

Oregon OSHA Adopted Changes to Spray Finishing AO 3-2003, filed & effective 4/21/03

Division 2/G, Occupational Health and Environmental Control

§1910.94 VENTILATION.

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(c) [~~Spray finishing operations.~~] Removed. In Oregon, 437-002-0107, Spray Finishing, in Division 2/H, applies.

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Division 2/H, Hazardous Materials

§1910.107 [~~SPRAY FINISHING USING FLAMMABLE AND COMBUSTIBLE MATERIALS.~~] Removed. In Oregon, 437-002-0107, Spray Finishing, applies.

437-002-0107 Spray Finishing.

~~[(1) Location and Application.]~~

~~[(a) Spray finishing shall be conducted in a spray room or booth provided with local exhaust ventilation except:]~~

~~[(A) When spraying is infrequent and of short duration; or]~~

~~[(B) When spraying is a single "air brush"; or]~~

~~[(C) The object to be sprayed is of such weight or proportion as to render it impracticable to move it into a spray area; or]~~

~~[(D) When spray painting is conducted out-of-doors.]~~

~~[(b) Spray finishing outside of a booth or room, as permitted by OAR 437-002-0107(1)(a)(C) above, shall be done only after the following provisions have been met:]~~

~~[(A) All light switches, fans, receptacles, overhead lights and all other sources of ignition within 20 feet of the spraying and overspray area shall be rendered inoperative or shall consist of Class I, Group D, explosion-proof types as specified in the National Electrical Code, NFPA 33-1989 and ANSI C2-1990.]~~

~~[(B) All building construction including floors, walls, ceilings, beams, etc., within 20 feet of the spraying and overspray area shall consist of or be protected by non-combustible materials.]~~

~~[(C) All areas within 20 feet of the spraying and over-spray area shall be protected by automatic sprinklers. Where automatic sprinklers are not available, other automatic extinguishing equipment shall be provided.]~~

~~[(D) Aisles leading to exits from the spray finishing area shall be maintained clear at all times.]~~

~~[(E) Employees not engaged in the spray finishing operation shall not be permitted within 20 feet of the spraying and overspray area.]~~

~~[(F) Employees engaged in spray finishing operations shall be provided with and wear respiratory protection unless exhaust ventilation has been provided and shown to reduce employee exposure to any material in the finish or its solvent to below the limits established in OAR 437-002-0382, Oregon Rules for Air Contaminants, in Division 2/Z. Respirators and their maintenance shall meet all of the requirements of 29 CFR 1910.134, Respiratory Protection, in Division 2/H.]~~

~~[(G) No combustible residues, paints, masking materials or other combustible material, except as specified in OAR 437-002-0107(1)(b)(B) above, shall be stored or allowed to accumulate in the spraying and overspray area. The spraying and overspray area shall be given daily housekeeping and maintenance while in use and it shall be left free of any accumulations between uses.]~~

~~[(H) Whenever possible spray finishing shall be conducted with maximum effective general or local exhaust ventilation and/or when the least number of employees are on the job. Such conditions may result when:]~~

~~[(i) Ventilation systems in other areas of the plant are shut down to maximize the efficiency of the spraying and overspray area exhaust system; or]~~

~~[(ii) Doors may be opened to provide general ventilation; or]~~

~~[(iii) At the end of the work shift or during the work shift which has the least number of employees.]~~

~~[(2) Design and Construction of Spray Rooms.]~~

~~[(a) All spray rooms, including floors, shall be designed, constructed and maintained to meet the minimum State of Oregon Uniform Building Code fire resistive classification of at least one hour.]~~

~~[(b) In addition to and not in lieu of the provisions in 29 CFR 1910.94(c)(6)(ii), spray rooms shall have a minimum of 30 air changes per hour.]~~

~~[(3) Velocity and Air Flow Requirements.~~ ~~In addition to and not in lieu of the provisions in 29 CFR 1910.94, Table G-10, Minimum Maintained Velocities Into Spray Booths, a "small booth" has a face area of less than 6 square feet and a "large booth" has a face area of 6 square feet or larger.]~~

(1) Scope. This section applies to finishing materials when applied as a spray by any means in a continuous or intermittent process. This section also covers the application of powders by powder spray guns, electrostatic powder spray guns, fluidized beds, or electrostatic fluidized beds. This section also applies to any sprayed material that produces combustible deposits or residue. This section does not apply to outdoor spray application of buildings, tanks, or other similar structures, nor to small portable spraying apparatus not used repeatedly in the same location.

(2) Definitions

(a) Aerated solid powders - Any powdered material used as a coating material fluidized within a container by passing air uniformly from below. It is common practice to fluidize such materials to form a fluidized powder bed and then dip the part to be coated into the bed in a manner similar to that used in liquid dipping. Such beds are also used as sources for powder spray operations.

(b) Approved - Approved and listed by a nationally recognized testing laboratory. Refer to §1910.7 for definition of nationally recognized testing laboratory.

(c) Electrostatic fluidized bed - A chamber holding powder coating material that is aerated from below to form an air-supported, expanded cloud of the powder. The powder is electrically charged with a charge opposite to that of the object or material being coated.

(d) Fluidized bed - A chamber holding powder coating material that is aerated from below to form an air-supported, expanded cloud of the powder. The object or material being coated is preheated, then immersed into the cloud.

(e) Infrequent and of short duration - Spray finishing that is:

(A) Less than nine square feet surface area per job, and

(B) Uses less than one gallon of material in one day, and

(C) Intermittent spraying where enough time elapses between spraying episodes to dilute the concentration of vapors essentially to zero before spraying is resumed.

(f) Listed - See "approved."

(g) Non-combustible materials - Materials that have a fire resistance rating of at least one hour.

(h) Overspray - Any sprayed material that is not deposited on the intended object.

(i) Spray area - Any area in which potentially dangerous quantities of flammable vapors or mists, or combustible residues, dusts, or deposits are present due to the operation of spraying processes.

(j) Spray booth - A power-ventilated structure provided to enclose or accommodate a spraying operation to confine and limit the escape of spray, vapor, and residue, and to safely conduct or direct them to an exhaust system.

(k) Spray room - A room designed to accommodate a spraying operation. For the purposes of this rule, the term "spray booth" includes spray rooms

except where specifically noted.

(3) Rules for All Spray Finishing Operations.

(a) Conduct spray finishing in a spray booth provided with local exhaust ventilation except:

(A) When spraying is infrequent and of short duration; or

(B) When spraying is a single "air brush"; or

(C) The object to be sprayed is of such weight or proportion as to render it impracticable to move it into a spray booth; or

(D) When only noncombustible or Class IIIB combustible liquids are used for spraying. This exception for Class IIIB combustible liquids only applies when the liquid is not heated for use to within 30E F (16.7E C) of the flashpoint; or

(E) When spray painting is conducted out-of-doors. For the purposes of this rule, out-of-doors means an area away from the main building and completely open at all times on at least two sides.

(b) Spray finishing outside of a booth, as permitted by OAR 437-002-0107(3)(a)(A), (C), and (D) above, must be done only in a spray area that meets the following requirements:

(A) All light switches, fans, receptacles, overhead lights and all other sources of ignition within 20 horizontal feet and 10 vertical feet of the overspray area must be inoperative or consist of Class I, Group D, explosion-proof types as specified in the National Electrical Code, NFPA 33-2000 and ANSI C2-2002.

(B) All building construction including floors, walls, ceilings, beams, etc., within 20 horizontal feet and 10 vertical feet of the overspray area must consist of or be protected by non-combustible materials.

(C) Protect all areas within 20 feet of the overspray area with automatic sprinklers. Where automatic sprinklers are not available, use other automatic extinguishing equipment. Alternatives may be used only when authorized in writing by the local fire authority.

(D) Aisles leading to exits from the spray finishing area must remain clear at all times.

(E) Provide the spray finishing area with at least 6 air changes per hour of airflow.

(F) Follow the requirements of paragraphs (3)(c) through (3)(e).

(c) Do not allow employees not engaged in spray finishing operations within 20 feet of the spraying and overspray area.

(d) Employees engaged in spray finishing operations must be provided with and wear respiratory protection unless exhaust ventilation is provided and reduces employee exposure to any material in the finish or its solvent to below the limits established in OAR 437-002-0382, Oregon Rules for Air Contaminants. Follow all of the requirements of OAR 437-002-1910.134, Respiratory Protection.

(e) Combustible Materials.

(A) Do not store combustible material or allow combustible material to accumulate in the spraying and overspray area unless specifically authorized in writing by the local fire authority.

(B) Give the spraying and overspray area daily housekeeping and maintenance while in use and keep it free of any accumulations between uses. Use only non-sparking tools for cleaning purposes.

(C) Combustible materials, such as paper, may be used to cover floors and walls in the spray and overspray area, but must be removed at the end of each workshift. The employer may use longer intervals only when the local fire authority has provided written approval to do so.

(f) Spray booths.

(A) Construction:

(i) Construct spray booths of substantially supported steel, concrete, or masonry.

(ii) When the booth is only used for intermittent or low volume spraying, other substantial non-combustible material may be used.

(iii) Design spray booths to sweep air currents toward the exhaust outlet.

(iv) Construct spray booths with materials that have a fire resistance rating of at least one hour. All adjacent construction must have a fire resistance rating of at least one hour or as otherwise required by the Oregon Building Codes Division.

(B) The interior surfaces of spray booths must be smooth and continuous without edges, designed to prevent residue pocketing, and designed to ease cleaning and washing.

(C) When the floor surface of a spray booth and operators' working area is combustible, it must be covered with a non-combustible material designed to prevent pocketing of residues and ease cleaning and washing.

(D) A spray booth should be equipped with:

(i) A water washing system designed to minimize dusts or residues entering exhaust ducts and to permit the recovery of overspray finishing material; or

(ii) Distribution or baffle plates to promote an even flow of air through the booth or cause the deposit of overspray before it enters the exhaust duct; or

(iii) Overspray dry filters to minimize dusts or residues entering exhaust ducts.

(E) Where dry powders are sprayed, arrange the powder collection systems in the exhaust to capture oversprayed material.

(F) When distribution or baffle plates are used, they must be of non-combustible material and readily removable or accessible on both sides for cleaning. Such plates will not be located in exhaust ducts.

(G) When using conventional dry type spray booths with overspray dry filters or filter rolls:

(i) Inspect filter rolls to ensure proper replacement of filter media.

(ii) Immediately remove all discarded filter pads and filter rolls to a safe area away from the spray finishing operation. Alternatively, place them in a water-filled metal container and dispose of them at the close of the day's operation unless they remain completely submerged.

(iii) Do not use filters or filter rolls when spraying a material known to be highly susceptible to spontaneous heating and ignition.

(iv) Clean filters or filter rolls must be non-combustible or authorized by the local fire authority.

(v) Do not use filters and filter rolls alternately for different types of coating materials, where the combination of materials may be conducive to spontaneous ignition.

(H) Spray booths with an open frontal area larger than 9 square feet must have a metal deflector or curtain at least 4-1/2 inches deep installed at the upper outer edge of the booth over the opening.

(I) Where conveyors are used to carry work into or out of spray booths, the openings must be as small as practical.

(J) Separate each spray booth from all other non-spray finishing operations by at least 3 feet, a wall, or a partition. This requirement does not apply to spray rooms.

(K) All portions of the spray booth must be readily accessible for cleaning.

(L) The exterior of the spray booth must have a clear space of at least 3 feet on all sides. Do not store any materials within this clear space. All construction within 3 feet of all sides of the spray booth must be noncombustible. This requirement does not apply to spray rooms.

(i) Exception: This requirement does not prohibit locating a spray booth closer than 3 feet to an exterior wall or roof assembly, provided that the wall or roof is constructed of a non-combustible material and the booth can be cleaned and maintained.

(M) When spraying areas are illuminated through glass panels or other transparent materials, use only fixed lighting units as a source of illumination.

(i) Seal panels to effectively isolate the spraying area from the area in which the lighting unit is located.

(ii) Use only non-combustible material constructed or protected so that breakage will be unlikely. Arrange panels so that normal accumulations of residue on the exposed surface of the panel will not be raised to a dangerous temperature by radiation or conduction from the source of illumination.

(N) Protect all spaces within the spray booth with automatic sprinklers acceptable to the local fire authority.

(i) Sprinkler heads must provide water distribution throughout the entire booth.

(ii) When filters are used, automatic sprinklers must be on both the downstream and upstream sides of the filters.

(iii) Keep sprinkler heads as free of overspray deposits as possible. Clean them daily if necessary. When sprinkler heads are covered to protect them from overspray, the material and method used must be authorized by the local fire authority.

(iv) When automatic sprinklers are infeasible or not practical, other means of fire protection must be provided and authorized in writing by the local fire authority.

(g) Electrical and other sources of ignition.

(A) Do not allow open flame or spark producing equipment within 20 feet of the spray area, unless separated by a partition.

(B) Do not place space-heating appliances, steampipes, or hot surfaces in a spraying area where deposits of combustible residues may readily accumulate.

(C) Ensure all electrical wiring and equipment conforms to the provisions of this paragraph and OAR 437, Division 2, Subdivision S.

(D) Do not put any electrical equipment in the spray or overspray area unless it is specifically approved for those locations. All wiring must be in rigid conduit or in boxes or fittings that do not contain taps, splices, or terminal connections.

(E) Electrical wiring and equipment not subject to deposits of combustible residues but located in a spraying area must be explosion-proof, approved for Class I, Group D locations, and conform to the provisions of OAR 437, Division 2, Subdivision S, for Class I, Division 1, Hazardous Locations. Electrical wiring, motors, and other equipment outside of but within 20 feet of any spraying area, and not separated by partitions, must not produce sparks under normal operating conditions and must conform to the provisions of OAR 437, Division 2, Subdivision S for Class I, Division 2 Hazardous Locations.

(F) Electric lamps outside of any spraying area but within 20 feet, and not separated by a partition, will be totally enclosed to prevent the falling of hot particles and will be protected from physical damage by appropriate guards or by location.

(G) Do not use portable electric lamps in any spraying area during spraying operations. If portable electric lamps are used during cleaning or repairing operations, use only the type approved for hazardous Class I locations.

(H) Electrically ground all metal parts of spray booths and exhaust ducts. Electrically ground piping systems that convey flammable or combustible liquids or aerated solids.

(h) Ventilation.

(A) Provide all spraying areas with mechanical ventilation adequate to remove flammable vapors, mists, or powders to a safe location and confine and control combustible residues so that life is not endangered. Keep mechanical ventilation in operation at all times while spraying operations are being conducted and for a sufficient time afterwards to exhaust vapors from drying material and residue.

(B) Interlock the spraying equipment with the ventilation system so that spraying operations cannot be conducted unless the ventilation system is operating.

(C) Air velocity throughout the spray booth must be sufficient to keep airborne contaminants below 25% of their lower explosive limit (LEL).

(i) Open-faced booths must maintain at least an average of 100 feet per minute (fpm) of airflow across the open face of the booth.

(ii) Enclosed booths must maintain at least an average of 100 fpm of airflow of cross-sectional area at the operators' position

(iii) Any deviation from the above must be authorized in writing by the local fire authority.

(iv) Install a visible gauge, audible alarm, or pressure activated device on each spray booth to indicate or ensure that the required air velocity is maintained.

(D) Provide each spray booth with an independent exhaust duct system that discharges to the exterior of the building. A common exhaust system may be used for multiple spray booths only when identical materials are sprayed and the combined frontal area of those booths is no more than 18 square feet.

(E) When more than one fan serves one booth, interconnect all fans so that one fan cannot operate without all fans being operated.

(F) The fan-rotating element must be non-ferrous or non-sparking or the casing must consist of or be lined with such material.

(i) Maintain ample clearance between the fan-rotating element and the fan casing to avoid a fire by friction. Prevent contact between moving parts and the duct or fan housing by making allowance for ordinary expansion and loading.

(ii) Mount fan blades on a shaft sufficiently heavy to maintain perfect alignment even when the blades of the fan are heavily loaded.

(iii) All bearings must be of the self-lubricating type, or lubricated from the outside duct.

(G) Place electric motors driving exhaust fans outside booths or ducts. See also paragraph (3)(g) of this section.

(H) When belts and pulleys are inside the duct or booth, they must be thoroughly enclosed.

(I) Construct exhaust ducts of substantially supported steel. Exhaust ducts without dampers are preferred; however, if dampers are installed, they must be fully opened when the ventilating system is in operation.

(i) Protect exhaust ducts against mechanical damage and maintain a clearance of at least 18 inches from unprotected combustible construction or other combustible material.

(ii) If combustible construction is provided with the following protection applied to all surfaces within 18 inches of the exhaust duct, clearances may be reduced to the distances indicated:

(a) 28-gage sheet metal on 1/4 -inch insulating millboard 12 inches.

(b) 28-gage sheet metal on 1/8-inch insulating millboard spaced out 1 inch on non-combustible spacers . . . 9 inches.

(c) 22-gage sheet metal on 1-inch rockwool batts reinforced with wire mesh or the equivalent . . . 3 inches.

(J) The terminal discharge point must be at least 6 feet from any combustible exterior wall or roof. The discharge point must not discharge in the direction of any combustible construction or unprotected opening in any non-combustible exterior wall within 30 feet.

(K) Keep air exhaust from spray operations away from makeup air or other ventilation intakes. Do not recirculate air exhausted from spray operations.

(L) Supply clean fresh air, free of contamination from adjacent industrial exhaust systems, chimneys, stacks, or vents, to a spray booth in quantities equal to the volume of air exhausted through the

spray booth.

(M) Provide exhaust ducts with an ample number of access doors when necessary to facilitate cleaning.

(N) Provide air intake openings to rooms containing spray finishing operations adequate for the efficient operation of exhaust fans and placed to minimize the creation of dead air pockets.

(O) Dry freshly sprayed articles only in spaces provided with adequate ventilation to prevent the formation of explosive vapors. Drying spaces without adequate ventilation will be considered a spraying area. See also paragraph (6) of this section.

(4) Rules for Spray Finishing with Flammable and Combustible Liquids

(a) These rules apply to spray finishing with Class I flammable liquids, Class II combustible liquids, and Class IIIA combustible liquids. These rules only apply to Class IIIB combustible liquids when they are heated for use to within 30E F (16.7E C) of their flashpoint.

(b) Flammable and combustible liquids – storage and handling.

(A) Store flammable or combustible liquids in compliance with the requirements of OAR 437-002-1910.106.

(B) Keep only the minimum quantity of flammable or combustible liquids required for operations in the vicinity of spraying operations and do not exceed a supply for one day or one shift. Bulk storage of portable containers of flammable or combustible liquids must be in a separate, constructed building detached from other important buildings or cut off in a standard manner.

(C) Use only the original closed containers, approved portable tanks, approved safety cans, or a properly arranged system of piping for bringing flammable or combustible liquids into the spray area. Do not use open or glass containers.

(D) Use approved pumps to withdraw flammable and combustible liquids from containers with a capacity of 61 gallons or more except as provided in paragraph (4)(b)(F) of this section.

(E) Withdraw and fill containers with flammable or combustible

liquids only in a suitable mixing room or in a spraying area when the ventilating system is in operation. Take adequate precautions to protect against spilling liquids and sources of ignition.

(F) Containers must conform to the following requirements:

(i) Use only closed containers to supply spray nozzles. Use metal covers to close containers that are not closed.

(ii) Use metal supports or wire cables to support containers that are not resting on floors.

(iii) When spray nozzles are supplied by gravity flow, do not use containers that exceed 10 gallons capacity.

(iv) Do not use air pressure in the original shipping containers to supply spray nozzles.

(G) Containers under air pressure supplying spray nozzles must also conform to the following requirements

(i) Use only limited capacity containers that only hold enough material for one day's operation.

(ii) Use only containers that are designed and approved for such use.

(iii) Provide containers with a visible pressure gauge.

(iv) Containers must be provided with a relief valve set to operate in conformance with the requirements of the Oregon Building Codes Division OAR 918-225, "Boilers and Pressure Vessels."

(H) Pipes and hoses.

(i) All containers or piping with an attached hose or flexible connection must have a shutoff valve at the connection. Keep such valves shut when not spraying.

(ii) When a pump is used to deliver the liquid used in a spray application process, use only piping, tubing, hoses, and accessories that are designed to withstand the maximum working pressure of the pump. Alternatively, provide

automatic means to limit the discharge pressure of the pump to a level within the design working pressure of the piping, tubing, hoses, and accessories.

(iii) Inspect all pressure hose and couplings at regular intervals appropriate to this service. Test the hose and couplings with the hose extended using the "inservice maximum operating pressures." Repair or discard any hose showing material deteriorations, signs of leakage, or weakness in its' carcass or at the couplings.

(iv) Piping systems conveying flammable or combustible liquids must be of steel or other material having comparable properties of resistance to heat and physical damage. Properly bond and ground piping systems.

(I) Use approved and listed electrically powered spray liquid heaters. Do not put heaters in spray booths or any other location subject to the accumulation of deposits or combustible residue.

(J) If flammable or combustible liquids are supplied to spray nozzles by positive displacement pumps, use an approved relief valve on the pump discharge line that discharges to a pump suction or a safe detached location, or use a device provided to stop the prime mover if the discharge pressure exceeds the safe operating pressure of the system.

(K) Whenever flammable or combustible liquids are transferred from one container to another, effectively bond and ground both containers to prevent discharge sparks of static electricity.

(c) Install an adequate supply of suitable portable fire extinguishers near all spraying areas.

(d) Operations and maintenance.

(A) Immediately remove and dispose residue scrapings and debris contaminated with residue from the premises. Deposit all rags or waste impregnated with finishing material in tightly-closing metal waste cans immediately after use. Properly dispose of the contents of waste cans at least once daily or at the end of each shift.

(B) Do not leave clothing worn during spray finishing on the

premises overnight unless kept in metal lockers.

(C) Only use solvents for cleaning operations with flashpoints at or above the flashpoints of material normally used. Cleaning operations must be done inside a spray booth with the ventilation system on, or an area authorized in writing by the local fire authority.

(D) Do not alternately use spray booths for different types of coating materials when the materials are incompatible with each other, unless all deposits of the first used material are removed from the booth and exhaust ducts prior to spraying with the second material.

(e) Mixing.

(A) Mix materials only in a mixing room, a spray area that meets the requirements of (3)(b), or in a spray booth. When a spray area or spray booth is used for mixing, the ventilation system must be on.

(B) Construct mixing rooms of substantially supported steel, concrete, or masonry. Use only non-combustible materials to construct mixing rooms.

(C) Design mixing rooms so that any spills remain inside the room.

(D) Provide at least 150 cubic feet per minute (CFM) of airflow in each mixing room. When the flooring of the mixing room is greater than 150 square feet, provide at least 1 CFM per square foot of flooring. The ventilation system for each mixing room must be on and operational at all times.

(E) Follow all of the provisions of paragraph (3)(g).

(F) Protect all spaces within the mixing room with automatic sprinklers acceptable to the local fire authority. Where automatic sprinklers are not available, use other automatic extinguishing equipment. Alternatives may be used only when authorized in writing by the local fire authority.

(5) Rules for Electrostatic Spray Finishing

(a) Fixed electrostatic apparatus.

(A) Use only approved electrostatic apparatus and devices in connection with coating operations.

(B) Transformers, power packs, control apparatus, and all other electrical portions of the equipment, with the exception of high-voltage grids, electrodes, and electrostatic atomizing heads and their connections, must be located outside of the spraying area, or must otherwise conform to the requirements of paragraph (3) of this section.

(C) Adequately support electrodes and electrostatic atomizing heads in permanent locations and effectively insulate them from the ground. Electrodes and electrostatic atomizing heads which are permanently attached to their bases, supports, or reciprocators are considered to comply with this section. Use only non-porous and non-combustible insulators.

(D) Properly insulate and protect high-voltage leads to electrodes from mechanical injury or exposure to destructive chemicals. Effectively and permanently support electrostatic atomizing heads on suitable insulators and effectively guard against accidental contact or grounding. Provide an automatic means for grounding the electrode system when it is electrically de-energized for any reason. Keep all insulators clean and dry.

(E) Maintain a safe distance between goods being painted and electrodes or electrostatic atomizing heads or conductors of at least twice the sparking distance. Conspicuously post a sign indicating this safe distance near the assembly.

(F) Support goods being painted using this process on conveyors. Arrange the conveyors to maintain safe distances between the goods and the electrodes or electrostatic atomizing heads at all times. Any irregularly shaped or other goods subject to possible swinging or movement must be rigidly supported to prevent swinging or movement which would reduce the clearance to less than that specified in paragraph (5)(a)(E) of this section.

(G) Equip electrostatic apparatus with automatic controls that immediately disconnect the power supply to the high voltage transformer and signals the operator when:

(i) Any failure occurs in the ventilation equipment.

(ii) The conveyor carrying goods through the high voltage field stops.

(iii) Occurrence of a ground or of an imminent ground at any point on the high voltage system.

(iv) The safe distance required by (5)(a)(E) is not maintained.

(H) Place adequate booths, fencing, railings, or guards around the equipment to assure, either by their location or character or both, that a safe isolation of the process is maintained from plant storage or personnel. Construct such railings, fencing, and guards of conducting material that is adequately grounded.

(b) Electrostatic hand spraying equipment.

(A) This paragraph applies to any equipment that uses 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.

(B) Use only approved electrostatic hand spray apparatus and devices in connection with coating operations. The high voltage circuits must be designed so it does not produce a spark of sufficient intensity to ignite any vapor-air mixtures or 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 must be capable of being energized only by a switch which also controls the coating material supply.

(C) Locate transformers, powerpacks, control apparatus, and all other electrical portions of the equipment outside of the spraying area. This requirement does not apply to the handgun itself and its connections to the power supply.

(D) Electrically connect the handle of the spraying gun to ground by a metallic connection. Ensure that the operator in normal operating position is in intimate electrical contact with the grounded handle.

(E) Adequately ground all electrically conductive objects in the spraying area. This requirement applies to paint containers, wash

cans, and any other objects or devices in the area. Prominently and permanently install a warning on the equipment regarding the necessity for this grounding feature.

(F) Maintain metallic contact between objects being painted or coated and the conveyor or other grounded support. Regularly clean hooks to ensure this contact.

(G) Areas of contact must be sharp points or knife edges where possible.

(H) Conceal points of support of the object from random spray where feasible.

(I) When objects being sprayed are supported from a conveyor, the point of attachment to the conveyor must not collect spray material during normal operation.

(J) Interlock the electrical equipment with the ventilation of the spraying area so that the equipment cannot be operated unless the ventilation fans are on.

(6) Drying, Curing, or Fusion Apparatus.

(a) Drying, curing, or fusion equipment.

(A) Equipment manufactured or modified on or before June 1, 2003, must comply with the provisions of the Standard for ovens and furnaces, NFPA No. 86A-1969 where applicable.

(B) Equipment manufactured or modified after June 1, 2003, must comply with the provisions of the Standard for Ovens and Furnaces, NFPA No. 86-1999 where applicable.

(b) Do not use a spray area for drying when such drying can increase the surface temperature of the spray area.

(c) Except as specifically provided in paragraph (6)(e) of this section, do not install an open flame heating system for drying, curing, or fusion in a spray area.

(d) Drying, curing, or fusion units may be installed adjacent to spray areas only when equipped with an interlocked ventilating system arranged to:

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

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

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

(e) Automobile refinishing spray booths or enclosures, otherwise installed and meeting the requirements of this section, may alternately be used for drying with portable electrical infrared drying apparatus that meets the following:

(A) Keep the interior (especially floors) of spray enclosures free of overspray deposits.

(B) Keep the apparatus out of the spray and overspray area while spray finishing is in progress.

(C) Equip the spraying apparatus, the drying apparatus, and the ventilating system of the spray enclosure with suitable interlocks arranged so:

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

(ii) The spray enclosure is purged of spray vapors for at least 3 minutes before the drying apparatus is energized.

(iii) The ventilating system maintains 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.

(D) All electrical wiring and equipment of the drying apparatus must meet the applicable sections of OAR 437, Division 2, Subdivision S. Only equipment of a type approved for Class I, Division 2 hazardous locations will be located within 18 inches of floor level. All metallic parts of the drying apparatus will be properly electrically bonded and grounded.

(E) Place a warning sign on the drying apparatus indicating that ventilation must be maintained during the drying period and that

spraying must not be conducted in the vicinity where spray will deposit on apparatus.

(7) Powder Coating.

(a) Ventilation.

(A) Ensure that exhaust ventilation is sufficient to maintain the atmosphere below the lowest explosive limits for the materials being applied. Ensure that all non-deposited air-suspended powders are safely removed via exhaust ducts to the powder recovery cyclone or receptacle.

(B) Do not release powders to the outside atmosphere.

(b) Operation and maintenance.

(A) Keep all areas free of the accumulation of powder coating dusts, particularly horizontal surfaces as ledges, beams, pipes, hoods, booths, and floors.

(B) Clean surfaces in a manner to avoid scattering dust to other places or creating dust clouds.

(C) Conspicuously post "No Smoking" signs in large letters on contrasting color background at all powder coating areas and powder storage rooms.

(c) Electrostatic fluidized beds.

(A) Use only approved electrostatic fluidized beds and associated equipment.

(B) Ensure that the maximum surface temperature of this equipment in the coating area does not exceed 150° F.

(C) Use only high voltage circuits that will not produce a spark of sufficient intensity to ignite any powder-air mixtures.

(D) Use circuits designed to eliminate shock hazards upon coming in contact with a grounded object under normal operating conditions.

(E) Locate transformers, powerpacks, control apparatus, and all other electrical portions of the equipment outside of the powder coating area, with the exception of the charging electrodes and their connections to the power supply.

(F) Adequately ground all electrically conductive objects within the charging influence of the electrodes. The powder coating equipment must carry a prominent, permanently installed warning regarding the necessity for grounding these objects.

(G) Objects being coated will be maintained in contact with the conveyor or other support in order to ensure proper grounding. Regularly clean hangers to ensure effective contact and areas of contact will be sharp points or knife edges where possible.

(H) Interlock the electrical equipment with the ventilation system so the equipment cannot be operated unless the ventilation fans are in operation.

Stat. Auth.: ORS 654.025(2) and ORS 656.726(4).

Stats. Implemented: ORS 654.001 through 654.295.

Hist: OR-OSHA Admin. Order 2-1992, f. 2/6/92, ef. 5/1/92.

OR-OSHA Admin. Order 3-2003, f. 4/21/03, ef. 4/21/03.