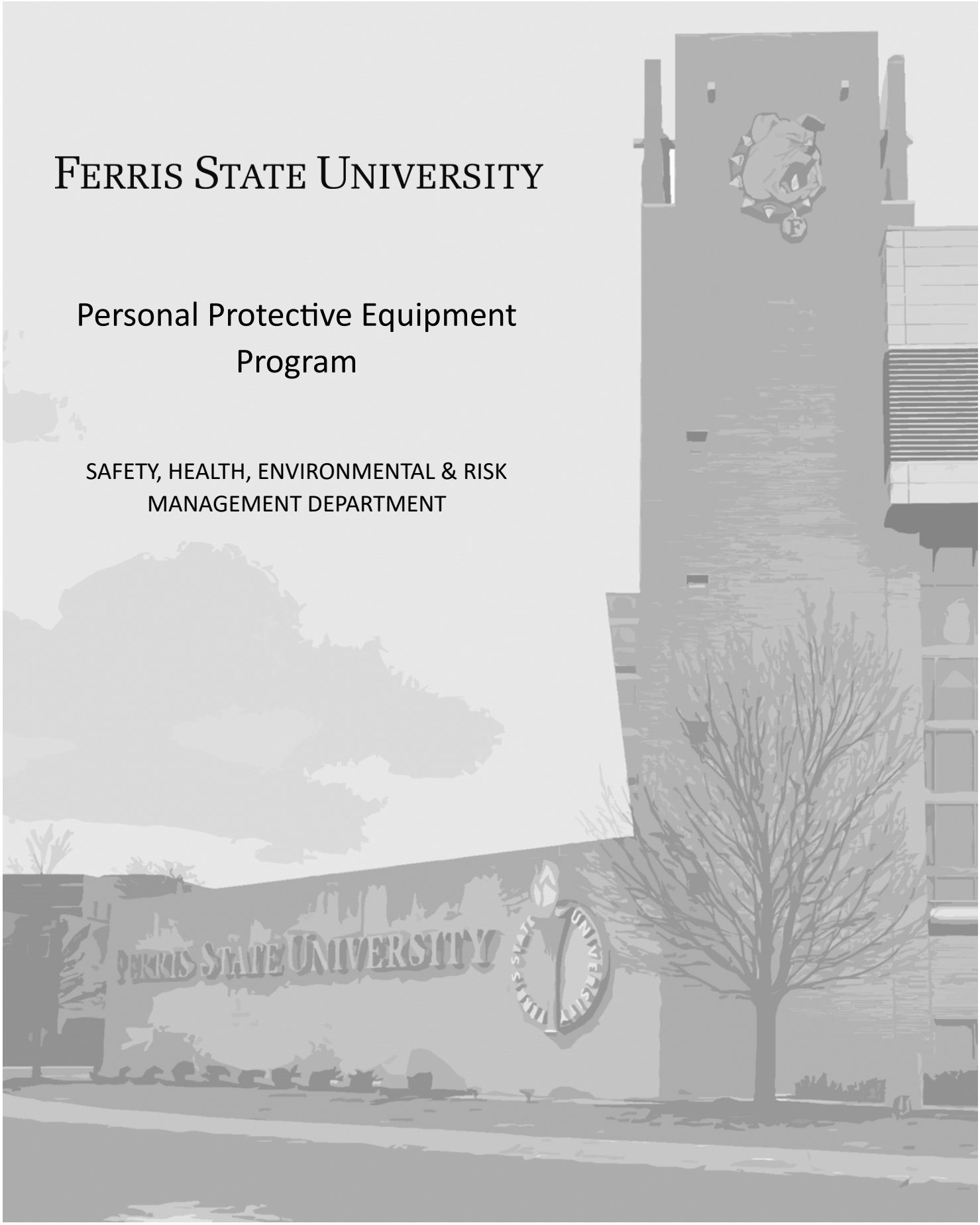
# FERRIS STATE UNIVERSITY

## Personal Protective Equipment Program

SAFETY, HEALTH, ENVIRONMENTAL & RISK MANAGEMENT DEPARTMENT

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This document can be found: https://www.ferris.edu/administration/adminandfinance/finance/sherm/Safety/homepage.htm

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## Purpose

The purpose of the Personal Protective Equipment (PPE) Program is to protect the Ferris State University's employees from the occupational hazards within the workplace by providing the proper PPE. It is the goal of Ferris State University to use engineering, administrative, and work practice controls as the primary method for protecting employees. When additional protection is necessary, appropriate PPE will be worn.

Ferris State University's policy and program shall follow the provisions of Michigan Occupational Safety and Health Administration (MIOSHA) Part 33 and Part 433 Personal Protective Equipment.

## Scope

This program applies to all applicable employees of Ferris State University, including full-time, part-time, temporary, and student employees. This program addresses eye, face, head, foot, and hand protection. Review Bloodborne Pathogen Exposure Control Plan, Confined Space Program, Hearing Conservation, Electrical Safety Program, Fall Protection, and Respiratory Protection Plan for appropriate PPE for those specific plans or programs.

## Definitions

**ANSI** – American National Standard Institute, a nonprofit, voluntary membership organization that coordinates the U.S. Voluntary Consensus Standards System. Their standards have been adopted throughout government and industry for various types of personal protective equipment.

**Hazard Assessment** – The investigation of the work environment for potential dangers that could result in an injury or illness.

**Safety Data Sheet (SDS)** – A document describing the hazards and safe handling practices for a specific product.

**Personal Protective Equipment (PPE)** – Equipment worn by workers to protect against hazards in the environment. Examples include safety glasses, face shields, respirators, gloves, hard hats, steel-toed shoes, and hearing protection.

## Responsibilities

### Supervisors/Managers/Directors

1. Complete and update hazard assessments and equipment selection.
2. Forward completed Hazard Assessment and Equipment Selection forms to SHERM.
3. Consult with SHERM before purchasing any new brand or type of PPE.
4. Ensuring that employees comply with the guidelines established by this program.
5. Ensure required PPE is available for all tasks.
6. Ensuring employees are trained on the proper use, care and cleaning of PPE.

7. Remove from service and replace any PPE that is defective or damaged.

### SHERM Department

It is the responsibility of the SHERM Department to:

1. Conduct initial training and retraining.
2. Maintain training records.
3. Maintain Hazard Assessment and Equipment Selection forms.
4. Provide technical information and assistance as requested.
5. Review and revise the PPE program, as needed.

### Ferris State University Employees

It is the responsibility of each employee to:

1. Attend the required training sessions and comply with all applicable safety requirements.
2. Wear all assigned PPE that is needed from the PPE Hazard Assessment to protect against hazards at no cost to the employee.
3. Report damaged or defective PPE to your supervisor.
4. Maintain PPE in a clean condition.
5. Report changes in exposure to hazardous conditions that might require a follow-up analysis of the task for PPE

## Requirements

1. Personal protective equipment shall be provided, used, and maintained in a sanitary and reliable condition wherever chemical hazards, radiological hazards, biological hazards, or mechanical irritants are encountered in a manner capable of causing injury or impairment through absorption, inhalation, or physical contact.
    A. Only those items of protective clothing and equipment that meet NIOSH (National Institute of Occupational Safety and Health) or ANSI (American National Standards Institute) standards will be procured or accepted for use.
2. Hazard Assessment and Equipment Selection:
    A. Each workplace shall be assessed to determine if hazards are present, or are likely to be present, that necessitates the use of PPE.
    B. If hazards are present and cannot be eliminated by engineering or work practice controls, the following steps shall be taken.
        i. Evaluate employee tasks for appropriate PPE and certify hazard assessment.

ii. Written certification of the hazard assessment should identify all the following information:
   a) The workplace evaluated
   b) The person who's certifying that the evaluation has been performed
   c) The date or dates of the hazard assessment

iii. Select PPE that is designed and constructed to be safe for the work being performed. Ensure all required PPE is worn. Selections shall be communicated to affected employees.

iv. Fit PPE to each employee.

v. Defective or damaged PPE shall not be used.

vi. If more than one employee wears the PPE, the item shall be sanitized before reissuance.

3. Head Protection:
   A. FSU shall ensure that each affected employee is provided with, and wears, approved head protection equipment and accessories when the employee is required to be present in areas where a hazard exists from any of the following:
      i. Falling or flying objects.
      ii. Other harmful contacts or exposures.
      iii. Where there is a risk of injury from any of the following:
         a) Electric shock.
            - Electrical classes for protective helmets shall be 1 of the following:
            - Class G, general protective helmets are intended to reduce the danger of contact with low voltage conductors.
            - Class E, electrical protective helmets are intended to reduce the danger of contact with higher voltage conductors.
         b) Hair entanglement.
         c) Chemicals.
      iv. Temperature extremes.
   B. Hair enclosures shall be worn where there is a possibility of hair entanglement, such as near revolving machinery.
4. Eye and Face Protection
   A. Approved eye and face protection shall be worn by all FSU employees where there is a probability of injury that can be prevented or reduced by such protection.
   B. FSU shall ensure that each affected employee uses approved eye or face protection, when exposed to eye or face hazards from any of the following:
      i. Flying objects or particles.
         a) FSU shall ensure that each affected employee uses eye protection that provides side protection when there is a hazard from flying objects (such as detachable side protectors, such as clip-on or slide-on side shields).
      ii. Harmful contacts.
      iii. Exposures.
      iv. Molten metal.

v. Liquid chemicals.
vi. Acids or caustic liquids.
vii. Chemical fumes, gases or vapors.
viii. Glare.
ix. Injurious radiation.
x. Electrical flash.

C. A combination of these hazards 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. Such devices shall be worn over suitable basic eye protection devices.
i. Typical uses for face shields include, but are not limited to, the following situations:
ii. Woodworking operations where chips and particles fly.
iii. Metal machining causing flying particles.
iv. Buffing, polishing, wire brushing, and grinding operations causing flying particles or objects.
v. Spot welding.
vi. Handling of hot or corrosive materials.

D. Appendix C, Table 1, "Eye and Face Protector Selection Chart," and Appendix D Figure 1, "Eye and Face Protective Devices Chart," shall be used as a guide in the selection of the proper eye and face protection.

5. Foot Protection:
A. FSU shall ensure that each affected employee shall wear approved protective footwear when working in areas where any of the following occur:
i. When the use of protective footwear will protect the affected employee from an electrical hazard, such as a static-discharge or electric-shock hazard, that remains after the employer takes other necessary protective measures.
ii. There is a danger of foot injuries due to falling or rolling objects.
iii. There is a danger of objects piercing the sole of the shoe.

6. Hand Protection:
A. FSU shall ensure that each affected employee shall wear approved hand protection when employees' hands are exposed to hazards, such as those from any of the following:
i. Skin absorption of harmful substances.
ii. Severe cuts or lacerations.
iii. Severe abrasions.
iv. Punctures.
v. Chemical burns.
vi. Thermal burns.
vii. Harmful temperature extremes.

B. FSU shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection related to all the following:
i. The task or tasks to be performed.
ii. Conditions present.

iii. Duration of use.
iv. The hazards and potential hazards identified.
v. Hand protection interiors shall be kept free of corrosive or irritating contaminants.
vi. If more than 1 employee wears a pair of gloves, the gloves shall be sanitized before re-issuance.

7. Body Protection:
   A. FSU shall ensure that each employee who is required to work so that his or her clothing becomes wet due to a condition other than the weather or perspiration uses any of the following:
      i. Aprons.
      ii. Coats.
      iii. Jackets.
      iv. Sleeves.
      v. Other garments that will keep his or her clothing dry.
   B. The material shall be unaffected by the wetting agent.
   C. The provision of dry, clean, acid-resistant clothing, in addition to rubber shoes or short boots and an apron, shall be considered a satisfactory substitute where small parts are cleaned, plated, or acid-dipped in an open tank.
   D. When abrasive blasting is not protected by an enclosure, the operator shall use heavy canvas or leather gloves and aprons or equivalent protection to provide protection from the impact of abrasives.

## TRAINING

Each employee shall be trained on the following items and certified that the employee has received and understood the required training.

1. When PPE is necessary.
2. What PPE is necessary.
3. How to properly don, doff, adjust, and wear PPE.

The limitations of the PPE. The proper care, maintenance, useful life, and disposal of the PPE. Use of defective or damaged PPE is prohibited.

## RETRAINING

Retraining is required when:

1. Changes in the workplace that render previous training obsolete.
2. Changes in the types of PPE to be used that render previous training obsolete.
3. Inadequacies in an affected employee's knowledge or use of assigned PPE which indicate that the employee has not retained the requisite understanding or skill.

All training records shall be sent to SHERM.

## RECORDKEEPING

Written records must be kept of the names of persons trained, the type of training provided, and the dates when training occurred. The supervisor should maintain their employees' records for at least 3 years. The safety coordinator will maintain the Hazard Assessment Documentation and training records received from supervisors. The supervisor will provide copies of these records to SHERM.

## CLEANING AND MAINTENANCE

It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. Personal Protective Equipment (PPE) should be inspected, cleaned, and maintained at regular intervals so that the PPE provides the requisite protection. It is also important to ensure that contaminated PPE which cannot be decontaminated, is disposed of in a manner that protects employees from exposure to hazards.

## REFRENCES AND FURTHER INFORMATION

1. MIOSHA GI Part 33, Personal Protective Equipment
2. Occupational Safety and Health Administration
3. National Institute for Occupational Safety and Health
4. American National Standards Institute
5. American Society for Testing Materials

## APPENDIX A

### Personal Protective Equipment/Hazard Assessment

**Position: _____**

**Department: _____**

**Shift Duration: _____**

**Brief Description of Job:**

**_____**

**_____**

| **Does Employee Have Exposure To** | | |
|---|---|---|
| **Impact (Head)** | **Yes** | **No** |
| **Penetration (Eye, Face, Foot, Hand)** | **Yes** | **No** |
| **Compression (Roll-over, Foot)** | **Yes** | **No** |
| **Chemical(s) (Respiratory, Body, Eye)** | **Yes** | **No** |
| **Heat (Electrical, Thermal)** | **Yes** | **No** |
| **Harmful Dust (Eye, Respiratory)** | **Yes** | **No** |
| **Light (optical) Radiation** | **Yes** | **No** |
| **Noise** | **Yes** | **No** |
| **Other Physical Hazards (Sharp objects, Cutters, Blades, Etc.)** | **Yes** | **No** |

## Personal Protective Equipment Required (*Currently*)

| | | | | | |
|---|---|---|---|---|---|
| Safety Glasses | ☐yes | ☐no | Safety Shoes/Toe Covers | ☐yes | ☐no |
| Face Shield | ☐yes | ☐no | Gloves | ☐yes | ☐no |
| Goggles | ☐yes | ☐no | Respirators | ☐yes | ☐no |
| Hearing Protection | ☐yes | ☐no | Protective Sleeves: | ☐yes | ☐no |

Other:

| **Has There Been Any Previous Incidents in This Position?** | | **Description(s) – list what type of injury, if recordable injury, what medical treatment was issued, and any corrective actions that were made.** |
|---|---|---|
| Yes | No | 1)<br><br>2)<br><br>3) |

## APPENDIX B

### HAZARD ANALYSIS AND RISK ASSESSMENT

Instructions: In each section, check each hazard present in the area or job being surveyed. Then determine the risk level, injury potential, and recommended type(s) of protective equipment.

| SECTION I: EYE AND FACE HAZARDS | |
|---|---|
| Flying Objects<br><br>☐No Hazard | • Working with, near, or around: ☐Chipping ☐Grinding ☐Machining ☐Masonry Work ☐Sawing ☐Woodworking ☐Drilling ☐Chiseling ☐Powered Fastening ☐Riveting ☐Sanding ☐Welding Automated/Hand/Spot ☐Other: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Safety Glasses with Side Shields ☐Goggles ☐Face Shield ☐Other: _____ |
| Liquids<br><br>☐No Hazard | • Working with, near, or around: ☐Pouring ☐Splashing ☐Mixing ☐Washing/Cleaning ☐Irritating ☐Mists ☐Irritating Spray ☐Other Liquid Hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Safety Glasses with Side Shields ☐Goggles ☐Face Shield ☐Other: _____ |
| Light<br>Radiation<br>Heat<br>Glare<br><br>☐No Hazard | • Working with, near, or around: ☐Cutting/Welding (arc) ☐Laser ☐Brazing ☐Cutting/Welding (gas) ☐Torch ☐Soldering ☐Pouring Hot Metal ☐Other: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Safety Glasses with Side Shields ☐Goggles ☐Face Shield ☐Welding Helmet ☐Other: _____ |

| SECTION II: RESPIRATORY HAZARDS | |
|---|---|
| Inhalation<br><br>☐No Hazard | • Working with, or near: ☐Dusts ☐Fogs ☐Fumes ☐Mists ☐Gases ☐Smokes ☐Sprays ☐Vapors ☐Other: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• Respirator Required: ☐Half-Face ☐Full-Face ☐PAPR ☐Air Line ☐SCBA ☐None |
| Atmospheric<br><br>☐No Hazard | • Working with, or near: ☐Toxic ☐Oxygen-Deficient (below 19.5% Oxygen) ☐Immediately dangerous to life/health (IDLH)<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• Respirator Required: ☐Half-Face ☐Full-Face ☐PAPR ☐Air Line ☐SCBA |

| SECTION III: HEAD HAZARDS | |
|---|---|
| Falling Objects<br><br>☐No Hazard | • Working below or around: ☐Materials that could fall ☐Other workers using tools ☐Conveyor belts carrying material ☐Machinery which may cause objects to fall ☐Other: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Bump Cap ☐Hard Hat ☐Other: _____ |
| Electrical Hazard<br><br>☐No Hazard | • Working near or around: ☐Exposed Wires ☐Energized Conductors ☐Energized Parts ☐Electrical Switch Gear ☐Other exposed electrical parts/hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Bump Cap ☐Hard Hat ☐Other: _____ |

| SECTION IV: FOOT HAZARDS | |
|---|---|
| Impact Hazards<br><br>☐No Hazard | • Carrying and/or handling: ☐Heavy Packages ☐Heavy Objects ☐Heavy Tools ☐Heavy Parts/Equipment ☐Other impact hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Leather Shoe ☐Steel Toe Shoe ☐Metatarsal Guard ☐Other Foot Protection: _____ |
| Compression Hazards<br><br>☐No Hazard | • Working with: ☐Hand Trucks ☐Bulk Rolls ☐Heavy Pipes ☐Unstable Material ☐Other compression hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Leather Shoe ☐Steel Toe Shoe ☐Metatarsal Guard ☐Other Foot Protection: _____ |
| Puncture Protection<br><br>☐No Hazard | • Working with or near: ☐Nails ☐Wire ☐Tacks ☐Glass ☐Large Staples ☐Scrap Metal ☐Screws ☐Other sharp object hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Leather Shoe ☐Steel Toe Shoe ☐Metatarsal Guard ☐Other Foot Protection: _____ |
| Electrical Hazards<br><br>☐No Hazard | • Working with or near: ☐Exposed Electrical Conductors ☐Energized Parts ☐Electrical Switch Gear ☐Other electrical hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Leather Shoe ☐Steel Toe Shoe ☐Metatarsal Guard ☐Other Foot Protection: _____ |

| SECTION V: HAND HAZARDS | |
|---|---|
| Chemical Hazards<br><br>☐No Hazard | • Working with or handling: ☐Liquid Chemicals ☐Powder Chemicals ☐Biological Hazards ☐Other absorption hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Chemical Resistant Gloves ☐Cut Resistant Gloves ☐Chemical Protective Gloves ☐Other Hand Protection: _____ |
| Physical Hazards<br><br>☐No Hazard | • Working with or handling: ☐Sharp objects ☐Tools ☐Jagged Objects ☐Irritating Material ☐Other: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐ Chemical Resistant Gloves ☐Cut Resistant Gloves ☐Thermal Protective Gloves ☐Other Hand Protection: ___ _____ |
| Thermal Hazards<br><br>☐No Hazard | • Working with or handling: ☐Hot Objects ☐Cold Objects ☐Wet Objects ☐Other thermal/environmental conditions: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐ Chemical Resistant Gloves ☐Cut Resistant Gloves ☐Thermal Protective Gloves ☐Other Hand Protection: _____ |

| SECTION VI: ELECTRICAL HAZARDS | |
|---|---|
| Electrical Hazards<br><br>☐No Hazard | • Working with or near: ☐Electrical Conductors ☐Exposed Wires ☐Energized Parts ☐Electrical Switch Gear ☐Other electrical hazards: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Insulating Blankets ☐Insulating Gloves ☐Insulating Covers ☐Other Electrical Protection: _____ |

| SECTION VII: EXTREMITY HAZARDS | |
|---|---|
| Physical Hazards<br><br>☐No Hazard | • Working with or near products or conditions: ☐Cold ☐Heat ☐Molten Material ☐Moist/Wet ☐Other conditions that may cause hazards to exposed extremities: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Coat/Jacket ☐Long Pants ☐Long Sleeves ☐Aprons ☐Rain Gear ☐Other extremity protection: _____ |
| Absorption Hazard<br><br>☐No Hazard | • Working with or near: ☐Corrosive materials ☐Materials absorbed by the skin ☐Radiological Materials ☐Other materials hazardous to exposed extremities: _____<br>• Risk Level: ☐High ☐Medium ☐Low<br>• Injury Potential: ☐High ☐Medium ☐Low<br>• PPE Required: ☐Coat/Jacket ☐Long Pants ☐Long Sleeves ☐Aprons ☐Rain Gear ☐Other extremity protection: _____ |

**Personal Protective Equipment Required (*Recommended Moving Forward)***

| | | | | | |
|---|---|---|---|---|---|
| Safety Glasses | ☐yes | ☐no | Safety Shoes/Toe Covers | ☐yes | ☐no |
| Face Shield | ☐yes | ☐no | Gloves | ☐yes | ☐no |
| Goggles | ☐yes | ☐no | Respirators | ☐yes | ☐no |
| Hearing Protection | ☐yes | ☐no | Protective Sleeves: | ☐yes | ☐no |
| Other: | | | | | |

Date Analysis Conducted: _____

Analysis Conducted By: _____
_____
_____
_____
_____

NOTES:

## APPENDIX C: Table 1

### EYE AND FACE PROTECTOR SELECTION

This guide is not intended to be the sole reference in selecting the proper eye and face protector.

Care shall be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of hazards must be provided.

| ACTIVITY AND ASSESSMENT | PROTECTOR CATEGORY AND STYLES | LIMITATIONS | NOT RECOMMENDED |
|---|---|---|---|
| **IMPACT** | | | |
| Chipping, grinding, machining, masonry work, riveting, and sanding.<br><br>Flying fragments, objects, large chips, particles, sand, dirt, etc. | Spectacles, goggles: B, C, D, E, F, G, H, I, J, K, L.<br>For Severe exposure add N. Respirators, R, T.<br><br>Faceshields shall only be worn over spectacles or goggles.<br><br>Persons whose vision requires the use of prescription lenses shall wear either protective devices fitted with prescription lenses or protective devices designed to be worn over regular prescription eyewear.<br><br>Wearers of contact lenses shall also be required to wear appropriate spectacles or goggles depending on the specific hazard. Dusty and/or chemical environments may represent an additional hazard to contact lens wearers.<br>Wearing of contact lenses under an R respirator is permitted.<br><br>Goggles, helmets and faceshield windows that bear the marking "Z-87+" comply with the High Impact Test Requirements. Those with "Z-87" markings comply only with Basic Impact Testing Requirements. Spectacle lenses that are marked with the manufacturers logo and a "+" sign comply with the High Impact Test Requirements. Those spectacle lenses marked with the manufacturers logo and no "+" comply only with Basic Impact Testing Requirements. (It is important during the selection process to remember that different product categories are tested at different levels of impact resistance. Goggles are tested at a higher level of impact than spectacles and face shields are tested at a higher level than goggles.)<br><br>The Z-87-2 frame marking indicates the frame meets high impact requirements with a minimum lens thickness of 2mm. | Protective devices do not provide unlimited protection.<br><br>Note: Caution should be exercised in the use of metal frame protective devices in electrical hazard areas.<br>Metal frame protective devices could potentially cause electrical shock and electrical burns through contact with, or thermal burns from exposure to the hazards of electrical energy, which include radiation from accidental arcs.<br><br>Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleaning may be required. | Protectors that do not provide protection from side exposure.<br><br>Filter or tinted lenses that restrict light transmittance, unless it is determined that a glare hazard exists. Refer to OPTICAL RADIATION.<br><br>Use of faceshields alone, without spectacles or goggles. |

## Table 1: EYE AND FACE PROTECTOR SELECTION

This guide is not intended to be the sole reference in selecting the proper eye and face protector.

Care shall be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of hazards must be provided.

| ACTIVITY AND ASSESSMENT | PROTECTOR CATEGORY AND STYLES | LIMITATIONS | NOT RECOMMENDED |
|---|---|---|---|
| **HEAT** | | | |
| Furnace operations, pouring, casting, hot dipping, gas cutting, and welding. | Note: Operations involving heat may also involve optical radiation. (See electric arc, gas, and glare under Optical Radiation below.) Protection from both hazards shall be provided. Faceshields shall only be worn over spectacles or goggles. | Spectacles, cup and cover type goggles do not provide unlimited facial protection.<br><br>Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided. | Protectors that do not provide protection from side exposure.<br><br>Use of faceshields alone, without spectacles or goggles. |
| Hot Sparks | Goggles, spectacles: B, C, D, E, F, G, H, I, J, K, L.<br>For severe exposure add N.<br>Respirators R, T. | | |
| Splash from molten metals | Faceshields worn over goggles H, K.<br>Respirators R, T or S, U if optical radiation hazard exists. | | |
| High temperature exposure | Screen faceshields, Reflective faceshields over spectacles or goggles. | | |
| **CHEMICAL** | | | |
| Acid and chemicals handling, degreasing, plating.<br>Splash and irritating mists. | Indirect vented: goggles, eyecup and cover types: G, H, K.<br>For severe exposure add N.<br>Respirators R, T.<br><br>Irritating Mist: Special purpose goggles: G. Cover goggle – No ventilation.<br>Respirators R, T. | Provides protection from splash entry with adequate ventilation.<br><br>Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleaning may be required. | Spectacles, welding, helmets, or handshields. |
| **DUST** | | | |
| Woodworking, buffing, general dusty conditions. Nuisance dust | Goggles, eyecup and cover types: G, H, K.<br>Respirators R, T. | Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleaning may be required. | |

## Table 1: EYE AND FACE PROTECTOR SELECTION

This guide is not intended to be the sole reference in selecting the proper eye and face protector.

Care shall be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of hazards must be provided.

| ACTIVITY AND ASSESSMENT | PROTECTOR CATEGORY AND STYLES | | LIMITATIONS | NOT RECOMMENDED |
|---|---|---|---|---|
| **OPTICAL RADIATION** | | | | |
| WELDING: Electric Arc | Note: Welding helmets or handshields shall be used only over spectacles or goggles. | | Protection from optical radiation is directly related to filter lens density. Select the darkest shade that allows adequate tasks performance. | Protectors that do not provide protection from optical radiation. |
| Viewing electric arc furnaces and boilers | TYPICAL FILTER LENS SHADE: 10-14 | PROTECTORS: Welding helmets or Welding Shields: O, P, Q Respirators S, U | Note: Filter lenses shall meet the requirements for shade designations in GI Part 33 Table 1. | Note: Filter lenses shall meet the requirements for shade designations in GI Part 33 Table 1. |
| WELDING: Gas, and viewing gas-fired furnaces and boilers | TYPICAL FILTER LENS SHADE: 4-8 | PROTECTORS: Welding goggles, Helmets. Welding Face shields over spectacles or goggles: J, K, L, M, N, O, P, Q or Respirators S, U. | Note: Faceshields and welding helmets shall only be worn over spectacles or goggles. | Use of welding helmets or faceshields alone, without spectacles or goggles. |
| CUTTING | TYPICAL FILTER LENS SHADE: 3-6 | PROTECTORS: Welding goggles, Helmets. Welding face shields: J, K, L, M, N, O, P, Q or Respirators S, U | | |
| TORCH BRAZING | TYPICAL FILTER LENS SHADE: 3-4 | PROTECTORS: Welding goggles, Helmets. Welding face shields: J, K, L, M, N, O, P, Q or Respirators S, U | | |
| TORCH SOLDERING | TYPICAL FILTER LENS SHADE: 1.5-3 | PROTECTORS: Spectacles or Welding Faceshield over spectacles: B, C, D, E, F, N or Respirators S, U. | | |
| GLARE | Spectacle: A, B, Faceshields N over spectacles or goggles. | | Shaded or Special Purpose lenses, as suitable. | |

## APPENDIX D: Figure 1

**APPENDIX FIGURE 1**
**EYE AND FACE PROTECTIVE DEVICES**

The illustrations shown are only representative of protective devices commonly available at this time. Protective devices do not need to take the forms shown, but must meet the requirements of this standard.

| | | | | |
|---|---|---|---|---|
| A. Spectacle, No sideshield  | B. Spectacle, Half sideshield  | C. Spectacle, Full Sideshield  | D. Spectacle, Detachable Sideshield  | E. Spectacle, Non-Removable Lens  |
| F. Spectacle, Lift Front  | G. Cover Goggle, No Ventilation  | H. Cover Goggle, Indirect Ventilation  | I. Cover Goggle, Direct Ventilation  | J. Cup Goggle, Direct Ventilation  |
| K. Cup Goggle, Indirect Ventilation  | L. Spectacle, Headband Temple  | M. Cover Welding Goggle, Indirect Ventilation  | N. Faceshield  | O. Welding Helmet, hand Hold  |
| P. Welding Helmet, Stationary Window  | Q. Welding Helmet, Lift Front  | R. Respirator    | | |
| S. Respirator  | T1. Respirator  | | T2. Respirator  | U. Respirator  |

(1) Care shall be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards must be provided.
(2) Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided.
(3) Faceshields shall only be worn over primary eye protection.
(4) Filter lenses shall meet the requirements for shade designations in General Industry Safety Standard Part 33 "Personal Protective Equipment," Table 1.
(5) Persons whose vision requires the use of prescription lenses shall wear either protective devices fitted with prescription lenses or protective devices designed to be worn over regular prescription eyewear.
(6) Wearers of contact lenses shall also be required to wear appropriate covering eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
(7) Caution should be exercised in the use of metal frame protection devices in electrical hazard areas.
(8) Refer to Section 6.5 "Special Purpose Lenses" in ANSI Z-87.1 2003 edition, as adopted in R 408.13301a.
(9) Welding helmets or handshields shall be used only over primary eye protection.
(10) Non-sideshield spectacles are available for frontal protection only.

## APPENDIX E: Table 2

### FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY

| TABLE 1<br>FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY | | | |
|---|---|---|---|
| **OPERATIONS** | **PLATE THICKNESS (INCHES)** | **PLATE THICKNESS (MM)** | **MINIMUM* PROTECTIVE SHADE** |
| Gas Welding:<br>Light<br>Medium<br>Heavy | <br>Under 1/8<br>1/8 to 1/2<br>Over 1/2 | <br>Under 3.2<br>3.2 to 12.7<br>Over 12.7 | <br>4<br>5<br>6 |
| Oxygen Cutting<br>Light<br>Medium<br>Heavy | <br>Under 1<br>1 to 6<br>Over 6 | <br>Under 25<br>25 to 150<br>Over 150 | <br>3<br>4<br>5 |
| **OPERATIONS** | **ELECTRODE SIZE 1/32 IN.** | **ARC CURRENT** | **MINIMUM* PROTECTIVE SHADE** |
| Shield metal<br>Arc welding | Less than 3<br>3 to 5<br>more than 5 to 8<br>more than 8 | Less than 60<br>60 to 160<br>161 to 250<br>251 to 550 | 7<br>8<br>10<br>11 |
| Gas metal arc<br>welding and flux | cored arc welding | Less than 60<br>60 to 160<br>161 to 250<br>251 to 500 | 7<br>10<br>10<br>10 |
| Gas tungsten arc | welding | Less than 50<br>50 to 150<br>151 to 500 | 8<br>8<br>10 |
| Air carbon<br>Arc cutting | (Light)<br>(Heavy) | Less than 500<br>500 to 1000 | 10<br>11 |
| Plasma arc welding | | Less than 20<br>20 to 100<br>101 to 400<br>401 to 800 | 6<br>8<br>10<br>11 |
| Plasma arc cutting | (Light)**<br>(Medium)**<br>(Heavy)** | Less than 300<br>300 to 400<br>401 to 800 | 8<br>9<br>10 |
| Torch brazing<br>Torch soldering<br>Carbon arc welding | | | 3<br>2<br>14 |
| * As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade that gives a sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation. | | | |
| ** These values apply where the actual arc is clearly seen. Experience has shown that light filters may be used when the arc is hidden by the workpiece. | | | |