§1910.121 (RESERVED)

437-002-0122 Dipping and Coating.

(1) Scope.

(a) *This rule applies to all operations where an object is partially or fully immersed in a liquid, or the vapors of a liquid. Such operations include, but are not limited to, cleaning, coating, altering the surface of an object, or changing the character of an object. Examples of covered operations are paint dipping, electroplating, pickling, quenching, tanning, degreasing, stripping, cleaning, roll coating, flow coating, and curtain coating. This rule also applies to draining or drying an object that has been dipped or coated.*

(b) *This rule does not apply to tanks that contain only water or a molten material.*

(2) Definitions*.*

Adjacent area: *Any area within 20 feet (6.1 m) of a vapor area that is not separated from the vapor area by tight partitions.*

Approved: *The equipment is listed or approved by a nationally recognized testing laboratory.*

Autoignition temperature: *The minimum temperature required to cause self-sustained combustion, independent of any other source of heat.*

Combustible liquid: *A liquid having a flash point of 100º F (37.8º C) or above. For purposes of this rule, combustible liquids include any liquid with a flash point above 200º F that is heated or has heated items placed in it.*

Dip tank: *A container holding a liquid other than water and is used for dipping or coating. An object may be immersed (or partially immersed) in a dip tank or it may be suspended in a vapor coming from the tank.*

Flammable liquid: *A liquid having a flashpoint below 100º F (37.8º C).*

Flashpoint: *The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite if tested in accordance with the definition of "flashpoint" in OAR 437-002-1910.1200(c).*

Lower flammable limit (LFL): *The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent by volume of the material in air (or other oxidant).*

Vapor area: *Any space containing a dip tank, including its drain boards, associated drying or conveying equipment, and any surrounding area where the vapor concentration exceeds 25% of the LFL of the liquid in the tank.*

(3) *Any container used as a dip tank must be strong enough to withstand any expected load.*

(4) Ventilation.

(a) *Ensure airborne concentrations of materials in any vapor area do not exceed 25% of its LFL.*

(b) *A tank cover or material that floats on the surface of the liquid in a dip tank to replace or supplement ventilation is acceptable, as long as the airborne concentrations do not exceed 25% of the LFL or any limit established by Division 2, Subdivision Z.*

(c) *When mechanical ventilation is used, it must conform to design standards based on national consensus standards that meet the following:*

(A) *The standard specifies the safety requirements for the particular equipment;*

(B) *The standard is recognized in the United States as providing specifications that result in an adequate level of safety;*

(C) *The standard was developed by a standards development organization under a method providing for input and consideration of views of industry groups, experts, users, governmental authorities, and others having broad experience and expertise in issues related to the design and construction of the particular equipment.*

(d) *Nonmandatory appendix A of this section contains examples of consensus standards that meet the requirements of paragraph (4)(c) of this section.*

(e) *When mechanical ventilation is used, each dip tank must have an independent exhaust system unless the combination of substances being removed will not cause a fire, explosion, or chemical reaction.*

(f) *When mechanical ventilation is used, it must draw the flow of air into a hood or exhaust duct.*

(A) *Ensure each room with exhaust hoods has make-up airflow that is at least 90% of the volume of air exhausted.*

(B) *Ensure that make-up air does not damage exhaust hoods.*

(C) *When air is recirculated, it must meet the requirements of OAR 437-002-0081, "Oregon Ventilation Regulations."*

(g) *Inspect hoods and ventilation ductwork for corrosion or damage at least quarterly and prior to operation after a prolonged shutdown.*

(h) *Ensure the ventilation airflow is adequate at least quarterly and prior to operation after a prolonged shutdown.*

(5) *Periodically inspect all dipping and coating equipment, including covers, drains, overflow piping, and electrical and fire-extinguishing systems, and promptly correct any deficiencies.*

(6) *Thoroughly clean dip tanks of solvents and vapors before permitting welding, burning, or open-flame work.*

(7) *Provide mechanical ventilation or respirators (selected and used as specified in OAR 437-002-1910.134, "Respiratory Protection) to protect employees in the vapor area from exposure to toxic substances released during welding, burning, or open-flame work.*

(8) Medical, first aid, and hygiene facilities.

(a) *All employees working with or around dip tanks must know the first-aid procedures appropriate to the dipping and coating hazards to which they are exposed.*

(b) *When employees work with liquids that may burn, irritate, or otherwise harm their skin:*

(A) *Obtain a physician's approval before an employee with a sore, burn, or other skin lesion that requires medical attention can return to work in a vapor area.*

(B) *Only a properly designated person can provide treatment for any skin abrasion, cut, rash, or open sore.*

(C) *Keep appropriate first-aid supplies near dipping or coating operations.*

(D) *Provide employees who work with chromic acid periodic examinations, at least annually, of their exposed body parts, especially their nostrils.*

(E) *Provide locker space or other storage space to prevent contamination of employee's street clothes.*

(F) *Provide at least one basin with hot water for every 10 employees who work with such liquids.*

(G) *Follow the emergency eyewash and shower facilities requirements of OAR 437-002-0161, "Medical & First Aid."*

(9) *Before cleaning a dip tank:*

(a) *Drain the tank and open the cleanout doors ; and*

(b) *Ventilate and clear any pockets where hazardous vapors may have accumulated.*

(10) Use of flammable or combustible liquids.

(a) *Use only dip tanks constructed from non-combustible materials. When drainboards are used, use only drainboards constructed from non-combustible materials.*

(b) Overflow piping.

(A) *Provide properly trapped overflow piping for dip tanks that have a capacity greater than 150 gallons (568 liters) or a surface area greater than 10 square feet (0.95 square meters).*

(B) *Overflow piping must discharge to a safe location.*

(C) *Overflow piping must be at least 3 inches (7.6 cm) diameter and must have sufficient capacity to prevent the tank from overflowing.*

(D) *The bottom of the overflow connector must be at least 6 inches (15.2 cm) below the top of the dip tank.*

(c) Bottom Drains.

(A) *Dip tanks containing more than 500 gallons (1893 L) of liquid must have a bottom drain.*

(i) *A bottom drain is not required if an automatic cover that meets the requirements of paragraph (10)(d)(C) is used.*

(ii) *A bottom drain is not required if the viscosity of the liquid at normal atmospheric temperature makes this impractical.*

(B) *Ensure the bottom drain will empty the dip tank in the event of a fire.*

(C) *Properly trap the bottom drain.*

(D) *Ensure the bottom drain has pipes that will empty the dip tank within 5 minutes.*

(E) *Bottom drains must discharge to a safe location.*

(F) *Bottom drains must be capable of manual and automatic operation. Manual operation must be from a safe and accessible location.*

(G) *When gravity flow from the bottom drain is impractical, use automatic pumps.*

(d) Fire Protection.

(A) *Provide portable fire extinguishers that meet the requirements of OAR 437-002-0187 in every vapor area.*

(B) *Provide an automatic fire extinguishing system:*

(i) *When the capacity of the dip tank is at least 150 gallons (568 L) or the liquid surface area is 4 square feet (0.38 square meters) or more; or*

(ii) *When the capacity of a hardening or tempering tank is at least 500 gallons (1893 L) or a liquid surface area of 25 square feet (2.37 square meters) or more.*

(C) *A cover that is closed by an approved automatic device for the automatic fire-extinguishing system may be used instead of the fire extinguishing system if the cover:*

(i) *Can also be activated manually;*

(ii) *Is noncombustible or tin-clad, with the enclosing metal applied with locked joints; and*

(iii) *Is kept closed when the dip tank is not in use.*

(D) *In each vapor area and any adjacent area, ensure that:*

(i) *All electrical wiring and equipment conform to OAR 437, Division 2, Subdivision S (except as specifically permitted in paragraph (15)); and*

(ii) *There are no flames, spark-producing devices, or other surfaces that are hot enough to ignite vapors.*

(E) *Electrically bond and ground portable containers used to add liquids to dip tanks to prevent static electrical sparks or arcs.*

(F) *All vapor areas must be free of combustible debris and as free as practicable of combustible stock.*

(G) *Deposit all rags or waste impregnated with dipping or coating material in a tightly-closing metal waste can immediately after use. Use only waste cans that are approved or acceptable to the local fire authority.*

(H) *Empty all waste containers at the end of each shift.*

(I) *Prohibit smoking in all vapor areas. Post a readily visible "No Smoking" sign near each dip tank or designate the entire area as "No Smoking."*

(e) *If a conveyor system is used with a dip tank, it must automatically shut down in the event of a fire. If a ventilation system is used to meet the ventilation requirements of paragraph (4), the conveyor system must automatically shut down if the ventilation system fails.*

(f) *If a liquid is heated in a dip tank, it must be maintained below the liquid's boiling point, and it must be maintained at least 100º F (37.8º C) below the liquid's autoignition temperature.*

(g) *Ensure that a heating system that is used in a drying operation and could cause ignition:*

(A) *Is installed in accordance with NFPA 86A-1969, Standard for Ovens and Furnaces (which is incorporated by reference in §1910.6 of this part); and*

(B) *Has adequate mechanical ventilation that operates before and during the drying operation; and*

(C) *Shuts down automatically if any ventilating fan fails to maintain adequate ventilation.*

(11) Hardening or Tempering Tanks.

(a) *Ensure that hardening or tempering tanks:*

(A) *Are located as far as practicable from furnaces;*

(B) *Are on noncombustible flooring;*

(C) *Have noncombustible hoods and vents (or equivalent devices) for venting to the outside. For this purpose, treat vent ducts as flues and keep them away from combustible materials, particularly roofs.*

(b) *Equip each tank with an alarm that will sound if the temperature of the liquid comes within 50º F (10º C) of its flashpoint (the alarm set point).*

(c) *When practicable, provide each tank with a limit switch to shut down the conveyor supplying work to the tank.*

(d) *If the temperature of the liquid can exceed the alarm set point, equip the tank with a circulating cooling system.*

(e) *If the tank has a bottom drain, the bottom drain may be combined with the oil-circulating system.*

(f) *Do not use air under pressure when filling the dip tank or agitating the liquid in the dip tank.*

(12) Flow Coating.

(a) *Use a direct low-pressure pumping system or a 10-gallon (38 L) or smaller gravity tank to supply the paint for flow coating. In case of fire, an approved heat-actuated device must shut down the pumping system.*

(b) *Ensure that the piping is substantial and rigidly supported.*

(13) *When roll coating, roll spreading, or roll impregnating operations use a flammable or combustible liquid that has a flashpoint below 140º F (60º C), prevent sparking of static electricity by:*

(a) *Bonding and grounding all metallic parts (including rotating parts) and installing static collectors; or*

(b) *Maintaining a conductive atmosphere (for example, one with a high relative humidity) in the vapor area.*

(14) Vapor degreasing tanks.

(a) *Ensure that the condenser or vapor-level thermostat keeps the vapor level at least 36 inches (91 cm) or one-half the tank width, whichever is less, below the top of the vapor degreasing tank.*

(b) *When using gas as a fuel to heat the tank liquid, the combustion chamber must be airtight (except for the flue opening) to prevent solvent vapors from entering the air-fuel mixture.*

(c) *The flue must be made of corrosion-resistant material, and it must extend to the outside. Install a draft diverter if mechanical exhaust is used on the flue.*

(d) *Do not allow the temperature of the heating element to cause a solvent or mixture to decompose or to generate an excessive amount of vapor.*

(15) *Ensure that cyanide tanks have a dike or other safeguard to prevent cyanide from mixing with an acid if a dip tank fails.*

(16) *If a liquid is sprayed in the air over an open-surface cleaning or degreasing tank, control the spraying to the extent feasible by:*

(a) *Enclosing the spraying operation; and*

(b) *Using mechanical ventilation to provide enough inward air velocity to prevent the spray from leaving the vapor area.*

(17) Electrostatic paint detearing.

(a) *Use only approved electrostatic equipment in paint-detearing operations. Electrodes in such equipment must be substantial, rigidly supported, permanently located, and effectively insulated from ground by nonporous, noncombustible, clean, dry insulators.*

(b) *Use conveyors to support any goods being paint deteared.*

(c) *Do not manually handle goods being electrostatically deteared.*

(d) *Maintain a minimum distance of twice the sparking distance between goods being electrostatically deteared and the electrodes or conductors of the electrostatic equipment.*

This minimum distance must be displayed conspicuously on a sign located near the equipment.

(e) *Ensure that the electrostatic equipment has automatic controls that immediately disconnect the power supply to the high-voltage transformer and signal the operator if:*

(A) *Ventilation or the conveyors fail to operate;*

(B) *A ground (or imminent ground) occurs anywhere in the high-voltage system; or*

(C) *Goods being electrostatically deteared come within twice the sparking distance of the electrodes or conductors of the equipment.*

(f) *Use fences, rails, or guards, made of conducting material and adequately grounded, to separate paint-detearing operations from storage areas and from personnel.*

(g) *To protect paint-detearing operations from fire, use automatic sprinklers or an automatic fire-extinguishing system conforming to the requirements of OAR 437, Division 2, Subdivision F.*

(h) *To collect paint deposits, provide drip plates and screens and clean these plates and screens in a safe location.*

Stat. Authority: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 9-2007, f. 12/3/07, ef. 12/3/07.

Appendix A: Criteria for Ventilation Consensus Standards (Nonmandatory)

This appendix lists ventilation design consensus standards that meet OAR 437-002-0122(4)(c).

ANSI Z9.1-2006, Ventilation and Control of Airborne Contaminants During Open-Surface Tank Operations

ANSI Z9.2-2001, Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems

NFPA 34-2007, Dipping and Coating Processes Using Flammable or Combustible Liquids

ACGIH's "Industrial Ventilation: A Manual of Recommended Practice" (25th ed., 2004)

Stat. Authority: ORS 654.025(2) and 656.726(4).
Stats. Implemented: ORS 654.001 through 654.295.
Hist: OR-OSHA Admin. Order 9-2007, f. 12/3/07, ef. 12/3/07.

- END OF DOCUMENT -