

Rule 3.20 WOOD PRODUCTS COATING OPERATIONS

(Adopted 12/05/2005, Amended 8/1/2011)

A. GENERAL

- A.1 **PURPOSE:** To establish limits on the emission of volatile organic compounds (VOC) from coatings and strippers used on wood products.
- A.2 **APPLICABILITY:** This rule applies to any person who uses, manufactures, blends, sells, repackages, distributes, or specifies the use of wood products coatings and/or strippers for use within the District.
- A.3 **SEVERABILITY:** If a court of competent jurisdiction issues an order that any provision of this Rule is invalid, it is the intent of the District that other provisions of this Rule remain in full force and effect, to the extent allowed by law.

B. EXEMPTIONS

- B.1 The provisions of this Rule shall not apply to the following:
- a. This rule does not apply to sources using less than 55 gallons per year (singly or in any combination) of wood products coatings and/or strippers.
 - b. Wood products coatings that are sold in non-refillable aerosol-spray containers.
 - c. Coating operations for the purpose of manufacturing a finished wood panel intended for attachment to the inside walls of buildings including, but not limited to, homes and office buildings, mobile homes, trailers, prefabricated buildings and similar structures; or a finished exterior wood siding intended for use in construction.
 - d. Coating of architectural components or structures not coated in a shop environment. Coating of architectural components or structures is subject to the provisions of Rule 3.15 Architectural Coatings.
 - e. Stencil coatings when used to comply with U.S. Military Specifications.

C. **DEFINITIONS**

- C.1 **Aerosol-Spray Container:** Any hand-held, pressurized, non-refillable container of 1 liter (1.1 quarts) or less where the contents are released when a valve on the container is depressed.
- C.2 **Air Assisted Airless Spray:** Equipment used to apply coatings that uses fluid air pressure to atomize coating and air pressure between 0.1 and 50 psig to adjust the spray pattern.
- C.3 **Binders:** Non-volatile polymeric organic materials (resins) that form the surface film in coating applications.
- C.4 **Capture Efficiency:** Expressed in percent, capture efficiency is the ratio of the weight of the VOC in the effluent stream entering a control device to the weight of the VOC emitted from wood product coating operations, both measured simultaneously, and can be calculated by the following equation:

$$\text{Capture Efficiency} = \frac{W_c}{W_e} \times 100$$

Where: W_c = Weight of VOC entering the control device
 W_e = Weight of VOC emitted

- C.5 **Clear Topcoat:** A final coating that contains binders, but not opaque pigments, and is specially formulated to form a transparent or translucent solid protective film.
- C.6 **Closed Container:** A container that has a cover where the cover meets with the main body of the container without any gaps between the cover and the main body of the container.
- C.7 **Coating:** A material which is applied to a surface and which forms a film in order to beautify and/or protect such surface. "Coating" includes, but is not limited to, materials such as topcoats, stains, sealers, fillers, conversion varnish, pigmented coatings, multicolored coatings, moldseal coatings, washcoats, and toners.
- C.8 **Control Efficiency:** Expressed in percent, control efficiency is the ratio of the weight of the VOC removed by the control device from the effluent stream entering the control device to the weight of VOC in the effluent stream entering the control device, both measured simultaneously. Control efficiency is calculated by the following equation:

$$\text{Control Efficiency} = \frac{(W_c - W_a)}{W_c} \times 100$$

Where: W_c = Weight of VOC entering the control device
 W_a = Weight of VOC discharged from the control device

- C.9 **Conversion Varnish:** A coating comprised of a homogeneous (alkyd-amino resin) liquid which, when acid catalyzed and applied, hardens upon exposure to air or heat by evaporation and polymerization to form a continuous film that imparts protective or decorative properties to wood surfaces. Any conversion varnish used as a self sealing system shall be classified as a conversion varnish rather than a sealer.
- C.10 **Dip Coat:** A coating which is applied by dipping an object into a vat of coating material and allowing any excess coating material to drain off.
- C.11 **Electrostatic Application:** The electrical charging of atomized coating droplets for deposition by electrostatic attraction.
- C.12 **Exempt Compound:** As defined in District Rule 1.1, Definitions.
- C.13 **Filler:** A preparation used to fill in cracks, grains, etc. of wood before applying a coating.
- C.14 **Flow Coat:** A coating of which is applied by flowing a stream of coating over an object and allowing any excess coating material to drain off.
- C.15 **High-Solid Stain:** Stains containing more than 454 grams (1 pound) of solids per 3.785 liters (1 gallon), by weight and can include wiping stains, glazes, and opaque stains.
- C.16 **High-Volume, Low-Pressure (HVLP):** Equipment used to apply coatings by means of a gun which is designed to be operated and which is operated between 0.1 and 10 pounds per square inch gauge (psig) air pressure measured dynamically at the center of the air cap and at the air horns.
- C.17 **Ink:** A fluid that contains dyes and/or colorants and is used to make markings but not to protect surfaces.
- C.18 **Low-Solids Stains:** Stains that contain 454 grams (1 pound) or less of solids per 3.785 liters (1 gallon) or less by weight.
- C.19 **Low-Volume, Low-Pressure (LVLP) Equipment:** Spray coating application equipment with air pressure between 0.1 and 10.0 psig and air volume less than 15.5 cubic feet per minute (cfm) per spray gun and which operates at a maximum fluid delivery pressure of 50 psig.

- C.20 **Mold-Seal Coating:** The initial coating applied to a new mold or repaired mold to provide a smooth surface which, when coated with a mold release coating, prevents products from sticking to the mold.
- C.21 **Multi-Colored Coating:** A coating which exhibits more than one color when applied and which is packaged in a single container and applied in a single coat.
- C.22 **New Wood Product:** A wood product which has not been previously coated. A wood product from which uncured coatings have been removed to repair flaws in initial coatings applications is a new wood product.
- C.23 **Pigmented Coatings:** Opaque coatings that contain binders and colored pigments that are formulated to hide the wood surface either as an undercoat or topcoat.
- C.24 **Reactive Diluents:** A liquid component of a coating that is a VOC during application, and one in which through chemical or physical reactions, such as polymerization, becomes an integral part of a finished coating.
- C.25 **Refinishing Operation:** The steps necessary to remove cured coatings and to repair, preserve, or restore a wood product.
- C.26 **Repair Coating:** A coating used to recoat portions of a product which has sustained mechanical damage to the coating following normal coating operations.
- C.27 **Roll Coater:** A series of mechanical rollers that form a thin coating film on the surface of the roller which is applied to a substrate by moving the substrate underneath the roller.
- C.28 **Sealer:** A coating containing binders which seals the wood prior to application of subsequent coatings.
- C.29 **Stencil Coating:** An ink or a pigmented coating which is rolled or brushed onto a template or stamp in order to add identifying letters and/or numbers to wood products.
- C.30 **Stripper:** A liquid used to remove cured coatings, cured inks, and/or cured adhesives.
- C.31 **Surface Preparation and Clean-up:** The removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants such as dust, soil, oil, grease, etc., at any step in the production, repair, maintenance, or servicing of parts,

products, tools, machinery, equipment, or general work areas and including the storage and disposal of VOC containing materials.

- C.32 **Toner:** A wash coat which contains binders and dyes or pigments to add tint to a coated surface.
- C.33 **Touch-up Coating:** A coating used to cover minor coating imperfections appearing after the main coating operation.
- C.34 **Volatile Organic Compound (VOC):** As defined in District Rule 1.1.
- C.35 **Volatile Organic Compound Composite Partial Vapor Pressure:** The sum of the partial pressures of compounds defined as VOC.
- C.36 **Wash Coat:** A coating that is used to seal wood surfaces, preventing undesired staining, and control penetration. For the purpose of this rule, wash coats shall be considered low-solids coatings and shall contain less than 454 grams (1 pound) of solids per 3.785 liters (1 gallon) by weight. Wash coats with greater than 454 grams (1 pound) of solids per 3.785 liters (1 gallon), by weight, shall be considered sealers.
- C.37 **Wood Panel:** Any piece of wood or wood composition which is solid or laminated, and which is larger than 10 square feet in size, and which is not subsequently cut into smaller pieces.
- C.38 **Wood Products:** Surface-coated products which include cabinets (kitchen, bath, and vanity), tables, chairs, beds, sofas, shutters, art objects, and any other coated objects made of solid wood and/or wood composition.
- C.39 **Wood Product Coating Application Operations:** A combination of coating application steps of which may include use of spray guns, flash-off areas, spray booths, ovens, conveyors, and/or other equipment operated for the purpose of applying coating materials.

D. REQUIREMENTS

- D.1 **Application Equipment Requirements:** A person subject to the provisions of this rule shall not apply any wood products coating to any wood products, unless one of the following application methods is used:
- a. Electrostatic application equipment;
 - b. High Volume Low Pressure spray equipment;
 - c. Low-Volume, Low-Pressure spray equipment;

- d. Air assisted airless, for touch-up and repair only;
- e. Hand application methods, such as brushes or rollers;
- f. Dip coat;
- g. Flow coat;
- h. Roll coat;
- i. Vacuum coat;
- j. Any other equivalent method, which has been approved in writing by the Air Pollution Control Officer (APCO) and the U.S. Environmental Protection Agency (EPA).

D.2 VOC Content of Coatings for New Wood Products: Except as provided in Sections D.5 and D.6 of this rule, no person shall apply any coating to a new wood product which has a volatile organic compound (VOC) content exceeding the applicable limits specified below:

Coating Category	VOC limits	
	Less water and exempt compounds	
	Grams per liter	lb-VOC/lb-solid
Clear Topcoats	275	0.35
Conversion	550	1.20
Filler	275	0.18
High-Solid Stain	350	0.42
Inks	500	0.96
Mold-Seal Coating	750	4.20
Multi-Colored Coating	275	0.33
Pigmented Coating	275	0.25
Sealer	275	0.36

Coating Category	VOC limits	
	Grams per liter	lbs./gal.
Low-Solid Stains, Toners, Wash coats	120	1.00

- a. Notwithstanding the VOC limits specified in this section, a person may apply a sealer with a VOC content not exceeding 680 grams/liter, provided that the topcoat used on the same wood product does not exceed 275 grams/liter.
- b. If emission averaging is not used to achieve compliance with this section, VOC limits expressed in grams per liter shall be used.
- c. If emission averaging is used to achieve compliance with this section, VOC limits expressed in pounds of VOC per pound of solids shall be used.

D.3 **VOC Content of Coatings for Refinishing, Repairing, Preserving, or Restoring Wood Products:** Except as provided in Sections D.5 and D.6 of this rule, no person shall apply any coating to refinish, repair, preserve, or restore a wood product which has volatile organic compound (VOC) content exceeding the applicable limits specified below:

Coating Category	VOC limits	
	Less water and exempt compounds	
	Grams per liter	lb-VOC/lb-solid
Clear Topcoats	680	2.50
Conversion	550	1.20
Filler	500	0.96
High-Solid Stain	700	2.57
Inks	500	0.96
Mold-Seal Coating	750	4.20
Multi-Colored Coating	680	2.60
Pigmented Coating	600	1.60
Sealer	680	2.50

Coating Category	VOC limits	
	Grams per liter	lbs./gal.
Low-Solid Stains, Toners, Wash coats	480	4.00

- a. If emission averaging is not used to achieve compliance with this section, VOC limits expressed in grams per liter shall be used.
- b. If emission averaging is used to achieve compliance with this section, VOC expressed in pounds of VOC per pound of solids shall be used.

D.4 **VOC Content For Strippers:** A person shall not use a stripper on wood products unless:

- a. It contains less than 350 grams of VOC per liter of material;
or
- b. The VOC composite partial vapor pressure is 2 mm Hg (0.04 psig) or less at 20°C (68°F), as calculated pursuant to Section G.9 of this rule.

D.5 **Emission Control Equipment:** As an alternative, a person may comply with the VOC limits specified in Sections D.2, D.3, and D.4. of this rule by using an approved air pollution control system consisting of all the following:

- a. A capture and control device which reduces VOC emissions from the application of wood products coatings or strippers by an equivalent or greater amount than the limits specified in Sections D.2, D.3, and D.4 of this rule, with written approval of the Air Pollution Control Officer (APCO). The minimum required overall capture and control efficiency of an emission system at which an equivalent or greater level of VOC reduction will be achieved shall be calculated by the following equation:

$$C.E. = 1 - \frac{VOC_{LWc}}{VOC_{LWnMax}} \times \frac{1 - \frac{VOC_{WnMax}}{D_{nMax}}}{1 - \frac{VOC_{LWc}}{D_c}} \times 100$$

- Where: C.E. = Overall Control Efficiency, percent.
 VOC_{LWc} = VOC Limit of Rule 3.20, less water and less exempt compounds, pursuant to Sections D.2, D.3, and/or D.4
 VOC_{LWn,Max} = Maximum VOC content of non-compliant coating used in conjunction with a control device, less water and less exempt compounds.
 D_{n,Max} = Density of solvent, reducer, or thinner contained in the non-compliant coating, containing the maximum VOC content of the multi-component coating.
 D_c = Density of corresponding solvent, reducer, or thinner used in the compliant coating system = 880 g/L

- b. The capture system shall vent all drying oven exhaust to the control device and shall have one or more inlets for collection of fugitive emissions;
- c. During any period of operation of a thermal incinerator, combustion temperature shall be continuously monitored;
- d. During any period of operation of a catalytic incinerator, exhaust gas temperature shall be continuously monitored;
- e. Written approval for the use of such equipment is obtained from the Air Pollution Control Officer (APCO) prior to installation or use of the equipment.

D.6 **Emissions Averaging Provisions:** A person may comply with the provisions of Sections D.2, D.3, and D.4 of this rule by using an averaging approach for all or a portion of the coatings used

at the facility, provided that all the following requirements of are met:

- a. A person shall demonstrate that the emissions from the coatings being averaged, on a pounds of VOC per pounds of solids basis on a rolling 30-day basis, are less than or equal to the allowable emissions, based on the following:

$$\sum_{i=1}^n \text{VOC}_i(U_i) \geq \sum_{i=1}^n \text{ER}_i(U_i)$$

Where: VOC_i = VOC content limit of coating "i" (grams of VOC per liter of material for low solids coatings and pounds of VOC per pound of solids for all other coatings, as required in Sections D.2, D.3, or D.4 of this rule.)

U_i = Usage of coating "i" (liters of material for low solids coatings, and pounds of solids for all other coatings), and

ER_i = Actual VOC content of coating "i", as applied (grams per liter for low solids materials and pounds of VOC per pounds of solids for all other coatings).

- b. Any wood product coating not included in emissions averaging shall comply with the VOC limits in Sections D.2, D.3, or D.4 of this rule.

D.7 Requirements for Surface Preparation and Clean-up Materials:

Any solvent cleaning of application equipment, parts, products, tools, machinery, equipment, general work areas, and the storage and disposal of VOC-containing materials used in surface preparation and clean-up operations shall be carried out pursuant to District Rule 3.14, Surface Preparation and Clean-up.

D.8 Storage and Disposal - General Requirements:

All VOC-containing materials, whether in its form for intended use or as a waste or used product, including items such as cloth or paper laden with VOC containing materials, shall be stored in non-absorbent, non-leaking containers which shall be kept closed at all times, except when filling or emptying, and disposed of in a manner to prevent evaporation of VOCs into the atmosphere at the facility.

E. ADMINISTRATIVE REQUIREMENTS

- E.1 Labeling Requirements - VOC content:** Each container of any coating or stripper manufactured after date of adoption shall display its maximum VOC content of the coating, as applied, and after any thinning as recommended by the manufacturer, or shall have this information provided in a product data sheet supplied with the container. VOC content shall be displayed as grams of VOC per liter of coating (less water and less exempt solvent, and excluding any colorant added to tint bases) or stripper. VOC content displayed may be calculated using product formulation data, or may be determined using the test method in Section G of this rule. Alternatively, containers for strippers subject to the provisions of Section D.4 of this rule may display only the partial vapor pressure.
- E.2 Operation and Maintenance Plan ("O&M Plan"):** Any person using an approved emission control device pursuant to Section D.5 as a means of complying with this rule must submit an O&M Plan for the emission control device to the Air Pollution Control Officer for approval. Each O&M Plan shall specify operation and maintenance that will demonstrate continuous operation of the emission control device during periods of emissions-producing operations. Each O&M Plan shall also specify which records must be kept to document these operations and maintenance procedures. An O&M Plan shall be implemented upon approval of the Air Pollution Control Officer.
- E.3 Emissions Averaging Plan ("EA Plan"):** A person wanting to use emissions averaging to achieve compliance with this rule pursuant to D.6 shall submit an Emissions Averaging Plan for approval by the Air Pollution Control Officer. The EA Plan may not be implemented until approved in writing, by the Air Pollution Control Officer. Submittal of an EA Plan does not provide an exemption from the requirements of this rule. If the EA Plan is not approved, emissions averaging will not be permitted. The EA Plan shall include, at a minimum:
- a. A description of the wood product coatings to be included in the averaging program; and
 - b. A description of the quantification and recordkeeping for coating usage, coating VOC and solids content, VOC emissions, and calculations to show compliance with Section D.6 of this rule.

F. MONITORING AND RECORDS:

F.1 **Usage Records:** Any person subject to this Rule shall maintain the following records in order to evaluate compliance:

- a. A data sheet, material list, or invoice giving material name, manufacturer identification, material application, and VOC content;
- b. Any catalysts, reducers, or other components used and the mix ratio; and the applicable VOC limit from Section D.2. or D.3. and the actual VOC content of the wood product coating as applied;
- c. For persons using coatings or materials that comply with the VOC limits specified in Sections D.2, D.3, and D.4 of this rule, records shall be maintained on a monthly basis showing the type and volume of coatings and strippers used. Coating type shall be designated according to the coating categories as listed in Sections D.2, D.3, and D.4;
- d. For persons using a collection and control system pursuant to Section D.5 of this rule, records shall be maintained on a daily basis showing the type and volume of coatings and solvents used. Key system operating and maintenance procedures of the control system shall also be maintained on a daily basis. Key system operating parameters are those necessary to ensure compliance with the requirements of Section D.5 of this rule.
- e. For coatings used in emissions averaging pursuant to Section D.6 of this rule, daily records shall be maintained showing the type and volume of coatings and strippers used;

F.2 **Duration of Records:** All records required by this rule shall be maintained for at least three (3) years, and shall be made available to the Air Pollution Control Officer upon request.

G. TEST METHODS AND CALCULATIONS

G.1 **General:** For the purposes of this Rule, the following test methods or calculation methods shall be used. Other test methods determined to be equivalent and approved in writing by the District and the EPA may also be used. VOC emissions or other parameters determined to exceed any limits established by this Rule through the use of any of the following test methods or calculations shall constitute a violation of this Rule.

- G.2 **Determination of VOC Content:** VOC content of wood products coatings, strippers, and surface preparation and clean-up materials subject to this rule shall be determined in accordance with EPA Method 24 and Section G.10 or G.11 of this rule, as applicable.
- G.3 **Determination of Composition of VOC:** The composition of VOC shall be as specified on the manufacturer's label or data sheet, or as determined by ASTM Method E-260, General Gas Chromatograph.
- G.4 **Determination of Compounds Exempt from VOC Definition:** Exempt compounds shall be determined in accordance with South Coast Air Quality Management District Method 303. If any of the perfluorocarbons or volatile cyclic and linear methyl siloxanes are being claimed as exempt compounds, the person making the claim must state in advance which compounds are present, and the EPA approved test method used to make the determination of these compounds.
- G.5 **Determination of Capture Efficiency:** Efficiency of the collection system shall be determined in accordance with EPA "Guidelines for Determining Capture Efficiency, January 9, 1995". Individual collection efficiency test runs subject to the U.S. EPA technical guidelines shall be determined by one of the following:
- a. Applicable U.S. EPA Methods 204, 204A, 204B, 204C, 204E, and/or, 204F; or
 - b. The South Coast Air Quality Management District "Protocol for Determination of Volatile Organic Compound (VOC) Capture Efficiency"; or
 - c. Any other method approved by the U.S. EPA, the California Air Resources Board, and the Air Pollution Control Officer.
- G.6 **Determination of Control Efficiency:** Efficiency of control equipment shall be determined in accordance with EPA Method 18, 25, 25A, EPA Method 2 or 2C (whichever is applicable).
- G.7 **Vapor Pressure:** Vapor pressures may be obtained from standard reference texts or may be determined by ASTM D-2879.
- G.8 **Volatile Content of Radiation Curable Materials:** Volatile content of radiation curable materials shall be obtained in accordance with ASTM Method D-5403-93.

G.9 **Calculation for Determining Volatile Organic Compound Composite Partial Vapor Pressure:** VOC composite partial vapor pressure for determination of compliance with Section D.4. of this rule shall be calculated by the following equation:

$$PP_c = \frac{\sum_{i=1}^n (W_i)(VP_i)/MW_i}{\frac{W_w}{MW_w} + \frac{W_e}{MW_e} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

Where: PP_c = VOC composite partial presser at 20°C, in mmHg.
 W_i = Weight of the "i"th VOC compound, in grams.
 W_w = Weight of water, in grams.
 W_e = Weight of exempt compounds, in grams.
 MW_i = Molecular weight of the "i"th VOC compound, in (g/gmole).
 MW_w = Molecular weight of water, in (g/gmole).
 MW_e = Molecular weight of exempt compound, in (g/gmole).
 VP_i = Vapor Pressure of the "i"th VOC compound at 20°C, in mmHg.

G.10 **Calculation For Determining Weight of VOC Per Volume of Coating, Less Water and Less Exempt Compounds:** The weight of VOC per combined volume of VOC and coating solids, shall be calculated by the following equation:

$$G1 = \frac{W_v - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

Where: W_v = Weight of Volatile Compounds, in grams.
 W_w = Weight of water, in grams
 W_{ec} = Weight of exempt compounds, in grams.
 V_m = Volume of coating material, in liters.
 V_w = Volume of water, in liters.
 V_{ec} = Volume of exempt compounds, in liters.

G.11 **Calculation for Determination of VOC Content per Volume of Material:** The volume of material is defined as the volume of the original material, plus any VOC-containing material added to the original material. The original material is the material before any VOC-containing material such as the solvent is added for purposes of mixing or thinning. The VOC content shall exclude any colorant added to a tint base. The weight of VOC per total

volume of material shall be calculated by the following equation:

$$\text{VOC Content per Volume of Material} = \frac{(W_v - W_w - W_{ec})}{V_m}$$

Where: W_v = Weight of all Volatile Compounds.
 W_w = Weight of water.
 W_{ec} = Weight of compounds listed as exempt from the definition of VOC as provided for in the definition of Exempt Compounds in this Rule.
 V_m = Volume of material.

G.12 Calculation for Determination of Pounds of VOC per Pound of Solids: Pounds of VOC per pound of solids is the weight of VOC per weight of coating solids within any given volume of coating, and can be calculated by the following equation:

$$\text{Pounds of VOC per Pound of Solids} = \frac{(W_s - W_w - W_{ec})}{W_r}$$

Where: W_s = Weight of all Volatile Compounds, in pounds.
 W_w = Weight of water, in pounds.
 W_{ec} = Weight exempt compounds, in pounds.
 W_r = Weight of coating solids, in pounds.

G.13 Calculation for Coatings That Contain Reactive Diluents: For coatings that contain reactive diluents, the VOC content of the coating is determined after curing. The pounds of VOC per pound of coating solids shall be calculated by the test method found in Section G and the following equation:

$$\text{Pounds of VOC per Pound of Solids} = \frac{(W_s - W_w - W_{ec})}{W_r}$$

Where: W_s = Weight of Volatile Compounds, in pounds emitted into the atmosphere during curing.
 W_w = Weight of water, in pounds emitted into the atmosphere during curing.
 W_{ec} = Weight exempt compounds, in pounds emitted into the atmosphere during curing.
 W_r = Weight of coating solids, in pounds prior to reaction.