect all safety stations annually for compliance with standard. (Section 7.5.5)

Barrier-Free Equipment

The Americans with Disabilities Act (ADA) requires that employers provide accessible workplaces for all employees. These workplaces may therefore require emergency eyewash and shower equipment that is specially constructed for wheelchair accessibility.

Barrier-free emergency equipment must comply with the provisions of ANSI A117.1-2009 ("Accessible and Usable Buildings and Facilities"). These provisions include dimensions for minimum knee clearance, maximum height and reach, and minimum distance from obstructions.

Guardian offers an array of eyewash and shower units designed for barrier-free applications. These units meet the provisions of ANSI Z358.1-2014 for emergency equipment and the accessibility provisions of ANSI A117.1-2009. The provisions of ANSI Z358.1-2014 are summarized on pages 2-10. The additional accessibility provisions of ANSI A117.1-2009 are shown here. Please refer to the standards for a complete description of these provisions.



(Credit Link for Pictures: http://www.gesafety.com/downloads/ANSIGuide.pdf)

Safety Data Sheets (SDS)

- Clearly marked (not electronically)
- Centrally located and easily accessible location known to all school staff and science instructors and emergency personnel.
- Contains all chemicals found in the room.

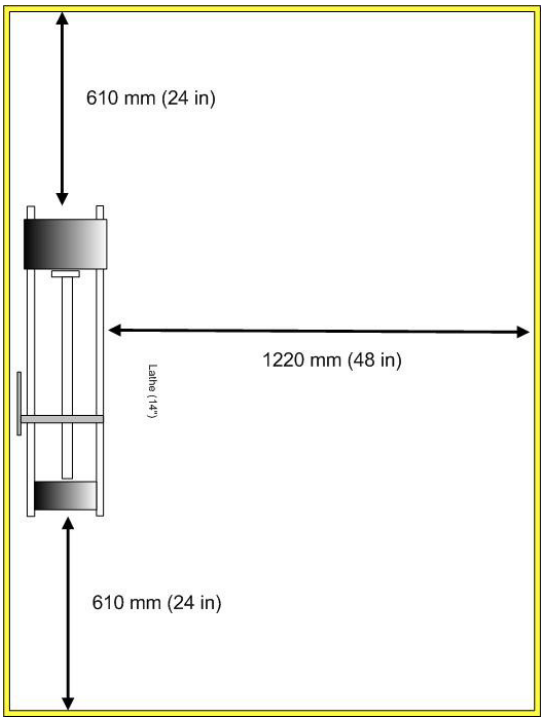
Size of Area
Adequate space shall be provided for classrooms, specialized instructional areas, support facilities and other areas as needed, these areas being grouped and arranged in such manner to provide optimum instructional function and class control.

Safety guards on machines
All original safety guards for the machinery must be maintained on the piece of equipment. The safety guards must be used in the manner they were intended by the manufacturer. Please refer to ODCTE regulations and subject specific evaluation tools.

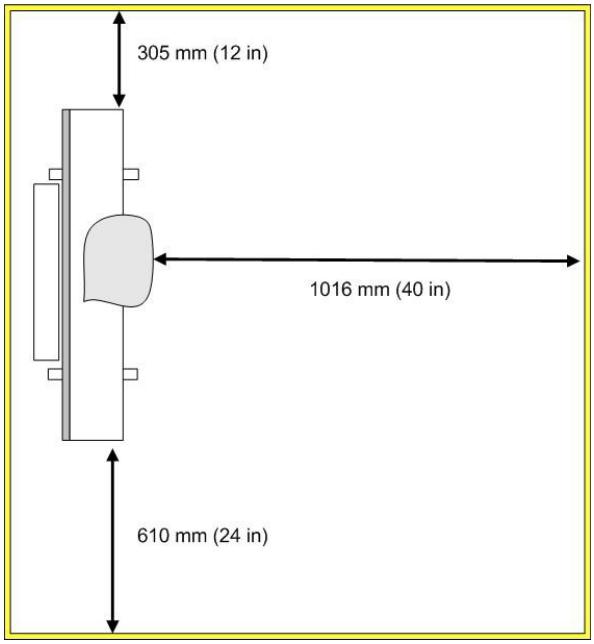
Safety lanes/zones around machinery
Safety lanes/zones should span large enough so the largest piece of work being made on one machine can not interfere with the largest piece of work being worked on at the same time on an adjacent machine.
Safety lanes/zones: Paint may be used or tape may be used. Yellow or Yellow & Black stripped is recommended. Refer to American National Institute standards (ANSI Z-535.1).

The following dimensions are suggested minimum requirements

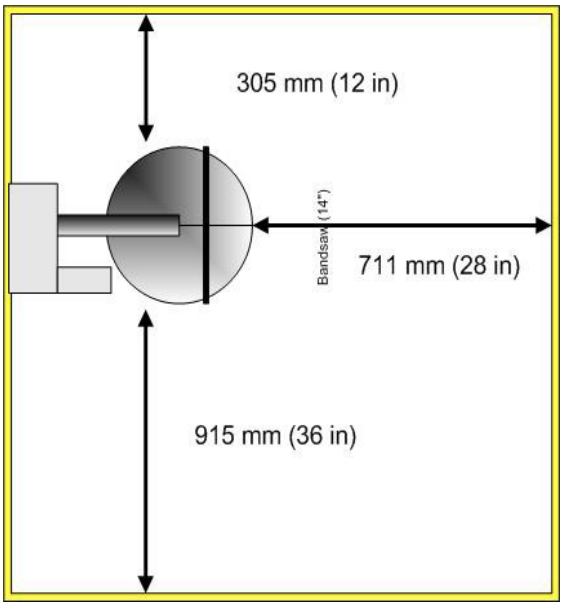
Lathe



Jointer



Bandsaw



Compound Miter Saw

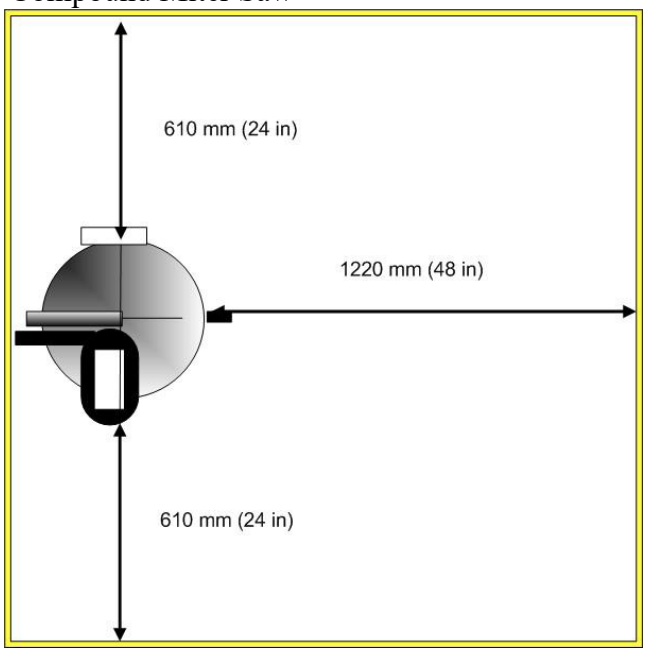
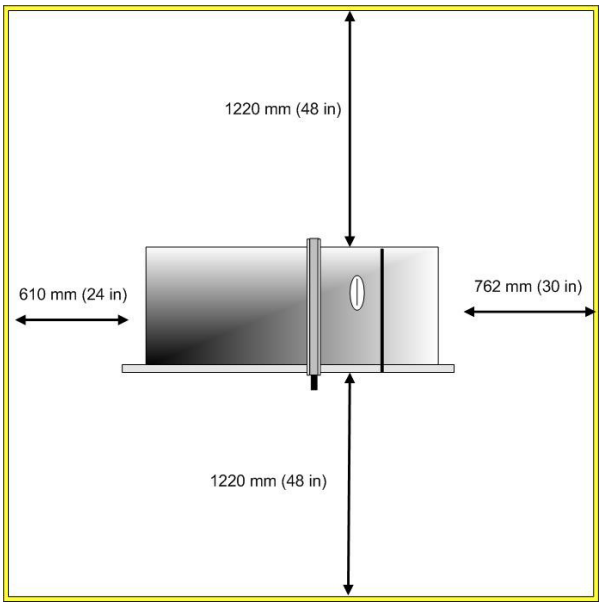
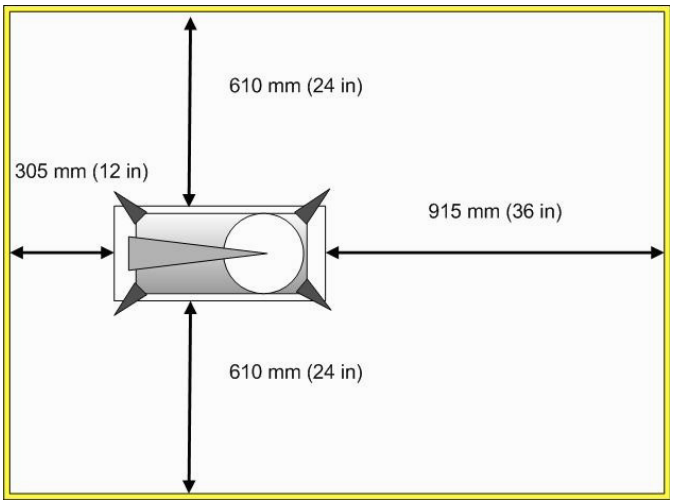


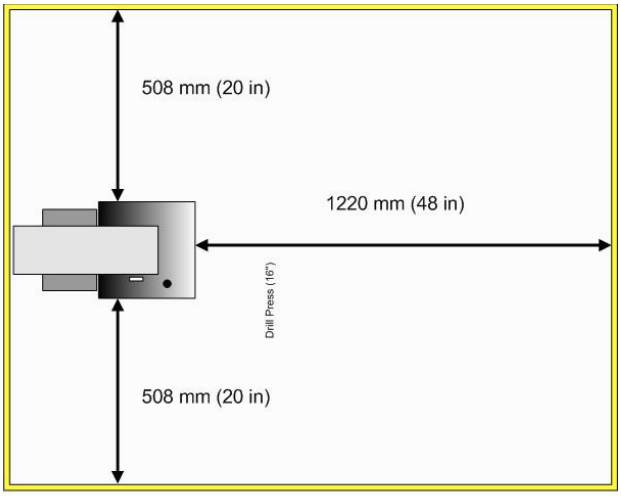
Table Saw



Scroll Saw



Drill Press



Rocketry/Drone Safety

Check on and/or obtain permits in advance (state and/or local) for flying model rockets or drones. Activities involving the firing of rockets or flying of drones must follow Federal Aviation Agency (FAA) regulations, state and local rules and regulations.

Referenced in this document:

American National Standards Institute. Standards. 2014 (Revised) https://www.ansi.org/
Federal Aviation Administration. Rules and Regulations https://www.faa.gov/regulations_policies/
Flinn Chemical & Biological Catalog Reference Manual 2014, Flinn Scientific, Inc., Batavia, IL., www.flinnsci.com
National Science Teacher Association (NSTA), Position Statement, 2015, http://www.nsta.org/about/positions/safety.aspx
Occupational Safety and Health Administration. U.S. DOL. OSHA 2254: Training Requirements in OSHA Standards and Training Guidelines. 1998 (Revised) www.osha.gov/index.html
Stroud, Linda M., Science Laboratory Safety Manual, Second Edition, 2008. Science & Safety Consulting Services, Inc. Raleigh, NC., www.sciencesafetyconsulting.com
ITEEA: Safety Spotlight: A Cleaner View of Emergency Shower and Eyewash Station Requirements https://www.iteea.org/Publications/Journals/TET/177697/TETSept20Safety.aspx#publicationContent
ACS Guidelines for Chemical Lab Safety in Secondary Schools https://ctyou.org/mod/resource/view.php?id=471359
ACS Guidelines and Recommendations for the Teaching of High School Chemistry https://ctyou.org/pluginfile.php/607286/mod_resource/content/1/recommendations-for-the-teaching-of-high-school-chemistry%20%281%29.pdf