

Personal Protective Equipment Program

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EMUDPS-EHS-P022

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Number: 1 of 28**I. PURPOSE**

The purpose of this Personal Protective Equipment (PPE) program is to protect the Eastern Michigan University (EMU) faculty, staff and student employees from hazards within the work and/or study environment by providing the proper personal protective equipment. It is EMU's goal to use engineering and administrative controls as the primary method for protecting faculty, staff and students. However, when additional protection is necessary, appropriate PPE must be worn. The scope of this program includes PPE for eye, face, head, foot, fall, and hand protection. If a respirator and/or hearing protection is necessary, their use is covered by the Respiratory Protection Program and the Hearing Conservation Program, respectively. This program is also designed to comply with the [Michigan Occupational Safety and Health Administration \(MIOSHA\), General Industry Safety Standard Part 33. Personal Protective Equipment.](#)

II. SCOPE AND APPLICATION

This program applies to all departments and divisions at EMU using personal protective equipment.

III. DEFINITIONS

ANSI – American National Standards Institute

ASTM – American Society for Testing Materials

NFPA – National Fire Protection Association

OSHA – Occupational Safety and Health Administration

PPE – Personal Protective Equipment

IV. RESPONSIBILITIES**A. EMU Providers Of Personal Protective Equipment**

1. Personal protective equipment (PPE) needed to protect against hazards from the personal protective equipment hazard assessment **must** be provided at no cost to the employees and adhere to union contract requirements.

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2. Replacement PPE must be provided and paid for under the following conditions:
 - a. When the PPE no longer provides the protection it was designed to provide.
 - b. When the previously provided PPE is no longer adequate or functional.
 - c. When an employee has lost or intentionally damaged their issued PPE, EMU is not required to pay for its replacement and may require the employee to pay for its replacement.
 - d. EMU is not required to pay for prescription safety eyewear with removable or permanent sideshields if EMU provides safety eyewear that fits over an employee's prescription lenses.
 - e. EMU is not required to pay for non-specialty prescription safety eyewear, provided EMU permits these items to be worn off campus.
 - f. EMU is not required to pay for non-specialty safety-toe protective footwear, including steel-toe shoes or steel-toe boots, provided EMU permits these items to be worn off campus.
 - g. EMU must provide, at no cost to employees, metatarsal guards attachable to shoes when metatarsal protection is necessary if both of the following apply:
 - i. If metatarsal protection is necessary and EMU requires employees to use metatarsal shoes instead of detachable guards, then EMU must provide the metatarsal shoe at no cost to the employee.
 - ii. If EMU provides metatarsal guards and allows the employee, at his or her request, to use shoes or boots with built-in metatarsal protection, then EMU is not required to pay for the metatarsal shoes or boots.
 - h. EMU is not required to pay for either of the following:
 - i. Everyday clothing, including any of the following:
 - a) Long-sleeve shirts.
 - b) Long pants.
 - c) Street shoes.
 - d) Normal work boots.
 - e) Ordinary clothing.
 - f) Skin creams.
 - ii. Other items used solely for protection from weather, including any of the following:
 - a) Winter coats.
 - b) Jackets.
 - c) Gloves.
 - d) Parkas.
 - e) Rubber boots.
 - f) Hats.
 - g) Raincoats.
 - h) Ordinary sunglasses.
 - i) Sunscreen.
 - i. EMU must pay for protection when ordinary weather gear is not sufficient to protect an employee and special equipment or extraordinary clothing is

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needed to protect the employee from unusually severe weather conditions. Clothing used in artificially controlled environments with extreme hot or cold temperatures, such as freezers, is not considered part of the weather gear exception.

- j. All of the following apply to upgraded and personalized PPE:
 - i. EMU is not required to pay for PPE requested by an employee that exceeds the PPE requirements, provided EMU provides PPE that meets the standards at no cost to the employee.
 - ii. If EMU allows an employee to acquire and use upgraded or personalized PPE, then EMU is not required to reimburse the employee for the equipment, provided EMU has provided adequate PPE at no cost to the employee.
 - iii. EMU must evaluate an employee's upgraded or personalized PPE to ensure it complies with all of the following:
 - a) Is adequate to protect from hazards present in the workplace.
 - b) Is properly maintained.
 - c) Is kept in a sanitary condition.
- k. If the provisions of another MIOSHA standard specify that EMU must pay for specific equipment, then the payment provisions of that standard prevails.
- l. Contractors are responsible for providing PPE for their employees.

B. Deans, Directors and Department Heads

1. Provide the leadership and the management systems necessary to ensure safe working conditions are maintained in their Colleges, Schools and Departments.
2. Ensure the PPE program is implemented in their area.
3. Motivate and assist faculty, managers and supervisors with PPE compliance.
4. Provide the necessary resources for the PPE program.
5. Require faculty and staff to attend all applicable training sessions.
6. Ensure all graduate assistants and student employees receive appropriate PPE and training.
7. Ensure disciplinary actions are taken when violations of the PPE program are egregious and/or repetitive.

C. Faculty, Managers and Supervisors

1. Implement the PPE program in their work area.
2. Conduct and document PPE hazard assessments.
3. Ensure the necessary PPE is provided, used and maintained.
4. Provide and document training on PPE use, maintenance and limitations.
5. Enforce the rules and requirements of the PPE program, including
6. disciplinary action for repeated and/or egregious non-compliance.
7. Remove defective PPE from service immediately.

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D. Employees and Students

1. Attend all required PPE training sessions.
2. Use all required PPE.
3. Report any defects in PPE to your supervisor or instructor.
4. Report signs and symptoms of possible exposures, known exposures, accidents and near misses to your supervisor or instructor.

E. Environmental Health and Safety (EHS)

1. Provide oversight and guidance on the PPE program.
2. Provide consultation, training, exposure monitoring and inspections as needed.
3. Periodically review and revise the PPE program as necessary.

V. HAZARD ASSESSMENTS

Each job/task performed must be assessed to determine if hazards are present, or are likely to be present, necessitating the use of PPE. Hazard assessments must be documented using the EMU [PPE Hazard Assessment Form](#) (emu-dps-ehs-f079), Appendix A. This documentation is the hazard assessment certification. Hazard assessments must include the following:

A. Assessment Guidelines

1. A survey of the work area must be conducted to identify sources of hazards to faculty, staff and students. The following safety categories should be reviewed:
 - a. Impact: Flying chips, objects, dirt, particles, collision, motion hazards.
 - b. Penetration: Falling/dropping objects, sharp objects that cut or pierce.
 - c. Compression: Roll-over or pinching.
 - d. Chemical: Splashing, burns, fumes.
 - e. Temperature Extremes: Sparks, splashes from molten materials, burns from high/low temperatures.
 - f. Harmful Dust: Dirt, particles, asbestos, lead, etc.
 - g. Light Radiation: Welding, cutting, brazing, lasers, furnaces, lights and sunlight.
2. During the survey, sources of the above potential hazards should also be reviewed. For example:
 - a. Machinery or processes where any movement of tools, machine elements or particles could exist.
 - b. Movement of personnel that could result in collision with stationary objects.
 - c. Any electrical hazards.
3. Please refer to the EMU [Personal Protective Equipment Worksheet](#) (emu-dps-ehs-f040), Appendix B, to assist with hazard assessments and determinations.

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4. Upon completion of the survey, the data should be organized and analyzed to assess the hazards. The following should be taken into consideration:
 - a. The potential for injuries.
 - b. Review each type hazard (listed above) and determine the type, level of risk and seriousness of potential injuries from each hazard noted in the survey.
 - c. Exposure to several hazards simultaneously should be reviewed.
5. Upon completion of the data analysis, if hazards are present measures should be taken to eliminate the hazard through engineering controls or administrative practices (e.g., less hazardous chemicals, etc.).
6. If engineering controls or administrative practices cannot remove the hazard, then PPE must be selected.

B. Selection Guidelines

1. Faculty, supervisors and managers must become familiar with the potential hazards and types of PPE available and the limitations of the PPE.
2. Upon completion of the hazard assessment, compare the hazards present and the available PPE.
3. Select the PPE that ensures a level of protection greater than the minimum required to protect people from the hazard(s).
4. Select PPE designed and constructed to be safe for the work/task/assignment to be performed.

C. Fit, Adjustment and Use Guidelines

1. Fit the user with the appropriate PPE. Provide instructions on the following:
 - a. Donning and doffing.
 - b. How to adjust the PPE for comfort and fit.
 - c. Care and use, including cleaning.
 - d. Limitations of the protective equipment.
 - e. When to replace the PPE.
2. Ensure the manufacturer's instructions are followed.

D. Training Requirement

1. Faculty, supervisors and managers must provide training to each person who is required by this program to use PPE. The training must include all of the following:
 - a. When PPE is necessary.
 - b. What PPE is necessary.
 - c. How to properly don, doff, adjust and wear the PPE.
 - d. The limitations of the PPE.
 - e. The proper care, maintenance, useful life and disposal of the PPE.
2. Each affected person must demonstrate an understanding of the training and the ability to use the equipment properly before being allowed to perform work/tasks/assignments requiring the use of PPE.

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3. Retraining is required when:
 - a. There are changes to the work/task/assignment that render the original training obsolete.
 - b. There are changes in the type PPE to be used.
 - c. When inadequacies, lack of understanding or retention lapses are noted.

E. Documentation and Reassessment

1. Written documentation of hazard assessments and training must be maintained.
2. Hazard assessments must include:
 - a. The name and signature of the person conducting the survey.
 - b. The date of the survey.
3. This certification must be kept on file until the work/task/assignment is reevaluated.
4. Training documentation must include:
 - a. Documentation of training on all of the items listed in D. 1 above.
 - b. The name and signature of the person conducting the training.
 - c. The date of the training.
 - d. Signature of the trainee(s).
5. When there is a change in procedure, new procedure added, lapse in PPE usage or change in PPE used, a new hazard assessment and updated PPE training are required.

VI. PERSONAL PROTECTIVE EQUIPMENT

A. Eye and Face Protection

1. General Guidelines
 - a. All eye and face protection supplied by Eastern Michigan University must meet the applicable American National Standards Institute ANSI Z87.1 standard for the device.
 - b. Safety glasses do not provide adequate protection from chemical splashes. If the potential for liquids to be splashed or sprayed is present, safety goggles must be worn.
 - c. A face shield may also be needed when liquids are under extreme high pressure. A face shield must be used in conjunction with safety goggles and cannot be used alone.
 - d. Appropriate eye and/or face protection must be used when the following hazards are present:
 - i. Flying objects or particles.
 - ii. Harmful contacts.
 - iii. Exposures.
 - iv. Molten metal.
 - v. Liquid chemicals.
 - vi. Acids or caustic liquids.
 - vii. Chemical fumes, gases or vapors.

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- viii. Glare.
- ix. Injurious radiation.
- x. Electrical flash.
- xi. A combination of these hazards.
- e. [Table 1 Eye and Face Protection Selection](#), Appendix C, must be used as a guide to select the proper eye and face protection.
- f. Each affected faculty, staff and/or student must use the eye protection provided with side protection when there is a hazard from flying objects. Detachable side protectors such as clip-on or slide-on shields that comply with the requirements of this program are acceptable.
- g. Face and/or eye protection must comply with all of the following minimum requirements:
 - i. It protects against the particular hazards for which it is designed.
 - ii. It fits snugly and does not unduly interfere with movements of the wearer.
 - iii. It must be capable of withstanding sanitizing.
- h. The manufacturer information must be clearly identified on face and eye protection.
- i. Users of PPE must be made aware of the manufacturer's limitations and precautions regarding face and eye protection and must abide by these warnings.
- j. Contact lenses or federal drug administration (FDA) standard hardened or plastic lenses are not considered as eye protective equipment.
- 2. Maintenance and Cleanliness of Eye and Face Protection
 - a. Eye and face protection must be kept clean and in good repair.
 - b. Cleaning facilities for face and eye protection must be provided away from the hazard, but readily accessible to the wearer.
 - c. A loose, worn out, sweat-soaked, knotted or twisted headband must be replaced.
 - d. Face and eye protection is a personal item and must be for the exclusive use of the person to whom it is issued. If circumstances require reissue, the face and eye protection must be in good condition thoroughly cleaned and sanitized.

B. Eye Protection

- 1. Eye Protector Materials
 - a. Materials used in the manufacturing of eye protectors must combine mechanical strength and lightness of weight to a high degree, must be non-irritating to the skin when subjected to perspiration and must withstand frequent sanitizing.
 - b. Metals, where used, must be corrosion resistant.
 - c. Plastic materials, when used, must be noncombustible or slow burning.
 - d. Cellulose nitrate, or materials having flammability characteristics approximating those of cellulose nitrate, must not be used.

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2. Lenses

- a. Lenses intended for use in eye protectors are of four basic types. They are:
 - i. Clear lenses that are impact resisting and provide protection against flying objects.
 - ii. Absorptive lenses of shades 1.7 through 3.0 which are impact resisting and provide protection against flying objects and glare or which are impact resisting and provide protection against flying objects and narrow-band spectral transmittance of injurious radiation.
 - iii. Protective-corrective lenses which are impact resisting and either clear or absorptive, as specified for persons requiring visual correction.
 - iv. Filter lenses that are impact resisting and provide protection against flying objects and narrow-band spectral transmittance of injurious radiation.
- b. Glass filter lenses intended for use in eyecup goggles must be heat-treated.
- c. The height of the safety lens must not be less than 30 millimeters.

3. Eyecup Goggles

- a. Components
 - i. Eyecup goggles must consist of two eyecups with lenses and lens retainers, connected by an adjustable bridge, and a replaceable and adjustable headband or other means for retaining the eyecups comfortably in front of the eyes.
 - ii. Recommended applications for the use of eyecup goggles are in [Table 1. Eye and Face Protection Selection](#), Appendix C.
- b. Types and Models
 - i. Eyecup goggles must be of the following two types:
 - a) Cup-type goggles designed to be worn by individuals who do not wear corrective spectacles.
 - b) Cover cup-type goggles designed to fit over corrective spectacles.
 - ii. The three (3) types of eyecup goggles are subdivided into the following classes:
 - a) Chipper's models providing impact protection against flying objects.
 - b) Dust and splash models providing protection against fine dust particles or liquid splashes and impact.
 - c) Welder's and cutter's models providing protection against glare, injurious radiation, and impact.
 - iii. The basic designs may be modified to provide more protection against special hazards, but the modified equipment must meet the same requirements as the basic design.
- c. Fit of Eyecup Goggles
 - i. The edge of the eyecup of eyecup goggles that touches the face must have a smooth surface free from roughness or irregularities that might exert undue pressure or cause discomfort to the wearer. The eyecups must be of a shape and size to protect the entire eye sockets.
 - ii. Cover cup-type goggles must provide ample clearance and not

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interfere with the spectacles of the wearer. The edge of the goggles that touches the face must have a smooth surface free from roughness or irregularities that might exert undue pressure or cause discomfort to the wearer.

- d. Eyecup Ventilation
 - i. Eyecups of chipper's models must be ventilated in a manner to permit circulation of air.
 - ii. Eyecups of dust and splash models must be ventilated in a manner to permit circulation of air. The ventilation openings must be baffled or screened to prevent direct passage of dust or liquids into the interior of the eyecups.
 - iii. Eyecups of welder's and cutter's models must be ventilated in a manner to permit circulation of air and must be opaque. The ventilation openings must be baffled to prevent passage of light rays into the interior of the eyecup.
- e. Lenses and Retaining Rings
 - i. An eyecup must be provided with a rigidly constructed lens retaining ring of metal or plastic designed to accommodate lenses and to permit their ready removal and replacement without damage to the eyecup or to the lenses and without the use of tools.
 - a) The ring must provide a complete clamping action against the lens.
 - b) Lens retainers for welder's and cutter's models must accommodate a filter lens, fiber gasket and cover lens.
 - ii. A filter lens must be marked with the shade designation and a permanent and legible marking which can readily identify the manufacturer.
 - iii. A glass filter lens, when treated for impact resistance, must also be marked with the letter "H".
- f. Flexible and Cushioned Fitting Goggles
 - i. Construction
 - a) Flexible and cushioned fitting goggles must consist of a wholly flexible frame, forming a lens holder or have a separate lens holder or a rigid frame with integral lens or lenses and having a separate cushioned fitting surface on the full periphery of the facial contact area.
 - b) Materials used must be chemical-resistant, nontoxic, non-irritating, and slow burning.
 - c) There must be a positive means of support on the face, such as an adjustable headband of suitable material or other suitable means of support to retain the frame comfortably and snugly in place in front of the eyes.
 - d) A frame that is a lens holder or has a separable lens holder must hold the lenses firmly and tightly and be removable or replaceable without the use of tools.
 - e) The goggles may be ventilated or not, as required by their intended use.

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- f) Where chemical goggles are ventilated, the openings must be designed to render the goggles splash proof.
- ii. Protection
 - a) Chipper's models of flexible and cushioned fitting goggles must provide protection against impact.
 - b) Dust and splash models must provide protection from fine dusts, fumes, liquids, splashes, mists and spray, alone or with reflected light or glare, wind and impact.
 - c) Gas welder's and cutter's models must provide protection against glare, injurious radiation and impact.
- iii. Marking
 - a) The frame of flexible and cushioned fitting goggles must have a trademark or name identifying the manufacturer.
 - b) Each separate lens must be distinctly marked in a manner by which the manufacturer may be identified.
 - c) A heat-treated glass filter plate or lens must also be marked with the shade designation and the letter "H".
 - d) The marking must be clear-cut and permanent and placed so as not to interfere with the vision of the wearer.
- g. Foundrymen's Goggles
 - i. Construction
 - a) A foundryman's goggles must consist of a mask made of a flexible, non-irritating, and non-combustible or slow-burning material, such as leather or flexible plastic, suitable lens holders attached thereto, lenses, and a positive means of support on the face, such as an adjustable headband, to retain the mask comfortably and snugly in place in front of the eyes.
 - b) The edge of the mask on contact with the face must be provided with a binding of corduroy or other suitable material.
 - c) The lens holders must hold the lenses firmly and tightly and may be readily removable or replaceable.
 - d) The lens holders must be ventilated to permit circulation of air.
 - ii. Protection
 - a) A foundryman's goggles must provide protection against impact and hot-metal splash hazards encountered in foundry operations such as melting, pouring, chipping, babbitting, grinding, and riveting. Where required, they must also provide protection against dusts.
 - b) Applications for use of foundry man's goggles can be found in [Table 2. Filter Lenses for Protection Against Radiant Energy](#), Appendix D.
 - c) Materials must resist flame, corrosion, water and be able to withstand sanitizing.
- h. Safety Glasses
 - i. Safety glasses of metal, plastic, or a combination thereof, must consist of lenses in a frame supporting the lenses around their entire periphery of suitable size and shape for the purpose intended,

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- connected by a nose bridge and retained on the face by temples or other suitable means.
- ii. The safety glasses must be furnished with or without side shields depending upon their intended use.
 - iii. The frames, temples and side shields may be metal or plastic and when made of plastic must be the slow burning type.
 - iv. Safety glasses must provide protection to the eye from flying objects, and, when required, from glare and injurious radiations.
 - v. Safety glasses without side shields are intended to provide frontal protection.
 - vi. Where side, as well as frontal, protection is required, the safety glasses must be provided with side shields.
 - vii. See [Table 1. Eye and Face Protector Selection](#), Appendix C and [Eye and Face Protective Devices](#), Appendix E for assistance in proper selection of eye protection.
 - viii. Frames must be designed for industrial exposure and must have a trademark identifying the manufacturer on both fronts and temples.
 - a) The frame front must carry a designation of the eye size and bridge size, where applicable.
 - b) Temples must be marked as to the overall length or fitting value.
 - ix. Temples may be of the cable or spatula type, as specified, and must be designed to permit adjustment and fit comfortably and securely on the wearer. The size of the temples must be clearly marked.
 - x. Safety lens in frames that do not comply with the above must not be worn.
- i. Prescription Safety Glasses
- i. Faculty, supervisors and managers must assure each affected person who wears prescription lenses while engaged in operations involving eye hazards must wear eye protection that incorporates that prescription in its design or must wear eye protection that can be worn over the prescription lenses without disturbing the proper position for the prescription lenses or protective lenses.
 - ii. EMU is not required to pay for prescription safety eyewear with removable or permanent side shields if EMU provides safety eyewear that fits over an employee's prescription lenses.
 - iii. EMU is not required to pay for non-specialty prescription safety eyewear, provided EMU permits these items to be worn off the job-site.

C. Face Shields

1. Face Shield Purposes and Uses

- a. Face shields are designed to provide protection to the front part of the head, including forehead, cheeks, nose, mouth, and chin, and to the neck, where required, from flying particles and sprays of hazardous liquids and to provide filter protection where required. Face shields must be worn over suitable basic eye protection devices.
- b. Typical uses for face shields include, but are not limited to, the following:

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- i. Woodworking operations where chips and particles fly.
 - ii. Metal machining causing flying particles.
 - iii. Buffing, polishing, wire brushing and grinding operations causing flying particles or objects.
 - iv. Spot welding.
 - v. Handling of hot or corrosive materials.
- 2. Face Shield Types and Materials
 - a. Three basic styles of face shields:
 - i. Headgear without crown protector.
 - ii. Headgear with crown protector.
 - iii. Headgear with crown protector and chin protector.
 - b. Each of these styles must accommodate any of the following window types:
 - i. Clear transparent.
 - ii. Colored transparent.
 - iii. Wire screen.
 - iv. Combination of plastic and wire screen.
 - v. Fiber window with filter plate mounting.
 - c. Materials used in the manufacture of a face shield must be non-irritating to the skin when subjected to perspiration and must be capable of withstanding frequent sanitizing.
 - d. Metals, when used, must be resistant to corrosion.
 - e. Plastic materials must be slow burning.
 - f. Clear or colored plastic materials used in windows must be of an optical grade.
 - g. Plastic windows must not be used in connection with welding operations unless they meet the requirements of Table 2. [Filter Lenses for Protection Against Radiant Energy](#), Appendix D.
- 2. Face Shield Components
 - a. A face shield must consist of a detachable transparent plastic window, wire screen window, or opaque frame with window, a tilting support, and adjustable headgear.
 - b. In addition, as required, a face shield must have a crown protector and chin protector.
- 4. Face Shield Windows
 - a. A window must be designed to fit the contour or the window support.
 - b. A window supporting or window holding member, which must be a band or crown protector, must be attached to the headgear. The window support must position the window in front of the face to provide clearance for the nose and eyeglasses of the wearer.
 - c. The attachment of the window to the window support must be secure and must permit easy removal and replacement. The sizes and types of windows for a face shield must be interchangeable for attachment to the window support.
 - d. A plastic or wire screen window without frame must not be less than 9-1/2 inches wide at the top and 8-1/2 inches wide at the bottom, measured

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over its curved surfaces when attached and in position on the window support, and not less than 6 inches high.

- i. A window, when used in a frame, must not be less than 4 inches wide and 2 inches high, and the frame must conform to the dimensions specified for a window without a frame.
 - ii. A plastic window must be not less than 0.040-inch nominal thickness.
 - e. The exposed borders of a wire screen window must be suitably bound or otherwise finished to eliminate sharp, rough or unfinished edges. A wire screen window must not be less than 20-mesh screen.
 - f. A window support must be pivotally attached to the sides of the headgear to permit easy tilting, either upward or downward, of the supporting member and of the attached window. The window must be capable of being tilted sufficiently upward so the center of its bottom edge is out of the line of horizontal vision. The tension of the tilting mechanism must be sufficient to hold the window without slippage in either the up or down position.
5. Face Shield Headgear
- a. Headgear must consist of at least a headband and a crown strap.
 - i. The headgear must be made from materials having low heat conductivity.
 - ii. The design must hold the window and window support comfortably and firmly in place on the wearer's head and must provide for tilting the window away from the face.
 - b. Headgear must be readily adjustable to head sizes from 6-1/2 to 7-5/8 without the use of tools.
 - i. The crown strap or band must be attached to and extend between the front and the rear centers or from the middle sides of the headband. It must be attached to and extend between the front and rear centers or from the middle sides of the headband. It must form an arc over the head to assist in positioning and holding the headgear in place.
 - ii. An adjusting device must be positive and hold firmly in place after being adjusted. Its mechanisms and movements must be protected so that the wearer's hair cannot catch in the device.
 - c. For greater protection, headgear may be replaced by an impact resistant hat or cap to which the window support is connected. The attachment may be either rigid or swiveled. If swiveled, the design must permit unobstructed vision or lowering to furnish protection.
6. Face Shield Crown and Chin Protectors
- a. A crown protector and chin protector must be made of material having an impact resistance not less than that of the plastic window.
 - b. When the crown protector is used in conjunction with the chin protector for protection against sprays of hazardous liquids, the assembly of the crown protector and window support and the assembly of the chin protector and window must not allow liquids to pass through any opening in the assembly and reach the face, forehead or chin of the wearer.
 - c. A crown protector must be shaped to cover at least the frontal portion of the head and must extend around each side at least to a vertical line at

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the front of the ears. It may be an integral part of the window support or a separate assembly. The design must provide a comfortable clearance over the forehead and the head of the wearer.

- d. A chin protector must be shaped to cover at least the chin and upper part of the neck. The design must provide a comfortable clearance under the chin of the wearer.
7. Face Shield Marking: Special Operating Conditions
- a. When a face shield is used in atmospheres or working conditions of non-conductivity or non-sparking, materials used must:
 - i. Be plainly and permanently labeled, identifying it as a “nonconductive face shield” or
 - ii. be a “non-sparking face shield.”
 - b. Headgear and a plastic window must have a permanent and legible marking by which the manufacturer can be readily identified.
 - c. A window offered for protection against glare must also have its shade designation.

D. Head Protection

1. Use of Head Protection
 - a. Each affected faculty, staff and student must be provided and wear head protection equipment and accessories when they are required to be in areas where a hazard exists from the following:
 - i. Falling or flying objects.
 - ii. Other harmful contacts or exposures.
 - iii. Where there is a risk of injury from:
 - a) Electric shock
 - b) Hair entanglement
 - c) Chemicals
 - d) Temperature extremes
 - b. Sanitizing facilities and replacement of needed parts must be provided when necessary and before head protection equipment is reissued.
 - c. Physically altered or damaged head protection equipment must not be worn or reissued to another employee.
 - d. Faculty, staff and student employees must not physically alter, and must guard against damage to, the head protection equipment provided.
 - e. Faculty, staff and student employees must use the provided head protection equipment in accordance with the instructions and training received.
 - f. Head protective equipment provided must meet the applicable ANSI Z-89.1 Standard for head protective equipment.
2. Protective Helmets
 - a. Protective helmets must be described by impact type and electrical class.
 - b. All protective helmets must meet either Type I or Type II requirements.
 - c. All helmets must be further classified as meeting Class G, Class E or Class C electrical requirements.
 - d. Impact type helmets must be classified as either of the following:

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- i. Impact Type Protective Helmets
 - a) Type I helmets are intended to reduce the force of impact resulting from a blow only to the top of the head.
 - b) Type II helmets are intended to reduce the force of impact resulting from a blow to the top or sides of the head.
 - ii. Electrical classes for protective helmets must be one (1) of the following:
 - a) Class G general protective helmets are intended to reduce the danger of contact with low voltage conductors. Test samples must be proof-tested at 2200 volts (phase to ground). This voltage is not intended as an indication of the voltage at which the helmet protects the wearer.
 - b) Class E electrical protective helmets are intended to reduce the danger of contact with higher voltage conductors. Test samples must be proof-tested at 20,000 volts (phase to ground). This voltage is not intended as an indication of the voltage at which the helmet protects the wearer.
 - c) Class C conductive protective helmets are not intended to provide protection against contact with electrical hazards.
 - e. A metallic head device must not be furnished or used for head protection, except where it has been determined that the use of other types of protective helmets or safety hats or caps is impractical. For example, where chemical reaction will cause deterioration of other types of head protection.
 - f. Furnished protective helmets must be identified on the inside of the shell with the name of the manufacturer.
 - g. When used in conjunction with protective helmets, face shields, welding helmets and goggles must comply with the requirements of this program for these protective devices.
 - h. Winter liners and chin straps used in conjunction with Class E helmets for high voltage protection must not contain any metallic parts or other conductive materials.
 - i. Winter liners and chin straps used in areas where there is a danger of ignition from heat, flame, or chemical reaction, must be made of materials that are non-burning or flame retardant.
 - j. Bump hats or caps or other limited-protection devices must not be used as a substitute for protective helmets for the hazards described in use of head protection, section D.1.
 - k. Faculty, staff and student employees who are near exposed electrical conductors that could come in contact with their head must wear protective helmets designed to reduce electrical shock hazard.
3. Hoods
- a. A hood must be made of materials that combine all of the following:
 - i. Have mechanical strength and lightness of weight to a high degree.
 - ii. Be non-irritating to the skin when subjected to perspiration.
 - iii. Be capable of withstanding frequent cleaning and disinfection.

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- b. Materials used in the manufacturer of hoods must also be suitable to withstand the hazards to which the user may be exposed.
 - c. A hood must have a permanent and legible marking by which the manufacturer can be readily identified.
 - d. A hood must be designed to provide adequate ventilation for the wearer.
 - e. A protective helmet must be used in conjunction with a hood where there is a head injury hazard and the hood must be designed to accommodate such helmet.
4. Hair Enclosures
- a. Faculty, staff and students must wear a hat, cap or net where there is a danger of hair entanglement in moving machinery or equipment, or where there is exposure to ignition sources.
 - b. Hair enclosures must include all of the following:
 - i. Be designed to be reasonably comfortable to the wearer.
 - ii. Completely enclose all loose hair.
 - iii. Be adjustable to accommodate all head sizes.
 - c. Materials used for hair enclosure must be all of the following:
 - i. Fast dyed.
 - ii. Non-irritating to the skin when subjected to perspiration.
 - iii. Capable of withstanding frequent cleaning.
 - d. Hair enclosures must not be reissued.

E. Hand Protection

- 1. Faculty, department heads, supervisors and managers must select and require faculty, staff and students to use appropriate hand protection when their hands are exposed to any of the following hazards:
 - a. Skin absorption of harmful substances.
 - b. Severe cuts or lacerations.
 - c. Severe abrasions.
 - d. Punctures.
 - e. Chemical burns.
 - f. Thermal burns.
 - g. Harmful temperature extremes.
- 2. Faculty, department heads, supervisors and managers must base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to all of the following:
 - a. The task(s) to be performed.
 - b. Conditions present.
 - c. Duration of use.
 - d. The hazards and potential hazards identified.
 - e. Other considerations include:
 - i. Dexterity required for the task.
 - ii. Task duration.
 - iii. Frequency and degree of exposure to the hazard.
 - iv. Physical stresses that may be present.

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- f. Protection against chemical hazards.
 - i. The toxic properties of the chemical(s) must be determined, especially, the ability of the chemical to cause local effects on the skin and/or to pass through the skin and cause systemic effects.
 - ii. Generally, any “chemical resistant” glove can be used for dry powders.
 - iii. For mixtures and formulated products, unless specific test data is available, a glove should be selected based on the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials.
 - iv. Glove users must be able to remove the gloves in such a manner as to prevent skin contamination.
3. Hand protection interiors must be kept free of corrosive or irritating contaminants.
4. If more than one employee wears a pair of gloves, the gloves must be sanitized before being reissued.
5. Reusable gloves must be cleaned after chemical exposure.
6. Single use gloves must not be cleaned or reused.
7. Glove Selection and Usage
 - a. Gloves provide protection against chemical, radiological and biological agents and physical hazards. Selection of proper gloves for the work task is critical in maintaining protection against hazardous agents and physical hazards.
 - b. Proper gloves must be worn when working with corrosive liquids, solvents, or other potentially hazardous materials.
 - c. Gloves must be removed prior to answering phones, using computers, opening doors, or any other situation that might cause the spread of hazardous materials.
 - d. Gloves must be removed prior to leaving the work area.
 - e. Hand washing is required anytime gloves are removed.
 - f. Be careful not to touch other parts of your body or apparel while wearing gloves (e.g., pushing up your glasses, etc.).
 - g. Please see the [General Glove Information Chart](#), Appendix F. The chart provides general information about glove types and their uses.
 - h. For assistance with glove selection, please contact Environmental Health and Safety at 7-0794.

F. Body Protection

1. Faculty, supervisors and managers must ensure the clothing of each person required to work does not become wet due to a condition other than the weather or perspiration and the following should be provided as necessary to keep clothing dry:
 - a. Aprons.
 - b. Coats.
 - c. Jackets.
 - d. Sleeves.
 - e. Other garments that will keep clothing dry.

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2. The material must be unaffected by the wetting agent.
3. The provision of dry, clean, acid-resistant clothing, in addition to rubber shoes or short boots and an apron, must be considered a satisfactory substitute where small parts are cleaned, plated or acid-dipped in an open tank.
4. When abrasive blasting is not protected by an enclosure, the operator must use heavy canvas or leather gloves and aprons or equivalent protection to provide protection from the impact of abrasives.
5. Laboratory Coats
 - a. Laboratory coats are issued to prevent the spread of hazardous and/or infectious materials outside the laboratory. Lab coats also prevent damage to personal clothing.
 - b. Laboratory coats must only be worn in the lab and outside the lab only to conduct laboratory procedures in another area.
 - c. University supplied laboratory coats must not be laundered at home. Laboratory coats need to be laundered by a professional cleaning company capable of handling contaminated laboratory coats.
 - d. Disposable coats are permissible.
 - e. Laboratory coats must be removed prior to leaving the laboratory.

G. Fall Protection

1. Fall protection is required whenever work is being conducted where there is a potential for a fall of four (4) feet or greater. Fall protection is also required for falls of less than four (4) feet if dangerous equipment or other hazards are present.
2. Fall protection is needed for the following conditions when the above criteria is present:
 - a. Unprotected sides and edges.
 - b. Leading edges.
 - c. Hoist areas.
 - d. Holes.
 - e. Ramps, runways and other walkways.
 - f. Excavations.
 - g. Dangerous equipment.
 - h. Roof work on low slope and steep sloped.
 - i. Wall openings.
 - j. Walking and working surfaces not specifically addressed.
3. The primary means of fall protection are:
 - a. Guardrail systems.
 - b. Safety net systems.
 - c. Personal fall arrest systems.
 - d. Travel restraints.
4. Other protection systems and practices include:
 - a. Positioning device systems.
 - b. Warning line systems.
 - c. Controlled access zones.
 - d. Safety monitoring systems.

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- e. Covers.
 - f. Protection from falling objects.
 - g. Fall protection plan.
5. Due to the complexities of fall protection and the required training, please contact Environmental Health and Safety at 7-0794 for any situation where there is a fall protection need or concern.

H. Foot and Toe Protection

1. Faculty, supervisors and managers must ensure each affected person wears protective footwear when working in areas where any of the following occur:
 - a. When using protective footwear will protect the affected people from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after other necessary protective measures have been taken.
 - b. There is a danger of foot injuries due to falling or rolling objects.
 - c. There is a danger of objects piercing the sole of the shoe.
 - d. If a hazard is created from a process, environment, chemical or mechanical irritant which could cause an injury or impairment to the feet by absorption or physical contact, other than from impact, then the affected people must be provided any of the following:
 - i. Boots.
 - ii. Overshoes.
 - iii. Rubbers.
 - iv. Wooden-soled shoes
 - v. The equivalent of a – d above.
2. Where toe protection other than safety toe footwear is worn, the toe protection must have an impact value of not less than that required for the safety toe footwear.
3. Protective footwear must comply with any of the following consensus standards:
 - a. ASTM F-2412
 - b. ASTM F-2413
 - c. ANSI Z-41
4. Safety shoes and boots that are not worn over shoes and that are worn by more than one person must be maintained, cleaned and sanitized inside and out before being issued to another person.

I. Electrical Protective Equipment

1. At EMU, only licensed electricians should have a need for electrical protective equipment. If you are planning to conduct work requiring electrical protective equipment, please contact Environmental Health and Safety at 7-0794 prior to starting any work.
2. The requirements of NFPA 70E must be complied with in addition to the requirements listed below.
3. Electrical Protective Equipment

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- a. Material other than rubber that offers protection equivalent to or greater than rubber may be used if the material is certified to meet the appropriate ASTM standard tests.
- b. An insulated blanket, gloves or sleeves must be capable of withstanding the voltage to which they may be subjected.
- c. Exposed conductors or equipment or both except for conductors or equipment being directly worked on, that is energized from 750 volts to 28,000 volts phase to ground and that a person may reach into or touch must be isolated or covered with at least one (1) of the following:
 - i. An insulating blanket.
 - ii. An insulating hood.
 - iii. An insulating line hose.
 - iv. An insulating barrier.
- d. Insulating gloves and sleeves capable of withstanding the imposed voltage must be worn when performing any of the following activities:
 - i. Working directly on, or within reaching distance of, a conductor or equipment at a nominal 750 volts or more phase to ground, except when using barehanded techniques or a hot stick.
 - ii. Sleeves are not required for a person who performs routine switching operations in a substation or powerhouse.
 - iii. Persons who use gloves and sleeves and work directly on or within reaching distance of a conductor or equipment energized at more than 5,000 volts phase to ground must do so from an insulated platform or board or an aerial device that has an insulated basket.
 - iv. Connecting or disconnecting primary neutrals, pole ground wires or other conductors normally connected to static wires or energized equipment. Exception: gloves and sleeves must not be worn while connecting and disconnecting a service neutral or secondary neutral.
 - v. Working on a de-energized conductor that extends into an area in which contact may be made with an energized conductor or exposed parts of energized equipment, unless the conductor is grounded or isolated. Insulating sleeves are optional at voltages of less than 750 volts phase to ground.
- e. Insulating gloves capable of withstanding the imposed voltage must be worn when performing either of the following activities:
 - i. When working with a powered or manual hole digger while using booms or using winch lines to install or remove poles or equipment where the hole digger may contact conductors or equipment energized at a voltage of 300 volts or more phase to ground. Gloves must not be used while in the enclosed cab of the equipment.
 - ii. When working directly on a conductor or equipment energized at a voltage of more than 240 volts phase to ground. This does not include the use of test equipment.
4. Design requirements for specific types of electrical protective equipment
 - a. Rubber insulating blankets, mattings, covers, line hoses, gloves and sleeves must meet the following:

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- i. Blankets, gloves and sleeves must be produced by a seamless process.
- ii. Each item must be clearly marked as follows:
 - a) Class 00 equipment must be marked class 00.
 - b) Class 0 equipment must be marked class 0.
 - c) Class 1 equipment must be marked class 1.
 - d) Class 2 equipment must be marked class 2.
 - e) Class 3 equipment must be marked class 3.
 - f) Class 4 equipment must be marked class 4.
 - g) Non-ozone-resistant equipment must be marked type I.
 - h) Ozone-resistant equipment must be marked type II.
 - i) Other relevant markings, such as the manufacturer's identification and the size of the equipment, may also be provided.
- iii. Markings must be non-conducting and must be applied in such a manner as not to impair the insulating qualities of the equipment.
- iv. Markings on gloves must be confined to the cuff portion of the glove.
- b. All of the following electrical requirements must be met by electrical protective equipment:
 - i. Equipment must be capable of withstanding the alternating current proof-test voltage specified in Table A. [Alternating Current Proof-Test Requirements](#), Appendix G or the direct current proof-test voltage specified in Table B [Direct Current Proof-Test Requirements](#), Appendix H. All of the following apply:
 - a) The proof test must reliably indicate that the equipment can withstand the voltage involved.
 - b) The test voltage must be applied continuously for three (3) minutes for equipment other than matting and must be applied continuously for one (1) minute for matting.
 - c) Gloves must be capable of separately withstanding the alternating current proof-test voltage specified in Table A. [Alternating Current Proof-Test Requirements](#), Appendix G, after a 16-hour water soak.
 - ii. When the alternating current proof test is used on gloves, the 60-hertz proof-test current must not exceed the values specified in Table A. [Alternating Current Proof-Test Requirements](#), Appendix G, at any time during the test period. All of the following apply:
 - a) If the alternating current proof test is made at a frequency other than 60 hertz, the permissible proof-test current must be computed from the direct ratio of the frequencies.
 - b) For the test, gloves (right side out) must be filled with tap water and immersed in water to a depth that is in accordance with Table C. [Glove Tests – Water Level](#), Appendix I. Water must be added to or removed from the glove, as necessary, so that the water level is the same inside and outside the glove.
 - c) After the specified 16-hour water soak, the 60-hertz proof-test current must not exceed the values given in Table A. [Alternating Current Proof-Test Requirements](#), Appendix G, by more than two (2) milliamperes.

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- iii. Equipment that has been subjected to a minimum breakdown voltage test must not be used for electrical protection.
 - iv. Material used for Type II insulating equipment must be capable of withstanding an ozone test, with no visible effects. The ozone test must reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material.
 - c. Workmanship and finish must comply with both the following:
 - i. Equipment must be free of physical irregularities that can adversely affect the insulating properties of the equipment and that can be detected by the tests or inspections required by these rules.
 - ii. Surface irregularities that may be present on all rubber goods, because of imperfections on forms or molds or because of inherent difficulties in the manufacturing process, and that may appear as indentations, protuberances, or imbedded foreign material are acceptable under the following conditions:
 - a) The indentation or protuberance blends into a smooth slope when the material is stretched.
 - b) Foreign material remains in place when the insulating material is folded and stretches with the insulating material surrounding it.
- 5. Design requirements for other types of electrical equipment not covered above in items 3 and 4.
 - a. Insulating equipment used for the protection of licensed electricians must be capable of withstanding, without failure, the voltages that may be imposed upon it. These voltages include transient over-voltages.
 - b. Equipment current must comply with the following:
 - i. Protective equipment used for the primary insulation of licensed electricians from energized circuit parts must be capable of passing a current test when subjected to the highest nominal voltage on which the equipment is to be used.
 - ii. When insulating equipment is tested pursuant to these rules, the equipment current may not exceed 1 microampere per kilovolt of phase-to-phase applied voltage.
 - iii. This requirement applies to primary insulation of electricians from energized parts. It does not apply to equipment used for secondary insulation or equipment used for brush contact only.
 - iv. For alternating current excitation, this current consists of the following three components:
 - a) Capacitive current because of the dielectric properties of the insulating material itself.
 - b) Conduction current through the volume of the insulating equipment.
 - c) Leakage current along the surface of the tool or equipment.
 - d) Note: The conduction current must be normally negligible. For clean, dry insulating equipment, the leakage current must be small and the capacitive current must predominate.

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- v. Plastic guard equipment is considered to conform to the performance requirements of this rule, if it meets and is used in accordance with ASTM requirements.
- 6. Care and Use of Electrical Protective Equipment
 - a. Electrical protective equipment must be maintained in a safe, reliable condition.
 - b. The following specific requirements apply to rubber insulating blankets, covers, line hoses, gloves and sleeves.
 - c. Maximum use voltages must conform to those listed in Table D. [Rubber Insulating Equipment, Voltage Requirements](#), Appendix J.
 - d. The electrician, supervisor, foreperson or manager must ensure insulating equipment is inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of causing damage.
 - e. Insulating gloves must be given an air test, along with the inspection.
 - f. Insulating equipment with any of the following defects must not be used.
 - i. A hole, tear, puncture or cut.
 - ii. Ozone cutting or ozone checking, that is, a series of interlacing cracks produced by ozone on rubber under mechanical stress.
 - iii. An embedded foreign object.
 - iv. Any of the following texture changes:
 - a) Swelling.
 - b) Softening.
 - c) Hardening.
 - d) Becoming sticky or inelastic.
 - e) Any other defect that damages the insulating properties.
 - g. The electrician, supervisor, foreperson or manager must ensure that insulating equipment found to have other defects that might affect its insulating properties is removed from service and returned for required testing, see items k and l below.
 - h. The electrical supervisor, foreperson or manager must ensure insulating equipment is cleaned as needed to remove foreign substances.
 - i. Insulating equipment must be stored in a location and in a manner as to protect it from all of the following:
 - i. Light.
 - ii. Temperature extremes.
 - iii. Excessive humidity.
 - iv. Ozone.
 - v. Other damaging substances and conditions.
 - j. Protector gloves must be worn over insulating gloves, except under the following conditions:
 - i. Protector gloves need not be used with Class 0 gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity.
 - a) Persons inspecting rubber insulating gloves used under these conditions must take extra care in visually examining them.

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- b) Persons using rubber insulating gloves used under these conditions must take extra care to avoid handling sharp objects.
- ii. If the voltage does not exceed 250 volts, alternating current, or 375 volts, direct current, protector gloves must not be used with Class 00 gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity.
 - a) Persons inspecting rubber insulating gloves used under these conditions must take extra care in visually examining them.
 - b) Persons using rubber insulating gloves used under these conditions must take extra care to avoid handling sharp objects
- iii. Any other class of glove may be used without protector gloves, under limited-use conditions, when small equipment and part manipulation necessitate unusually high finger dexterity, but only if the electrical supervisor or foreman can demonstrate that the possibility of physical damage to the gloves is small and if the class of glove is one (1) class higher than that required for the voltage involved.
- iv. Insulating gloves that have been used without protector gloves may not be reused until they have been tested as required by these rules.
- k. Electrical protective equipment must be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests must be pursuant to Appendices J and K. Table D. [Rubber Insulating Equipment, Voltage Requirements](#) and Table E. [Rubber Insulating Equipment Test Intervals](#).
- l. The test method used must reliably indicate whether the insulating equipment can withstand the voltages involved: see Table 3. [American Society of Testing Materials Standards](#), Appendix L.
- m. Insulating equipment failing to pass inspections or electrical tests must not be used, except as follows:
 - i. Rubber insulating line hose may be used in shorter lengths with the defective portion cut off.
 - ii. Rubber insulating blankets may be salvaged by severing the defective area from the undamaged portion of the blanket. The resulting undamaged area must not be smaller than 22 inches by 22 inches for Class 1, 2, 3 and 4 blankets.
 - iii. Rubber insulating blankets must be repaired using a compatible patch that results in physical and electrical properties equal to those of the blanket.
 - iv. Rubber insulating gloves and sleeves with minor physical defects, such as small cuts, tears, or punctures, must be repaired by the application of a compatible patch. In addition, rubber insulating gloves and sleeves with minor surface blemishes must be repaired with a compatible liquid compound. The repaired area must have electrical and physical properties equal to those of the surrounding material.
 - v. Repairs to gloves must be permitted only in the area between the wrist and the reinforced edge of the opening.
- n. The electrical supervisor, foreperson or manager must ensure that repaired insulating equipment is retested before an electrician uses it.

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- o. The electrical supervisor, foreperson or manager must certify that equipment has been tested pursuant to these rules. The certification must be documented in writing and must identify the equipment that passed the test and the date it was tested.

J. Welding Helmets and Hand Shields

1. Purposes, Types, Styles and Marking

- a. Welding helmets and hand shields are designed to provide protection for the face, eyes, ears and neck against intense radiant energy and spatter resulting from arc welding.
- b. A helmet and a hand shield are the only permissible types.
- c. A helmet and a hand shield must be made with the same basic design and of the same basic materials: an opaque, bowl-shaped or modified bowl-shaped device containing a window with filter plate that allows the wearer to see the radiant object, yet prevents harmful intensities or radiation from reaching the person's eyes.
- d. A helmet must be supported on the head by adjustable headgear.
- e. A hand shield must have a handle attached to the bottom by which it is held in the hand.
- f. The basic designs may be modified to provide protection against special hazards, but modified equipment must meet the same requirements as the basic design.
- g. A helmet and a hand shield must bear a permanent and legible marking readily identifying the manufacturer.

2. Rigid Helmet Bodies

- a. A rigid helmet body must be of such a size and shape to protect the face, forehead, ears and neck to a vertical line back of the ears.
- b. The helmet must have one or more openings in the front for filter plates or filter lenses.
- c. The helmet body must be attached to the headgear so that it will not come in contact with any part of the head and so that it can be lifted up from in front of the face and hold its position in front of the head.
- d. The helmet body must be made of vulcanized fiber, reinforced plastic or other suitable material that must be thermally insulating, noncombustible or slow burning, opaque to visible, ultraviolet and infrared radiations and capable of withstanding sanitizing.
- e. The inside of the helmet body must have a low-light reflecting finish.
- f. Rivets or other metal parts, if terminating on the inside surface, must be adequately separated from the wearer's head.

3. Rigid Helmet Headgear or Cradles

- a. A rigid helmet must have a headgear or cradle that holds the helmet body comfortably and firmly on the wearer's head, but permits the helmet body to be tilted back over the head.
- b. The headgear must be readily adjustable for all head sizes from 6-1/2 to 7-5/8, without the use of tools.

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- c. The headgear must be made of materials which are thermally insulating, noncombustible or slow burning, resistant to heat and capable of withstanding sanitizing.
 - d. Where required, the headgear must be fitted with a removable and replaceable sweatband covering for at least the forehead portion of the headband. The sweatband must be made of leather or other suitable material which is slow-burning and non-irritating.
4. Rigid Helmet Headgear Substitutes
- a. The headgear for a rigid helmet may be replaced by an impact resistant hat or cap that meets the requirements of head protection equipment or other suitable device to which the helmet body is connected, if the helmet body may be lifted and adjusted to permit unobstructed vision or lowered to furnish complete protection as required.
 - b. The alternative device must meet the requirements for sanitizing and resistance to heat and must meet the applicable requirements of any additional functions, such as protection against falling objects.
5. Rigid Helmet Filter Plates
- a. A filter plate on a rigid helmet must fit into the frame and cover the window.
 - b. Both surfaces of a filter plate must be well polished and must be free from striations, waves, or other defects that would impair the optical quality of the surfaces. Filter plate surfaces must be flat and substantially parallel.
 - c. Table 2. [Filter Lenses for Protection Against Radiant Energy](#), Appendix D, must be used to select the proper shade number of filter lenses or plates during welding operations.
 - d. When specified, a filter plate must be impact-resistant, unless impact-resistant eye protection is worn in conjunction with a welding helmet.
 - e. A filter plate must be marked with the shade designation and the manufacturer must be readily identifiable.
 - f. A glass filter plate, when treated for impact-resistance, must be marked with the letter "H."
 - g. A cover plate made of plain glass, of glass coated on one or both sides with plastic or of a slow-burning solid plastic sheet must be used to protect a filter plate from damage. A cover plate must be the same peripheral size and shape as the filter plate and the thickness of a cover plate must not be less than 0.050 inches.
 - h. A cover plate must transmit not less than 75% of the luminous radiation and must be substantially free from optical imperfections.
6. Non-Rigid Helmets
- a. A helmet may be made of non-rigid materials where it is to be used in confined spaces, or may be collapsible for carrying and/or storage convenience.
 - b. The helmet may be of the same general shape as a rigid helmet, except that a more complete covering of the top of the head is necessary in order to maintain the face, side, and windows in proper position.

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- c. The requirements for the filter plates, cover plates and lens mounting frame are the same as for a rigid helmet.
 - d. Headgear may be used. The material must be non-conducting and opaque to ultraviolet, visible and infrared radiations.
 - e. Stitched seams must be welded. Stitching must not be exposed.
7. Hand Shield
- a. A hand shield must be constructed of materials similar to those used for a helmet and in a like manner.
 - b. The materials, lens mounting, arrangement, filter and cover plates must conform to the requirements for the corresponding parts of the helmet body with headgear.
 - c. The handle must be made of a material that is a non-conductor of electricity and is noncombustible or slow burning.
 - d. The handle must be of such size and shape to be held easily by one hand and must be firmly attached to the lower portion of the shield.
 - e. A hand shield intended for use by other than a welding operator must have filter and cover plates suitable for the intended use.
8. Helmet and Hand Shield Lift Fronts and Chin Rests
- a. The lift front of a helmet must be fabricated from metal, plastic, or other suitable material.
 - b. A snap hinge must be provided so that the front part will stay up or down, but will not remain in a partially opened position.
 - c. The lift front seal against the helmet must be light tight.
 - d. The lift front must be designed to accommodate three plates: a clear impact-resisting plate in the back or fixed part; a filter plate, impact-resisting, when specified; and a cover plate in the front part.
 - e. The back or fixed part plate must be clear heat-treated glass or plastic not more than $\frac{3}{16}$ inch thick or less than $\frac{1}{8}$ inch and capable of withstanding the impact test.
 - f. To avoid contact of a helmet or hand shield with the face of the wearer, a chin rest or adjustable position stop must be provided. The chin rest or adjustable position stop must be constructed of suitable rigid material and must be detachable from the shell of the hand shield.
9. Helmet Snoods, Neck Protectors and Aprons
- a. A snood or back-of-head-and-neck protector where required must be of material that is flame resistant, a good insulator of heat and electricity, and capable of withstanding sanitizing.
 - b. Snoods and neck protectors must be designed for easy attachment to the helmet, helmet headgear, or cradle.
 - c. An apron or bib, where required for a helmet, must be of nonflammable, non-conducting material that is flexible and capable of withstanding sanitizing.

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K. Hearing Protection

If you are working in a noisy environment or will be working in an area where it is loud or work will create significant noise, please contact EHS at 7-0794 for assistance with hearing protective devices and/or noise monitoring.

L. Respiratory Protection

If you are working in an area where there are potential respiratory hazards, please contact EHS at 7-0794 for an evaluation. Respiratory protection requirements are covered under the EMU [Respiratory Protection Program](#) EMUDPS-EHS-P019.

VII. REFERENCES

- A. [MIOSHA General Industry Safety and Health Standard Part 33. Personal Protective Equipment](#)
- B. [ANSI Z-89.1](#)
- C. [NFPA-70E](#)

VIII. APPENDICES

- a. [EMU PPE Hazard Assessment Form](#) (emu-dps-ehs-f079)
- b. [EMU PPE Worksheet](#) (emu-dps-ehs-f040)
- c. [Table 1. Eye and Face Protection Selection](#)
- d. [Table 2. Filter Lenses for Protection Against Radiant Energy](#)
- e. [Figure 1. Eye and Face Protective Devices](#)
- f. [General Glove Information Chart](#)
- g. Table A. [Alternating Current Proof-Test Requirements](#)
- h. Table B. [Direct Current Proof-Test Requirements](#)
- i. Table C. [Glove Tests – Water Level](#)
- j. Table D. [Rubber Insulating Equipment, Voltage Requirements](#)
- k. Table E. [Rubber Insulating Equipment Test Intervals](#)
- l. Table 3. [American Society of Testing Materials Standards](#)

IX. HISTORY

REVISION	DATE	CHANGE(S)
0	11/2004	Original Program
1	1/29/2021	Updated format, revisions to standard updated, revisions to appendices. Hyperlinks added