

GENERAL PPE REQUIREMENTS

(PERSONAL PROTECTIVE EQUIPMENT)

GENERAL PPE REQUIREMENTS (OSHA 29 CFR 1915.152)

- “Provision and use of equipment. The employer shall provide and shall ensure that each affected employee uses the appropriate personal protective equipment (PPE) for the eyes, face, head, extremities, torso, and respiratory system, including protective clothing, protective shields, protective barriers, personal fall protection equipment, and life saving equipment, meeting the applicable provisions of this subpart, wherever employees are exposed to work activity hazards that require the use of PPE.”
- Employers are responsible for conducting a workplace hazard analysis to determine if any PPE is necessary.

SAFETY GLASSES REQUIREMENTS (OSHA 29 CFR 1910.133)

- “The employer shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.”
- “The employer shall ensure that each affected employee uses eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g. clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.”
- Eyeglasses designed for ordinary wear do not provide the level of protection necessary to protect against workplace hazards.
- Safety glasses are a top requirement for any laboratory environment. Chemical splashes, flying pieces of sample, liquid asphalt, etc...can all cause permanent eye damage without warning.

PROTECTIVE FOOTWEAR (OSHA 29 CFR 1910.136)

- “The employer shall ensure that each affected employee uses protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, or when the use of protective footwear will protect the affected employee from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after the employer takes other necessary protective measures.”
- Steel-toe-shoes are also at the top of the list for recommended requirements in any laboratory environment. Heavy equipment and test materials could cause severe damage if dropped on toes.

GLOVES (OSHA 29 CFR 1910.138)

- “Employers shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.”
- In general, long heat-resistant gloves should be worn when dealing with ovens or hot materials. Special gloves should also be worn when dealing with any solvents or hazardous chemicals.



LABORATORY SAFETY INFORMATION



HAZARDOUS CHEMICALS & HAZCOM

THE REQUIREMENTS (29 CFR 1910.1450)

If laboratory employees use hazardous chemicals, employers are required to develop and implement a written chemical hygiene plan. In addition to appropriate safety and health procedures and hygiene practices for hazardous chemicals in laboratories, the plan must include the following:

- Criteria for reducing employee exposure to hazardous chemicals;
- Use of personal protective equipment;
- Requirements that ensure fume hoods and other protective equipment are functioning properly;
- Provisions for employee training;
- Circumstances requiring employer approval of certain laboratory operations, procedures, or activities before implementation;
- Provisions for medical consultation;
- Measures to protect employees from particularly hazardous substances; and
- Assignment of a Chemical Hygiene Officer- a qualified employee who by training or experience can provide technical guidance in developing and implementing the chemical hygiene plan.

SAFETY DATA SHEETS (SDS)

Employers are required to ensure that SDSs are readily accessible to employees.

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. The HCS requires new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information. See Appendix D of 29 CFR 1910.1200 for a detailed description of SDS contents.

Often, laboratory operations require transferring chemicals from the original labeled container into a secondary container (e.g., beaker, flask, or bottle). Portable containers must comply with the labeling requirements listed in 29 CFR 1910.1200(f). This label must contain two key pieces of information: the identity of the hazardous chemical(s) in the container (e.g., chemical name) and the hazards present. There are many ways to communicate this hazard information. Employers should select a system that will work for each location.

COMMON HAZARDOUS CHEMICALS/MATERIALS IN CMT LABS

Some of the common hazardous chemicals and materials in laboratories include:

- Any solvents including trichloroethylene, methylene chloride, and terpene solvents
- Mercury
- Lead
- Hexavalent Chromium
- Silica
- Toluene
- Xylene
- Hydrogen Chloride
- Compressed gas cylinders
- Aerosols

SILICA EXPOSURE & RESPIRATORS

LABORATORY SAFETY INFORMATION

THE FACTS ON SILICA EXPOSURE

Crystalline silica is a common mineral found in the earth's crust. Materials like sand, stone, concrete, and mortar contain crystalline silica. It is also used to make products such as glass, pottery, ceramics, bricks, and artificial stone.

Respirable crystalline silica – very small particles at least 100 times smaller than ordinary sand you might find on beaches and playgrounds – is created when cutting, sawing, grinding, drilling, and crushing stone, rock, concrete, brick, block, and mortar. About 2.3 million people in the U.S. are exposed to silica at work.

Workers who inhale these very small crystalline silica particles are at increased risk of developing serious silica-related diseases, including:

- Silicosis, an incurable lung disease that can lead to disability and death;
- Lung cancer;
- Chronic obstructive pulmonary disease (COPD); and
- Kidney disease.

To better protect workers exposed to respirable crystalline silica, OSHA has issued two new respirable crystalline silica standards: one for construction, and the other for general industry and maritime. OSHA began enforcing most provisions of the standard for construction on September 23, 2017, and will begin enforcing most provisions of the standard for general industry and maritime on June 23, 2018.

In laboratories, high exposure is more likely to come from soil samples that have high silica amounts than fine aggregate samples. The amount of material finer than No. 200 sieve and the silica content are what affect the amount of respirable silica.

WHAT SHOULD YOU DO

OSHA's Respirable Crystalline Silica standard for general industry requires employers to limit worker exposures to respirable crystalline silica and to take other steps to protect workers. (29 CFR 1926.1153)

Among other things, the standard requires employers to:

- Assess employee exposures to silica if it may be at or above an action level of 25 $\mu\text{g}/\text{m}^3$, averaged over an 8-hour day;
- Protect workers from respirable crystalline silica exposures above the permissible exposure limit (PEL) of 50 $\mu\text{g}/\text{m}^3$, averaged over an 8-hour day;
- Limit workers' access to areas where they could be exposed above the PEL;
- Use dust controls to protect workers from silica exposures above the PEL;
- Provide respirators to workers when dust controls cannot limit exposures to the PEL;
- Use housekeeping methods that do not create airborne dust, if feasible;
- Establish and implement a written exposure control plan that identifies tasks that involve exposure and methods used to protect workers;
- Offer medical exams - including chest X-rays and lung function tests - every three years for workers exposed at or above the action level for 30 or more days per year;
- Train workers on work operations that result in silica exposure and ways to limit exposure; and
- Keep records of exposure measurements, objective data, and medical exams.



HEARING CONSERVATION

THE FACTS OF HEARING LOSS

Hearing loss is a permanent condition. In most occurrences, it happens gradually and isn't detected until it's too late. Some hearing loss is a natural part of aging, but we can delay most hearing loss by taking some precautionary steps in our personal lives and in the workplace. Noise-Induced hearing loss is case by prolonged exposure to higher levels of noise.

The National Institute of Health reports that about 15 percent of Americans aged 20 to 69 have high frequency hearing loss related to occupational or leisure activities. Hearing loss generally occurs from repeated exposure to loud tasks and environments that creates a cumulative effect on the tissues and hairs in our ears.

"Hearing loss can impact ones life in many ways. You may be less able to understand conversation or appreciate music. A ringing in the ears, called tinnitus, commonly occurs after noise exposure, and it often becomes permanent. Some people react to loud noise with anxiety and irritability, an increase in pulse rate and blood pressure, or an increase in stomach acid. Very loud noise can reduce efficiency in performing difficult tasks by diverting attention from the job." – The American Hearing Research Foundation

THE REQUIREMENTS (29 CFR 1910.1450)

OSHA requires that a hearing conservation program be implemented where workers are exposed to a time weighted average (TWA) noise level of 85 decibels (dB) or higher over an 8-hour work day. This program must include annual audiograms and an analysis of job tasks to determine when hear protection should be required.

OSHA permissible exposure limit (PEL) a TWA (8 hours) is 90 dB. Impulse or impact noise should not exceed 140 dB (peak sound pressure level). This chart shows the time of permitted exposure of each noise level.

Noise Level (dB)	Hours of Permitted Exposure
90	8
95	4
100	2

COMMON EQUIPMENT THAT EXCEEDS LIMITS IN CMT LABS

Some of the common equipment/tasks that are above 85dB in laboratories include:

- LA Abrasion machine
- Mechanical sieve shakers
- Marshall hammer compaction
- Saws cutting concrete or asphalt samples
- Air compressors
- Forklifts or other industrial trucks

