Personal Protective Equipment (PPE) Policy

Adopted: February 14, 2003
Updated: September 19, 2003

POLICY

I. APPLICATION and SCOPE

This purpose of this policy is to comply with Occupational Safety and Health Administration (OSHA) personal protective equipment (PPE) requirements of 29 CFR 1910.132 thru 29 CFR 1910.140. This policy applies to the West Lafayette and Regional Campuses; University Research Farms and Agricultural Centers; and any other university related facilities or operations.

Personal protective equipment such as protective clothing, respiratory devices (respirators), shields, and barriers shall be used to protect against chemical, radiological, biological, or mechanical hazards and irritants capable of causing injury or impairment through absorption, inhalation, or physical contact. PPE must be provided, used, and maintained in a sanitary and reliable condition.

The following elements are necessary to effectively implement the PPE policy in your area:

- Ensure all employee are aware of and have access to the PPE policy.
- Conduct hazard assessments and document them.
- Select and provide PPE and other relevant protection measures for affected employees.
- Communicate selection decisions to employees.
- Train employees how and when to use selected PPE and protection measures.
- Document all training.
- Periodically evaluate employee's understanding of training. Retrain as necessary.

II. HAZARD ASSESSMENTS

A. *"Hazard Assessment"*

Hazard assessment is the act of identifying the hazards associated with defined tasks and prescribing appropriate personal protective equipment (along with other relevant protection measures which must be employed) to reduce the risk from the hazards. The work area's responsible individual shall assess each work assignment to determine if hazards are present or likely to be present and require the use of appropriate personal protective equipment if the hazard cannot be removed or mitigated with engineering controls.

B. *"Certification of Hazard Assessment"*

The Certification of Hazard Assessment documents and details the hazard assessment findings for particular hazardous tasks. The work area's responsible individual must ensure hazard assessments are performed; sign and date the certification; and ensure it is readily available or posted in the location(s) where the hazards exist. The certification must be updated and signed anytime a new hazardous task is introduced into the lab and should be reviewed at least annually. The responsible individual may delegate or contract the labor involved in this process, but cannot reassign or disclaim the responsibility.

III. DOCUMENTING HAZARD ASSESSMENTS

You can use one of the suggested formats from Appendices A1 – A3 formats, a combination thereof, or devise your own. Refer to the EHS Forms webpage for useable forms.

A. APPENDIX A1 is designed to cover a single task.

1. Describe the task.

2. List hazards associated with each body part.

3. Determine PPE requirements for each hazard.

4. List other required control measures.

B. APPENDIX A2 is designed to cover all tasks requiring PPE for a position or job title.

1. Identify hazards that may be encounter while performing normal duties.
2. List each task where hazard is present.
3. List PPE requirements for each hazardous task.
4. List any other required control measures.

C. APPENDIX A3 is designed for evaluation of a location and is best suited to laboratory environments.

1. Identify the hazards.
2. List each task where hazard is present.
3. Determine PPE requirements for each task.
4. List other control measures required.

V. RESPONSIBILITIES: PPE SELECTION, USE, and MAINTENANCE

A. Responsible Individual's Responsibilities

After performing a hazard assessment and determining that hazards are present, or likely to be present, the supervisor shall do the following:

1. Never assign a task for which PPE is required but not available.
2. Select the types of PPE that the affected employee will use for the hazards identified in the hazard assessment.
3. Assure the adequacy of the PPE; proper fit protection, maintenance, and sanitation.
4. Communicate selection decisions to each affected employee.
5. Ensure every affected employee is trained and knows how to use their PPE correctly. Training must be specific to where the employee works and the tasks they perform. In addition, training must be provided by someone intimately familiar with the work area and tasks performed. Generic PPE training alone is unacceptable
6. Ensure every affected employee uses the appropriate and required PPE when performing tasks identified in the hazard assessment.
7. Prevent the use of PPE that is defective or damaged by replacing defective or damaged PPE.
8. Hold employee subject to disciplinary action for failure to abide by Purdue University's Personal Protective Equipment policy.

B. Employee Responsibilities

After a hazard assessment has been performed and hazards requiring PPE are identified, the employee shall do the following:

1. Only perform task requiring PPE when the required PPE is available.
2. Always wear and use PPE correctly.
3. Never use PPE that is defective or damaged. Ask for a replacement.
4. Be subject to disciplinary action for failure to abide by Purdue University's Personal Protective Equipment policy.

VI. TRAINING: REQUIREMENTS and DOCUMENTATION

A. The responsible individual shall provide adequate training to each employee who is required to use PPE. Each employee shall be trained to know at least the following:

1. When PPE is necessary
2. What PPE is necessary
3. How to properly don, doff, adjust, and wear PPE
4. The limitations of the PPE
5. The proper care, maintenance, useful life, and disposal of the PPE

B. Each affected employee must demonstrate an understanding of the training provided, and the ability to use the PPE properly, before performing any work requiring the use of PPE. Show-and-tell competence demonstrations are appropriate for most situations.

C. When the supervisor has reason to believe that an affected employee who has already been trained does not have the understanding and skill required the supervisor shall retrain the employee.

Circumstances that render previous training obsolete or inadequate and therefore require new training or retraining include, but are not limited to:

1. Changes in the workplace.

2. Changes in the types of PPE to be used.

3. Inadequacies in the affected employee's knowledge or use of assigned PPE.

D. The supervisor must verify that each affected employee has received and understood the required training through a written training certification that must contain the name of each employee trained, the date(s) of training, and identify the subject of training (e.g. **APPENDIX B)**.

VII. SPECIFIC PROTECTION GUIDELINES

PPE shall comply with appropriate ANSI standards, when standards exist.

A. Electrical Protection

Refer to **Appendix C** for eye and electrical protection selection specifics.

B. Eye and Face Protection

Each affected employee shall…

1. Use appropriate eye and face protection equipment when exposed to hazards from flying objects or particles, molten metal, fumes, chemical liquids, gases, vapors, dusts, acids, caustics, and other potentially injurious chemical or physical hazards.

2. Use appropriate eye protection equipment with filter lenses that have a shade number appropriate for the work being performed when exposed to an eye hazard from potentially injurious light radiation.

3. When wearing prescription lenses while engaged in operations that involve eye hazards wear eye protection that incorporates the prescription in its design, or wear eye protection that can be worn over the prescription lenses without disturbing the prescription lenses or the protective lenses.

Refer to **APPENDIX D** for eye and face protection selection specifics.

C. Foot Protection

Each affected employee shall wear protective footwear when working in areas where there is danger of objects falling on or rolling across the foot, piercing the sole, and where the feet are exposed to electrical or chemical hazards. Foot protection shall comply with appropriate ANSI standards.

D. Hand and Body Protection

Supervisors shall select and require employees to use appropriate hand protection when the hands are exposed to hazards from severe cuts, lacerations, abrasions or punctures, chemical or thermal burns, harmful temperature extremes, and skin absorption of harmful substances.

Supervisors shall base the selection of hand protection on an evaluation of the performance characteristics relative to hazards potential hazards of the task(s) to be performed, conditions present, duration of use.

Refer to **APPENDIX E** for hand and body protection selection specifics.

E. Head Protection

Each affected employee shall wear protective helmets when working in areas where there is a potential for injury to the head from falling objects or "bump" hazards.

F. Hearing Protection

Each employee shall wear appropriate hearing protection in environments where noise levels equal or exceed the OSHA Occupational Noise Exposure Standard (29 CFR 1910.95) 8-hour time weighted average (TWA) of 85 dBA.

G. Respiratory Protection

The use of respiratory protective equipment (respirators) shall be in compliance with the Purdue University Respiratory Protection Program.

H. Hazard Assessment and Personal Protective Equipment Selection

Refer to **APPENDIX F** for compliance assistance for supervisors and employees in implementing requirements for a hazard assessment and the selection of personal protective equipment.

VIII. ADDITIONAL INFORMATION

For additional information concerning this policy, contact Environmental Health and Safety.

APPENDICES

CERTIFICATION OF HAZARD ASSESSMENT
(Single Task)

Appendix A1

Certification of Hazard Assessment
(Single Task)

Assessment Date(s): _____

Department: _____ **Building:** _____

Task or Assignment Description: _____

_____

Hazards Identified:

Eye and Face: _____ Respiratory: _____

Head: _____ Foot: _____

Electrical: _____ Hand: _____

Whole Body: _____ Other: _____

PPE Requirements:

Eye and Face: _____ Respiratory: _____

Head: _____ Foot: _____

Electrical: _____ Hand: _____

Whole Body: _____ Other: _____

Other Control Measures: _____

_____

Certification:

I certify the hazard assessment was conducted in accordance with the provisions of the Purdue University Personal Protective Equipment Policy.

Name: _____ **Date:** _____

Distribution:

- Departmental PPE hazard assessment certification file ***and/or***
- Post in work area

Page **1** of **1**

APPENDIX A2

CERTIFICATION OF HAZARD ASSESSMENT
(Position/Title)

Appendix A2

Certification of Hazard Assessment
(Position/Title)

Assessment Date(s): _____

Department: _____ **Building:** _____ **Room:** _____

Position/Title: _____

Eye and Face Hazard	Task	PPE Required

Head Hazard	Task	PPE Required

Electrical Hazard	Task	PPE Required

Whole Body	Task	PPE Required

Respiratory	Task	PPE Required

Foot	Task	PPE Required

Hand	Task	PPE Required

Other	Task	PPE Required

Other Control Measures: _____

Certification:

I certify the hazard assessment was conducted in accordance with the provisions of the Purdue University Personal Protective Equipment Policy.

Name: _____ **Date:** _____

Distribution:

- Departmental PPE hazard assessment certification file ***and/or***
- Post in work area

Page **1** of **1**

APPENDIX A3

CERTIFICATION OF HAZARD ASSESSMENT
(Location)

Appendix A3

Certification of Hazard Assessment
(Location)

Supervisor (print):	**Assessment Date(s):**
Signature:	**Location(s) Covered:**

Hazards	Task (Hands-on work or within reach of potential hazards of described activity/items)	Minimum Requirements

Other Control Measures: _____

_____

Distribution:

- Departmental PPE hazard assessment certification file ***and/or***
- Post in work area

Page **1** of **1**

APPENDIX B

PERSONAL PROTECTIVE EQUIPMENT
CERTIFICATION OF TRAINING

Appendix B

PURDUE UNIVERSITY
Personal Protective Equipment Policy

PPE Certification of Training

Training Date(s): _____

Task or Assignment: _____

_____

_____

PPE Requirements: _____

_____

_____

Attendee Name (Print)	Attendee Signature

Certification

I certify that training was conducted in accordance to the provisions of the Purdue University Personal Protective Equipment Policy and that each affected employee has received and understood the training provided.

Instructor Name (Print)	Instructor Signature	Date

Distribution:

- Department PPE Training File

APPENDIX C

ELECTRICAL PROTECTIVE EQUIPMENT REQUIREMENTS

TABLE C1: AC Proof-Test Requirements

Class of Equipment	Proof Test Voltage ms V	Maximum Proof Test Current, mA (Gloves Only)			
		267 mm (10.5-in.) Glove	356 mm (14-in.) Glove	406 mm (16-in.) Glove	457 mm (18-in.) Glove
0	5,000	8	12	14	16
1	10,000	--	14	16	18
2	20,000	--	16	18	20
3	30,000	--	18	20	22
4	40,000	--		22	24

TABLE C2: DC Proof-Test Requirements

Class of Equipment	Proof-Test Voltage
0	20,000
1	40,000
2	50,000
3	60,000
4	70,000

Note for TABLE C2:
The d-c voltages listed in this table are not appropriate for proof testing rubber insulating line hose or covers. For this equipment, k-c proof tests shall use a voltage high enough to indicate that the equipment can be used at the voltages listed in Table I-4. See ASTM D 1050-90 and ASTM D 1049-88 for further information on proof tests for rubber insulating line hose and covers.

TABLE C3: Glove Tests - Water Level [1, 2]

Class of Glove	AC Proof Test		DC Proof Test	
	mm	in.	mm	in.
0	38	1.5	38	1.5
1	38	1.5	51	2.0
2	64	2.5	76	3.0
3	89	3.5	102	4.0
4	127	5.0	153	6.0

Notes for TABLE C3:
1. The water level is given as the clearance from the cuff of the GLOVE to the water line, with a tolerance of ± 13 mm. (± 0.5).
2. If atmospheric conditions make the specified clearances impractical, the clearances may be increased by a maximum of 25 mm (1 in).

ELECTRICAL PROTECTIVE EQUIPMENT REQUIREMENTS

TABLE C4: Rubber Insulating Equipment Voltage Requirements

Class of Equipment	Maximum use Voltage [1] AC (rms)	Retest Voltage [2] AC (rms)	Retest Voltage [2] DC (avg.)
0	1,000	5,000	20,000
1	7,500	10,000	40,000
2	17,000	20,000	50,000
3	26,500	30,000	60,000
4	36,000	40,000	70,000

Notes for TABLE C4:

1. The maximum use voltage is the a-c voltage (rms) classification of the protective equipment that designates the maximum nominal design voltage of the energized system that may be safely worked. The nominal design voltage is equal to the phase-to-phase voltage on multiphase circuits. However, the phase-to-ground potential is considered to be the nominal design voltage:

a. If there is no multiphase exposure in a system area and if the voltage exposure is limited to the phase-to-ground potential, or

b. If the electrical equipment and devices are insulated or insolate or both so that the multiphase exposure on a grounded wye circuit is removed.

2. The proof-test voltage shall be applied continuously for at least 1 minute, but no more than 3 minutes.

TABLE C5: Rubber Insulating Equipment Test Intervals

Type of Equipment	When to Test
Rubber insulating line hose	Upon indication that insulating value is suspect
Rubber insulating covers	Upon indication that insulating value is suspect
Rubber insulating blankets	Before first issue and every 12 months thereafter[1]
Rubber insulating gloves	Before first issue and every 6 months thereafter[1]
Rubber insulating sleeves	Before first issue and every 12 moths thereafter[1]

Notes for TABLE C5:

1. If the insulating equipment has been electrically tested but not issued for service, it may not be placed into service unless it has been electrically tested within the previous 12 months.

Contact rem
EHS, B173 HAMP, for specific requirements and recommendations.

APPENDIX D

EYE AND FACE PROTECTION

TABLE D1: Eye and Face Protection Selection

Source	Assessment of Hazard	Protection
IMPACT: Chipping, grinding machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles, sand, dirt, etc	Spectacles with side protection, goggles, face shield. See notes (1), (3), (5), (6), and (10). For severe exposure, use face shields.
HEAT: Furnace operations, pouring, casting, hot dipping, and welding.	Hot sparks	Face shields, goggles, and spectacles with side protection. For severe exposure, use face shield. See notes (1), (2), (3)
	Splash from molten metals	Face shields worn over goggles. See notes (1), (2), (3)
	High temperature exposure	Screen face shields, reflective face shields. See notes (1), (2), (3)
CHEMICALS: Acid and chemicals handling, degreasing plating	Splash	Goggles, eyecup, and cover types. For severe exposure use face shield. See notes (3), (11).
	Irritating mists	Special-purpose goggles.
DUSTS: Woodworking, buffing, and general dusty conditions	Nuisance dust	Goggles, eyecup, and cover types. See note (8).
LIGHT and/or RADIATION		
Source	**Assessment of Hazard**	**Protection**
WELDING: electric arc	Optical radiation	Welding helmets or welding shields. Typical shades: 10-14. See notes (9), (12).
WELDING: gas	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding: 4-8, cutting: 3-6, brazing: 3-4. See note (9).
CUTTING: torch brazing, torch soldering	Optical radiation	Spectacles or welding face shield. Typical shades: 1.5-3. See notes (3), (9).
GLARE	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable. See notes (9), (10).

Notes for TABLE D1:

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 hazard 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. Face shields 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 1910.133(a) (5). 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 prescriptions (Rx) lenses must wear either protective devices fitted with prescription (R_x) 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 hazard areas.

8. Atmospheric condition are restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.

9. Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).

10. Non-side shield 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.

EYE AND FACE PROTECTION

TABLE D2: Filter Lenses for Protection Against Radiation

Operations		Electrode Size 1/32 inch	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		(Light)	Less than 500	10
Arc cutting		(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
Gas welding:	Light	Under 1/8	Under 3.2	4
	Medium	1/8 to ½	3.2 to 12.7	5
	Heavy	Over ½	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

Notes for TABLE D2:

***** 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 area is hidden by the workplace.

APPENDIX E

HAND AND BODY PROTECTION

TABLE E: Hand and Body Protection Chemical Resistance

Chemical	PVC	Latex	Nitrile	Neoprene
Acetaldehyde	NR	F	P	E
Acetic acid	F	G	G	E
Acetone	NR	G	NR	G
Acetonitrile	NR	F	NR	F
Ammonium Hydroxide <30%	E	G	E	E
Amyl acetate	P	F	E	NR
Aniline	F	P	NR	G
Animal fats	G	P	E	E
Battery acid	E	G	E	E
Benzaldehyde	NR	F	NR	NR
Benzene	NR	NR	P	NR
Benzyl Chloride	NR	P	NR	NR
Butane	P	P	E	F
Butyl Acetate	NR	P	F	NR
Butyl Alcohol	G	E	P	E
Butyl Cellosolve	NR	E	E	E
Carbolic Acid	G	P	P	E
Carbon Disulfide	NR	NR	NR	NR
Carbon Tetrachloride	NR	NR	G	P
Castor Oil	E	E	E	E
Cellosolve Acetate	NR	G	G	F
Cellosolve Solvent	NR	E	G	E
Chlorobenze	NR	NR	NR	NR
Chloroform	NR	NR	F	F
Chloronapthalenes	NR	NR	F	NR
Chlorthene VG	P	NR	F	NR
Chromic Acid	G	NR	F	F
Citric Acid	E	E	E	E
Cottonseed Oil	G	P	E	E
Cresol	F	P	G	G
Cutting Oil	P	F	E	E
Cyclohexane	P	P	E	F
Cyclohexanol	G	P	E	E
Dibutylphthalate	G	P	G	F
Diethylamine	NR	NR	F	P
Di-Isobutyl Ketone	P	P	E	P
Dimethyl Formamide (DMF)	NR	E	NR	G
Dimethyl Sulfoxide (DMSO)	NR	E	E	E
Dioctyl Phthalate (DOP)	NR	P	G	G
Dioxane	NR	F	NR	NR
Ethyl Acetate	NR	P	NR	F
Ethyl Alcohol	G	E	E	E

APPENDIX E
(Continued)

Chemical	PVC	Latex	Nitrile	Neoprene
Ethylene Dichloride	NR	P	NR	NR
Ethylene Glycol	E	E	E	E
Ethyl Ether	NR	NR	E	E
Ethylene Trichloride	NR	P	P	P
Formaldehyde	E	E	E	E
Formic Acid	E	E	F	E
Freon	NR	NR	F	G
Furfural	NR	E	NR	G
Gasoline	P	NR	E	P
Glycerine	E	E	E	E
Hexane	NR	NR	E	E
Hydraulic Fluid - Petroleum Based	G	P	E	F
Hydraulic Fluid - Ester Base	P	P	P	P
Hydazine 65%	E	G	E	E
Hydrochloric Acid	E	G	E	E
Hydrofluoric Acid	E	G	E	E
Hydrogen Peroxide	E	E	E	E
Hydroquinone	E	G	E	E
Isobutyl Alcohol	G	E	E	E
Kerosene	F	P	E	E
Lactic Acid	E	E	E	E
Lauric Acid	F	G	E	E
Linoleic Acid	G	P	E	E
Linseed Oil	E	P	E	E
Maleic Acid	G	P	E	E
Methyl Acetate	NR	P	P	G
Methyl Alcohol	G	E	E	E
Methylamine	E	E	E	G
Methylene Bromide	NR	NR	NR	NR
Methylene Chloride	NR	NR	NR	NR
Methyl Cellosolve	-	P	F	E
Methyl Ethyl Ketone (MEK)	NR	G	NR	G
Methyl Isobutyl Ketone	NR	F	P	NR
Methyl Methacrylate	NR	P	P	NR
Mineral Oil	F	P	E	E
Mineral Spirits	F	NR	E	G
Monoethanolamine	E	G	E	E
Morpholine	NR	G	NR	P
Muriatic Acid	G	G	G	E
Naptha V.M. & P.	P	NR	E	G
Nitric Acid <30%	G	G	P	E
Nitric Acid 70%	F	F	NR	G
Nitric Acid Red Fuming	P	P	NR	NR
Nitric Acid White Fuming	P	P	NR	NR
Nitrobenzne	NR	P	NR	NR
Nitromethane	P	G	F	E
Nitropropane	NR	E	NR	G

APPENDIX E
(Continued)

Chemical	PVC	Latex	Nitrile	Neoprene
Octyl Alcohol	F	G	E	E
Oleic Acid	F	P	E	E
Paint Remover	P	F	G	G
Palmitic Acid	G	G	G	E
Pentachlorophenol	F	P	E	E
Pentane	NR	P	E	E
Perchloric Acid 60%	E	P	E	E
Perchloroethylene	NR	NR	G	NR
Phenol	G	G	NR	E
Phosphoric Acid	G	G	E	E
Picric Acid	E	G	E	E
Potassium Hydroxide < 50%	E	E	G	E
Printing Ink	F	G	E	G
Propyl Acetate	NR	P	F	P
Propyl Alcohol	F	E	E	E
Propylene Oxide	NR	P	NR	NR
Rubber Solvent	NR	NR	E	G
Sodium Hydroxide <50%	G	E	G	E
Stoddard Solvent	NR	P	E	E
Styrene	NR	NR	NR	NR
Sulfuric Acid 95%	G	NR	NR	F
Tannic Acid 65%	E	E	E	E
Tetrahydrofuran (THF)	NR	NR	NR	NR
Toluene	NR	NR	G	P
Toluene Dilsocyanate (TDI)	P	P	NR	NR
Trichloroethylene (TCE)	NR	NR	G	P
Tricresyl Phosphate (TCP)	F	G	E	F
Triethanolamine 85%	E	G	E	E
Tung Oil	F	NR	E	E
Turbin Oil	F	P	G	E
Turpentine	P	P	E	G
Vegetable Oil	F	P	E	E
Xylene	NR	NR	G	P
Abrasion Resistance	G	G	E	G
Elongation	F	E	G	E
Tear Resistance	F	G	G	G
Tensile Strength	F	E	E	E

E = Excellent
G = Good
F = Fair
P = Poor
NR = Not Recommended

APPENDIX F

GUIDELINES FOR HAZARD ASSESSMENT AND PERSONAL PROTECTIVE EQUIPMENT SELECTION

I. Controlling Hazards

PPE devices alone should not be relied on to provide protection against hazards, but should be used in conjunction with guards, engineering controls, and sound work practices.

II. Assessment and Selection

It is necessary to consider certain general guidelines, as outlined in the following sections of this appendix, when assessing a task and selecting means of hazard control. It is the responsibility of the supervisor to exercise common sense and appropriate expertise to accomplish assessment and selection requirements.

III. Assessment Guidelines

A. Survey

Conduct a walk-through survey of the areas in question. The purpose of the survey is to identify sources of hazards to workers and co-workers. Consideration should be given to the basic hazard categories:

1. Impact
2. Penetration
3. Compression (Roll-Over)
4. Chemical
5. Heat
6. Harmful dust
7. Light (Optical) Radiation

B. Sources

During the walk-through survey, the safety officer should observe:

1. Sources of motion; i.e. machinery or process where any movement where any movement of tools, machine elements or particles could exist, or movement or personnel that could result in collision with stationary objects;
2. Sources of high temperatures that could result in burns, eye injury of ignition of protective equipment, etc.;
3. Types of chemical exposures;
4. Sources of harmful dust;
5. Sources of light radiation, i.e. welding, brazing, cutting, furnaces, heat treating, high-intensity lights, etc.;
6. Sources of falling objects or potential for dropping objects;
7. Sources of sharp objects which might pierce the feet or cut the hands;
8. Sources of rolling or pinching objects which could crush the feet;
9. Layout of workplace and location of co-workers; and
10. Any electrical hazards; in addition; injury/accident data should be reviewed to help identify problem areas.

C. Organize Data

Following the walk-through survey, it is necessary to organize the data and information for use in the assessment of hazards. The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment.

D. Analyze Data

Having gathered and organized data on a workplace, an estimate of the potential for injuries should be made. Each of the basic hazards (paragraph 3.a) should be reviewed and a determination made as to type, level of risk, and seriousness of potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.

IV. Selection Guidelines

After Completion of the procedures in paragraph 3 the general procedure for selection of protective equipment is to:

A. Become familiar with the potential hazards and the type of protective equipment that is available, and what it can do, etc. i.e. splash protection, impact protection, etc.;

B. Compare the hazards associated with the environment; i.e. impact velocities, masses projectile shape, radiation intensities, with the capabilities of the available protective equipment;

C. Select the protective equipment which ensures a level of protection greater than the minimum required to protect the employee from the hazards;

D. Fit the user with the protective device and give instructions on care and use of the PPE.

E. Ensure that end users be made aware of all warning labels for and limitations of their PPE.

V. Fitting the Device

Careful consideration must be given to comfort and fit. PPE that fits poorly may not afford the necessary protection. Continued wearing of the device is more likely if it fits the wearer comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected.

VI. Devices with Adjustable Features

Adjustments should be made on an individual basis for a comfortable fit that will maintain the protective device in the proper position. Particular care should be taken in fitting devices for eye protection against dust and chemical splash to ensure that the devices are sealed to the face. In addition, proper fitting of helmets is important to ensure that it will not fall off during work operations. In some cases, a chin strap may be necessary to keep the helmet on an employee's head. (Chin straps should break at a reasonably low force, however, so as to prevent a strangulation hazard.) Where manufacturer's instructions are available, they should be followed carefully.

VII. Reassessment of Hazards

It is the responsibility of the supervisor to reassess the workplace hazard situation as necessary, by identifying and evaluating new equipment and processes, reviewing accident records, and reevaluating the suitability of previously selected PPE.

VIII. Selection Guidelines for Eye and Face Protection

Some occupations for which eye protection should be routinely considered are: carpenters, electricians, machinists, mechanics and repairers, millwrights, plumbers and pipe fitters, sheet metal workers and tinsmiths, assemblers, sanders, grinding machine operators, lathe and milling machine operators, sawyers, welders, laborers, chemical process operators and handlers, and timber cutting and logging workers. The appended chart provides general guidance for the proper selection of eye and face protection to protect against hazards associated with the listed hazard "source" operations.

IX. Selection Guidelines For Head Protection

All head protection is designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available that provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important. Class A helmets, in addition to impact and penetration resistance; provide electrical protection from low-voltage conductors (they are proof-tested to 2,200 volts). Class B helmets, in addition to impact and penetration resistance; provide electrical protection from high-voltage conductors (they are proof-tested to 20,000 volts). Class C helmets

provide impact and penetration resistance (they are usually made of aluminum which conducts electricity), and should not be used around electrical hazards.

Where falling object hazards are present, helmets must be worn. Some examples include: working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or object to fall; and working on exposed energized conductors.

Some examples of occupations for which head protection should be routinely considered are: carpenters, electricians, linemen, mechanics and repairers, plumbers and pipe fitters, assemblers, packers, wrappers, sawyers, welders, laborers, freight handlers, timber cutting and logging workers, stock handlers, and warehouse laborers.

X. Selection Guidelines for Foot Protection

Safety shoes and boots which meet the ANSI Z41-1991 Standard provide both impact and compression protection. Where necessary, safety shoes can be obtained which provide puncture protection. In some work situations, metatarsal protection should be provided, and in other special situations, electrical conductive or insulating safety shoes would be appropriate.

Safety shoes or boots with impact protection would be required for carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped; and for other activities where objects might fall onto the feet. Safety shoes or boots with compression protection would be required for work activities involving skid trucks (manual material handling carts) around bulk rolls (such as paper rolls) and around heavy pipes, all of which could potentially roll over an employee's feet. 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.

Some occupations (not a complete list) for which foot protection should be routinely considered are: shipping and receiving clerks, stock clerks, carpenters, electricians, machinists, mechanics and repairers, plumbers and pipe fitters, structural metal workers, assemblers, drywall installers and lathers, packers, wrappers, craters, punch and stamping press operators, sawyers, welders, laborers, freight handlers, gardeners and groundskeepers, timber cutting and logging workers, stock handlers and warehouse laborers.

XI. Selection Guidelines for Hand Protection

Gloves are often relied upon to prevent cuts, abrasions, burns, and skin contact with chemicals that are capable of causing local or systemic effects following dermal exposure. OSHA is unaware of any gloves that provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against may chemicals. Therefore, it is important to select the most appropriate glove for a particular location and to determine how long it can be worn, and whether it can be reused.

It is also important to know the performance characteristics of gloves relative to the specific hazard anticipated (e.g. chemical hazards, cut hazards like flame hazards, etc.) Their performance characteristics should be assessed by using standard test procedures. Before purchasing gloves, the employer should request documentation from the manufacturer that the gloves meet the appropriate test standard(s) for hazard(s) anticipated.

A. Other factors to be considered for glove selection in general include:

1. As long as the performance characteristics are acceptable in certain circumstances, it may be more cost-effective to regularly change cheaper gloves than to reuse more expensive types, and;

2. The work activities of the employee should be studied to determine the degree of dexterity required, the duration, frequency, and degree of exposure of the hazard, and the physical stress that will be required.

B. With respect to selection of gloves for protection against chemical hazards:

1. The toxic properties of the chemical(s) must be determined; in particular, the ability of the chemical to cause local effects on the skin and/or pass through the skin and cause systemic effects;

2. Generally, any "chemical resistant" glove can be used for dry powders;

3. For mixtures and formulated products (unless specified 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; and,
4. Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

XII. 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.

For compliance with 29 CFR 1910.132(a) and (b), 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.