



DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS DIRECTOR'S OFFICE GENERAL INDUSTRY SAFETY STANDARDS

Filed with the Secretary of State on March 2, 1983 (as amended November 15, 1989)
(as amended May 31, 1995) (as amended May 14, 1997)

These rules take effect 15 days after filing with the Secretary of State.

(By authority conferred on the director of the department of consumer and industry services by sections 16 and 21 of Act No. 154 of the Public Acts of 1974, as amended, and Executive Reorganization Order No. 1996-2, being §§408.1016, 408.1021, and 445.2001 of the Michigan Compiled Laws)

R 408.13311, R 408.13312, R 408.13350, R 408.13370, R 408.13372, R 408.13383, R 408.13385, R 408.13387, R 408.13390 and R 408.13394, of the Michigan Administrative Code, appearing on pages 359 and 360 of the 1983 Annual Supplement to the 1979 Michigan Administrative Code and pages 839 to 853 of the 1995 Annual Supplement to the Code, are amended to read as follows:

PART 33. PERSONAL PROTECTIVE EQUIPMENT

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GENERAL PROVISIONS

R 408.13301. Scope.

Rule 3301. This standard shall apply to all places of employment in this state and includes requirements by 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.

R 408.13302. Definitions; A to E.

- Rule 3302. (1) "Absorptive lens"** means a filter lens whose physical properties are designed to attenuate the effect of glare, reflective, and stray light.
- (2) "Apparatus"** means electrical equipment.
- (3) "Bare hand technique"** means a method of working on energized conductors by isolating the

employee from any ground potential and by placing the employee in continuous firm contact with the energized electric field.

- (4) **“Bump hat or cap”** means a device worn on the head to protect the wearer from bumps or blows but which does not meet the requirements of class A, B, C, and D protective helmets.
- (5) **“Conductor”** means a material, such as a bus bar, wire, or cable, suitable for carrying an electric current.
- (6) **“Corrective lens”** means a lens ground to the wearer’s individual prescription.
- (7) **“Cover lens”** means a removable disc or colorless glass, plastic-coated glass, or plastic that covers a filter lens and protects it from weld spatter, pitting, or scratching when used in a goggle.
- (8) **“Cover plate”** means a removable pane of colorless glass, plastic-coated glass, or plastic that covers a filter plate and protects it from weld spatter, pitting, or scratching when used in a helmet, hood, or goggle.
- (9) **“Electrical worker”** means an operational or maintenance employee working on electrical conductors or equipment, except mining and construction operations.
- (10) **“Energized,”** sometimes known as “live,” means to be electrically charged, or that to which voltage is being applied.
- (11) **“Eye size”** means a measurement expressed in millimeters and denoting the size of the lens-holding section of an eye frame.

R 408.13303. Definitions; F, G.

- Rule 3303. (1) “Face shield”** means a device worn in front of the eyes and a portion or all of the face, whose predominant function is protection of the eyes and face.
- (2) **“Filter lens”** means removable disc in the eyecup of a goggle that absorbs varying proportions of the ultraviolet, visible, and infrared rays according to the composition and density of the lens.
 - (3) **“Filter plate”** means a removable pane in the window of a helmet, hood, or goggle that absorbs varying proportions of the ultraviolet, visible, and infrared rays according to the composition and density of the plate.
 - (4) **“Foot or toe protection”** means a device or equipment, such as, but not limited to, safety toe footwear, toe protectors, or foot guards, that protects an employee’s foot or toes against injury.
 - (5) **“Goggle”** means a device with contour-shaped eyecups or facial contact with glass or plastic lenses, worn over the eyes and held in place by a headband or other suitable means for the protection of the eyes and eye sockets.

R 408.13304. Definitions; H, I.

- Rule 3304. (1) “Hair enclosure”** means a hat, cap, or hair net specifically designed to protect the wearer from hair entanglement in moving machinery.
- (2) **“Headband”** means that part of a goggle, helmet, or hood suspension consisting of a supporting band that encircles the head.
 - (3) **“Headgear”** means that part of a protective helmet, hood, or face shield that supports the device on the wearer’s head, usually consisting of a headband and crown strap.
 - (4) **“Hood”** means a device that is worn to provide protection against acids, chemicals, abrasives, and temperature extremes and entirely encloses the

whole head including face, neck, and shoulders. Air line hoods and hoods used to protect wearers from inhalation or harmful atmospheres are not included in this part.

- (5) **“Interpupillary distance”** means the distance in millimeters between the centers of the pupils of the eyes.
- (6) **“Inservice load”** means an imposed physical load on a safety belt or harness from a free fall of more than 3 feet.
- (7) **“Insulated barrier”** means a separation from another conducting surface by a dielectric substance or air space.
- (8) **“Isolated”** means that all energized conductors or the exposed energized parts of equipment are isolated from the work area by an insulated barrier. Conductors may be isolated by moving them out of reaching distance by use of hot line tools.

R 408.13305. Definitions; L to R.

- Rule 3305. (1) “Lanyard”** means a tether attached to a safety belt or harness at one end and to a lifeline or a fixed object at the other.
- (2) **“Lens”** means the transparent glass or plastic device through which a wearer of protective goggles or spectacles sees.
 - (3) **“Lifeline”** means a rope line, except where used in tree trimming, attached at one end to a fixed object or attended by a person and to which a safety belt or lanyard is secured.
 - (4) **“Lift front”** means a type of mounting frame for a welding helmet, hood, or goggles which is made of 2 connected parts: the front part, which may be removed from the line of vision, contains the high density filter plate with its cover plate, and the back part, which is fixed to the helmet, contains a low density or clear impact resistant plate.
 - (5) **“Plano lens”** means a lens which does not incorporate correction.
 - (6) **“Protective helmet” “protective hat or cap”, or “safety hat or cap”** means a rigid device, often referred to as a safety cap or hat, that is worn to provide protection for the head or portions thereof against impact, flying particles, or electric shock, or any combination thereof, and which is held in place by a suitable suspension.
 - (7) **“Protector”** means a device that provides eye or face protection against the hazards of processes encountered in employment.
 - (8) **“Radiant energy or radiation”** means the 3 kinds of radiant energy which are pertinent to this standard:
 - (a) Ultraviolet.
 - (b) Visible light.
 - (c) Infrared.
 - (9) **“Reaching distance”** means the employee’s reach as extended by a conductive material or equipment.

R 408.13306. Definitions; S to W.

- Rule 3306. (1) “Safety belt”** means a belt worn around the waist and capable of restraining a pull or fall of an employee.
- (2) **“Safety harness”** means a belt with a shoulder strap worn around the waist and shoulder and capable of restraining a pull or fall of an employee.
 - (3) **“Safety strap”** means a restraining line secured at both ends to a safety belt or harness to hold an employee to a fixed object.

- (4) **“Safety toe footwear”** means footwear containing a safety toe box of steel or equivalent material capable of meeting the requirements of this part.
- (5) **“Sanitizing”** means an act or process of destroying organisms that may cause disease.
- (6) **“Shield”** means a device to be held in the hand, or supported without the aid of the operator, whose predominant function is protection of the eyes and face.
- (7) **“Side shield”** means a device of metal, plastic, or other material fixed to a spectacle lens frame to protect an eye from side exposure.
- (8) **“Snood”** means a flexible attachment to the back of a hood or helmet for protection against injury to the back of the head and neck.
- (9) **“Spectacle”** 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.
- (10) **“Supplier”** means a manufacturer or an authorized dealer representative.
- (11) **“Temple”** means that part of a spectacle or other protector extending to and dropping behind the ear of the wearer and intended to position the device before the eyes.
- (12) **“Temple length”** means the measured length of a temple designated in inches.
- (13) **“Working gloves”** means gloves used as personal protective equipment to protect an employee from injuries on the job.

R 408.13308. Hazard assessment and equipment selection.

- Rule 3308. (1)** An employer shall assess the workplace to determine if hazards that necessitate the use of personal protective equipment are present, or are likely to be present. If the hazards are present or are likely to be present 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 the personal protective equipment that properly fits each affected employee.
- (2) An employer shall verify that the required workplace hazard assessment has been performed through a written certification which identifies the document as a certification of hazard assessment and which specifies all of the following information:
- (a) The workplace evaluated.
 - (b) The person who certifies that the evaluation has been performed.
 - (c) The date of the hazard assessment.
- (3) Defective or damaged personal protective equipment shall not be used.

R 408.13309. Training.

- Rule 3309. (1)** An employer shall provide training to each employee who is required by this part to use personal protective equipment. Each employee who is required by this part to use personal protective equipment shall be trained in all of the following areas:
- (a) When 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 equipment.
 - (e) The useful life of the equipment and the proper care, maintenance, and disposal of the 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 existence 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.
- (4) An employer shall verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained and the date of training and that identifies the subject of the certification.

R 408.13310. Employer's and employee's responsibilities.

- Rule 3310. (1)** An employer shall provide to an employee, at no expense to the employee, the initial issue of the type of personal protective equipment which is suitable for the work to be performed as required by this standard or any other general industry safety standard, unless specifically indicated otherwise in this standard or any other general industry safety standard. The employer shall also provide replacement equipment if necessary due to wear and tear on the previous equipment or if the equipment is lost due to the work environment, unless covered by a collective bargaining agreement.
- (2) An employee shall use all of the personal protective equipment provided by the employer.

FACE AND EYE PROTECTION

R 408.13311. Certification.

- Rule 3311. (1)** All eye and face protection devices purchased after July 5, 1994, shall be in compliance with occupational and educational eye and face protection of the American national standards institute standard Z87.1-1989 or the devices shall be demonstrated by the employer to be equally effective. The standard is adopted by reference in these rules and may be purchased from the American National Standards Institute, 11 West 42 Street, New York, New York 10036, or from the Safety Standards Division, Michigan Department of Consumer and Industry Services, 7150 Harris Drive,

Box 30643, Lansing, Michigan 48909, at a cost at the time of adoption of these rules of \$18.00.

- (2) If it is impractical for eye and face protection devices to be marked in compliance with ANSI standard Z87.1-1989, then the containers for eye and face protection shall be in compliance with the standard.
- (3) Eye and face protection devices purchased before July 5, 1994, shall be in compliance with the ANSI standard entitled "Occupational and Educational Eye and Face Protection," Z87.1-1968, or the devices shall be demonstrated by the employer to be equally effective. The standard is adopted by reference in these rules and may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Safety Standards Division, Michigan Department of Consumer and Industry Services, Box 30643, Lansing, Michigan 48909, at a cost at the time of adoption of these rules of \$18.00.

R 408.13312. Face and eye protection generally.












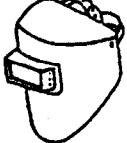



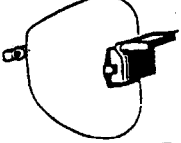
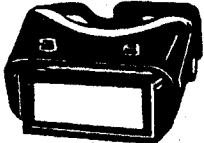
Rule 3312. (1) An employer shall ensure that each affected employee shall use appropriate eye or face protection as prescribed in R 408.13311 if a hazard exists due to any of the following:

- (a) Flying objects or particles.
- (b) Harmful contacts.
- (c) Exposures.
- (d) Molten metal.
- (e) Liquid chemicals.
- (f) Acids or caustic liquids.

- (g) Chemical gases or vapors.
- (h) Glare.
- (i) Injurious radiation.
- (j) Electrical flash.
- (k) A combination of the hazards specified in this subrule.

- (2) Table 1 shall be used as a guide to select the proper eye and face protection. Each affected employee shall use eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors, such as clip-on or slide-on side shields, that are in compliance with the pertinent requirements of this rule are acceptable.
- (3) Contact lenses or federal drug administration (FDA) standard hardened or plastic lenses are not eye protection as required by these rules.
- (4) A face or eye protector shall be in compliance with all of the following minimum requirements:
 - (a) It shall protect against the particular hazards for which it is designed.
 - (b) It shall fit snugly and shall not unduly interfere with movements of the wearer.
 - (c) It shall be capable of withstanding sanitizing.
- (5) A protector shall be distinctly marked to identify the manufacturer.
- (6) Limitations or precautions indicated by the manufacturer shall be transmitted to the user and care taken to see that the limitations or precautions are observed.
- (7) Table 1 reads as follows:

**TABLE 1
FACE AND EYE PROTECTOR SELECTION CHART
PROTECTIVE DEVICES**

A.  Spectacle, No Sideshield	E.  Spectacle, Non-Removable Lens	I.  Cover Goggle, Direct Ventilation	N.  Faceshield
B.  Spectacle, Half Sideshield	F.  Spectacle, Lift Front	J.  Cup Goggle, Direct Ventilation	O.  Welding Helmet, Hand Held
C.  Spectacle, Full Sideshield	G.  Cover Goggle, No Ventilation	K.  Cup Goggle, Indirect Ventilation	P.  Welding Helmet, Stationary Window
D.  Spectacle, Detachable Sideshield	H.  Cover Goggle, Indirect Ventilation	L.  Spectacle, Headband Temple	Q.  Welding Helmet, Lift Front
<p>*The illustrations shown are only representative of protective devices commonly available at the time of the writing of this standard. Protective devices do not need to take the forms shown, but must meet the requirements of the standard.</p>		M.  Cover Welding - Burning Goggles Indirect Ventilation	

NOTES:

- (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 Table 2.
- (5) Persons whose vision requires the use of prescription (Rx) lenses shall 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 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. (ANSI Z87.1-1989)
- (9) Welding helmets or handshields shall be used only over primary eye protection.
- (10) Non-sideshield spectacles are available for frontal protection only.

		ASSESSMENT SEE NOTE (1)	PROTECTOR TYPE	PROTECTORS	LIMITATIONS	NOT RECOMMENDED
I M P A C T	Chipping, grinding, machining, masonry, work, riveting, and sanding.	Flying fragments, objects, large chips, particles, sand, dirt, etc.	B, C, D, E, F, G, H, I, J, K, L, N	Spectacles, goggles, face shields. SEE NOTES (1) (3) (5) (6) (10) For severe exposure add N	Protective devices do not provide unlimited protection. SEE NOTE (7)	Protectors that do not provide protection from side exposure. SEE NOTE (10) Filter or tinted lenses that restrict light transmittance, unless it is determined that a glare hazard exists. Refer to OPTICAL RADIATION.
H E A T	Furnace operations, pouring, casting, hot dipping, gas cutting, and welding.	Hot sparks	B, C, D, E, F, G, H, I, J, K, L, N,	Face shields, goggles, spectacles *For severe exposure Add N SEE NOTE (2) (3)	Spectacles, cup and cover type goggles not provide unlimited protection. SEE NOTE (2)	Protectors that do not provide protection from side exposure.
		Splash from molten metals	*N	*Face shields worn over goggles H, K		
		High temperature exposure	N	Screen face shields, Reflective face shields. SEE NOTE (2) (3)	SEE NOTE (3)	
C H E M I C A L	Acid and chemicals handling, degreasing, plating.	Splash	G, H, K, *N	Goggles, eyecup, and cover types. *For severe exposure Add N.	Ventilation should be adequate but well protected from splash entry.	
		Irritating mists	G	Special purpose goggles.	SEE NOTE (3)	
D U S T	Woodworking, buffing, general dusty conditions.	Nuisance dust	G, H, K	Goggles, eyecup and cover types	Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleaning may be required.	
O P T I C A L R A D I A T I O N	WELDING: Electric Arc		O, P, Q	TYPICAL FILTER LENS PRO-SHADE TECTORS SEE NOTE (9) 10-14 Welding Helmets Or Welding Shields	Protection from optical radiation is directly related to filter lens density. SEE NOTE (4). Select the darkest shade that allows adequate task performance.	Protectors that do not provide protection from optical radiation. SEE NOTE (4)
	WELDING: Gas		J, K, L, M, N, O, P, Q	SEE NOTE (9) 4-8 Welding Goggles Or Welding Faceshields		
	CUTTING			3-6		
	TORCH BRAZING			3-4		
	TORCH SOLDERING		B, C, D, E, F, N	1.5-3 Spectacles Or Welding Faceshield	SEE NOTE (3)	
GLARE			A, B	Spectacle SEE NOTE (9) (10)	Shaded or special Purpose lenses as suitable SEE NOTE (8)	

(8) Each affected employee shall use equipment that has filter lenses which have shade numbers appropriate for the work being performed for protection from injurious light radiation. Table 2 is a

listing of appropriate shade numbers for various operations.

(9) Table 2 reads as follows:

**TABLE 2
FILTER LENSES FOR PROTECTION AGAINST RADIANT ENERGY**

OPERATIONS	ELECTRODE SIZE 1/32 INCH	ARC CURRENT	MINIMUM* PROTECTIVE SHADE	
Shield metal arc welding	Less than 3	Less than 60	7	
	3-5	60-160	8	
	More than 5-8	161-250	10	
	More than 8	251-550	11	
Gas metal arc welding and flux cored arc welding		Less than 60	7	
		60-160	10	
		161-250	10	
		251-500	10	
Gas tungsten arc welding		Less than 50	8	
		50-150	8	
		150-500	10	
Air carbon	(Light)	Less than 500	10	
Air cutting	(Heavy)	500-1,000	11	
Plasma arc welding		Less than 20	6	
		20-100	8	
		101-400	10	
		401-800	11	
Plasma arc cutting	(Light)**	Less than 300	8	
	(Medium)**	300-400	9	
	(Heavy)**	401-800	10	
Torch brazing			3	
Torch soldering			2	
Carbon arc welding			14	
OPERATIONS	PLATE THICKNESS (INCHES)	(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 151	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 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 lighter filters may be used when the arc is hidden by the workpiece.

R 408.13313. Maintenance and cleanliness of protectors.

Rule 3313. (1) A face or eye protector shall be kept clean and in good repair.

(2) Cleaning facilities for protectors shall be provided away from the hazard, but readily accessible to the wearer.

(3) A slack, worn out, sweat-soaked, knotted, or twisted headband shall be replaced.

(4) A face or eye protector is a personal item and shall be for the individual and exclusive use of the person to whom it is issued. If circumstances require reissue, the protector shall be thoroughly cleaned, sanitized, and in good condition.

radiant energy and spatter resulting from arc welding.

(2) A helmet and a hand shield are the only permissible types.

(3) A helmet and a hand shield shall be made with the same basic design and of the same basic materials: an opaque, bowl-shaped or modified bowl-shaped device containing a window with filter plate which allows the wearer to see the radiant object, yet prevents harmful intensities or radiation from reaching his eyes. A helmet shall be supported on the head by an adjustable headgear. A hand shield shall have a handle attached to the bottom by which it is held in the hand. The basic designs may be modified to provide protection against special hazards, but modified equipment shall meet the same requirements as the basic design.

(4) A helmet and a hand shield shall bear a permanent and legible marking by which the manufacturer may be readily identified.

WELDING HELMETS AND HAND SHIELDS

R 408.13320. Purposes, types, styles, and marking.

Rule 3320. (1) The devices described in R 408.13320 to R 408.13330 are designed to provide protection for the face, eyes, ears, and neck against intense

R 408.13321. Rigid helmet bodies.

Rule 3321. A helmet body of a rigid helmet shall be of such size and shape as to protect the face, forehead, ears, and neck to a vertical line back of the ears. It shall have 1 or more openings in the front for filter plates or filter lenses. The helmet body shall be attached to the headgear so that it will not come in contact with any part of the head and so that it can be lifted up from in front of the face and hold its position in front of the head. The helmet body shall be made of vulcanized fiber, reinforced plastic, or other suitable material which shall be thermally insulating, noncombustible or slow burning, opaque to visible, ultraviolet, and infrared radiations, and capable of withstanding sanitizing. The inside of the helmet body shall have a low light reflecting finish. Rivets or other metal parts, if terminating on the inside surface, shall be adequately separated from the wearer's head.

R 408.13322. Rigid helmet headgear or cradles.

Rule 3322. A rigid helmet shall have a headgear or cradle that shall hold the helmet body comfortably and firmly on the wearer's head, but shall permit the helmet body to be tilted back over the head. The headgear shall be readily adjustable for all head sizes from 6 1/2 to 7 5/8, without the use of tools. The headgear shall be made of materials which are thermally insulating, noncombustible or slow burning, resistant to heat, and capable of withstanding sanitizing. Where required, the headgear shall be fitted with a removable and replaceable sweatband covering at least the forehead portion of the headband. The sweatband shall be made of leather or other suitable material which is slow-burning and nonirritating.

R 408.13323. Rigid helmet headgear substitutes.

Rule 3323. A headgear for a rigid helmet may be replaced by an impact resistant hat or cap that meets the requirements of R 408.13370 to R 408.13378 of this part, or other suitable device to which the helmet body is connected, if the helmet body may be lifted and adjusted to permit unobstructed vision or lowered to furnish complete protection, as required. The alternative device shall meet the requirements for sanitizing and resistance to heat and, in addition, shall meet the applicable requirements of any additional functions, such as protection against falling objects.

R 408.13324. Rigid helmet filter plates.

Rule 3324. (1) A filter plate on a rigid helmet shall fit into the frame and cover the window.

- (2) Both surfaces of a filter plate shall be well polished and shall be free from striae, waves, or other defects that would impair the optical quality of the surfaces. Filter plate surfaces shall be flat and substantially parallel.
- (3) Table 2 of R 408.13312 shall be used to select the proper shade number of filter lenses or plates during welding operations.
- (4) When specified, a filter plate shall be impact-resistant, unless impact-resistant eye protection is worn in conjunction with a welding helmet.
- (5) A filter plate shall be marked with the shade designation and a permanent and legible marking by which the manufacturer may be readily identified. In addition, a glass filter plate, when treated for

impact resistance, shall be marked with the letter "H."

- (6) A cover plate made of plain glass, of glass coated on 1 or on both sides with plastic, or of a slow-burning solid plastic sheet shall be used to protect a filter plate from damage. A cover plate shall be the same peripheral size and shape as the filter plate, and the thickness of a cover plate shall not be less than 0.050 inches. A cover plate shall transmit not less than 75% of the luminous radiation and shall be substantially free from optical imperfections.

R 408.13325. Nonrigid helmets.

Rule 3325. A helmet may be made of nonrigid materials where it is to be used in confined spaces, or may be collapsible for convenience in carrying or storing. The helmet may be of the same general shape as a rigid helmet, except that a more complete covering of the top of the head is necessary in order to maintain the face, side, and windows in proper position. The requirements for the filter plates, cover plates, and lens mounting frame are the same as for a rigid helmet. A headgear may be used. The material shall be nonconducting and opaque to ultraviolet, visible, and infrared radiations. Stitched seams shall be welded. No stitching shall be exposed.

R 408.13327. Hand shield.

Rule 3327. A hand shield shall be constructed of materials similar to those used for a helmet and in like manner. The materials, lens mounting arrangement, and filter and cover plates shall conform to the requirements for the corresponding parts of the helmet body with headgear. The handle shall be made of a material that is a nonconductor of electricity and is noncombustible or slow burning. It shall be of such size and shape as to be held easily by 1 hand and shall be firmly attached to the lower portion of the shield. A hand shield intended for use by other than a welding operator shall have filter and cover plates suitable for the intended use.

R 408.13329. Helmet and hand shield lift fronts and chin rests.

Rule 3329. (1) The lift front of the helmet shall be fabricated from metal, plastic, or other suitable material. A snap hinge shall be provided so that the front part will stay up or down but will not remain in a partially opened position. The lift front seal against the helmet shall be light tight. The lift front shall be designed to accommodate 3 plates: a clear impact-resisting plate in the back or fixed part; a filter plate, impact-resisting, when specified; and a cover plate in the front part. The back or fixed part plate shall be clear heat treated glass or plastic not more than 3/16 inch thick or less than 1/8 inch and capable of withstanding the impact test.

- (2) To avoid contact of a helmet or hand shield with the face of the wearer, a chin rest or adjustable position stop shall be provided. They shall be constructed of suitable rigid material and shall be detachable from the body of the hand shield.

R 408.13330. Helmet snoods, neck protectors, and aprons.

Rule 3330. (1) A snood or back-of-head-and-neck protector where required shall be of material that is flame resistant, that is a good insulator of heat and electricity, and that is capable of withstanding

sanitizing. They shall be designed for easy attachment to the helmet, helmet headgear, or cradle.

- (2) An apron or bib, where required for a helmet, shall be of nonflammable, nonconducting material that is flexible and capable of withstanding sanitizing.

R 408.13332. Effect of head protection standards.

Rule 3332. The characteristics and performance requirements of these rules for welding helmets shall in no way be altered through their attachment to protective hats and caps, as required by R 408.13370 to R 408.13378 of this part.

FACE SHIELDS

R 408.13340. Purposes and uses.

Rule 3340. (1) The devices described in R 408.13340 to R 408.13347 of this part are designed to provide protection to the front part of the head, including forehead, cheeks, nose, mouth, and chin, and to the neck, where required, from flying particles and sprays of hazardous liquids, and to provide filter protection where required. Such devices shall be worn over suitable basic eye protection devices.

- (2) Typical uses for face shields include, but are not limited to, the following situations:
- Woodworking operations where chips and particles fly.
 - Metal machining causing flying particles.
 - Buffing, polishing, wire brushing, and grinding operations causing flying particles or objects.
 - Spot welding.
 - Handling of hot or corrosive materials.

R 408.13342. Types and materials.

Rule 3342. (1) Face shields are of 3 basic styles: headgear without crown protector; headgear with crown protector; and headgear with crown protector and chin protector. Each of these styles shall accommodate any of the following styles of windows:

- Clear transparent.
 - Colored transparent.
 - Wire screen.
 - Combination of plastic and wire screen.
 - Fiber window with filter plate mounting.
- (2) Materials used in the manufacture of a face shield shall be nonirritating to the skin when subjected to perspiration and shall be capable of withstanding frequent sanitizing. Metals, when used, shall be resistant to corrosion. Plastic materials shall be slow burning. Clear or colored plastic materials used in windows shall be of an optical grade. Plastic windows shall not be used in connection with welding operations unless they meet the requirements of table 1 of this part.

R 408.13343. Components.

Rule 3343. A face shield shall consist of a detachable transparent plastic window, wire screen window, or opaque frame with window; a tilting support, an adjustable headgear; and, as required, a crown protector and chin protector.

R 408.13344. Windows.

Rule 3344. (1) A window shall be designed to fit the contour of the window support.

- (2) A window supporting or window holding member, which shall be a band or crown protector, shall be attached to the headgear. The window support shall

position the window in front of the face to provide clearance for the nose and eyeglasses of the wearer.

- (3) The attachment of the window to the window support shall be secure and shall permit easy removal and replacement. The several sizes and types of windows for a face shield shall be interchangeable for attachment to the window support.
- (4) A plastic or wire screen window without frame shall be not less than 9 1/2 inches wide at the top and 8 1/2 inches wide at the bottom, measured over its curved surfaces when attached and in position on the window support, and not less than 6 inches high. A window, when used in a frame, shall not be less than 4 inches wide and 2 inches high, and the frame shall conform to the dimensions specified for a window without a frame. A plastic window shall be not less than 0.040 inch nominal thickness.
- (5) The exposed borders of a wire screen window shall be suitably bound or otherwise finished to eliminate sharp, rough, or unfinished edges. A wire screen window shall not be less than 20-mesh screen.
- (6) A window support shall be pivotally attached to the sides of the headgear to permit easy tilting, either upward or downward, of the supporting member and of the window attached thereto. The window shall be capable of being tilted sufficiently upward so that the center of its bottom edge shall be out of the line of horizontal vision. The tension of the tilting mechanism shall be sufficient to hold the window without slippage in either the up or down position.

R 408.13345. Headgear.

Rule 3345. (1) A headgear shall consist of at least a headband and a crown strap. The headgear shall be made from materials having a low heat conductivity. The design shall hold the window and window support comfortably and firmly in place on the wearer's head and shall provide for tilting the window away from the face.

- (2) A headgear shall be readily adjustable to head sizes from 6 1/2 to 7 5/8 without the use of tools. The crown strap or band shall be attached to and extend between the front and rear centers or from the middle sides of the headband. It shall form an arc over the head to assist in positioning and holding the headgear in place. An adjusting device shall be positive and hold firmly in place after being adjusted. Its mechanisms and movements shall be protected so that the wearer's hair cannot catch in the device.
- (3) For greater protection, headgear may be replaced by an impact resistant hat or cap to which the window support is connected. The attachment may be either rigid or swiveled. If swiveled, the design shall permit lifting and adjusting of the window to permit unobstructed vision or lowering to furnish protection.

R 408.13346. Crown and chin protectors.

Rule 3346. (1) A crown protector and chin protector shall be made of material having an impact resistance not less than that of the plastic window. When the crown protector is used in conjunction with the chin protector for protection against sprays of hazardous liquids, the assembly of the crown protector and window support and the assembly of the chin protector and window shall not allow liquids

to pass through any opening in the assembly and reach the face, forehead, or chin of the wearer.

- (2) A crown protector shall be shaped to cover at least the frontal portion of the head and shall extend around each side at least to a vertical line at the front of the ears. It may be an integral part of the window support or a separate assembly. The design shall provide a comfortable clearance over the forehead and the head of the wearer.
- (3) A chin protector shall be shaped to cover at least the chin and upper part of the neck. The design shall provide a comfortable clearance under the chin of the wearer.

R 408.13347. Marking; special operating conditions.

- Rule 3347. (1)** When a face shield is used in atmospheres or working areas requiring special conditions of nonconductivity or nonsparking, materials used shall meet these requirements. A face shield shall be plainly and permanently labeled, identifying it as a "nonconductive face shield" or "nonsparking face shield."
- (2) A headgear and a plastic window shall bear a permanent and legible marking by which the manufacturer may be readily identified. A window offered for protection against glare shall also bear its shade designation.

EYE PROTECTORS

R 408.13350. Prescription lenses.

Rule 3350. An employer shall assure that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards shall wear eye protection which incorporates that prescription in its design or shall wear eye protection which can be worn over the prescription lenses without disturbing the proper position for the prescription lenses or protective lenses.

R 408.13352. Materials.

Rule 3352. Materials used in the manufacturing of eye protectors shall combine mechanical strength and lightness of weight to a high degree, shall be nonirritating to the skin when subjected to perspiration, and shall withstand frequent sanitizing. Metals, where used, shall be corrosion resistant. Plastic materials, when used, shall be noncombustible or slow burning. Cellulose nitrate, or materials having flammability characteristics approximately those of cellulose nitrate, shall not be used.

R 408.13353. Lenses.

- Rule 3353. (1)** Lenses intended for use in eye protectors are of 4 basic types, as follows:
- (a) Clear lenses which are impact-resisting and provide protection against flying objects.
 - (b) Absorptive lenses of shades 1.7 through 3.0 which are impact-resisting and provide protection against flying objects and glare or which are impact-resisting and provide protection against flying objects, and narrowband spectral transmittance of injurious radiation.
 - (c) Protective-corrective lenses which are impact-resisting and either clear or absorptive, as specified for persons requiring visual correction.

(d) Filter lenses which are impact-resisting and provide protection against flying objects and narrow-band spectral transmittance of injurious radiation.

- (2) Glass filter lenses intended for use in eyecup goggles shall be heat treated.
- (3) The height of the safety lens shall not be less than 30 millimeters.

R 408.13355. Eyecup goggles; components.

Rule 3355. Eyecup goggles shall consist of 2 eyecups with lenses and lens retainers, connected by an adjustable bridge, and a replaceable and adjustable headband or other means for retaining the eyecups comfortably in front of the eyes. Recommended applications for the use of eyecup goggles are shown in table 1 of R 408.13312(7).

R 408.13356. Eyecup goggles; types and models.

- Rule 3356. (1)** Eyecup goggles shall be of 2 types as follows:
- (a) Cup-type goggles designed to be worn by individuals who do not wear corrective spectacles.
 - (b) Cover cup-type goggles designed to fit over corrective spectacles.
- (2) The 2 types of eyecup goggles are subdivided into the following classes:
 - (a) Chipper's models providing impact protection against flying objects.
 - (b) Dust and splash models providing protection against fine dust particles or liquid splashes and impact.
 - (c) Welder's and cutter's models providing protection against glare, injurious radiations, and impact.
 - (3) The basic designs may be modified to provide more protection against special hazards, but the modified equipment shall meet the same requirements as the basic design.

R 408.13357. Eyecup goggles; fit.

- Rule 3357. (1)** The edge of the eyecup of eyecup goggles which bears against the face shall have a smooth surface free from roughness or irregularities which might exert undue pressure or cause discomfort to the wearer. The eyecups shall be of such shape and size as to protect the entire eye sockets.
- (2) Cover cup-type goggles shall provide ample clearance and not interfere with the spectacles of the wearer. The edge of the goggles which bears against the face shall have a smooth surface free from roughness or irregularities which might exert undue pressure or cause discomfort to the wearer.

R 408.13359. Eyecup ventilation.

- Rule 3359. (1)** Eyecups of chipper's models shall be ventilated in a manner to permit circulation of air.
- (2) Eyecups of dust and splash models shall be ventilated in a manner to permit circulation of air. The ventilation openings shall be baffled or screened to prevent direct passage of dust or liquids into the interior of the eyecups.
 - (3) Eyecups of welder's and cutter's models shall be ventilated in a manner to permit circulation of air and shall be opaque. The ventilation openings shall be baffled to prevent passage of light rays into the interior of the eyecup.

R 408.13360. Eyecup lenses and retaining rings.

Rule 3360. (1) An eyecup shall be provided with a rigidly constructed lens retaining ring of metal or of plastic designed to accommodate lenses and to permit their ready removal and replacement without damage to the eyecup or to the lenses and without the use of tools. The ring shall provide a complete clamping action against the lens. Lens retainers for welder's and cutter's models shall accommodate a filter lens, fiber gasket, and cover lens.

(2) A filter lens shall be marked with the shade designation and a permanent and legible marking by which the manufacturer may be readily identified. A glass filter lens, when treated for impact resistance, shall also be marked with the letter "H".

R 408.13362. Flexible and cushioned fitting goggles; construction.

Rule 3362. Flexible and cushioned fitting goggles shall consist of a wholly flexible frame, forming a lens holder or with a separable lens holder or a rigid frame with integral lens or lenses, having a separate cushioned fitting surface on the full periphery of the facial contact area. Materials used shall be chemical-resistant, nontoxic, nonirritating, and slow burning. There shall be a positive means of support on the face, such as an adjustable headband of suitable material or other suitable means of support to retain the frame comfortable and snugly in place in front of the eyes. A frame which is a lens holder or has a separable lens holder shall hold the lenses firmly and tightly and be removable or replaceable without the use of tools. The goggles may be ventilated or not, as required by their intended use. Where chemical goggles are ventilated, the openings shall be such as to render the goggles splashproof.

R 408.13363. Flexible and cushioned fitting goggles; protection.

Rule 3363. (1) Chipper's models of flexible and cushioned fitting goggles shall provide protection against impact.

(2) Dust and splash models shall provide protection from fine dusts, fumes, liquids, splashes, mists, and spray, alone or with reflected light or glare, wind, and impact.

(3) Gas welder's and cutter's models shall provide protection against glare, injurious radiations, and impact.

R 408.13364. Flexible and cushioned fitting goggles; marking.

Rule 3364. (1) The frame of flexible and cushioned fitting goggles shall bear a trademark or name identifying the manufacturer.

(2) Each separate lens shall be distinctly marked in a manner by which the manufacturer may be identified.

(3) A heat-treated glass filter plate or lens shall also be marked with the shade designation and the letter "H".

(4) The marking shall be clear cut and permanent and so placed as not to interfere with the vision of the wearer.

R 408.13366. Foundrymen's goggles; construction.

Rule 3366. (1) A foundryman's goggles shall consist of a mask made of a flexible, nonirritating, and noncombustible or slow-burning material, such as a leather or flexible plastic,

suitable ends holders attached thereto, lenses, and a positive means of support on the face, such as an adjustable headband, to retain the mask comfortably and snugly in place in front of the eyes. The edge of the mask on contact with the face shall be provided with a binding of corduroy or other suitable material. The lens holders shall hold the lenses firmly and tightly and may be readily removable or replaceable. The lens holders shall be ventilated to permit circulation of air.

R 408.13367 Foundrymen's goggles; protection.

Rule 3367. (1) A foundryman's goggles shall provide protection against impact and hot-metal splash hazards encountered in foundry operations such as melting, pouring, chipping, babbitting, grinding, and riveting. Where required, they shall also provide protection against dusts.

(2) Applications for use of foundryman's goggles are shown in Table 1 or R 408.13312(7).

(3) Materials shall resist flame, corrosion, water, and sanitizing.

R 408.13369. Metal, plastic, and combination metal and plastic spectacles.

Rule 3369. (1) Spectacles of metal, plastic, or a combination thereof, shall consist of 2 lenses in a frame which supports the lenses around their entire periphery of suitable size and shape for the purpose intended connected by a nose bridge, and retained on the face by temples or other suitable means. The spectacles shall be furnished with or without sideshields depending upon their intended use. The frames, temples, and sideshields may be metal or plastic and when made of plastic shall be of the slow-burning type.

(2) Spectacles shall provide protection to the eye from flying objects, and, when required, from glare and injurious radiations. Spectacles without sideshields are intended to provide frontal protection. Where side as well as frontal protection is required, the spectacles shall be provided with sideshields. See Table 1 of R 408.13312(7).

(3) Frames shall be designed for industrial exposure and shall bear a trademark identifying the manufacturer on both fronts and temples. The frame front shall carry a designation of the eye size and bridge size, where applicable. Temples shall be marked as to the overall length or fitting value.

(4) Temples may be of the cable or spatula type, as specified, and shall be of such design as to permit adjustment and fit comfortably and securely on the wearer. The size of the temples shall be clearly marked.

(5) Safety lens in frames which do not comply with this part shall not be worn.

HEAD PROTECTION EQUIPMENT**R 408.13370. Head protection generally.**

Rule 3370. (1) An employer shall ensure that each affected employee shall be provided with, and shall wear, head protection equipment and accessories when the employee is required to be present in areas where a hazard exists from falling or flying objects or from other harmful contacts or exposures or where there is a risk of injury from electric shock, hair entanglement, chemicals, or temperature extremes.

- (2) Service facilities shall be provided for the sanitizing and replacement of needed parts when necessary and before head protection equipment is reissued.
- (3) Head protection equipment that has been physically altered or damaged shall not be worn or reissued to an employee.
- (4) An employee shall not physically alter, and shall guard against damage to, the head protection equipment provided.
- (5) An employee shall use the provided head protection equipment in accordance with the instructions and training received.

R 408.13372. Head protection; adoption of standards by reference.

Rule 3372. (1) Protective helmets purchased after July 5, 1994, shall be in compliance with American national standards institute standard Z89.1-1986, entitled "Requirements for Protective Headwear for Industrial Workers," or shall be demonstrated to be equally effective. The standard is adopted by reference in these rules and may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Safety Standards Division, Michigan Department of Consumer and Industry Services, Box 30643, Lansing, Michigan 48909, at a cost at the time of adoption of these rules of \$12.00.

- (2) Protective helmets purchased before July 5, 1994, shall be in compliance with American national standards institute standard Z89.1-1969, entitled "Requirements for Industrial Head Protection," or shall be demonstrated by the employer to be equally effective. The standard is adopted by reference in these rules and may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Safety Standards Division, Michigan Department of Consumer and Industry Services, Box 30643, Lansing, Michigan 48909, at a cost at the time of adoption of these rules of \$12.00.

R 408.13375. Protective helmets.

Rule 3375. (1) Protective helmets or safety hats and caps shall be of the following types:

- (a) Class - A - Limited voltage protection.
- (b) Class - B - High voltage protection.
- (c) Class - C - No voltage protection.
- (d) Class - D - Limited voltage protection – fire fighters service helmets with full brim.
- (2) A class C helmet or any metallic head device shall not be furnished by an employer or used by an employee for head protection, except where it has been determined that the use of other types of protective helmets or safety hats or caps is impractical, such as where chemical reaction will cause the deterioration of other types of head protection.
- (3) A protective helmet furnished by an employer shall be identified on the inside of the shell with the name of the manufacturer.
- (4) When used in conjunction with protective helmets, face shields, welding helmets, and goggles shall be in compliance with the requirements set forth in R 408.13311 to R 408.13369 and Michigan department of consumer and industry services, division of occupational health standards for hearing protection being R 325.60101.
- (5) Winter liners and chin straps used in conjunction with class B helmets for high-voltage protection

shall not contain any metallic parts or other conductive materials. Winter liners and chin straps used in areas where there is a danger of ignition from heat, flame, or chemical reaction shall be made of materials that are nonburning or flame retardant.

- (6) Bump hats or caps or other limited-protection devices shall not be used as a substitute for protective helmets for the hazards described in R 408.13370.
- (7) Protective helmets designed to reduce electrical shock hazard shall be worn by an employee who is near exposed electrical conductors that could come in contact with the employee's head.

R 408.13376. Hoods.

Rule 3376. (1) A hood shall be made of materials that combine mechanical strength and lightness of weight to a high degree, shall be nonirritating to the skin when subjected to perspiration and shall be capable of withstanding frequent cleaning and disinfection. Materials used in the manufacture of hoods shall also be suitable to withstand the hazards to which the user may be exposed.

- (2) A hood shall bear a permanent and legible marking by which the manufacturer may be readily identified.
- (3) A hood shall be designed to provide adequate ventilation for the wearer. Where air lines are used they shall be installed and used in accordance with Michigan department of consumer and industry services, division of occupational health standards.
- (4) A protective helmet shall be used in conjunction with a hood where there is a head injury hazard and the hood shall be designed to accommodate such helmet.

R 408.13378. Hair enclosures.

Rule 3378. A hat, cap, or net shall be used by a person where there is a danger of hair entanglement in moving machinery or equipment, or where there is exposure to means of ignition. It shall be designed to be reasonably comfortable to the wearer, completely enclose all loose hair, and be adjustable to accommodate all head sizes. Material used for a hair enclosure shall be fast dyed, nonirritating to the skin when subjected to perspiration, and capable of withstanding frequent cleaning. It shall not be reissued from one employee to another unless it has been thoroughly sanitized.

FOOT PROTECTION

R 408.13383. Certification.

Rule 3383. (1) All protective footwear purchased after July 5, 1994, shall bear a permanent mark to show the manufacturer's name or trademark and certification of compliance with the provisions of ANSI standard Z41-1991, entitled "Personal Protective Footwear," which is adopted by reference in these rules and which may be inspected at the Lansing office of the Michigan department of consumer and industry services. The standard may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Michigan Department of Consumer and Industry Services, Safety Standards Division, Box 30643, Lansing, Michigan 48909, at a cost at the time of adoption of these rules of \$7.00.

- (2) Protective footwear purchased before July 5, 1994, shall bear a permanent mark to show the manufacturer's name or trademark and certification of compliance with American national standards institute standard Z41.1-1967, entitled "Men's Safety-Toe Footwear," which is adopted by reference in these rules and which may be inspected at the Lansing office of the Michigan department of consumer and industry services. The standard may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Michigan Department of Consumer and Industry Services, Safety Standards Division, Box 30643, Lansing, Michigan 48909, at a cost at the time of adoption of these rules of \$32.00.

R 408.13384. Toe protection.

Rule 3384. Where toe protection other than safety toe footwear is worn, the toe protection shall have an impact value of not less than that required for the safety toe footwear.

R 408.13385. Foot protection generally.

Rule 3385. (1) An employer shall ensure that each affected employee shall wear protective footwear when working in areas where an employee's feet are exposed to electrical hazards or where there is a danger of foot injuries due to falling or rolling objects or a danger of objects piercing the sole of the shoe. The payment for protective footwear shall be determined between the employer and the employee or shall be as determined by a collective bargaining agreement.

- (2) Safety shoes and boots which are not worn over shoes and which are worn by more than 1 employee shall be maintained, cleaned, and sanitized inside and out before being issued to another employee.

R 408.13386. Foot protection; specific requirements.

Rule 3386. Where a hazard is created from a process, environment, chemical, or mechanical irritant which would cause an injury or impairment to the feet by absorption or physical contact, other than from impact, footwear, such as boots, overshoes, rubbers, wooden-soled shoes, or their equivalent, shall be used.

ELECTRICAL PROTECTIVE EQUIPMENT

R 408.13387. Electrical protective equipment; design; certification; use; storage.

Rule 3387. (1) Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber shall be in compliance with all of the following requirements as applicable:

- (a) Blankets, gloves, and sleeves shall be produced by a seamless process.
- (b) Each item shall be clearly marked as follows:
 - (i) Class 0 equipment shall be marked class 0.
 - (ii) Class 1 equipment shall be marked class 1.
 - (iii) Class 2 equipment shall be marked class 2.
 - (iv) Class 3 equipment shall be marked class 3.
 - (v) Class 4 equipment shall be marked class 4.

- (vi) Non-ozone-resistant equipment other than matting shall be marked type 1.
- (vii) Ozone-resistant equipment other than matting shall be marked type II.
- (viii) Other relevant markings, such as the manufacturer's identification and the size of the equipment, may also be provided.

(c) Markings shall be nonconducting and shall be applied in a manner that does not impair the insulating qualities of the equipment.

(d) Markings on gloves shall be confined to the cuff portion of the glove.

- (2) Equipment shall be capable of withstanding the alternating current proof test voltage specified in table 4 or the direct current proof test voltage specified in table 5. The proof test shall reliably indicate that the equipment can withstand the voltage involved. The test voltage shall be applied continuously for 3 minutes for equipment other than matting and shall be applied continuously for 1 minute for matting.

- (3) Gloves shall also be capable of withstanding the alternating current proof test voltage specified in table 4 after a 16-hour water soak. When the alternating current proof test is used on gloves, the 60-hertz proof test current may not be more than the values specified in table 4 at any time during the test period. If the alternating current test is made at a frequency other than 60 hertz, the permissible proof test current shall be computed from the direct ratio of the frequencies. For the test, gloves (right side out) shall be filled with tap water and immersed in water to a depth that is in accordance with table 6. Water shall be added to or removed from the glove, as necessary, so that the water level is the same inside and outside the glove. After the 16-hour water soak specified in this rule, the 60-hertz proof test current may exceed the values specified in table 4 by not more than 2 milliamperes.

- (4) Equipment that has been subjected to a minimum breakdown voltage test may not be used for electrical protection. See subrule (3) of this rule.

- (5) Material used for type II insulating equipment shall be capable of withstanding an ozone test without visible effects. The ozone test shall reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material. See subrule (3) of this rule.

- (6) Equipment shall be free of harmful physical irregularities that can be detected by the tests or inspections required under this rule. Surface irregularities that may be present on all rubber goods because of imperfections on forms or molds or because of inherent difficulties in the manufacturing process and that may appear as indentations, protuberances, or imbedded foreign material are acceptable if both of the following conditions are satisfied:

(a) The indentation or protuberance blends into a smooth slope when the material is stretched.

(b) Foreign material remains in place when the insulating material is folded and stretches with the insulating material surrounding it.

- (7) The standards listed in table 3 are adopted by reference in these rules and may be inspected at the Lansing office of the department of consumer and industry services. The ANSI standards may be

purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10018, and the ASTM standards may be purchased from the American Society of Test and Materials, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428, or any of the standards may

be purchased from the Michigan Department of Consumer and Industry Services, Safety Standards Division, Box 30643, Lansing, Michigan 48909, at a cost at the time of adoption of these rules as listed in Table 3.

TABLE 3
ITEM ANSI-ASTM COST

ITEM	ANSI-ASTM	COST
Rubber insulating gloves	D 120-87el	\$16.50
Rubber matting for use around electrical apparatus	D 178-88	\$16.50
Rubber insulating blankets	D 1048-88Ael	\$16.50
Rubber insulating covers	D 1049-88	\$16.50
Rubber insulating line hose	D 1050-90	\$16.50
Rubber insulating sleeves	D 1051-87	\$16.50
In-service care – line hose and covers	F 478-92	\$15.00
In-service care insulating blankets	F 479-88a	\$15.00
In-service care of insulating gloves and sleeves	F 496-91	\$12.00
These standards contain specifications for conducting the various tests required in subrules (1) to (6) of this rule.		

- (8) Electrical protective equipment shall be maintained in a safe, reliable condition.
- (9) All of the following specific requirements apply to insulating blankets, covers, line hose, gloves, and sleeves made of rubber as applicable:
- (a) Maximum use voltages shall conform to the voltages listed in table 7.
 - (b) Insulating equipment shall be inspected for damage before each days use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air test in addition to being inspected.
 - (c) Insulating equipment that has any of the following defects shall not be used:
 - (i) A hole, tear, puncture, or cut.
 - (ii) Ozone cutting or ozone checking, the cutting action produced by ozone on rubber under mechanical stress into a series of interlacing cracks.
 - (iii) An embedded foreign object.
 - (iv) Any of the following texture changes:
 - (a) Swelling.
 - (b) Softening.
 - (c) Hardening.
 - (d) Becoming sticky or inelastic.
 - (v) Any other defect that damages the insulating properties.
 - (d) Insulating equipment found to have other defects that might affect its insulating properties shall be removed from service and returned for testing under subdivisions (h) and (j) of this subrule.
 - (e) Insulating equipment shall be cleaned as needed to remove foreign substances.
 - (f) Insulating equipment shall be stored in a location and in a manner to protect it from all of the following:
 - (i) Light.
 - (ii) Temperature extremes.
 - (iii) Excessive humidity.
 - (iv) Ozone.
 - (v) Other injurious substances and conditions.
 - (g) Protector gloves shall be worn over insulating gloves, except that protector gloves need not be used with class 0 gloves under limited-use conditions or where small equipment and parts manipulation necessitate unusually high finger dexterity. Any other class of glove may be used for similar work without protector gloves if the employer can demonstrate that the possibility of physical damage to the gloves is small and if the class of glove is 1 class higher than that required for the voltage involved. Insulating gloves that have been used without protector gloves shall not be used at a higher voltage until they have been tested under the provisions of subdivisions (h) and (i) of this subrule. Extra care shall be taken when visually examining gloves and to avoid handling sharp objects.
 - (h) Electrical protective equipment shall be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests shall be in accordance with table 7 and table 8.
 - (i) The test method used in this rule shall reliably indicate whether the insulating equipment can withstand the voltages involved. The standard electrical test methods considered as meeting this requirement are listed in table 3.
 - (j) Only insulating equipment that passes inspection or electrical tests may be used by employees, except that rubber insulating line hose may be used in shorter lengths if the defective portion is cut off. Rubber insulating blankets may be repaired using a compatible patch that results in physical and electrical properties equal to those of the blanket. Rubber insulating blankets may be salvaged by severing the defective area from the undamaged portion of the blanket. The resulting undamaged area may not be less than 22 inches by 22 inches (560mm by 560mm) for class 1, 2, 3, and 4 blankets. Rubber insulating gloves and sleeves that have minor physical defects, such as small cuts, tears, or punctures, may be repaired by

applying a compatible patch. Also, rubber insulating gloves and sleeves that have minor surface blemishes may be repaired with a compatible liquid compound. The patched area shall have electrical and physical properties equal to those of the surrounding material. Repairs to gloves are permitted only in the area between the wrist and the reinforced edge of the opening.

- (k) Repaired insulating equipment shall be retested before it may be used by employees.
- (l) An employer shall certify that equipment has been tested in accordance with the requirements of R 408.13387(9)(h), (l), and (k) of this subrule. The certification shall identify the equipment that passed the test and the date it was tested. The marking of equipment and entering the results of the tests and the dates of testing onto logs are acceptable means of equipment identification.
- (10) Material other than rubber that offers protection equivalent to or greater than rubber may be used if the material is certified to meet the appropriate ANSI-ASTM standard tests.
- (11) An insulated blanket, glove, or sleeve shall be capable of withstanding the voltage to which it may be subjected.
- (12) Exposed conductors or equipment, or both, except for conductors or equipment being directly worked on, which is energized from 750 volts to 28,000 volts phase to ground and which an employee may reach into or touch shall be isolated or covered with at least 1 of the following:
 - (a) An insulating blanket.
 - (b) An insulating hood.
 - (c) An insulating line hose.
 - (d) An insulating barrier.
- (13) An employee shall use insulating gloves and sleeves capable of withstanding the imposed voltage when performing any of the following activities:
 - (a) Working directly on, or within reaching distance of, a conductor or equipment at a nominal 750 volts or more phase to ground, except when using barehanded techniques or a hot stick. Sleeves are not required for an employee who performs routine switching operations in a substation or powerhouse. An employee who uses gloves and sleeves and works directly on or within reaching distance of a conductor or equipment energized at more than 5,000 volts phase to ground shall do so from an insulated platform or board or an aerial device that has an insulated basket.
 - (b) Connecting or disconnecting primary neutrals, pole ground wires, or other conductors normally connected to static wires or energized equipment, except that gloves and sleeves need not be worn while connecting and disconnecting a service neutral or secondary neutral.
 - (c) Working on a de-energized conductor that extends into an area in which contact may be made with an energized conductor or exposed parts of energized equipment, unless the conductor is grounded or isolated. Insulating sleeves are optional at voltages of less than 750 volts phase to ground.
- (14) An employee shall use insulating gloves capable of withstanding the imposed voltage when performing either of the following activities:
 - (a) When working with a powered or manual hole digger while using booms or using winch lines to install or remove poles or equipment where the hole digger may contact conductors or equipment energized at a voltage of 300 volts or more phase to ground. An employee need not use the gloves while in the enclosed cab of the equipment.
 - (b) When working directly on a conductor or equipment energized at a voltage of more than 240 volts phase to ground. This does not include the use of test equipment.

**TABLE 4
ALTERNATING CURRENT PROOF-TEST REQUIREMENTS**

CLASS OF EQUIPMENT	PROOF-TEST VOLTAGE RMS V	MAXIMUM PROOF-TEST CURRENT, Ma (Globes Only)			
		267MM (10.5 in.) glove	356MM (14 in.) glove	406MM (16 in.) glove	457MM (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 5
DIRECT CURRENT PROOF-TEST REQUIREMENTS**

CLASS OF EQUIPMENT	PROFF-TEST VOLTAGE
0	20,000
1	40,000
2	50,000
3	60,000
4	70,000

NOTE: The direct current voltages listed in this table are not appropriate for proof-testing rubber insulating line hose or covers. For this equipment, direct current proof tests shall use a voltage high enough to indicate that the equipment can be safely used to the voltages listed in table 6. See ASTM D1050-90 and ASTM D1049-88 for further information on proof tests for rubber insulating line hose and covers.

**TABLE 6
GLOVE TESTS – WATER LEVEL 1, 2**

CLASS OF GLOVE	ALTERNATING CURRENT PROOF TEST		DIRECT CURRENT PROOF TEST	
	mm.	Inches	mm.	Inches
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

1. The water level is given as the clearance from the cuff of the glove to the waterline, with a tolerance of ± 13 mm. (± 0.5 inches).

2. If atmospheric conditions make the specified clearances impractical, the clearances may be increased by a maximum of 25mm. (1 inch).

**TABLE 7
RUBBER INSULATING EQUIPMENT VOLTAGE REQUIREMENTS**

CLASS OF EQUIPMENT	MAXIMUM USE VOLTAGE	RETEST VOLTAGE ALTERNATING CURRENT ROOT MEAN SQUARE	RETEST VOLTAGE DIRECT CURRENT AVERAGE
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

1 The maximum use voltage is the alternating current voltage (root mean square) classification of the protective equipment that designates the maximum nominal design voltage of the energized system that may be safely worked. The nominal 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 in either of the following situations:

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

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

2 The proof-test voltage shall be applied continuously for not less than 1 minute, but not more than 3 minutes.

**TABLE 8
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.
RUBBER INSULATING GLOVES	BEFORE FIRST ISSUE AND EVERY 6 MONTHS THEREAFTER.
RUBBER INSULATING SLEEVES	BEFORE FIRST ISSUE AND EVERY 12 MONTHS THEREAFTER.

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

SAFETY BELTS, HARNESSSES, LIFELINES, AND LANYARDS

R 408.13390. General requirements; safety belts, safety harnesses, lifelines, and lanyards generally.

Rule 3390. (1) Unless a safety net is used as prescribed in construction safety standard, Part 45.

Fall Protection, being R 408.44501 et seq. of the Michigan Administrative Code, or an employee is protected by a perimeter guardrail or is working on a portable ladder, the employee shall be safeguarded by a safety belt or safety harness secured to a lifeline or structure capable of sustaining the imposed load, if the employee's work station is more than 25 feet above the ground, floor, water, or other

surface. The safety belt and harness and any lifeline or lanyard shall be used only for safeguarding the employee. A safety belt, safety harness, lifeline, or lanyard subjected to in-service loading, rather than static loading, shall be removed from service and shall not be used again for employee safeguarding.

- (2) Safety belt, safety harness, and lanyard hardware shall be made of cadmium-plated, drop forged or pressed steel or metal of equivalent strength with edges free of sharp edges. The safety belt and lanyard hardware shall withstand a tensile load of 4,000 pounds without cracking, breaking, or permanent deformation. A lineman's body belt "D" ring and snaps shall withstand 5,000 pounds tensile test and the buckle 2,000 pounds tensile test.
- (3) A lifeline shall be secured above the employee's workplace to an anchorage or structural member capable of supporting a dead weight of not less than 5,400 pounds.
- (4) A lifeline shall not be less than 3/4-inch manila rope or a material of equivalent strength, having a breaking strength of not less than 5,400 foot pounds except where the lifeline is used on rock-scaling operation or in areas where the lifeline may be subject to cutting or abrasion, the line shall be not less than 7/8-inch manila rope with a wire core.
- (5) A lanyard or safety strap shall be not less than 1/2-inch nylon rope or its equivalent with a maximum length to provide a free fall of not more than 6 feet. The breaking strength of the lanyard shall be not less than 5,400 pounds.
- (6) A safety belt, safety strap, safety harness, lanyard, or lifeline, including the hardware, shall be inspected before using each day.
- (7) A safety belt, safety harness, lifeline, or lanyard shall be stored in a clean dry area away from excessive heat or other deteriorating conditions.
- (8) A lifeline or lanyard made of synthetic fibers shall not be kinked, run over sharp corners, used when frozen, left in freezing temperatures when wet, or exposed to sources of ignition or flame.

HAND PROTECTION

R 408.13392. Hand protection generally.

Rule 3392. (1) An employer shall select and require employees to use appropriate hand protection when employee's hands are exposed to hazards that may cause any of the following:

- (a) Skin absorption of harmful substances.
- (b) Severe cuts or lacerations.
- (c) Severe abrasions.
- (d) Punctures.
- (e) Chemical burns.
- (f) Thermal burns.

- (g) Harmful temperature extremes.
- (2) 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 to be performed.
 - (b) Conditions present.
 - (c) Duration of use.
 - (d) The hazards and potential hazards identified.
- (3) Hand protection interiors shall be kept free of corrosive or irritating contaminants. If more than 1 employee wears a pair of gloves, the gloves shall be sanitized before reissuance.

R 408.13394. Body protection.

Rule 3394. (1) An employer shall assure that an employee who is required to work so that his or her clothing becomes wet due to a condition other than the weather or perspiration shall use such aprons, coats, jackets, sleeves, or other garments that will keep his or her clothing dry. The material shall be unaffected by the wetting agent. The provision of dry, clean, acid-resistant clothing, in addition to rubber shoes or short boots and an apron, shall be considered a satisfactory substitute where small parts are cleaned, plated, or acid-dipped in an open tank.

- (2) When abrasive blasting is not protected by an enclosure, the operator shall use heavy canvas or leather gloves and aprons or equivalent protection to provide protection from the impact of abrasives.

R 408.13398. Rescission.

Rule 3398. The following general industry safety standards promulgated by the general industry safety standards commission pursuant to Act No. 154 of the Public Acts of 1974, as amended, being §408.1001 et seq. of the Michigan Compiled Laws, are rescinded:

- (a) R 408.13101 to R 408.13135 of the Michigan Administrative Code, appearing on pages 3,717 to 3,721 of the 1979 Michigan Administrative Code and pages 136 and 137 of Quarterly Supplement No. 6 to the 1979 Code.
- (b) R 408.13201 to R 408.13241 of the Michigan Administrative Code, appearing on pages 3,724 to 3,738 of the 1979 Michigan Administrative Code.
- (c) R 408.13501 to R 408.13569 of the Michigan Administrative Code, appearing on pages 3,724 to 3,738 of the 1979 Michigan Administrative Code.



Michigan Occupational Safety and Health Administration
 PO Box 30643, Lansing, Michigan 48909-8143
 Ph: 517.322.1845

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