Personal Protective Equipment

Introduction

Delgado Community College is committed to providing a healthy and safe working environment for all members of the campus community. This Personal Protective Equipment (PPE) policy is designed to prevent workplace injuries and illnesses for all academic appointees, staff, students, and visitors.

Purpose

To prevent workplace injuries/illnesses and maximize health and safety for constituents of the College. This policy is applicable to all employees, students, and visitors of the College. Under no circumstances shall a person knowingly be subjected to a hazardous condition without appropriate personal protective equipment. If those individuals required to wear personal protective equipment fail to do so, they may be subject to disciplinary action.

Authority and Responsibility

I. The following departments and personnel are responsible for administering and coordinating the policy:
   a. Immediate Supervisors
      i. Ensuring PPE is available
      ii. Provide PPE as required and/or upon request to all employees
      iii. Ensuring PPE is being used by each affected employee during all job tasks which require such protection
      iv. Conducting specific hazard assessments for person protective equipment use upon request
      v. Documenting purchase and distribution of all PPE
      vi. Taking the appropriate corrective action in accordance with Delgado Community College policy and procedures.
   b. Environmental Safety
      i. Assessing the workplace to determine if hazards are present, or are likely to be present, which necessitates the use of PPE
      ii. Communicating selection decisions to each affected employee and supervisor
      iii. Selecting and recommending PPE that properly fits each affected employee
      iv. Providing training in the proper use and care of PPE
      v. Documenting aforementioned hazard assessment components.

II. Considerations
   a. PPE devices alone shall not be relied on to provide protection against hazards, but shall be used in conjunction with guards, engineering controls, administrative controls and sound manufacturing practices. When selecting PPE, utilize the following considerations as a basic directive:

- Application: What part of the body is being protected?
- Chemical Resistance: Will material maintain its structural integrity protective qualities?
- Strength: Is the material resistant to punctures, tears, and abrasions?
- Flexibility: Does PPE provide the necessary dexterity?
- Thermal Limits: Does clothing maintain its mobility and protective capacity in temperature extremes?
- Cleanable: Can material be easily cleaned and reused?
- Longevity: Will clothing resist aging?

1. **Respiratory Protection**
2. **Eye and Face Protection**
3. **Head Protection**
4. **Foot and Leg Protection**
5. **Hand and Arm Protection**
6. **Body Protection**
7. **Fall Protection**
8. **Hearing Protection**

Respiratory Protection

Toxic materials can enter the body in three ways:

- through the gastrointestinal tract
- through the skin
- through the lungs.

The human respiratory system presents the quickest and most direct avenue of entry because of its association with the circulatory system and the constant need to oxygenate the tissue cells.

The following information provides background information on different types of respirators and the hazards associated with their use. All respirators used on the Delgado Community College campus shall be NIOSH/MSHA approved. SCBA's shall be NFPA approved.

If respirator use, other than a dust mask, is necessary, DCC recommends having a medical evaluation, fit testing, and maintenance schedule. Dust masks do not require a medical evaluation or fit testing.

Classification of Respiratory Protection Devices (Respirators)

Respiratory protection devices fall into three classes:

- Air purifying
    - Air Purifying Devices (Respirators) remove contaminants from the atmosphere and can be used only in atmospheres containing sufficient oxygen to sustain life (at least 16 percent by volume at sea level) and within specified concentration

limitations of the specific device. Various chemicals remove specific gases and vapors, and mechanical filters remove particulate matter. The useful life of an air purifying device is dependent upon the concentration of the contaminants, the breathing volume of the wearer, and the capacity of the air purifying medium.

The basic types of air purifying devices are:

- Mechanical filter respirators: provides respiratory protection against particulate matter such as non-volatile dusts, mists, or metal fumes. Selection of the appropriate respirator is based on the type, toxicity, and particle size of the particulate matter.
- Chemical cartridge respirators: provides respiratory protection against certain gases and vapors in concentrations not in excess of 0.1% (by volume).
- Combinations of chemical cartridge and mechanical filter respirators: provides respiratory protection where exposure is both gaseous and particulate.
- Gas masks: provides respiratory protection against certain specific gases and vapors in concentrations up to 2% (by volume) or as specified on the canister label and against particulate matter.

- Air supplied
  - Air Supplied Respirators deliver air through a supply hose connected to the wearer's face piece. These devices shall be used only in atmospheres not immediately dangerous to life or health, unless an auxiliary ingress or egress cylinder is incorporated into the system.
  - Airline respirators are available with or without auxiliary ingress or egress cylinders. The airline respirator is connected to a suitable compressed air source (a purified air compressor and/or cylinder supply system) by a hose and air is delivered in sufficient volume to meet the wearer's breathing requirements.
  - All air supplied respirator systems shall meet OSHA 1910.134 criteria, and no air supplied system shall be used on a DCC campus without approval from the Safety and Risk Manager.
- Self-contained breathing apparatus.
  - Self-Contained Breathing Apparatus (SCBA) provides respiratory protection against toxic gases and oxygen deficient atmospheres. SCBA's are not for underwater use.
  - All users of SCBA's shall be trained in its use by a competent instructor.

Eye and Face Protection

- Protect against specific hazard(s) encountered by employees
- Comfortable to wear
- Must not restrict vision or movement
- Durable and easy to clean and disinfect
- Must not interfere with the function of another required PPE

- Eye protection shall meet the ANSI Z87.1-1989 standard and the eyewear shall indicate such on the lens or the frame.

Eye Protection for Employees Who Wear Eyeglasses

- Prescription spectacles, with side shields and protective lenses meeting requirements of ANSI Z87.1
- Goggles that can fit comfortably over corrective eyeglasses without disturbing their alignment
- Goggles that incorporate corrective lenses mounted behind protective lenses

Face Shields

- Do not protect employees from impact hazards
- Use face shields in combination with goggles or safety spectacles when you must protect your employees from impact hazards, even in the absence of dust or potential splashes

Industry Recommended Eye and Face Protectors

- GOGGLES, Flexible Fitting, Regular Ventilation
- GOGGLES, Flexible Fitting, Hooded Ventilation
- GOGGLES, Cushioned Fitting, Rigid Body
- SPECTACLES, Metal Frame, With Side shields
- SPECTACLES, Plastic Frame, With Side shields
- SPECTACLES, Metal-Plastic Frame, With Flat-Fold Side shields
- WELDING GOGGLES, Eyecup type, Tinted Lenses
- CHIPPING GOGGLES, Eyecup Type, Clear Safety Lenses
- WELDING GOGGLES, Eyecup type, Tinted Plate Lens
- CHIPPING GOGGLES, Coverspec Type, Clear Safety Lenses
- WELDING GOGGLES, Coverspec Type, Tinted Plate Lens
- ACE SHIELD (Available with Plastic or Mesh Window, Tinted/Transparent)

Head Protection

- 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
- Head protection used shall bear the ANSI Z89.1 or Z89.2 approval, manufacturer's name, and ANSI class designation (A, B, C, or D). Employees shall only be allowed to purchase or receive them through an authorized department representative to insure compliance.
- Hazardous material falling on head may require protective helmets. They must resist penetration by objects and absorb the shock of a blow.

Classes of hard hats:

- Class A
    - Used for general service (e.g., mining, building construction, shipbuilding, lumbering, manufacturing)
    - Provide good impact protection but limited voltage protection
- Class B
    - Used for electrical work

    - Protect against falling objects and high-voltage shock and burns
- Class C
    - Protect heads that might bump against fixed objects, but do not protect against falling objects or electrical shock
- Class D
    - Firefighters' helmet

All employees/students with long hair or beards who work around chains, belts, or other machines with moving parts shall be required to wear protective hair coverings. Hair nets, bandannas, and turbans shall not be considered satisfactory. Contact local vendors for information on the type of protective hair coverings available. Those who work around sparks, hot metals, flames, etc., shall use flame-resistant protective hair coverings.

Foot and Leg Protection

For all non-office personnel, "Footwear such as sandals, open-toed shoes, platforms, high heels, cloth-bodied tennis shoes, or sneakers is not considered safe and is prohibited for use as a good work shoe. Well-built safety shoes, leather-bodied shoes, or boots in good condition with low heels and hard soles are to be used."

Foot protection used shall meet ANSI Z41.1 "Safety-Toe Footwear."

All foot protection shall be kept reasonably clean and in good repair. Shoes shall be repaired or replaced periodically.

Some of the potential hazards that would require foot and leg protection include:

- Heavy objects such as barrels or tools that might roll onto or fall on employees' feet
- Sharp objects such as nails or spikes that might pierce the soles or uppers of ordinary shoes
- Molten metal that might splash on feet or legs
- Hot or wet surfaces
- Slippery surfaces
- Grinding
- Foot and Leg Protection Choices

Leggings protect lower legs and feet from heat hazards, like molten metal or welding sparks. Safety snaps allow leggings to be removed quickly.

Metatarsal Guards strapped to outside of shoes to protect instep area from impact and compression. Made of aluminum, steel, fiber or plastic.

Toe Guards fit over the toes of regular shoes to protect only the toes from impact and compression. Made of steel, aluminum, or plastic.

Combination Foot and Shin Guards. May be used in combination with toe guards when greater protection is needed.

Safety Shoes have impact-resistant toes and heat-resistant soles that protect against hot work surfaces common in roofing, paving, and hot metal industries.

- May have metal insoles to protect against puncture wounds
- May be designed to be electrically conductive for use in explosive atmospheres
- May be designed to be electrically nonconductive to protect from workplace electrical hazards

Hand and Arm Protection

When engineering and work practice controls fail to eliminate the risk of injury to your employees' hands or arms, protective gloves are the primary means of protecting their hands.

When the risk of injury includes the arm, protective sleeves, often attached to the gloves, should be worn.

The nature of the hazard(s) and the operation to be performed will determine your selection of gloves.

- Types of Gloves:
    - Framing gloves
        - designed to protect professional carpenters with a functional fingerless design that delivers more dexterity when measuring, cutting and framing structures.
    - Metal Mesh, Leather, or Canvas Gloves
        - Sturdy gloves made from metal mesh, leather, or canvas provide protection from cuts, burns, and sustained heat.
    - Leather Gloves
        - Protect against sparks, moderate heat, blows, chips, and rough objects
        - Welders in particular need the durability of higher-quality leather gloves
    - Aluminized Gloves
        - Provide reflective and insulating protection against heat
        - Usually used for welding, furnace, and foundry work
        - Require an insert made of synthetic materials that protect against heat and cold
    - Aramid Fiber Gloves
        - Aramid is a synthetic material that protects against heat and cold
        - Many glove manufacturers use aramid fiber to make gloves that are cut- and abrasive-resistant and wear well
    - Other Synthetic Materials
        - Several manufacturers make gloves with other synthetic fabrics that offer protection against heat and cold
        - Cut- and abrasive-resistant and may withstand some diluted acids
        - Do not stand up well against alkalis and solvents
    - Fabric and Coated Fabric Gloves
        - Gloves made of cotton or other fabric protect against dirt, slivers, chafing, and abrasion but do not provide sufficient protection to be used with rough, sharp or heavy materials
        - Cotton flannel gloves coated with plastic transform fabric gloves into general-purpose hand protection offering slip-resistant qualities
        - Coated fabric gloves are used for tasks ranging from handling bricks and wire rope to handling chemical containers in laboratory operations

        - For protection against chemical exposure hazards, always check with the manufacturer to determine the gloves' effectiveness against the specific chemicals and conditions in the workplace
    - Chemical and Liquid-Resistant Gloves
        - Gloves made of rubber (latex, nitrile, or butyl), plastic, or synthetic rubber like material such as neoprene, protect workers from burns, irritation, and dermatitis caused by contact with oils, greases, solvents, and other chemicals
        - Use of rubber gloves also reduces the risk of exposure to blood and other potentially infectious substances
- Common Gloves Used for Chemical Protection
    - Butyl Rubber Gloves
        - Protect against nitric acid, sulfuric acid, hydrofluoric acid, red fuming nitric acid, rocket fuels, and peroxide
        - Resist oxidation and ozone corrosion.
        - Resist abrasion and remain flexible at low temperatures.
    - Natural Latex or Rubber Gloves
        - Comfortable wear and pliability along with their protective qualities make them a popular general-purpose glove
        - Resist abrasions caused by sandblasting, grinding, and polishing and protect workers' hands from most water solutions of acids, alkalis, salts, and ketones
        - Hypoallergenic gloves, glove liners, and powderless gloves possible alternatives for those allergic to latex
    - Neoprene Gloves
        - Good pliability, finger dexterity, high density, and tear resistance
        - Provide protection from hydraulic fluids, gasoline, alcohols, organic acids, and alkalis
    - Nitrile Rubber Gloves
        - Provide protection from chlorinated solvents such as trichloroethylene and perchloroethylene
        - Intended for jobs requiring dexterity and sensitivity, yet stand up to heavy use even after prolonged exposure that cause other gloves to deteriorate
        - Resist abrasion, puncturing, snagging, and tearing

Body Protection

Workplace hazards that could injure your employees' bodies include the following:

- Intense heat
- Splashes of hot metals and other hot liquids
- Impact from tools, machinery, and materials
- Cuts
- Hazardous chemicals
- Contact with potentially infectious materials, like blood
- Radiation

Types of Body Protection

- Vests
- Jackets
- Aprons
- Coveralls
- Surgical Gowns
- Full Body Suits

Materials for Protective Clothing

- Paper-Like Fiber
    - Disposable suits made of this material provide protection against dust and splashes.
- Treated Wool and Cotton
    - Adapts well to changing work place temperatures. Comfortable and fire resistant.
    - Protects against dust, abrasions, and rough and irritating surfaces.
- Duct
    - Protects employees against cuts and bruises while they handle heavy, sharp, or rough materials.
- Leather
    - Often used against dry heat and flame.
- Rubber, Rubberized Fabrics, Neoprene, and Plastics
    - Provides protection against certain acids and other chemicals.

Protective clothing shall be routinely cleaned unless disposable. Disposable clothing shall be disposed of after use. Damaged, torn, ripped, etc., clothing shall be replaced before use.

Protective clothing shall fit the wearer comfortably and shall not be too loose or baggy.

Employees in occupations which expose them to arcs, flames, and explosions shall wear clothes which will not melt, drip, or burn in the presence of one of these hazards. Heavy cotton of flame-resistant fabrics shall be worn.

Fall Protection

Fall protection shall be utilized by those employees/students for the specific purpose of securing, suspending, or retrieving the employee/student in or from a hazardous work area, and/or when work exposes them to the risk of falling more than 6’ whether outdoors or inside buildings.

Fall protection and devices and equipment shall meet ANSI A 10.14.

The appropriate safety belt shall be chosen for the hazard. It shall be securely buckled and worn tightly enough to prevent any possibility of the wearer slipping out.

Safety belts and associated equipment shall be inspected before each use. Every one to three months they shall be inspected by a trained inspector. Cut, worn, or damaged belts, lifelines, lanyards, etc., shall be discarded and replaced. Safety belts in service shall not be tested for maximum impact loading.

Classification of safety belts and harnesses:

- Class I: Body belt (work belts), used to restrain a person in a hazardous work position and to reduce the probability of falls and to avert falls from bucket trucks.
- Class II: Chest harness, used where there are only limited fall hazards (no vertical free-fall hazard) and for retrieval purposes, such as removal of a person from a tank, bin, or other enclosed place.
- Class III: Body harness, used to arrest the most severe free-falls. This harness is ideal for workers on elevated sites. During a fall, it distributes the fall impact over the body.
- Class IV: Suspension belts, independent work supports used to suspend or support the worker.
- Lifeline: A horizontal line between two fixed anchorages.
- Personal Lifeline: This system is usually a rope system that provides flexibility for worker freedom of movement, yet will arrest a fall and help absorb the shock. These systems always have some type of belt or harness that is worn around the waist to which a lanyard or rope-grabbing device is attached.
- Lanyard: A short piece of flexible line used to secure wearer of safety belt to a lifeline or dropline, or fixed anchorage, such as on the boom of a bucket truck.

Hearing Protection

Hearing protection shall be worn by employees/students when noise exposure is above that of the 90dB when measured on the A-scale of the standard sound level meter at slow response. An employee/student may also be required to wear hearing protection if hearing loss is demonstrated during audiometric testing. Audiometric testing is required at 85dBA of noise exposure and the employees/students is placed in the hearing conservation program.

Personal hearing protection devices shall meet ANSI 53.19.

Selection of hearing protection shall take into consideration durability, ease of fit, noise calculations in area, and length of time to be worn.

There are many types of disposable and permanent hearing protection. Listed below are three:

- Earmuffs: fluid or foam-filled cushions connected by a plastic or metal band that fits over the head. They reduce noise levels by 35-40dB depending on type and fit. In order for them to be effective, a perfect seal must be formed. Glasses, long side burns, and facial movements can reduce protection.
- Ear Plugs: the most commonly used ear protection device. They come in many different shapes, sizes, and materials. Ear plugs can be purchased as disposables, preformed, or molded (professionally fitted). They reduce noise levels by 25-30dB depending on type and fit. Cotton is ineffective as ear plugs.
- Ear Caps: a cross between ear muffs and ear plugs–ear plugs connected to a plastic (usually) band which can be worn under the chin, over the top of the head, or behind the neck. They reduce noise levels by 25-35dB depending on type and fit.

* Combinations or ear plugs and ear muffs can reduce noise level be an additional 3-5dB depending on type and fit.

Preformed ear plugs have to be professionally fitted.

Noise exposure depends on:

- Level of sound, measured in decibels on the A-scale (dBA)
- Duration of employee's exposure to sound of various levels throughout the work day

Noise exposure is measured with noise dosimeter, which indicates daily noise dose in percentage.

All ear protection, if not disposable, shall be inspected and cleaned before each use. All damaged ear protection shall be discarded and replaced. No unauthorized modifications shall be allowed.

When is Hearing Protection Required?

- As with other types of hazards, you must implement feasible engineering and work practice controls before resorting to PPE, in this case hearing protection
- OSHA's noise standard (29 CFR 1910.95) requires the use of hearing protection when the employee's noise exposure exceeds an 8-hour time-weighted average sound level (TWA) of 90 dBA (dose of 100 percent)
- Employees who are exposed to an 8-hour TWA of 85 dBA (dose of 50 percent) and who have measured hearing loss (as prescribed by the OSHA standard) are also required to wear hearing protection

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