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DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

OCCUPATIONAL HEALTH STANDARDS

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(as amended April 5, 1999) (as amended September 20, 2000) (**as amended February 6, 2014**)

These rules become effective immediately upon filing with the Secretary of State
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(By authority conferred on the director of the department of licensing and regulatory affairs
by sections 14 and 24 of 1974 PA 154, MCL 408.1001 and 408.1094,
and Executive Reorganization Order Nos. 1996-1, 1996-2, 2003-1, 2008-4, and 2011-4,
MCL 330.3101, 445.2001, 445.2011, 445.2025, and 445.2030.)

R 325.60001, R 325.60002, R 325.60003, R 325.60005, R 325.60006, R 325.60008, R 325.60009, R 325.60010,
and R 325.60011 of the Michigan Administrative Code are amended,
and R 325.60002a, R 325.60002b, R 325.60003a, and R 325.60008a are added,
and R 325.60004, R 325.60007, R 325.60012, and R 325.60013 are rescinded, as follows:

PART 433. PERSONAL PROTECTIVE EQUIPMENT

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GENERAL PROVISIONS

R 325.60001 Scope.

Rule 1. (1) This standard provides specifications for personal protective equipment and prescribes the use of this equipment for the protection of the employee's eyes, face, and hands during general industry operations.

(2) This standard shall apply to all places of general industry employment in this state and includes requirements of the employer and use by the employee of personal protective equipment and provides reasonable and adequate means, ways, and methods for the proper selection and safe use of this equipment.

(3) Personal protective safety equipment relating to eye and face protection, head protection, hand protection, feet protection, body protection, and electrical protective equipment shall be in compliance with General Industry Safety Standard Part 33 "Personal Protective Equipment," as referenced in R 325.60002a.

(4) Hearing protection shall be in compliance with Occupational Health Standard Part 380 "Occupational Noise Exposure," as referenced in R 325.60002a.

(5) Respiratory protection shall be in compliance with Occupational Health Standard Part 451 “Respiratory Protection,” as referenced in R 325.60002a.

R 325.60002 Application.

Rule 2. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition, wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants, encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.

R 325.60002a Adoption of standards by reference; access to other MIOSHA rules; appendices.

Rule 2a. (1) The following standards are adopted by reference in these rules and are available from IHS Global, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 or via the internet at website: http://global.ihs.com; at a cost as of the time of adoption of these rules, as stated in this subrule.

(a) American National Standards Institute (ANSI) Z-87.1 "American National Standard Practice for Occupational and Educational Eye and Face Protection," 2003 edition. Cost $82.00.

(b) ANSI Z-87.1 "American National Standard Practice for Occupational and Educational Eye and Face Protection," 1989 edition, revised 1998. Cost $148.00.

(c) ANSI Z-87.1 "American National Standard Practice for Occupational and Educational Eye and Face Protection," 1989 edition. Cost: $148.00.

(2) The standards adopted in subrule (1) of this rule are also available for inspection at the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143.

(3) Copies of the standards adopted in subrule (1) of this rule may be obtained from the publisher or may also be obtained from the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143, at the cost charged in this rule, plus $20.00 for shipping and handling.

(4) The following Michigan occupational safety and health standards (MIOSHA) are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of licensing and regulatory affairs, MIOSHA standards section, 7150 Harris Drive, P.O. Box 30643, Lansing, MI, 48909-8143 or via the internet at website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, at the time of adoption of these rules, is 4 cents per page.

(a) General Industry Safety Standard Part 33 “Personal Protective Equipment,” R 408.13301 to R 408.13398.

(b) Occupational Health Standard Part 380 “Occupational Noise Exposure,” R 325.60101 to R 325.30128.

(c) Occupational Health Standard Part 451 “Respiratory Protection,” R 325.60051 to R 325.60052.

(5) The appendices are informational only and are not intended to create any additional obligations or requirements not otherwise imposed or to detract from any established obligations or requirements.

R 325.60002b Definitions.

Rule 2b. (1) “Chin protector” means the portion of a device that offers protection to a wearer’s chin, lower face, and neck.

(2) “Face shield” means a device commonly intended to shield the wearer's face, or portions thereof, in addition to the eyes, from certain hazards, depending on faceshield type.

(3) “Filter lens” means a lens that attenuates specific wavelengths of ultraviolet, visible, and infrared radiation.

(4) “Frame” means a device, which holds the lens or lenses on the wearer.

(5) “Front” means the part of a spectacle or goggle frame that is intended to contain the lens or lenses.

(6) “Goggle” means a protective device intended to fit the face surrounding the eyes in order to shield the eyes from certain hazards, depending on goggle type.

(7) “Handshield” means a hand-held welding helmet. See "welding helmet."

(8) “Headband” means the part of the harness that encircles the head.

(9) “Helmet” also called a hard hat or cap, means a device that is worn on the head and that is designed to provide limited protection against impact, flying particles, or electric shock.

(10) “Lens” means the transparent part of a protective device through which the wearer sees, also referred to as a plate or window for some devices.

(11) “Lift-front” means a type of supplementary lens and holder that covers the viewing area of a protector immediately in front of the wearer's eyes and that can be positioned outside the line of sight.

(12) “Light” means optical radiation weighted by its ability to cause visual sensations.

(13) “Manufacturer” means a business entity that marks or directs the permanent marking of the components or complete devices as compliant with this standard, and sells them as compliant.

(14) “Non-removable lens” means a lens and holder that are homogeneous and continuous.

(15) “Prescription lens” means a lens manufactured to the wearer's individual corrective prescription.

(16) “Protector” means a device that provides eye or face protection against the hazards of processes encountered in employment.

(17) “Radiant energy or radiation” means the 3 kinds of radiant energy which are pertinent to this standard including the following:

(a) Ultraviolet.

(b) Visible light.

(c) Infrared.

(18) “Sanitizing” means an act or process of destroying organisms that may cause disease.

(19) “Side shield” means a part of, or attachment to, a spectacle that provides side impact resistance.

(20) “Spectacles” also known as “safety glasses,” means a protective device intended to shield the wearer's eyes from certain hazards, depending on the spectacle type; also means a device patterned after conventional-type spectacle eyewear, but of more substantial construction, with or without side shields, and with plano or corrective impact resistant lenses of clear or absorptive filter glass or plastic.

(21) “Temple” means the part of a spectacle frame commonly attached to the front and generally extending behind the ear of the wearer.

(22) “Welding goggle” means a goggle intended for limited welding applications.

(23) “Welding faceshield” means a faceshield intended for limited welding applications. Faceshields shall be used only in conjunction with spectacles or goggles, or both.

(24) “Welding helmet” means a protective device intended to provide protection for the eyes and face against optical radiation and weld spatter, which shall be worn only in conjunction with spectacles or goggles.

(25) “Window,” means the lens portion of a faceshield (see definition of “lens” in R 325.60002b(10)).

R 325.60003 Employer’s and employee’s responsibilities.

Rule 3. (1) Where employees provide their own protective equipment, an employer shall be responsible for ensuring the adequacy of the equipment, including proper maintenance, and for the sanitation of the equipment.

(2) An employer shall not permit defective or damaged personal protective equipment to be used.

PAYMENT FOR PERSONAL PROTECTIVE EQUIPMENT

R 325.60003a Payment for personal protective equipment (PPE).

Rule 3a. (1) An employer shall provide at no cost to employees the personal protective equipment necessary to protect against hazards that the employer is aware of as a result of any required assessments.

(2) An employer shall pay for replacement PPE, as necessary, under either of the following conditions:

(a) When the PPE no longer provides the protection it was designed to provide.

(b) When the previously provided PPE is no longer adequate or functional.

(3) When an employee has lost or intentionally damaged the PPE issued to him or her, an employer is not required to pay for its replacement and may require the employee to pay for its replacement.

(4) An employer is not required to pay for prescription safety eyewear with removable or permanent sideshields as long as the employer provides safety eyewear that fits over an employee’s prescription lenses.

(5) An employer is not required to pay for non-specialty prescription safety eyewear, provided that the employer permits these items to be worn off the job-site.

(6) An employer is not required to pay for either of the following:

(a) Everyday clothing, which includes any of the following:

(i) Long-sleeve shirts.

(ii) Long pants.

(iii) Street shoes.

(iv) Normal work boots.

(v) Ordinary clothing.

(vi) Skin creams.

(b) Other items used solely for protection from weather, which includes any of the following:

(i) Winter coats.

(ii) Jackets.

(iii) Gloves.

(iv) Parkas.

(v) Rubber boots.

(vi) Hats.

(vii) Raincoats.

(viii) Ordinary sunglasses.

(ix) Sunscreen.

(7) An employer shall pay for protection when ordinary weather gear is not sufficient to protect an employee and special equipment or extraordinary clothing is needed to protect the employee from unusually severe weather conditions. Clothing used in artificially-controlled environments with extreme hot or cold temperatures, such as freezers, is not considered part of the weather gear exception.

(8) All of the following apply to upgraded and personalized PPE:

(a) An employer is not required to pay for PPE requested by an employee that exceeds the PPE requirements, provided that the employer provides PPE that meets the standards at no cost to the employee.

(b) If an employer allows an employee to acquire and use upgraded or personalized PPE, then the employer is not required to reimburse the employee for the equipment, provided that the employer has provided adequate PPE at no cost to the employee.

(c) An employer shall evaluate an employee’s upgraded or personalized PPE to ensure that it complies with all of the following:

(i) Adequate to protect from hazards present in the workplace.

(ii) Properly maintained.

(iii) Kept in a sanitary condition.

(9) When the provisions of another MIOSHA standard specify whether the employer shall pay for specific equipment, the payment provisions of that standard prevails.

R 325.60004 Rescinded.

HAZARD ASSESSMENT

R 325.60005 Personal protective hazard assessment and equipment selection.

Rule 5. (1) An employer shall assess the workplace to determine if hazards are present, or are likely to be present, that necessitate the use of personal protective equipment.

(2) If hazards are present, or are likely to be present, and if the employer cannot eliminate the hazards by feasible engineering controls, then the employer shall do all of the following:

(a) Select, and have each affected employee use, the types of personal protective equipment that will protect the affected employee from the hazards identified in the hazard assessment.

(b) Communicate selection decisions to each affected employee.

(c) Select personal protective equipment that properly fits each affected employee.

(d) Select personal protective equipment that shall be designed and constructed to be safe for the work to be performed.

(3) Non-mandatory Appendix B contains an example of procedures that complies with the requirement for a hazard assessment.

(4) An employer shall verify, that the required workplace hazard assessment has been performed through a written certification which identifies all of the following information:

(a) The workplace evaluated.

(b) The person certifying that the evaluation has been performed.

(c) The date or dates of the personal protective hazard assessment.

(d) The document is a certification of hazard assessment.

TRAINING

R 325.60006 Personal protective equipment training.

Rule 6. (1) An employer shall provide training to each employee who is required by these rules to use personal protective equipment. The training shall include all of the following:

(a) When and why personal protective equipment is necessary.

(b) What personal protective equipment is necessary.

(c) How to properly don, doff, adjust, and wear the personal protective equipment.

(d) The limitations of the personal protective equipment.

(e) The proper care, maintenance, useful life, and disposal of the personal protective equipment.

(2) Each affected employee shall demonstrate an understanding of the training specified in subrule (1) of this rule and the ability to use the equipment properly before being allowed to perform work requiring the use of personal protective equipment.

(3) When an employer has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by subrule (2) of this rule, the employer shall retrain the employee. The occurrence of any of the following circumstances requires retraining:

(a) Changes in the workplace that render previous training obsolete.

(b) Changes in the types of personal protective equipment to be used that render previous training obsolete.

(c) Inadequacies in an affected employee's knowledge or use of assigned personal protective equipment which indicate that the employee has not retained the requisite understanding or skill.

R 325.60007. Rescinded.

EYE AND FACE PROTECTION

R 325.60008 Use of eye and face protection.

Rule 8. (1) An employer shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards from any of the following:

(a) Flying particles.

(b) Molten metal.

(c) Liquid chemicals.

(d) Corrosive materials.

(e) Air contaminants.

(f) Radiation.

(2) See Appendix B, Appendix Table 1, "Eye and Face Protector Selection Chart," and Appendix Figure 1, "Eye and Face Protective Devices Chart," which shall be used as a guide in the selection of the proper eye and face protection.

(3) An employer shall ensure that each affected employee uses eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors, such as clip-on or slide-on sideshields, that are in compliance with the pertinent requirements of this rule are acceptable.

(4) An employer shall ensure that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards wears eye protection that incorporates the prescription in its design or wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

(5) An employer shall ensure that eye and face personal protective equipment shall be distinctly marked to facilitate identification of the manufacturer.

R 325.60008a Filter lenses.

Rule 8a. (1) An employer shall ensure that each affected employee uses equipment that has filter lenses which have a shade numbers appropriate for the work being performed for protection from injurious light radiation.

(2) Table 1 is a listing of appropriate shade numbers for various operations.

(3) Table 1 reads as follows:

TABLE 1
FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY

OPERATIONS	PLATE THICKNESS (INCHES)	PLATE THICKNESS (MM)	MINIMUM* PROTECTIVE SHADE
Gas Welding: Light Medium Heavy	 Under 1/8 1/8 to 1/2 Over 1/2	 Under 3.2 3.2 to 12.7 Over 12.7	 4 5 6
Oxygen Cutting Light Medium Heavy	 Under 1 1 to 6 Over 6	 Under 25 25 to 150 Over 150	 3 4 5
OPERATIONS	**ELECTRODE SIZE 1/32 IN.**	**ARC CURRENT**	**MINIMUM* PROTECTIVE SHADE**
Shield metal Arc welding	Less than 3 3 to 5 more than 5 to 8 more than 8	Less than 60 60 to 160 161 to 250 251 to 550	7 8 10 11
Gas metal arc welding and flux	cored arc welding	Less than 60 60 to 160 161 to 250 251 to 500	7 10 10 10
Gas tungsten arc	welding	Less than 50 50 to 150 151 to 500	8 8 10
Air carbon Arc cutting	(Light) (Heavy)	Less than 500 500 to 1000	10 11
Plasma arc welding		Less than 20 20 to 100 101 to 400 401 to 800	6 8 10 11
Plasma arc cutting	(Light)** (Medium)** (Heavy)**	Less than 300 300 to 400 401 to 800	8 9 10
Torch brazing Torch soldering Carbon arc welding			3 2 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.

R 325.60009 Eye and face protection; consensus standards.

Rule 9. (1) All protective eye and face protection devices, shall be in compliance with any of the following consensus standards:

(a) ANSI Z-87.1 "American National Standard Practice for Occupational and Educational Eye and Face Protection," 2003 edition, as adopted in R 325.60002a.

(b) ANSI Z-87.1 "American National Standard Practice for Occupational and Educational Eye and Face Protection," 1989 (Revised 1998) edition, as adopted in R 325.60002a.

(c) ANSI Z-87.1 "American National Standard Practice for Occupational and Educational Eye and Face Protection," 1989 edition, as adopted in R 325.60002a.

(2) Protective eye and face protection devices that the employer demonstrates are at least as effective as protective eye and face protection devices that are constructed in accordance with 1 of the consensus standards adopted in subrule (1) of this rule shall be considered to be in compliance with this rule.

HAND PROTECTION

R 325.60010 Hand protection, generally.

Rule 10. An employer shall select and require employees to use appropriate hand protection when employees' hands are exposed to hazards, such as those from any of the following:

(a) Skin absorption of harmful substances.
(b) Severe cuts or lacerations.
(c) Severe abrasions.
(d) Punctures.
(e) Chemical burns.
(f) Irritating materials.
(g) Thermal burns.
(h) Harmful temperature extremes.

R 325.60011 Hand protection, selection.

Rule 11. An employer shall base the selection of the appropriate hand protection on an evaluation of the performance characteristics of the hand protection relative to all of the following:

(a) The task or tasks to be performed.
(b) Conditions present.
(c) Duration of use.
(d) The hazards and potential hazards identified.

R 325.60012 Rescinded.

R 325.60013 Rescinded.

APPENDIX A
RESOURCES (Non-Mandatory)

For further assistance in implementing requirements for a hazard assessment and the selection of personal protective equipment, contact MIOSHA, OSHA, NIOSH, your union, or industry association.
MIOSHA Michigan Occupational Safety and Health Administration Consultation Education & Training Division (CET) www.michigan.gov/cet Phone: 517.322.1856
OSHA Federal Occupational Safety and Health Administration http://www.osha.gov
NIOSH National Institute of Occupational Safety and Health http://www.cdc.gov/niosh

APPENDIX B
GUIDELINES FOR HAZARD ASSESSMENT AND PERSONAL PROTECTIVE EQUIPMENT SELECTION
(Non-Mandatory)

This Appendix is intended to provide compliance assistance for employers and employees in implementing requirements for a hazard assessment and the selection of personal protective equipment.

1. 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 manufacturing practices.

2. ASSESSMENT AND SELECTION.

It is necessary to consider certain general guidelines for assessing the eyes, face, head, hands, feet, and body hazard situations that exist in an occupational or educational operation or process, and to match the protective devices to the particular hazard. It should be the responsibility of the safety officer to exercise common sense and appropriate expertise to accomplish these tasks.

3. ASSESSMENT GUIDELINES.

In order to assess the need for PPE the following steps should be taken:

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:

(a) Impact.
(b) Penetration.
(c) Compression (roll-over).
(d) Chemical.
(e) Heat.
(f) Harmful dust.
(g) Light (optical) radiation.

b. Sources. During the walk-through survey the safety officer should observe:

(a) Sources of motion; i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects.
(b) Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment, etc..
(c) Types of chemical exposures.
(d) Sources of harmful dust.
(e) Sources of light radiation, i.e., welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc.
(f) Sources of falling objects or potential for dropping objects.
(g) Sources of sharp objects which might pierce the feet or cut the hands.
(h) Sources of rolling or pinching objects which could brush the feet.
(i) Layout of workplace and location of co-workers; and
(j) 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 the type, level of risk, and seriousness of the potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.

4. 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; 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 employees from the hazards; and
(d) Fit the user with the protective device and give instructions on care and use of the PPE. It is very important that end users be made aware of all warning labels for and limitations of their PPE.

5. FITTING THE DEVICE.

Careful consideration must be given to comfort and fit. PPE that fits poorly will 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.

6. 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 reasonable low force, however, so as to prevent a strangulation hazard). Where manufacturer's instructions are available, they should be followed carefully.

7. REASSESSMENT OF HAZARDS.

It is the responsibility of the safety officer 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.

8. SELECTION CHART GUIDELINES FOR EYE AND FACE PROTECTION.

Some occupations (not a complete list) for which eye protection should be routinely considered are:
Assemblers,
Carpenters,
Chemical process operators and handlers,
Electricians,
Grinding machine operators,
Laborers,
Lathe and milling machine operators,
Machinists,
Mechanics and repairers,
Millwrights,
Plumbers and pipe fitters,
Sanders,
Sawyers,
Sheet metal workers and tinsmiths,
Timber cutting and logging workers.
Welders.

Appendix Table 1, "Eye and Face Protector Selection Chart," and Appendix Figure 1, "Eye and Face Protective Devices," are intended to aid in identifying and selecting the types of eye and face protectors that are available, their capabilities and limitation for the hazard "activity and assessment" operations that are listed.

APPENDIX 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 the hazards must be provided.

ACTIVITY AND ASSESSMENT	PROTECTOR CATEGORY AND STYLES	LIMITATIONS	NOT RECOMMENDED
IMPACT			
Chipping, grinding, machining, masonry work, riveting, and sanding. Flying fragments, objects, large chips, particles, sand, dirt, etc.	Spectacles, goggles: B, C, D, E, F, G, H, I, J, K, L. For Severe exposure add N. Respirators, R, T. Faceshields shall only be worn over spectacles or goggles. 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. 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. Wearing of contact lenses under an R respirator is permitted. 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.) 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. Note: Caution should be exercised in the use of metal frame protective devices in electrical hazard areas. 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. 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. Filter or tinted lenses that restrict light transmittance, unless it is determined that a glare hazard exists. Refer to OPTICAL RADIATION. Use of faceshields alone, without spectacles or goggles.

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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. Operations involving heat may also involve optical radiation. Protection from both hazards shall be provided.	Protectors that do not provide protection from side exposure. Use of faceshields alone, without spectacles or goggles.
Hot Sparks	Goggles, spectacles: B, C, D, E, F, G, H, I, J, K, L. For severe exposure add N. Respirators R, T.		
Splash from molten metals	Faceshields worn over goggles H, K. 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. Splash and irritating mists.	Indirect vented: goggles, eyecup and cover types: G, H, K. For severe exposure add N. Respirators R, T. Irritating Mist: Special purpose goggles: G. Cover goggle – No ventilation. Respirators R, T.	Provides protection from splash entry with adequate ventilation. 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. Respirators R, T.	Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleaning may be required.	

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EYE AND FACE PROTECTOR SELECTION

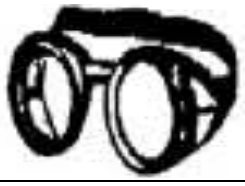
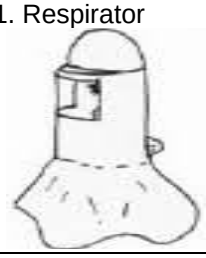
This guide is not intended to be the sole reference in selecting the proper eye and face protector.

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 the 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 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 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, as referenced in R 325.60002b.

(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 325.60002b.

(9) Welding helmets or handshields shall be used only over primary eye protection.

(10) Non-sideshield spectacles are available for frontal protection only.

9. SELECTION GUIDELINES FOR HEAD PROTECTION.

All head protection (helmets) is designed to provide protection from impact and penetration hazards caused by falling objects. Head protection is also available which provides protection from electric shock and burn. When selecting head protection, knowledge of potential electrical hazards is important.

Protective helmets are described by impact type and electrical class. All protective helmets shall meet either Type I or Type II requirements. All helmets shall be further classified as meeting Class G, Class E, or Class C electrical requirements. Helmets shall be classified as follows:

(a) Impact type protective helmets shall be as follows:

(i) Type I helmets are intended to reduce the force of impact resulting from a blow only to the top of the head.

(ii) Type II helmets are intended to reduce the force of impact resulting from a blow to the top or sides of the head.

(b) Electrical classes for protective helmets shall be as follows:

(i) Class G, General protective helmets are intended to reduce the danger of contact with low voltage conductors. Test samples shall be proof-tested at 2200 volts (phase to ground). This voltage is not intended as an indication of the voltage at which the helmets protects the wearer.

(ii) Class E, Electrical protective helmets are intended to reduce the danger of contact with higher voltage conductors. Test samples are proof-tested at 20,000 volts (phase to ground). This voltage is not intended as an indication of the voltage at which the helmet protects the wearer.

(iii) Class C, Conductive protective helmets are not intended to provide protection against contact with electrical hazards.

Where falling object hazards are present, helmets must be worn. Some examples include: working below other workers who are using tools and materials which could fall; working around or under conveyor belts which are carrying parts or materials; working below machinery or processes which might cause material or objects 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.
Stock handlers.
Warehouse laborers.

10. SELECTION GUIDELINES FOR FOOT PROTECTION.

Safety shoes and boots which meet the American Society for Testing and Materials Standards ASTM F 2412 “Standard Test Methods for Foot Protection,” 2005 edition, and ASTM F2413 “Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear,” 2005 edition standards that 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:
Assemblers.
Carpenters.
Craters.
Drywall installers and lathers.
Electricians.
Freight handlers.
Gardeners and grounds- keepers.
Laborers.
Machinists.
Mechanics and repairers.
Packers.
Plumbers and pipe fitters.
Punch and stamping press operators.
Sawyers.
Shipping and receiving clerks.
Stock clerks.
Stock handlers and warehouse laborers.
structural metal workers.
timber cutting and logging workers.
Welders.
Wrappers.

11. 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. MIOSHA is unaware of any gloves that provide protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. Therefore, it is important to select the most appropriate glove for a particular application 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, flame hazards, etc. These 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 the hazard(s) anticipated. Other factors to be considered for glove selection in general include:

(A) 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,

(B) 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 stresses that will be applied.

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

(A) 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 to pass through the skin and cause systemic effects;

(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; and,

(D) Employees must be able to remove the gloves in such a manner as to prevent skin contamination.

12. 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.

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