process is maintained from plant storage or personnel. Such railings, fencing, and guards shall be of conducting material, adequately grounded.

(11) *Ventilation*. Where electrostatic atomization is used the spraying area shall be so ventilated as to insure safe conditions from a fire and health standpoint.

(12) *Fire protection*. All areas used for spraying, including the interior of the booth, shall be protected by automatic sprinklers where this protection is available. Where this protection is not available, other approved automatic extinguishing equipment shall be provided.

(f) *Electrostatic hand spraying equipment*—(1) *Application*. This paragraph shall apply to any equipment using electrostatically charged elements for the atomization and/or, precipitation of materials for coatings on articles, or for other similar purposes in which the atomizing device is hand held and manipulated during the spraying operation.

(2) *Conformance*. Electrostatic hand spraying equipment shall conform with the other provisions of this section.

(3) *Equipment approval and specifications*. Electrostatic hand spray apparatus and devices used in connection with coating operations shall be of approved types. The high voltage circuits shall be designed so as to not produce a spark of sufficient intensity to ignite any vapor-air mixtures nor result in appreciable shock hazard upon coming in contact with a grounded object under all normal operating conditions. The electrostatically charged exposed elements of the handgun shall be capable of being energized only by a switch which also controls the coating material supply.

(4) *Electrical support equipment*. Transformers, powerpacks, control apparatus, and all other electrical portions of the equipment, with the exception of the handgun itself and its connections to the power supply shall be located outside of the spraying area or shall otherwise conform to the requirements of paragraph (c) of this section.

(5) *Spray gun ground*. The handle of the spraying gun shall be electrically connected to ground by a metallic connection and to be so constructed that the operator in normal operating position is in intimate electrical contact with the grounded handle.

(6) *Grounding-general*. All electrically conductive objects in the spraying area shall be adequately grounded. This requirement shall apply to paint containers, wash cans, and any other objects or devices in the area. The equipment shall carry a prominent permanently installed warning regarding the necessity for this grounding feature.

(7) *Maintenance of grounds*. Objects being painted or coated shall be maintained in metallic contact with the conveyor or other grounded support. Hooks shall be regularly cleaned to insure this contact and areas of contact shall be sharp points or knife edges where possible. Points of support of the object shall be concealed from random spray where feasible and where the objects being sprayed are supported from a conveyor, the point of attachment to the conveyor shall be so located as to not collect spray material during normal operation.

(8) *Interlocks*. The electrical equipment shall be so interlocked with the ventilation of the spraying area that the equipment cannot be operated unless the ventilation fans are in operation.

(9) *Ventilation*. The spraying operation shall take place within a spray area which is adequately ventilated to remove solvent vapors released from the operation.

(g) *Drying, curing, or fusion apparatus*—(1) *Conformance*. Drying, curing, or fusion apparatus in connection with spray application of flammable and combustible finishes shall conform to the Standard for Ovens and Furnaces, NFPA 86A–1969, where applicable and shall also conform with the following requirements of this paragraph.

(2) *Alternate use prohibited*. Spray booths, rooms, or other enclosures used for spraying operations shall not alternately be used for the purpose of drying by any arrangement which will cause a material increase in the surface temperature of the spray booth, room, or enclosure.

(3) *Adjacent system interlocked*. Except as specifically provided in paragraph (g)(4) of this section, drying, curing, or fusion units utilizing a heating system

having open flames or which may produce sparks shall not be installed in a spraying area, but may be installed adjacent thereto when equipped with an interlocked ventilating system arranged to:

(i) Thoroughly ventilate the drying space before the heating system can be started;

(ii) Maintain a safe atmosphere at any source of ignition;

(iii) Automatically shut down the heating system in the event of failure of the ventilating system.

(4) *Alternate use permitted.* Automobile refinishing spray booths or enclosures, otherwise installed and maintained in full conformity with this section, may alternately be used for drying with portable electrical infrared drying apparatus when conforming with the following:

(i) Interior (especially floors) of spray enclosures shall be kept free of overspray deposits.

(ii) During spray operations, the drying apparatus and electrical connections and wiring thereto shall not be located within spray enclosure nor in any other location where spray residues may be deposited thereon.

(iii) The spraying apparatus, the drying apparatus, and the ventilating system of the spray enclosure shall be equipped with suitable interlocks so arranged that:

(*a*) The spraying apparatus cannot be operated while the drying apparatus is inside the spray enclosure.

(*b*) The spray enclosure will be purged of spray vapors for a period of not less than 3 minutes before the drying apparatus can be energized.

(*c*) The ventilating system will maintain a safe atmosphere within the enclosure during the drying process and the drying apparatus will automatically shut off in the event of failure of the ventilating system.

(iv) All electrical wiring and equipment of the drying apparatus shall conform with the applicable sections of subpart S of this part. Only equipment of a type approved for Class I, Division 2 hazardous locations shall be located within 18 inches (45.72 cm) of floor level. All metallic parts of the drying apparatus shall be properly electrically bonded and grounded.

(v) The drying apparatus shall contain a prominently located, permanently attached warning sign indicating that ventilation should be maintained during the drying period and that spraying should not be conducted in the vicinity that spray will deposit on apparatus.

[58 FR 35149, June 30, 1993]

Subpart E—Personal Protective and Life Saving Equipment

AUTHORITY: 40 U.S.C. 3701 *et seq.;* 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736), 1–90 (55 FR 9033), 6–96 (62 FR 111), 5–2002 (67 FR 65008), 5–2007 (72 FR 31160), 4–2010 (75 FR 55355), or 1–2012 (77 FR 3912), as applicable; and 29 CFR part 1911.

§ 1926.95 Criteria for personal protective equipment.

(a) *Application.* Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, 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.

(b) *Employee-owned equipment.* Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

(c) *Design.* All personal protective equipment shall be of safe design and construction for the work to be performed.

(d) *Payment for protective equipment.* (1) Except as provided by paragraphs (d)(2) through (d)(6) of this section, the protective equipment, including personal protective equipment (PPE), used to comply with this part, shall be provided by the employer at no cost to employees.

(2) The employer is not required to pay for non-specialty safety-toe protective footwear (including steel-toe shoes or steel-toe boots) and non-specialty prescription safety eyewear, provided that the employer permits such items to be worn off the job-site.

(3) When the employer provides metatarsal guards and allows the employee, at his or her request, to use shoes or boots with built-in metatarsal protection, the employer is not required to reimburse the employee for the shoes or boots.

(4) The employer is not required to pay for:

(i) Everyday clothing, such as long-sleeve shirts, long pants, street shoes, and normal work boots; or

(ii) Ordinary clothing, skin creams, or other items, used solely for protection from weather, such as winter coats, jackets, gloves, parkas, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen.

(5) The employer must pay for replacement PPE, except when the employee has lost or intentionally damaged the PPE.

(6) Where an employee provides adequate protective equipment he or she owns pursuant to paragraph (b) of this section, the employer may allow the employee to use it and is not required to reimburse the employee for that equipment. The employer shall not require an employee to provide or pay for his or her own PPE, unless the PPE is excepted by paragraphs (d)(2) through (d)(5) of this section.

(7) This section shall become effective on February 13, 2008. Employers must implement the PPE payment requirements no later than May 15, 2008.

NOTE TO § 1926.95(d): When the provisions of another OSHA standard specify whether or not the employer must pay for specific equipment, the payment provisions of that standard shall prevail.

[58 FR 35152, June 30, 1993, as amended at 72 FR 64429, Nov. 15, 2007]

§ 1926.96 Occupational foot protection.

Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1–1967.

[58 FR 35152, June 30, 1993]

§ 1926.97 Electrical protective equipment.

(a) *Design requirements for specific types of electrical protective equipment.* Rubber insulating blankets, rubber insulating matting, rubber insulating covers, rubber insulating line hose, rubber insulating gloves, and rubber insulating sleeves shall meet the following requirements:

(1) *Manufacture and marking of rubber insulating equipment.* (i) Blankets, gloves, and sleeves shall be produced by a seamless process.

(ii) Each item shall be clearly marked as follows:

(A) Class 00 equipment shall be marked Class 00.

(B) Class 0 equipment shall be marked Class 0.

(C) Class 1 equipment shall be marked Class 1.

(D) Class 2 equipment shall be marked Class 2.

(E) Class 3 equipment shall be marked Class 3.

(F) Class 4 equipment shall be marked Class 4.

(G) Nonozone-resistant equipment shall be marked Type I.

(H) Ozone-resistant equipment shall be marked Type II.

(I) Other relevant markings, such as the manufacturer's identification and the size of the equipment, may also be provided.

(iii) Markings shall be nonconducting and shall be applied in such a manner as not to impair the insulating qualities of the equipment.

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

(2) *Electrical requirements.* (i) Equipment shall be capable of withstanding the ac proof-test voltage specified in Table E–1 or the dc proof-test voltage specified in Table E–2.

(A) The proof test shall reliably indicate that the equipment can withstand the voltage involved.

(B) 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.

(C) Gloves shall also be capable of separately withstanding the ac proof-test voltage specified in Table E–1 after a 16-hour water soak. (See the note following paragraph (a)(3)(ii)(B) of this section.)

(ii) When the ac proof test is used on gloves, the 60-hertz proof-test current may not exceed the values specified in Table E–1 at any time during the test period.

(A) If the ac proof 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.

(B) 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 E–3. 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.

(C) After the 16-hour water soak specified in paragraph (a)(2)(i)(C) of this section, the 60-hertz proof-test current may not exceed the values given in Table E–1 by more than 2 milliamperes.

(iii) Equipment that has been subjected to a minimum breakdown voltage test may not be used for electrical protection. (See the note following paragraph (a)(3)(ii)(B) of this section.)

(iv) Material used for Type II insulating equipment shall be capable of withstanding an ozone test, with no 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 the note following paragraph (a)(3)(ii)(B) of this section.)

(3) *Workmanship and finish.* (i) Equipment shall be free of physical irregularities that can adversely affect the insulating properties of the equipment and that can be detected by the tests or inspections required under this section.

(ii) 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 under the following conditions:

(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.

NOTE TO PARAGRAPH (a): Rubber insulating equipment meeting the following national consensus standards is deemed to be in compliance with the performance requirements of paragraph (a) of this section:

American Society for Testing and Materials (ASTM) D120–09, *Standard Specification for Rubber Insulating Gloves.*

ASTM D178–01 (2010), *Standard Specification for Rubber Insulating Matting.*

ASTM D1048–12, *Standard Specification for Rubber Insulating Blankets.*

ASTM D1049–98 (2010), *Standard Specification for Rubber Insulating Covers.*

ASTM D1050–05 (2011), *Standard Specification for Rubber Insulating Line Hose.*

ASTM D1051–08, *Standard Specification for Rubber Insulating Sleeves.*

The preceding standards also contain specifications for conducting the various tests required in paragraph (a) of this section. For example, the ac and dc proof tests, the breakdown test, the water-soak procedure, and the ozone test mentioned in this paragraph are described in detail in these ASTM standards.

ASTM F1236–96 (2012), *Standard Guide for Visual Inspection of Electrical Protective Rubber Products,* presents methods and techniques for the visual inspection of electrical protective equipment made of rubber. This guide also contains descriptions and photographs of irregularities that can be found in this equipment.

ASTM F819–10, *Standard Terminology Relating to Electrical Protective Equipment for Workers,* includes definitions of terms relating to the electrical protective equipment covered under this section.

(b) *Design requirements for other types of electrical protective equipment.* The following requirements apply to the design and manufacture of electrical protective equipment that is not covered by paragraph (a) of this section:

(1) *Voltage withstand.* Insulating equipment used for the protection of employees shall be capable of withstanding, without failure, the voltages that may be imposed upon it.

NOTE TO PARAGRAPH (b)(1): These voltages include transient overvoltages, such as

switching surges, as well as nominal line voltage. See appendix B to subpart V of this part for a discussion of transient overvoltages on electric power transmission and distribution systems. See IEEE Std 516–2009, *IEEE Guide for Maintenance Methods on Energized Power Lines*, for methods of determining the magnitude of transient overvoltages on an electrical system and for a discussion comparing the ability of insulation equipment to withstand a transient overvoltage based on its ability to withstand ac voltage testing.

(2) *Equipment current.* (i) Protective equipment used for the primary insulation of employees from energized circuit parts shall be capable of passing a current test when subjected to the highest nominal voltage on which the equipment is to be used.

(ii) When insulating equipment is tested in accordance with paragraph (b)(2)(i) of this section, the equipment current may not exceed 1 microampere per kilovolt of phase-to-phase applied voltage.

NOTE 1 TO PARAGRAPH (b)(2): This paragraph applies to equipment that provides primary insulation of employees from energized parts. It does not apply to equipment used for secondary insulation or equipment used for brush contact only.

NOTE 2 TO PARAGRAPH (b)(2): For ac excitation, this current consists of three components: Capacitive current because of the dielectric properties of the insulating material itself, conduction current through the volume of the insulating equipment, and leakage current along the surface of the tool or equipment. The conduction current is normally negligible. For clean, dry insulating equipment, the leakage current is small, and the capacitive current predominates.

NOTE TO PARAGRAPH (b): Plastic guard equipment is deemed to conform to the performance requirements of paragraph (b) of this section if it meets, and is used in accordance with, ASTM F712–06 (2011), *Standard Test Methods and Specifications for Electrically Insulating Plastic Guard Equipment for Protection of Workers.*

(c) *In-service care and use of electrical protective equipment*—(1) *General.* Electrical protective equipment shall be maintained in a safe, reliable condition.

(2) *Specific requirements.* The following specific requirements apply to rubber insulating blankets, rubber insulating covers, rubber insulating line hose, rubber insulating gloves, and rubber insulating sleeves:

(i) Maximum use voltages shall conform to those listed in Table E–4.

(ii) Insulating equipment shall be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of causing damage. Insulating gloves shall be given an air test, along with the inspection.

NOTE TO PARAGRAPH (c)(2)(ii): ASTM F1236–96 (2012), *Standard Guide for Visual Inspection of Electrical Protective Rubber Products,* presents methods and techniques for the visual inspection of electrical protective equipment made of rubber. This guide also contains descriptions and photographs of irregularities that can be found in this equipment.

(iii) Insulating equipment with any of the following defects may not be used:

(A) A hole, tear, puncture, or cut;

(B) Ozone cutting or ozone checking (that is, a series of interlacing cracks produced by ozone on rubber under mechanical stress);

(C) An embedded foreign object;

(D) Any of the following texture changes: Swelling, softening, hardening, or becoming sticky or inelastic.

(E) Any other defect that damages the insulating properties.

(iv) Insulating equipment found to have other defects that might affect its insulating properties shall be removed from service and returned for testing under paragraphs (c)(2)(viii) and (c)(2)(ix) of this section.

(v) Insulating equipment shall be cleaned as needed to remove foreign substances.

(vi) Insulating equipment shall be stored in such a location and in such a manner as to protect it from light, temperature extremes, excessive humidity, ozone, and other damaging substances and conditions.

(vii) Protector gloves shall be worn over insulating gloves, except as follows:

(A) Protector gloves need not be used with Class 0 gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity.

NOTE TO PARAGRAPH (c)(2)(vii)(A): Persons inspecting rubber insulating gloves used under these conditions need to take extra care in visually examining them. Employees using rubber insulating gloves under these

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conditions need to take extra care to avoid handling sharp objects.

(B) If the voltage does not exceed 250 volts, ac, or 375 volts, dc, protector gloves need not be used with Class 00 gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity.

NOTE TO PARAGRAPH (c)(2)(vii)(B): Persons inspecting rubber insulating gloves used under these conditions need to take extra care in visually examining them. Employees using rubber insulating gloves under these conditions need to take extra care to avoid handling sharp objects.

(C) Any other class of glove may be used without protector gloves, under limited-use conditions, when small equipment and parts manipulation necessitate unusually high finger dexterity but only if the employer can demonstrate that the possibility of physical damage to the gloves is small and if the class of glove is one class higher than that required for the voltage involved.

(D) Insulating gloves that have been used without protector gloves may not be reused until they have been tested under the provisions of paragraphs (c)(2)(viii) and (c)(2)(ix) of this section.

(viii) Electrical protective equipment shall be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests shall be in accordance with Table E–4 and Table E–5.

(ix) The test method used under paragraphs (c)(2)(viii) and (c)(2)(xi) of this section shall reliably indicate whether the insulating equipment can withstand the voltages involved.

NOTE TO PARAGRAPH (c)(2)(ix): Standard electrical test methods considered as meeting this paragraph are given in the following national consensus standards:

ASTM D120–09, *Standard Specification for Rubber Insulating Gloves*.

ASTM D178–01 (2010), *Standard Specification for Rubber Insulating Matting*.

ASTM D1048–12, *Standard Specification for Rubber Insulating Blankets*.

ASTM D1049–98 (2010), *Standard Specification for Rubber Insulating Covers*.

ASTM D1050–05 (2011), *Standard Specification for Rubber Insulating Line Hose*.

ASTM D1051–08, *Standard Specification for Rubber Insulating Sleeves*.

ASTM F478–09, *Standard Specification for In-Service Care of Insulating Line Hose and Covers*.

ASTM F479–06 (2011), *Standard Specification for In-Service Care of Insulating Blankets*.

ASTM F496–08, *Standard Specification for In-Service Care of Insulating Gloves and Sleeves*.

(x) Insulating equipment failing to pass inspections or electrical tests may not be used by employees, except as follows:

(A) Rubber insulating line hose may be used in shorter lengths with the defective portion cut off.

(B) 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 smaller than 560 millimeters by 560 millimeters (22 inches by 22 inches) for Class 1, 2, 3, and 4 blankets.

(C) Rubber insulating blankets may be repaired using a compatible patch that results in physical and electrical properties equal to those of the blanket.

(D) Rubber insulating gloves and sleeves with minor physical defects, such as small cuts, tears, or punctures, may be repaired by the application of a compatible patch. Also, rubber insulating gloves and sleeves with minor surface blemishes may be repaired with a compatible liquid compound. The repaired 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.

(xi) Repaired insulating equipment shall be retested before it may be used by employees.

(xii) The employer shall certify that equipment has been tested in accordance with the requirements of paragraphs (c)(2)(iv), (c)(2)(vii)(D), (c)(2)(viii), (c)(2)(ix), and (c)(2)(xi) of this section. The certification shall identify the equipment that passed the test and the date it was tested and shall be made available upon request to the Assistant Secretary for Occupational Safety and Health and to employees or their authorized representatives.

NOTE TO PARAGRAPH (c)(2)(xii): Marking equipment with, and entering onto logs, the