Personal Protective Equipment Guidelines

Purpose

To establish guidelines for use and care of personal protective equipment, which is to be used by employees and /or students when a hazard is found to exist that can not be controlled through engineering design, isolation or guarding.

Responsibilities

Area Supervisor or instructor will evaluate each possible hazard to decide if personal protective equipment is necessary for the well being of the employees or students. Once a hazard has been recognized and it can not be controlled by any other means, proper personal protective equipment will be utilized to assure safe working conditions. The area supervisor will instruct the employee or student in the proper use and care of the equipment and maintain follow-up to assure the equipment is being used as directed.

Employees or students will be responsible for using personal protective equipment as instructed and for maintaining the equipment in good order. Damaged or worn equipment should be reported to the area supervisor immediately for replacement.

Environmental Health and Safety will periodically inspect areas to verify personal protective equipment is being used for the hazard and/or equipment evaluation. Records will be maintained for such inspections.

Hazard Assessments

The hazard assessment will be conducted to identify sources of hazards, including impact, penetration, compression, chemical, heat, dust, electrical sources, material handling, and light radiation.

Protective Devices

All personal protective clothing and equipment will be of safe design shall meet national standards (ANSI) and /or NIOSH certification where applicable. Newly purchased PPE must conform to the updated ANSI standards which have been incorporated into the
OSHA PPE regulations, as follows:

- Eye and Face Protection ANSI A87.1-1989
- Head Protection ANSI Z89.1-1986
- Foot Protection ANSI Z41.1-1991
- Hand Protection, There are no ANSI standards for gloves; however, selection must be based on the performance characteristics of the glove in relation to the tasks to be performed.

Free-training.com offers a free course in Personal Protection Equipment located at: **http://www.free-training.com/osha/ppe/ppemenu.htm**

Eye Protection

Eye protection is required in work locations and during activities where eye hazards or potential eye hazards exist. These hazards may include flying particles, molten metal, and chemicals such as acids or caustic liquids, gases, vapors or light radiation. Work areas where these hazards may be found include shop areas, laboratories, ground work, constructions sites, chemical use, machining, carpentry, welding, hazardous waste management, and laser operations.

Contact lenses do not provide eye protection from chemical assault. Contact lenses may cause materials or particles on the surface of the eye to become trapped. Chemical splash goggles must be worn for proper protection.

Selecting the most suitable eye protection for employees should take into consideration the following elements:

- Ability to protect against specific workplace hazards.
- Should fit properly and be reasonably comfortable to wear.
- Should provide unrestricted vision and movement.
- Should be durable and cleanable.

- Should allow unrestricted functioning of any other PPE.

Some of the most common types of eye and face protection include the following:

- Safety spectacles- These protective eyeglasses have safety frames constructed of metal or plastic and impact-resistant lenses. Side shields are available on some models.
- Goggles – These are tight-fitting eye protection that completely cover the eyes, eye sockets and the facial area immediately surrounding the eyes and provide protection from impact, dust and splashes. Some goggles will fit over corrective lenses.
- Welding shields – Constructed of vulcanized fiber or fiberglass and fitted with a filtered lens, welding shields protect eyes from burns caused by infrared or intense radiant light; they also protect both the eyes and face from flying sparks, metal spatter and slag chips produced during welding, brazing, soldering and cutting operations. OSHA requires filter lenses to have a shade number appropriate to protect against harmful light radiation.
- Laser safety goggles- These specialty goggles protect against intense concentrations of light produced by lasers. Refer to the Laser Safety manual for more details.

Head Protection

A head injury can impair an employee for life or it can be fatal. Wearing a safety helmet or hard hat is one of the easiest ways to protect an employee's head from injury.

Employees must wear head protection if any of the following apply:

- Objects might fall from above and strike them on the head;
- They might bump their heads against fixed objects, such as exposed pipes or beams; or
- There is a possibility of accidental head contact with electrical hazards.

Protective helmets or hard should do the following:

- Resist penetration by objects
- Absorb the shock of a blow
- Be water-resistant and slow burning

- Have clear instructions explaining proper adjustment and replacement of the suspension and headband.

Hard hats are divided into three industrial classes:

- Class A- provide impact and penetration resistance along with limited voltage protection (up to 2,200 volts).
- Class B – provide the highest level of protection against electrical hazards, with high-voltage shock and burn protection (up to 2,200 volts). They also provide protection from impact and penetration hazards by flying/falling objects.
- Class C - provide lightweight comfort and impact protection but offer no protection from electrical hazards.

Foot Protection

Foot wear is required in work locations and during activities where foot injury hazards or the potential for foot injuries exist. These hazards may include falling and rolling objects, (objects weighing more than fifteen pounds which if dropped, would likely result in a foot injury), objects piercing the sole, or electrical hazards.
Protective foot wear shall comply with ANSI Z41-1991,"American National Standard for Personal Protection-Protective Footwear."

Hand Protection

Employees shall use hand protection when exposed to hazards including:

Skin absorption of harmful substances
Lacerations
Severe cuts
Severe abrasions
Punctures
Chemical burns
Thermal burns
Harmful temperature extremes

Wear proper hand protection whenever the potential for contact with chemicals, sharp objects, or very hot or cold materials exists. Select gloves based on the properties of the material in use, the degree of protection

needed, and the nature of the work (direct contact necessary, dexterity needed, etc).

Leather gloves may be used for protection against sharp edged objects, such as when picking up broken glassware or inserting glass tubes into stoppers. When working at temperature extremes, use insulated gloves. Materials such as **Nome and Kevlar** may be used briefly up to 1000 F. When considering chemical gloves, note that glove materials will be permeated (pass through) by chemicals. The permeation rate varies depending on the chemical, glove material, and thickness. Double gloving is recommended when handling highly toxic or carcinogenic materials. Before each use, inspect the gloves for discoloration, punctures and tears. Before removal, wash gloves if the glove material is impermeable to water. Observe any changes in glove color and texture, including hardening or softening, which may be indications of glove degradation**.**

Glove Chart

Type	Advantages	Disadvantages	Use Against
Natural rubber	Low cost, good physical properties, dexterity	Poor vs. oils, greases, organics. Frequently imported; may be poor quality	Bases, alcohols, dilute water solutions; fair vs. aldehydes, ketones.
Natural rubber blends	Low cost, dexterity, better chemical resistance than natural rubber vs. some chemicals	Physical properties frequently inferior to natural rubber	Same as natural rubber
Polyvinyl chloride (PVC)	Low cost, very good physical properties, medium cost, medium chemical resistance	Plasticizers can be stripped; frequently imported may be poor quality	Strong acids and bases, salts, other water solutions, alcohols
Neoprene	Medium cost, medium chemical resistance, medium	NA	Oxidizing acids, anilines, phenol, glycol ethers

	physical properties		
Nitrile	Low cost, excellent physical properties, dexterity	Poor vs. benzene, methylene chloride, trichloroethylene, many ketones	Oils, greases, aliphatic chemicals, xylene, perchloroethylene, trichloroethane; fair vs. toluene
Butyl	Specialty glove, polar organics	Expensive, poor vs. hydrocarbons, chlorinated solvents	Glycol ethers, ketones, esters
Polyvinyl alcohol (PVA)	Specialty glove, resists a very broad range of organics, good physical properties	Very expensive, water sensitive, poor vs. light alcohols	Aliphatics, aromatics, chlorinated solvents, ketones (except acetone), esters, ethers
Fluoro-elastomer (Viton) ™ *	Specialty glove, organic solvents	Extremely expensive, poor physical properties, poor vs. some ketones, esters, amines	Aromatics, chlorinated solvents, also aliphatics and alcohols
Norfoil (Silver Shield)	Excellent chemical resistance	Poor fit, easily punctures, poor grip, stiff	Use for Hazmat work

*Trademark of DuPont Dow Elastomers