

PERSONAL PROTECTIVE EQUIPMENT (PPE)

INTRODUCTION

Per OSHA 29 CFR 1910.132 personal protective equipment (PPE) shall be provided, maintained, and used whenever the workplace poses a hazard to the head, eyes, hands or feet. To determine if these hazards exist, and what PPE is necessary, a hazard assessment of the workplace shall be conducted and documented. In addition, each employee required to use PPE addressed herein, shall be trained in its use. Training shall be documented as well.

NOTE: For PPE requirements against hazards not addressed in this chapter refer to other chapters in this manual that deal with specific risks such as noise, radiation and sources of ignition from electric arcs, welding, open flames, radiant heat and sparks. The referenced standards in those chapters will address the PPE requirement that matches the exposure.

PROGRAM DESCRIPTION

Hazard Assessment and Certification:

Each division/ section shall ensure a PPE hazard assessment is conducted and documented for their area of responsibility. The method used to conduct the assessment shall be determined by each division/ section. Documentation shall be accomplished via a written, dated record, including the workplace evaluated, and name(s) of the person(s) who conducted the assessment.

Training:

Divisions/ Sections shall provide their employees with PPE training. Training methods used shall be determined by each division/ section. Training tools can be obtained through the ES&H Section's Safety & Environmental Protection Group. Minimally, employees shall know:

- when PPE is necessary,
- what PPE is necessary,
- how to properly don, doff, adjust, and wear PPE,
- the limitations of the PPE, and
- the proper care, maintenance, useful life and disposal of the PPE.

All training shall be documented in the ES&H Train database.

Non-Mandatory use of PPE:

Divisions/ Sections may, at their discretion, distribute PPE to employees not required to use such PPE. However, Fermilab does not approve the personal use of Fermilab supplied PPE for uses other than Fermilab approved activities.

Technical Appendix:

The attached technical standard contains guidance on the following:

- The need for PPE
- Selection of PPE
- Maintenance of PPE
- How to obtain PPE
- Training tools
- [Hazards assessment checklist](#)

TECHNICAL APPENDIX Personal Protective Equipment

WHEN MUST PPE BE USED?

1. Eye & Face Protection:

- a. Each employee shall wear eye or face protection when exposed to eye or face hazards from:
- "desktop" soldering iron operations,
 - torch soldering or debrazing,
 - welding,
 - Oxygen cutting,
 - flying particles or objects,
 - molten metal,
 - hazardous, liquid chemicals,
 - acids,
 - caustic liquids,
 - hazardous gases, vapors or fumes,
 - cryogenic liquids,
 - potentially injurious light radiation, and
 - any other work condition posing a hazard to the face and/ or eyes.

2. Head Protection:

Each employee shall wear protective helmets while:

- a. working in areas where there is a potential for injury to the head from falling objects,
- b. working near electrical conductors -- these helmets must be designed to reduce electrical shock, See FESHM Chapter 5048 for further guidance.
- c. working below other workers who are using tools and materials which could fall,
- d. working around or under conveyor belts which are carrying parts or materials,
- e. working below machinery or processes that might cause material or objects to fall,

NOTE: This appendix contains a list of helpful guidelines to be used as a reference when determining the need for head protection (see Guidelines for Selecting Protection).

3. Foot Protection:

- a. Each employee shall wear protective footwear while working in areas where there is a danger of foot injuries due to falling and rolling objects, objects piercing the sole, and electrical hazards.

NOTE: This appendix contains a list of helpful guidelines to be used as a reference when determining the need for foot protection (see Guidelines for Selecting Foot Protection).

NOTE: See Fermilab's [request form for safety shoes](#).

4. Hand Protection:

- a. Each employee shall wear the appropriate hand protection while their hands are exposed to hazards such as those from:

- skin absorption from harmful substances,
- cuts or lacerations,
- abrasions,
- punctures,
- chemical burns,
- thermal burns, and
- harmful temperature extremes.

NOTE: This appendix contains a list of helpful guidelines to be used as a reference when determining the need for hand protection (see Guidelines for Selecting Hand Protection).

SELECTING PPE

Where foot, head, eye and face, and hand hazards exist, appropriate expertise must be applied to select the proper PPE to be used.

Minimally, the selected PPE shall:

- a. provide adequate protection against the particular hazards for which they are designed,
- b. be reasonably comfortable during use,
- c. fit snugly and shall not interfere with the wearer's movements,
- d. be durable,
- e. where feasible, be capable of being disinfected (for PPE that is not capable of being disinfected, e.g., disposable PPE, the PPE, if contaminated, shall be disposed of in a manner that protects employees from exposure to hazards),
- f. unless disposable, be easily cleanable, and
- g. not present a hazard due to use.

NOTE: Guidelines for selecting PPE are included at the end of this appendix.

Other things to consider when selecting PPE are:

- a. eye protection equipped with side shields shall be worn during exposure to flying particles,
- b. employees requiring prescription lenses shall wear eye protection that incorporates the prescription into its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses,
- c. eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer,
- d. for exposure to injurious light radiation, employees shall use filter lenses that have a shade number appropriate for the work being performed.

MAINTENANCE OF PPE

All PPE shall be inspected, cleaned, and maintained at regular intervals so that it provides the required protection. Defective and/ or damaged PPE shall not be used. This is particularly important for eye and face protection where dirty or fogged lenses could impair vision.

Also, contaminated PPE that cannot be decontaminated shall be disposed of in a manner that protects employees from exposure to associated hazards.

OBTAINING PPE - Eye & Face Protection

1. Non-Prescription Eye & Face Protection:
 - a. The Laboratory Stockroom provides safety eyewear (wrap arounds only), safety goggles and face shields. Welding goggles and helmets must be purchased through outside vendors and must comply with ANSI Z87.1 standards.
2. Prescription Eyewear:
 - a. The ES&H Section coordinates the dispensing of prescription safety eyewear and has a limited supply of safety eyewear with plano (A lens that does not incorporate a corrective prescription; this lens is not necessarily flat) plastic polycarbonate lenses. Other divisions/ sections also supply approved safety eyewear. Contact your division/ section ES&H group for more details.

- b. The division/ section SSO and pertinent supervisor must approve all prescription safety lenses containing "glass lenses." This practice is strongly discouraged since their use presents an unacceptable risk of injury in some work situations.
- c. Procedures for obtaining prescription safety eyewear are described in this appendix. The latest version of the "[Fermilab Optical Prescription Safety Eyewear Request](#)" form can be obtained from the web. It is also available from the ES&H Section, WH-7E or division/ section ES&H groups. Below are some points to remember when obtaining prescription safety eyewear.
- In general, not more than one pair of prescription safety eyewear will be provided to an employee within any 12-month period. Exceptions may be granted by the employee's supervisor.
 - The Fermilab optics technician contractor cannot determine an eyeglass prescription from an existing pair of eyeglasses. A prescription from your physician must accompany your request when placing your order for safety eyewear. Prescriptions shall not be more than 12 months old.
 - When appropriate, lens tinting is used to limit exposure to visible, ultraviolet and/ or infrared radiations. This may include sunlight, welding arc radiation, or laser radiation.
 - Contact lenses are not protective eyewear. They may in some cases be worn in conjunction with protective eye and face devices.
- Deviations from these procedures will be allowed only on the written permission of the employee's Senior Safety Officer and the Fermilab Medical Department with advice from the employee's optometrist or ophthalmologist.

Protective Eye & Face Selection Chart

SOURCE	HAZARD ASSESSMENT	PROTECTION
IMPACT - Chipping, grinding, machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, sanding, etc.	Flying fragments, objects, large chips, particle, sand, dirt, etc.	Spectacles with side protection, goggles, face shields. See notes 1, 3, 5, 6, & 10. For severe exposures, use faceshield.
HEAT - Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks Splash from molten metals High temperature exposure	Faceshields, goggles, spectacles with side protection. For severe exposure use faceshield. See notes 1, 2, & 3. Faceshields worn over goggles. See notes 1, 2, & 3. Screen face shields, reflective face shields. See notes 1, 2, & 3.
CHEMICALS- Acid and chemicals handling, degreasing, plating, etc.	Splash Irritating mists	Goggles, eyecup and cover types. For severe exposure, use face shield. See notes 3 & 11. Special-purpose goggles.
DUST – Woodworking, buffing, general dusty conditions.	Nuisance dust	Goggles, eyecup and cover types. See note 8.
LIGHT and/ or RADIATION Welding: Electric arc Welding: Gas Cutting, Torch brazing, Torch soldering Glare	Optical radiation Optical radiation Optical radiation Poor vision	Welding helmets or welding shields. Typical shades: 10-14. See notes 9 & 12. Welding goggles or welding face shield. Typical shades: gas welding 4-8, cutting 3-6, brazing 3-4. See note 9. Spectacles or welding face-shield. Typical shades, 1.5-3. See notes 3 & 9. Spectacles with shaded or special-purpose lenses, as suitable. See notes 9 & 10.

NOTE: For hazard sources not listed, refer to pertinent safety person or review Material Safety Data Sheet for proper PPE.

Notes to Eye & Face Protection Selection Chart:

1. Care should 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 should be provided. Protective devices do not provide unlimited protection.
2. Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.
3. Faceshields should only be worn over primary eye protection (spectacles or goggles).
4. As required by the standard, filter lenses must meet the requirements for shade designations in Table 1 below. Tinted and shaded lenses are *not* filter lenses unless they are marked or identified as such.
5. As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.
6. Wearers of contact lenses must also wear appropriate 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 protective devices in electrical hazards areas.
8. Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
9. Welding helmets or faceshields should be used only over primary eye protection (spectacles or goggles).
10. Non-sideshield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for "impact."
11. Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.
12. Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows task performance.

Table 1 - Filter Lenses for Protection Against Radiant Energy

OPERATIONS	ELECTRIC SIZE 1/32 IN.	ARC CURRENT	MINIMUM* PROTECTIVE SHADE
Shielded metal arc welding	Less than 3	Less than 60	7
	3-5	60-160	8
	5-8	160-250	10
	More than 8	250-550	11
Gas metal arc welding and flux cored arc welding		Less than 60	7
		60-160	10
		160-250	10
		250-500	10
Gas Tungsten arc welding		Less than 50	8
		50-150	8
		150-500	10
Air Carbon Arc Cutting	(Light)	Less than 500	10
	(Heavy)	500-1000	11
Plasma arc welding		Less than 20	6
		20-100	8
		100-400	10
		400-800	11
Plasma arc cutting	(Light)**	Less than 300	8
	(Medium)**	300-400	9
	(Heavy)**	400-800	10
Torch brazing			3
Torch soldering			2
Carbon arc welding			14

Filter Lenses for Protection Against Radiation Energy - Continued

OPERATIONS	PLATE THICKNESS - INCHES	PLATE THICKNESS --MM	MINIMUM* PROTECTIVE SHADE
Gas welding: Light Medium Heavy	Under 1/ 8	Under 3.2	4
	1/ 8 to 1/ 2	3.2 to 12.7	5
	Over 1/ 2	Over 12.7	6
Oxygen cutting: Light Medium Heavy	Under 1	Under 25	3
	1 to 6	25 to 150	4
	Over 6	Over 150	5

* As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives 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 lighter filters may be used when the arc is hidden by the workpiece.

GUIDELINES FOR SELECTING HEAD PROTECTION

The context below provides guidance for selecting the appropriate safety helmet for a given hazard. Safety helmets may be obtained through the Laboratory Stockroom, or purchased through outside vendors. All helmets shall meet ANSI Z89.1 standards.

1. Types of Helmets

- a. **Class G (General)** helmets intended to reduce the danger of exposure to low voltage electrical conductors, proof tested at 2,200 volts. Class G is tested at 2,200 volts for 1 minute, with 3 milliamps max. leakage. (formerly Class A)
- b. **Class E (Electrical)** helmets intended to reduce the danger of exposure to high voltage electrical conductors, proof tested at 20,000 volts. Class E is tested for force transmission first, then tested at 20,000 volts for 3 minutes, with 9 milliamps maximum current leakage; then tested at 30,000 volts, with no burn-through permitted. (formerly Class B)
- c. **Class C (Conductive)** helmets not intended to provide protection from electrical conductors. Class C is not tested for electrical resistance. (no change in class designation)

2. When Should Helmets be Worn?

Protective helmets must be worn where falling objects present hazards. Some examples include:

- a. working below other workers who are using tools and materials which could fall,
- b. working around or under conveyor belts which are carrying parts or materials,
- c. working below machinery or processes which might cause material or objects to fall, and
- d. working on exposed energized conductors, See FESHM Chapter 5048 for further guidance.

3. Occupations Requiring Head Protection:

Some examples of occupations for which the use of head protection should be considered include:

a. carpenters	f. linemen	k. packers
b. electricians	g. mechanics	l. handlers
c. pipe fitters	h. repairers	m. stock handlers
d. assemblers	i. plumbers	n. warehouse laborers
e. timber cutters	j. loggers	o. riggers

GUIDELINES FOR SELECTING FOOT PROTECTION

The context below contains guidance for selecting the appropriate safety footwear for a given hazard. To order safety footwear, the [Safety Toe Footwear Request form](#) must be properly completed. The latest version of the "[Fermilab/ Knippen Shoes Safety Toe Footwear Request](#)" form can be obtained from the web. It is also available from the ES&H Section, WH-7E or division/ section ES&H groups.

1. Types of Foot Protection:

- a. Safety shoes or boots with impact protection would be required for carrying or handling materials such as packages, objects, parts or heavy tools, and for other activities where objects might fall onto the feet.
- b. Safety shoes or boots with compression protection would be required for work activities involving skid truck (manual material handling carts) around bulk rolls (such as paper rolls) and heavy pipes, all of which could roll over an employee's feet.
- c. Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal, etc., could be stepped on by employees causing a foot injury.

2. Occupations Requiring Foot Protection:

Some examples of occupations for which the use of foot protection should be considered include:

a. shipping and receiving clerks	m. stock clerks
b. punch and stamping press operators	n. welders
c. carpenters	o. laborers
d. electricians	p. mechanics
e. machinists	q. repairers
f. gardeners and grounds-keepers	r. plumbers
g. timber cutting and logging workers	s. lathers
h. pipe fitters	t. packers
i. stock handlers and warehouse laborers	u. wrappers
j. structural metal workers	v. craters
k. technicians	w. sawyers
l. drywall installers	x. assemblers

GUIDELINES FOR SELECTING HAND PROTECTION

The context below provides guidance for determining the appropriate hand protection for a given hazard. Gloves may be obtained through the Laboratory Stockroom, or purchased through outside vendors.

1. General Hand Protection Information:

- a. Selection of the appropriate hand protection shall be based on an evaluation of:
 - the task(s) to be performed,
 - conditions present,
 - duration of use, and
 - the hazards and potential hazards identified.
- b. Generally, any "chemical resistant" glove can be used for dry powders.
- c. For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials.
- d. Employees must be able to remove gloves in such a manner as to prevent skin contamination.

Additionally, the selection of protective gloves should be determined based on the type of hazard -- the duration, frequency, and degree of the exposure, and the physical stresses that will be applied. Also to be considered are toxic properties and potential health effects of the chemical(s) present.

NOTE: Employees are urged to wash their hands with soap and water after removing personal protective gloves.

PPE TRAINING TOOLS

Videotape #FN000199, *PPE Availability and Use*, is designed to make employees and other Lab workers aware of the PPE requirements and to familiarize them with the various types of PPE available at the Lab. It can be given in a classroom environment or on the job. The classroom presentation includes a lesson plan with a short video. The "on the job" (OJT) material consists of small laminated lesson plans to be used by the supervisor for one-on-one training.

For more information on PPE training tools, contact the ES&H Section.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

INTRODUCTION

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NOTE: For PPE requirements against hazards not addressed in this chapter refer to other chapters in this manual that deal with specific risks such as noise, radiation and sources of ignition from electric arcs, welding, open flames, radiant heat and sparks. The referenced standards in those chapters will address the PPE requirement that matches the exposure.

PROGRAM DESCRIPTION

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- when PPE is necessary,
- what PPE is necessary,
- how to properly don, doff, adjust, and wear PPE,
- the limitations of the PPE, and
- the proper care, maintenance, useful life and disposal of the PPE.

All training shall be documented in the ES&H Train database.

Non-Mandatory use of PPE:

Divisions/Sections may, at their discretion, distribute PPE to employees not required to use such PPE. However, Fermilab does not approve the personal use of Fermilab supplied PPE for uses other than Fermilab approved activities.

Technical Appendix:

The attached technical standard contains guidance on the following:

- The need for PPE
- Selection of PPE
- Maintenance of PPE
- How to obtain PPE
- Training tools
- Hazards assessment checklist

WHEN MUST PPE BE USED?

1. Eye & Face Protection:

a. Each employee shall wear eye or face protection when exposed to eye or face hazards from:

- torch soldering or debrazing,
- welding,
- oxygen cutting,
- flying particles or objects,
- molten metal,
- hazardous, liquid chemicals,
- acids,
- caustic liquids,
- hazardous gases, vapors or fumes,
- cryogenic liquids,
- potentially injurious light radiation, and
- any other work condition posing a hazard to the face and/or eyes.

2. Head Protection:

Each employee shall wear protective helmets while:

- a. working in areas where there is a potential for injury to the head from falling objects,
- b. working near electrical conductors -- these helmets must be designed to reduce electrical shock, See FESHM Chapter 5048 for further guidance.
- c. working below other workers who are using tools and materials which could fall,
- d. working around or under conveyor belts which are carrying parts or materials,
- e. working below machinery or processes that might cause material or objects to fall,

NOTE: This appendix contains a list of helpful guidelines to be used as a reference when determining the need for head protection (see Guidelines for Selecting Protection).

3. Foot Protection:

a. Each employee shall wear protective footwear while working in areas where there is a danger of foot injuries due to falling and rolling objects, objects piercing the sole, and electrical hazards.

NOTE: This appendix contains a list of helpful guidelines to be used as a reference when determining the need for foot protection (see Guidelines for Selecting Foot Protection).

NOTE: See Fermilab's request form for safety shoes in the appendices.

4. Hand Protection:

a. Each employee shall wear the appropriate hand protection while their hands are exposed to hazards such as those from:

- skin absorption from harmful substances,
- cuts or lacerations,
- abrasions,
- punctures,
- chemical burns,
- thermal burns, and
- harmful temperature extremes.

NOTE: This appendix contains a list of helpful guidelines to be used as a reference when determining the need for hand protection (see Guidelines for Selecting Hand Protection).

SELECTING PPE

Where foot, head, eye and face, and hand hazards exist, appropriate expertise must be applied to select the proper PPE to be used.

Minimally, the selected PPE shall:

- a. provide adequate protection against the particular hazards for which they are designed,
- b. be reasonably comfortable during use,
- c. fit snugly and shall not interfere with the wearer's movements,
- d. be durable,
- e. where feasible, be capable of being disinfected (for PPE that is not capable of being disinfected, e.g., disposable PPE, the PPE, if contaminated, shall be disposed of in a manner that protects employees from exposure to hazards),
- f. unless disposable, be easily cleanable, and
- g. not present a hazard due to use.

NOTE: Guidelines for selecting PPE are included at the end of this appendix.

Other things to consider when selecting PPE are:

- a. eye protection equipped with side shields shall be worn during exposure to flying particles,
- b. employees requiring prescription lenses shall wear eye protection that incorporates the prescription into its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses,
- c. eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer,
- d. for exposure to injurious light radiation, employees shall use filter lenses that have a shade number appropriate for the work being performed.

MAINTENANCE OF PPE

All PPE shall be inspected, cleaned, and maintained at regular intervals so that it provides the required protection. Defective and/or damaged PPE shall not be used. This is particularly important for eye and face protection where dirty or fogged lenses could impair vision.

Also, contaminated PPE that cannot be decontaminated, shall be disposed of in a manner that protects employees from exposure to associated hazards.

OBTAINING PPE - Eye & Face Protection

1. Non-Prescription Eye & Face Protection:

- a. The Laboratory Stockroom provides safety eyewear (wrap arounds only), safety goggles and face shields. Welding goggles and helmets must be purchased through outside vendors and must comply with ANSI Z87.1 standards.

2. Prescription Eyewear:

- a. The ES&H Section coordinates the dispensing of prescription safety eyewear and has a limited supply of safety eyewear with plano (A lens that does not incorporate a corrective prescription; this lens is not necessarily flat) plastic polycarbonate lenses. Other divisions/sections also supply approved safety eyewear. Contact your division/section ES&H group for more details.
- b. The division/section SSO and pertinent supervisor must approve all prescription safety lenses containing "glass lenses", "photo chromic lenses" or "transition lenses" prior to final approval from the ES&H Section head. This practice is strongly discouraged since their use presents an unacceptable risk of injury in some work situations.
- c. Procedures for obtaining prescription safety eyewear are described in this appendix. The latest version of the "Fermilab Optical Prescription Safety Eyewear Request" form can be obtained from the web. It is also

available from the ES&H Section, WH-7E or division/section ES&H groups. Below are some points to remember when obtaining prescription safety eyewear.

- In general, not more than one pair of prescription safety eyewear will be provided to an employee within any 12-month period. Exceptions may be granted by the employee's supervisor.
- The Fermilab optics technician contractor cannot determine an eyeglass prescription from an existing pair of eyeglasses. A prescription from your physician must accompany your request when placing your order for safety eyewear. Prescriptions shall not be more than 18 months old.
- When appropriate, lens tinting is used to limit exposure to visible, ultraviolet and/or infrared radiations. This may include sunlight, welding arc radiation, or laser radiation. Photo chromic lenses, which darken upon exposure to ultraviolet radiation, discouraged for use and will not be ordered unless approved by D/S for use in safety eyewear. These lenses require several minutes to change shading and may darken in dark areas where ultraviolet radiation is present or lighten in light areas where ultraviolet radiation is absent. The resulting reduction in seeing ability may constitute a risk.
- Contact lenses are not protective eyewear. They may in some cases be worn in conjunction with protective eye and face devices.
- Deviations from these procedures will be allowed only on the written permission of the employee's Senior Safety Officer and the Fermilab Medical Department with advice from the employee's optometrist or ophthalmologist.

PERSONAL PROTECTIVE EQUIPMENT (PPE) TRADE ASSOCIATION CONTRACTORS	
TRADE ASSOCIATION CONTRACTORS	TRADE ASSOCIATION CONTRACTORS
Basic Eyewear	_____
Sunglasses	_____
Torch Braze	_____
Solder Cut Lenses	_____
Side Shields	_____
Perm. Att.	_____
VDT Lenses	_____
Detachable	_____
Polarized Lenses	_____
Brow Guards	_____

**FERMILAB/AEARO CO.
PRESCRIPTION SAFETY EYEWEAR REQUEST**

Employee Name _____ ID# _____

Division/Section _____ Mail Station _____ Ext. _____

The employee's work activities require that he/she wear safety glasses. Fermilab will provide 1 pair of prescription safety eyewear in accordance with ANSI Z87.1 as indicated below.

Please obtain the signature of your supervisor to order prescription safety eyewear having the options in the box below. All lenses will be polycarbonate.

Basic Eyewear	Sunglasses	VDT Lenses	Polarized Lenses
Torch Braze	Side Shields	Side Shields	Brow Guards
Solder Cut Lenses	Perm. Att.	Detachable	

Approval:
Supervisor _____ Date _____

The options in the box below are **strongly discouraged** since their use presents an unacceptable risk of injury in some work situations. Therefore, these options may only be ordered after evaluation, and signature approval, of ALL the persons indicated.

Glass Lenses - Although glass lenses meet safety design specifications, they may shatter on severe impact. Plastic safety lenses will not shatter.

Photochromic or Transition Lenses - These lenses require several minutes to change shading and may darken in dark areas where ultraviolet radiation is present, or lighten in light areas where ultraviolet radiation is absent. The use of these lenses is discouraged by the DOE eye protection standard (ANSI Z87.1).

Approvals:

Supervisor	_____	Date	_____
D/S Safety Officer	_____	Date	_____
ES&H Section Head	_____	Date	_____

PROCEDURES FOR OBTAINING PRESCRIPTION SAFETY EYEWEAR

1. You must have a prescription for corrective lenses that is not more than 12 months old. You may have your eyes examined by any qualified eye specialist, including those listed below. Fermilab does not pay for eye exams.
2. With the help of your supervisor and/or safety officer, fill out the reverse side of this form. The form should be signed by your supervisor and others as indicated. A form is required for each pair of glasses you need on your job.
3. Bring your prescription and completed form with you to order prescription safety eyewear. An optician is available at WH-GROUND FLOOR EAST, EOC (door just past the stairs to the Mezzanine) each Friday from 10 AM to 12 PM by appointment only. Go to <http://www-esh.fnal.gov/eyewear/> for more information. Orders may also be placed at any of the facilities listed below. Please call for an appointment to avoid delays.
4. If you choose a frame style that has an additional charge, you will have to pay that amount prior to your order being placed. **Visa/Mastercard is the preferred method of payment.** Check/Money Order will delay the processing of your order.
5. Your prescription safety eyewear will generally be ready for pickup within 7 to 10 working days of placement of your order. Please call Ext. 3783 on Thursday after 3 PM to see if your eyewear has come in. The ES&H Section will also send you an e-mail message when your safety eyewear arrives.

Note: *If you choose to go to an offsite facility, you will be expected to do so on your own time.*

If you have any questions, comments, or problems, please contact the ES&H Section at Ext. 8277.

Call one of the locations below for an appointment. You **must** present this completed form when ordering prescription safety eyewear. No orders will be accepted without this authorization form. Call the off-site location prior to your scheduled appointment if you do NOT have Visa/Mastercard, check or money order to make other arrangements.

TRLI Optics**
1852 Bay Circle, Suite 112
Naperville, IL 60540
Phone: (630) 355-1531

DeKalb Optometrics
121 E. Locust Street
DeKalb, IL 60115
Phone: (815) 765-6388

Geneva Optometrics**
829 W. State Street
Geneva, IL 60134
Phone: (630) 232-7112

Dr. Gindorf
5610 W. Cermak
Chicago, IL 60650
Phone: (708) 863-2550

****Please Note: Repair parts will only be available from the Fermilab ES&H Section and the facilities with the ** after the facility name. The other offsite facilities will not carry any repair parts.**

This form is also available on the Web in the FESHM Chapter 5101.

Protective Eye & Face Selection Chart

SOURCE	HAZARD ASSESSMENT	PROTECTION
IMPACT - Chipping, grinding, machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, sanding, etc.	Flying fragments, objects, large chips, particle, sand, dirt, etc.	Spectacles with side protection, goggles, face shields. See notes 1, 3, 5, 6, & 10. For severe exposures, use faceshield.
HEAT - Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks Splash from molten metals High temperature exposure	Faceshields, goggles, spectacles with side protection. For severe exposure use faceshield. See notes 1, 2, & 3. Faceshields worn over goggles. See notes 1, 2, & 3. Screen face shields, reflective face shields. See notes 1, 2, & 3.
CHEMICALS - Acid and chemicals handling, degreasing, plating, etc.	Splash Irritating mists	Goggles, eyecup and cover types. For severe exposure, use face shield. See notes 3 & 11. Special-purpose goggles.
DUST – Woodworking, buffing, general dusty conditions.	Nuisance dust	Goggles, eyecup and cover types. See note 8.
LIGHT and/or RADIATION Welding: Electric arc Welding: Gas	Optical radiation Optical radiation	Welding helmets or welding shields. Typical shades: 10-14. See notes 9 & 12. Welding goggles or welding face shield. Typical shades: gas

Cutting, Torch brazing, Torch soldering Glare	Optical radiation	welding 4-8, cutting 3-6, brazing 3-4. See note 9. Spectacles or welding face-shield. Typical shades, 1.5-3. See notes 3 & 9.
	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable. See notes 9 & 10.

NOTE: For hazard sources not listed, refer to pertinent safety person or review Material Safety Data Sheet for proper PPE.

Notes to Eye & Face Protection Selection Chart:

- Care should 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 should be provided. Protective devices do not provide unlimited protection.
- Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.
- Faceshields should only be worn over primary eye protection (spectacles or goggles).
- As required by the standard, filter lenses must meet the requirements for shade designations in Table 1 below. Tinted and shaded lenses are *not* filter lenses unless they are marked or identified as such.
- As required by the standard, persons whose vision requires the use of prescription (Rx) lenses must wear either protective devices fitted with prescription (Rx) lenses or protective devices designed to be worn over regular prescription (Rx) eyewear.
- Wearers of contact lenses must also wear appropriate 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.
- Caution should be exercised in the use of metal frame protective devices in electrical hazards areas.
- Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
- Welding helmets or faceshields should be used only over primary eye protection (spectacles or goggles).
- Non-sideshield spectacles are available for frontal protection only, but are not acceptable eye protection for the sources and operations listed for “impact.”
- Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.
- Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows task performance.

Table 1 - Filter Lenses for Protection Against Radiant Energy

OPERATIONS	ELECTRIC SIZE 1/32 IN.	ARC CURRENT	MINIMUM* PROTECTIVE SHADE
Shielded metal arc welding	Less than 3	Less than 60	7
	3-5	60-160	8
	5-8	160-250	10
	More than 8	250-550	11
Gas metal arc welding and flux cored arc welding		Less than 60	7
		60-160	10
		160-250	10
		250-500	10

Gas Tungsten arc welding		Less than 50	8
		50-150	8
		150-500	10
Air Carbon Arc Cutting	(Light)	Less than 500	10
	(Heavy)	500-1000	11
Plasma arc welding		Less than 20	6
		20-100	8
		100-400	10
		400-800	11
Plasma arc cutting	(Light)**	Less than 300	8
	(Medium)**	300-400	9
	(Heavy)**	400-800	10
Torch brazing			3
Torch soldering			2
Carbon arc welding			14

Filter Lenses for Protection Against Radiation Energy - Continued

OPERATIONS	PLATE THICKNESS -- INCHES	PLATE THICKNESS -- MM	MINIMUM* PROTECTIVE SHADE
Gas welding:			
Light	Under 1/8	Under 3.2	4
Medium	1/8 to 1/2	3.2 to 12.7	5
Heavy	Over 1/2	Over 12.7	6
Oxygen cutting:			
Light	Under 1	Under 25	3
Medium	1 to 6	25 to 150	4
Heavy	Over 6	Over 150	5

* As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives 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 lighter filters may be used when the arc is hidden by the workpiece.

GUIDELINES FOR SELECTING HEAD PROTECTION

The context below provides guidance for selecting the appropriate safety helmet for a given hazard. Safety helmets may be obtained through the Laboratory Stockroom, or purchased through outside vendors. All helmets shall meet ANSI Z89.1 standards.

1. Types of Helmets

- a. **Class G (General)** helmets intended to reduce the danger of exposure to low voltage electrical conductors, proof tested at 2,200 volts. Class G is tested at 2,200 volts for 1 minute, with 3 milliamps max. leakage. (formerly Class A)
- b. **Class E (Electrical)** helmets intended to reduce the danger of exposure to high voltage electrical conductors, proof tested at 20,000 volts. Class E is tested for force transmission first, then tested at 20,000 volts for 3 minutes, with 9 milliamps maximum current leakage; then tested at 30,000 volts, with no burn-through permitted. (formerly Class B)
- c. **Class C (Conductive)** helmets not intended to provide protection from electrical conductors. Class C is not tested for electrical resistance. (no change in class designation)

2. When Should Helmets be Worn?

-

Protective helmets must be worn where falling objects present hazards. Some examples include:

- a. working below other workers who are using tools and materials which could fall,
- b. working around or under conveyor belts which are carrying parts or materials,
- c. working below machinery or processes which might cause material or objects to fall, and
- d. working on exposed energized conductors, See FESHM Chapter 5048 for further guidance.

3. Occupations Requiring Head Protection:

Some examples of occupations for which the use of head protection should be considered include:

a. carpenters	f. linemen	k. packers
b. electricians	g. mechanics	l. handlers
c. pipe fitters	h. repairers	m. stock handlers
d. assemblers	i. plumbers	n. warehouse laborers
e. timber cutters	j. loggers	o. riggers

GUIDELINES FOR SELECTING FOOT PROTECTION

The context below contains guidance for selecting the appropriate safety footwear for a given hazard. To order safety footwear, the Safety Toe Footwear Request form must be properly completed (see following page).

1. Types of Foot Protection:

- a. Safety shoes or boots with impact protection would be required for carrying or handling materials such as packages, objects, parts or heavy tools, and for other activities where objects might fall onto the feet.
- b. Safety shoes or boots with compression protection would be required for work activities involving skid truck (manual material handling carts) around bulk rolls (such as paper rolls) and heavy pipes, all of which could roll over an employee's feet.
- c. Safety shoes or boots with puncture protection would be required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal, etc., could be stepped on by employees causing a foot injury.

2. Occupations Requiring Foot Protection:

Some examples of occupations for which the use of foot protection should be considered include:

a. shipping and receiving clerks	m. stock clerks
b. punch and stamping press operators	n. welders
c. carpenters	o. laborers
d. electricians	p. mechanics
e. machinists	q. repairers
f. gardeners and grounds-keepers	r. plumbers
g. timber cutting and logging workers	s. lathers
h. pipe fitters	t. packers
i. stock handlers and warehouse laborers	u. wrappers
j. structural metal workers	v. craters
k. technicians	w. sawyers
l. drywall installers	x. assemblers

FERMILAB/KNIPPEN'S SHOES SAFETY TOE FOOTWEAR REQUEST
P.O. Number 557046

Employee Name _____ ID# _____ FNAL Ext. _____ Task # _____

Expenditure Organization _____ Project # _____

This employee is to be provided with one pair of ANSI Class 75 safety toe footwear as indicated below. The supervisor must sign this request.

Supervisor's Signature

Date

In addition, the Fermilab occupational medicine director must sign this form for footwear requiring medically-prescribed corrections.

Medically prescribed corrections required (describe):	

_____ FNAL Occupational Medicine Director's Signature	_____ Date

The division/section safety officer must sign this form for footwear requiring unusual occupationally-required options.

Unusual occupationally required options required (describe):	

_____ Division/Section Safety Officer's Signature	_____ Date

PROCEDURES FOR OBTAINING SAFETY TOE FOOTWEAR

1. Fill out the information above, including your task number and project number, for one pair of ANSI Class 75 safety toe footwear. The form must be signed by your supervisor, and others, as indicated. A separate form is required for each pair of safety toe footwear you require. **The request forms will be returned to your division/section representative for verification of approval signature.**
2. Bring this form and your Fermilab I.D. card with you to order your safety toe footwear. The vendor "shoemobile" is available in the parking lot behind Industrial Center Building every Tuesday from 8:00 a.m. to 4:00 p.m. (closed for lunch from 11:30 a.m. to 12:30 p.m.).
3. If you choose a style that costs more than the \$85 allocated by Fermilab, you are responsible to pay the additional amount at the time the order is submitted. Make check or money order payable to "Knippen's Shoes." (Note: The Lab will pay the additional cost for medically prescribed and occupationally required corrections.)
4. Many styles are stocked in the shoemobile and can be picked up immediately upon placement of the order. Other footwear will be delivered to the snowmobile within two weeks and can be picked up at that time. Please check with the vendor about delivery times when you place your order.

If you have any questions, contact the ES&H Section at Ext. 3482.

ES&H/Admin Form #1

Revised 06/2006

GUIDELINES FOR SELECTING HAND PROTECTION

The context below provides guidance for determining the appropriate hand protection for a given hazard. Gloves may be obtained through the Laboratory Stockroom, or purchased through outside vendors.

1. General Hand Protection Information:
 - a. Selection of the appropriate hand protection shall be based on an evaluation of:
 - the task(s) to be performed,
 - conditions present,
 - duration of use, and
 - the hazards and potential hazards identified.
 - b. Generally, any "chemical resistant" glove can be used for dry powders.
 - c. For mixtures and formulated products (unless specific test data are available), a glove should be selected on the basis of the chemical component with the shortest breakthrough time, since it is possible for solvents to carry active ingredients through polymeric materials.

- d. Employees must be able to remove gloves in such a manner as to prevent skin contamination.

Additionally, the selection of protective gloves should be determined based on the type of hazard -- the duration, frequency, and degree of the exposure, and the physical stresses that will be applied. Also to be considered are toxic properties and potential health effects of the chemical(s) present.

NOTE: Employees are urged to wash their hands with soap and water after removing personal protective gloves.

PPE TRAINING TOOLS

Videotape #FN000199, *PPE Availability and Use*, is designed to make employees and other Lab workers aware of the PPE requirements and to familiarize them with the various types of PPE available at the Lab. It can be given in a classroom environment or on the job. The classroom presentation includes a lesson plan with a short video. The "on the job" (OJT) material consists of small laminated lesson plans to be used by the supervisor for one-on-one training.

For more information on PPE training tools, contact the ES&H Section.

Personal Protective Equipment (PPE) Hazard Assessment Checklist

Reviewer (Print) _____ ID No. _____ Division/Section _____ Date _____

Building, Department, Work Area or Employee: _____

Hazard	Hazard Present	Description of Hazard
Foot		
Falling Objects	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Sole Punctures	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Compression	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Head		
Falling Objects	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Bump Hazards	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Penetration Falling Objects	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Electric Shock	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Eye/Face		
Impact, Flying Objects	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Heat, Hot sparks	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Splash From Molten Metal	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
High Temperature Exposure	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Chemical Splash	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Chemical, Irritating Mist	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Nuisance Dust	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Light Radiation, Welding	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Light Radiation, Glare	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Radiation, Non-Ionizing	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Hand		
Cuts	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Abrasions	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Chemicals	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Temperature Extremes	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____

Other _____

The signature on this document certifies that a hazard assessment required by OSHA 29 CFR 1910.132, has been performed of the above identified building, department, work area or employee.

Signature of Reviewer: _____ Date: _____