

Chapter E 516

FINISHING PROCESSES

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E 516.01 Definition. This chapter shall apply to locations where paints, lacquers or other flammable finishes are regularly or frequently applied by spraying, dipping, brushing or by other means, and where volatile flammable solvents or thinners are used or where readily ignitable deposits or residues from such paints, lacquers or finishes may occur.

Note: For information regarding safeguards for finishing processes, see the Wisconsin Administrative Code chapter Ind 21, NFPA Standard for Spray Finishing Using Flammable Materials (No. 33) and the NFPA Standard for Dip Tanks Containing Flammable or Combustible Liquids (No. 34).

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 516.02 Hazardous areas. Classification with respect to flammable vapors. For deposits and residues, see section E 516.03.

(1) The following areas shall be considered to be class I, division 1 locations:

(a) The interiors of spray booths and their exhaust ducts.

(b) 20 feet horizontally and up to an elevation of 12 feet above the floor or 7 feet above the work, whichever is higher where open-spraying operations more extensive than touch-up spraying are permitted. The dimensions may be reduced if the space is limited by a ceiling or permanent walls.

(c) 20 feet horizontally and 12 feet above the floor or 7 feet above the top of dip tanks and their drain boards, whichever is higher. The dimensions may be reduced if the space is limited by a ceiling or permanent walls.

(d) Spaces where hazardous concentrations of flammable vapors are likely to occur.

(2) The following shall be considered to be class I, division 2 locations:

(a) A rectangular base area 10 feet wide having a long side extending across any door, open face, material handling or conveyor opening and 10 feet beyond either face of these openings and extending to the ceiling or 5 feet above the top of the booth. The upper limit for any hazardous area through which material passes after leaving the booth shall be at least 7 feet above the work. The hazardous area shall not include any space directly above the booth.

1. EXCEPTION No. 1. Where a fully closing door is equipped with an additional electric interlock so installed and interconnected with the compressed air supply for spray painting as to prevent spraying

unless the door is fully closed, that door need not be considered an opening for the purpose of this subsection.

2. EXCEPTION No. 2. Door openings equipped with suitable filter pads need not be considered for the purpose of this subsection.

(b) Thirty feet horizontally beyond the limits of class I, division 1 areas (see subsection (1)) surrounding open spraying dip tanks and drain boards and other hazardous operations. The vertical dimension of the class I, division 2 area shall be the same as the class I, division 1 area. The area need not extend above ceilings nor beyond permanent walls.

(3) Adjacent areas which are cut off from the defined hazardous areas by tight partitions without communicating openings, and within which hazardous vapors are not likely to be released, shall be classed as non-hazardous.

(4) Drying and baking areas provided with positive mechanical ventilation adequate to prevent formation of flammable concentrations of vapors, and provided with effective interlocks to de-energize all electrical equipment (other than equipment approved for class I locations) in case the ventilating equipment is inoperative, may be classed as non-hazardous.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 516.03 Wiring and equipment in hazardous areas. (1) All electrical wiring and equipment within the hazardous areas defined in section E 516.02 shall conform to applicable provisions of chapter E 501.

(2) Unless approved for both readily ignitable deposits and the flammable vapor location, no electrical equipment shall be installed or used where it may be subject to hazardous accumulations of readily ignitable deposits or residues, except that wiring in rigid conduit or in threaded boxes or fittings containing no taps, splices or terminal connections may be installed in such locations. Type MI cable without fittings or boxes may be used.

(3) Illumination of readily ignitable areas through panels of glass or other transparent or translucent material is permissible only where: (a) fixed lighting units are used as the source of illumination, (b) the panel effectively isolates the hazardous area from the area in which the lighting unit is located, (c) the lighting unit is approved for its specific location, (d) the panel is of a material or is so protected that breakage will be unlikely and (e) the arrangement is such that normal accumulations of hazardous residue on the surface of the panel will not be raised to a dangerous temperature by radiation or conduction from the source of illumination.

(4) Portable electric lamps or other utilization equipment shall not be used within a hazardous area during operation of the finishing process. When such lamps or utilization equipment are used during cleaning or repairing operations, they shall be of a type approved for class I locations, and all exposed metal parts shall be effectively grounded.

(5) Electrostatic spraying or detearing equipment shall be installed and used only as provided in section E 516.04.

Note: For more details, see NFPA No. 33.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

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Register, January, 1968, No. 145

E 516.04 Fixed electrostatic equipment. Where electrostatic spraying and detearing equipment is installed, such equipment shall be of approved type, and shall conform to the following requirements:

(1) No transformers, power packs, control apparatus, or other electrical portion of the equipment (except high voltage grids and their connections) shall be installed in any of the hazardous areas defined in section E 516.02 unless of a type approved for the location.

(2) High voltage grids or electrodes shall be located in suitable non-combustible booths or enclosures provided with adequate mechanical ventilation, shall be rigidly supported and of substantial construction, and shall be effectively insulated from ground by means of non-porous noncombustible insulators.

(3) High voltage leads shall be effectively and permanently supported on suitable insulators, shall be effectively guarded against accidental contact or grounding, and shall be provided with automatic means for discharging any residual charge to ground when the supply voltage is interrupted.

(4) Goods being processed shall be supported on conveyors in such a manner that minimum clearance between goods and high voltage grids or conductors cannot be less than twice the sparking distance. A conspicuous sign indicating the sparking distance shall be permanently posted near the equipment.

(5) Approved automatic controls which will operate without time-delay shall be provided to disconnect the power supply and to signal the operator in case of (a) stoppage of ventilating fans or failure of ventilating equipment from any cause, (b) stoppage of the conveyor carrying goods through the high voltage field, (c) occurrence of a ground or of an imminent ground at any point on the high voltage system, or (d) reduction of clearance below that specified in subsection (4).

(6) Adequate fencing, railings or guards which are electrically conducting and effectively grounded shall be provided for safe isolation of the process, and signs shall be permanently posted designating the process zone as dangerous because of high voltage.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 516.05 Electrostatic hand spraying equipment. Electrostatic hand spray apparatus and devices used in connection with paint spraying operations shall be of approved types and shall conform to the following requirements:

(1) The equipment shall be so designed that the maximum surface temperature of the equipment in the spraying area cannot exceed 150°F. under any condition. The high voltage circuits shall be designed so as to be intrinsically safe and not produce a spark of sufficient intensity to ignite any vapor-air mixtures nor result in appreciable shock hazard upon coming on contact with a grounded object. The electrostatically charged exposed elements of the hand gun shall be capable of being energized only by a switch which also controls the paint supply.

(2) Transformers, power packs, control apparatus, and all other electrical portion of the equipment, with the exception of the hand gun itself and its connections othe power supply, shall be located outside of the hazardous area.

(3) The handle of the spraying gun shall be electrically connected to ground by a metallic connection and be so constructed that the operator in normal operating position is in intimate electrical contact with the grounded handle. This requirement is to prevent build-up of a static charge on the operator's body.

(4) 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.

(5) Objects being painted 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.

(6) The spraying operation shall take place within a spray area which is adequately ventilated to remove solvent vapors released from the operation. The electrical equipment shall be so interlocked with the ventilation of spraying area that the equipment cannot be operated unless the ventilation fans are in operation.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 516.06 Wiring and equipment above hazardous areas. (1) All fixed wiring above hazardous areas shall be in metallic raceways or shall be type MI cable or type ALS cable. Cellular metal floor raceways may be used only for supplying ceiling outlets or extensions to the area below the floor of a hazardous area, but such raceways shall have no connection leading into or through the hazardous area above the floor unless suitable seals are provided. No electrical conductor shall be installed in any cell, header or duct which contains a pipe for steam, water, air, gas, drainage, or for other service except electrical.

(2) Equipment which may produce arcs, sparks or particles of hot metal, such as lamps and lampholders for fixed lighting, cutouts, switches, receptacles, motors, or other equipment having make and break or sliding contacts, where installed above a hazardous area or above an area where freshly finished goods are handled, shall be of totally-enclosed type or shall be provided with suitable guards or screens to prevent escape of sparks or hot metal particles.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.

E 516.07 Grounding. All metallic raceways, and all non-current-carrying metallic portions of fixed or portable equipment, regardless of voltage, shall be grounded as provided in chapter E 250.

History: Cr. Register, January, 1968, No. 145, eff. 2-1-68.