

DISTRICT DEPARTMENT OF THE ENVIRONMENT

Chapter 7 - Volatile Organic Compounds

743 ADHESIVES AND SEALANTS – GENERAL REQUIREMENTS

743.1 This section applies to any person who, on or after January 1, 2012, supplies, sells, offers for sale, manufactures for sale, or uses or applies adhesives, sealants, or adhesive or sealant primers, except as provided in § 745.

743.2 For purposes of §§ 743 through 749 and of any definitions in §799 applicable to §§ 743 through 749, the District incorporates by reference rules and test methods from the California Air Resource Board (CARB), the South Coast Air Quality Management District (SCAQMD), and the American Society for Testing and Materials (ASTM), where specifically cited.

744 ADHESIVES AND SEALANTS – VOC STANDARDS

744.1 On and after January 1, 2012, no person shall sell, supply, offer for sale in the District of Columbia any adhesive, sealant, adhesive primer, or sealant primer manufactured on or after January 1, 2012, or manufacture for sale in the District of Columbia any adhesive, sealant, adhesive primer or sealant primer in excess of the applicable VOC content limits specified in the Table of Standards in § 744.2, except as provided in §§ 744.5 and 745.

744.2 No person shall use or apply any adhesive, sealant, adhesive primer, or sealant primer manufactured on and after January 1, 2012, within the District of Columbia in excess of the applicable VOC content limits specified in the following Table of Standards, except as provided in §§ 744.5 and 745:

Table of Standards. VOC Content Limits for Adhesives, Sealants, Adhesive Primers, Sealant Primers and Adhesives Applied to Particular Substrates.

Adhesive, sealant, adhesive primer or sealant primer category	VOC content limit (grams VOC per liter*)
CATEGORY 1: ADHESIVES	VOC Limits (g/L)
ABS welding	400
Ceramic tile installation	130
Computer diskette jacket manufacturing	850
Contact or contact bond	250
Cove base installation	150
CPVC welding	490

Indoor floor covering installation	150
Metal to urethane/rubber molding or casting	850
Motor vehicle	250
Motor vehicle weatherstrip	750
Multi-purpose construction	200
Non-membrane roof installation/repair	300
Outdoor floor covering installation	250
Plastic cement welding (except ABS, PVC or CPVC)	510
PVC welding	510

Adhesive, sealant, adhesive primer or sealant primer category	VOC content limit (grams VOC per liter*)
Single-ply roof membrane installation/repair	250
Structural glazing	100
Thin metal laminating	780
Tire retread	100
Perimeter bonded sheet vinyl flooring installation	660
Waterproof resorcinol glue	170
Sheet-applied rubber installation	850
CATEGORY 2: SEALANTS	VOC Limits in (g/L)
Architectural	250
Marine deck	760
Non-membrane roof installation / repair	300
Roadway	250
Single-ply roof membrane	450
Other	420
CATEGORY 3: ADHESIVE PRIMERS	VOC Limits in (g/L)
Automotive glass	700
Motor vehicle glass bonding	900
Plastic cement welding	650
Single-ply roof membrane	250
Traffic marking tape	150
Other	250
CATEGORY 4: SEALANT PRIMERS	VOC Limits in (g/L)

Architectural – non-porous material	250
Architectural – porous material	775
Marine deck	760
Other	750
CATEGORY 5: ADHESIVES APPLIED TO PARTICULAR SUBSTRATES	VOC Limits in (g/L)
Flexible vinyl	250
Fiberglass	200
Reinforced plastic composite	200

Adhesive, sealant, adhesive primer or sealant primer category	VOC content limit (grams VOC per liter*)
Metal	30
Porous material (other than wood)	120
Rubber	250
Wood	30
Other substrates	250

** The VOC content is determined as the weight of VOCs, less water and exempt compounds as specified in §747.*

744.3 The VOC content limits in the Table of Standards in § 744.2 for adhesives applied to particular substrates (such as, Category 5), shall apply as follows:

- (a) If an operator uses an adhesive or sealant subject to a specific VOC content limit for such adhesive or sealant in the Table of Standards in § 744.2, such specific limit applies rather than an adhesive-to-substrate limit; and
- (b) If an adhesive is used to bond dissimilar substrates together, the applicable substrate category with the highest VOC content shall be the limit for such use.

744.4 Except as provided in §§ 744.5 and 745, any person subject to §§ 743 to 749 using a surface preparation or cleanup solvent shall:

- (a) Except as provided in paragraph (b) of this section for single-ply roofing, not use materials containing VOCs for surface preparation, unless the VOC content of the surface preparation solvent is less than seventy grams per liter (70 g./L);
- (b) If a surface preparation solvent is used in applying single-ply roofing, not use materials for surface preparation containing VOCs, unless the composite vapor pressure of the surface preparation solvent, excluding 3

water and exempt compounds, does not exceed forty-five millimeters of mercury (45 mm. Hg) at twenty degrees Celsius (20° C) or sixty-eight degrees Fahrenheit (68° F);

- (c) Except as provided in paragraph (d) of this section, not use materials containing VOCs for the removal of adhesives, sealants, or adhesive or sealant primers from surfaces, other than spray application equipment, unless the composite vapor pressure of the solvent used, excluding water and exempt compounds, is less than forty-five millimeters of mercury (45 mm. Hg) at twenty degrees Celsius (20° C) or sixty-eight degrees Fahrenheit (68° F); and
- (d) Remove an adhesive, sealant, adhesive primer, or sealant primer from the parts of spray application equipment by:
 - (1) An enclosed cleaning system, or an equivalent cleaning system as determined by the SCAQMD's "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems," dated October 3, 1989;
 - (2) Using a solvent with a VOC content of seventy grams (70 g) of VOC per liter of material, or less; or
 - (3) Soaking parts containing dried adhesive in a solvent as long as the composite vapor pressure, excluding water and exempt compounds, of the solvent is nine and one half millimeters of mercury (9.5 mm. Hg) at twenty degrees Celsius (20° C) or sixty-eight degrees Fahrenheit (68° F) or less and is kept in a closed container, which shall be closed except when depositing or removing parts of materials from the container.

744.5 A person using an adhesive, sealant, adhesive primer, or sealant primer subject to §§ 743 to 749 may comply with § 744.2 and 744.4 using add-on air pollution control equipment if such equipment meets the following requirements:

- (a) The VOC emissions from the use of all adhesives, sealants, adhesive primers, or sealant primers subject to §§ 743 to 749 are reduced by an overall capture and control efficiency of at least eighty-five percent (85%) by weight;
- (b) The combustion temperature is continuously monitored if a thermal incinerator is operated;
- (c) Inlet and exhaust gas temperatures are continuously monitored if a catalytic incinerator is operated;
- (d) Control device efficiency is continuously monitored when a carbon absorber or control device other than a thermal or catalytic incinerator is operated; and

- (e) Operation records sufficient to demonstrate compliance with the requirements of this section are maintained as required by § 746.

744.6 Any person using adhesives, sealants, adhesive primers, sealant primers, or surface preparation or cleanup solvents subject to §§ 743 to 749 shall:

- (a) Store or dispose of all absorbent materials, such as cloth or paper, which are moistened with adhesives, sealants, primers, or solvents subject to §§ 743 to 749, in non-absorbent containers that shall be closed except when placing materials in or removing materials from the container;
- (b) Store all VOC-containing adhesives, sealants, adhesive primers, sealant primers, surface preparation and cleanup solvents, and related waste materials in closed containers;
- (c) Ensure that mixing and storage containers used for VOC-containing adhesives, sealants, adhesive primers, sealant primers, surface preparation and cleanup solvents, and related waste materials are kept closed at all times except when depositing or removing these materials;
- (d) Minimize spills of VOC-containing adhesives, sealants, adhesive primers, sealant primers, surface preparation and cleanup solvents, and related waste materials;
- (e) Convey VOC-containing adhesives, sealants, adhesive primers, sealant primers, surface preparation and cleanup solvents, and related waste materials from one location to another in closed containers or pipes; and
- (f) Minimize VOC emission from cleaning of application, storage, mixing, and conveying equipment by ensuring that equipment cleaning is performed without atomizing the cleaning solvent and all spent solvent is captured in closed containers.

744.7 No person shall solicit, require the use or specify the application of any adhesive, sealant, adhesive primer, sealant primer, surface preparation or cleanup solvent if such use or application results in a violation of the provisions of 20 DCMR chapter 7. The prohibition of this subdivision shall apply to all written or oral contracts under which any adhesive, sealant, adhesive primer, sealant primer, and surface preparation or cleanup solvent subject to §§ 743 to 749 is to be used at any location in the District of Columbia.

745 ADHESIVES AND SEALANTS – EXEMPTIONS AND EXCEPTIONS

745.1 The provisions of §§ 743 through 749 shall not apply to the use or sale of the following compounds:

- (a) Adhesives, sealants, adhesive primers, or sealant primers being tested or evaluated in any research and development, quality assurance or analytical laboratory, provided records are maintained as required in § 746;

to VOC standards in 20 DCMR § 720;

- (c) Adhesives and sealants that contain less than twenty grams (20 g.) of VOC per liter of adhesive or sealant, less water and less exempt compounds, as applied;
- (d) Cyanoacrylate adhesives;
- (e) Adhesives, sealants, adhesive primers, or sealant primers that are sold or supplied by the manufacturer or supplier in containers with a net volume of sixteen (16) fluid ounces or less, or a net weight of one pound (1 lb.) or less, except plastic cement welding adhesives and contact adhesives; or
- (f) Contact adhesives that are sold or supplied by the manufacturer or supplier in containers with a net volume of one gallon (1 gal.) or less.

745.2 The requirements of §§ 743 through 749 shall not apply to the use of adhesives, sealants, adhesive primers, sealant primers, or surface preparation and cleanup solvents in the following operations:

- (a) Tire repair operations, provided the label on the adhesive states “For Tire Repair Only”;
- (b) In the assembly, repair, and manufacture of aerospace components or undersea-based weapon system components;
- (c) Medical equipment manufacturing; or
- (d) Plaque laminating operations in which adhesives are used to bond clear, polyester acetate laminate to wood with lamination equipment installed before July 1, 1992.

745.3 The provisions of §§ 743 through 749 shall not apply to a person who uses or applies any adhesive, sealant, adhesive primer, and sealant primer at a stationary source if the total VOC emissions from all adhesives, sealants, adhesive primers, and sealant primers used at the stationary source are less than two hundred pounds (200 lb.) per calendar year, or an equivalent volume.

745.4 The provisions of § 744.2 and 744.4 shall not apply to the use of any adhesives, sealants, adhesive primers, sealant primers, cleanup solvents, and surface preparation solvents, provided the total volume of non-complying adhesives, sealants, primers, cleanup and surface preparation solvents applied facility-wide at a stationary source does not exceed fifty-five gallons (55 gal.) per calendar year.

745.5 Any person claiming an exemption pursuant to § 745.2(d) thru 745.4 shall record and maintain monthly operational records sufficient to demonstrate compliance, and in accordance with § 746.

- 745.6 Subsections 743 to 749 shall not apply to a manufacturer or distributor who sells, supplies or offers for sale in the District of Columbia any adhesive, sealant, adhesive primer, or sealant primer that does not comply with § 744.1 provided that such manufacturer or distributor makes and keeps records demonstrating:
- (a) The adhesive, sealant, adhesive primer, or sealant primer is intended for shipment and use outside of the District of Columbia; and
 - (b) The manufacturer or distributor has taken reasonable precautions to assure that the adhesive, sealant, adhesive primer, or sealant primer is not distributed to, or within, the District of Columbia.
- 745.7 Subsection 745.6 shall not apply to any adhesive, sealant, adhesive primer, or sealant primer that is sold, supplied, or offered for sale by any person to a retail outlet in the District of Columbia.
- 745.8 Subsection 744.1 shall not apply to the sale of any adhesive, sealant, adhesive primer, or sealant primer to a person using add-on air pollution control equipment, pursuant to § 744.5, to comply with the requirements of §§ 743 to 749.
- 745.9 The VOC content limits specified in the Table of Standards in § 744.2 shall not apply to any manufacturer or distributor who sells, supplies, or offers for sale any single-ply roof membrane installation or repair adhesive, single-ply roof membrane sealant, or single-ply roof membrane adhesive primer before January 1, 2012.

746 ADHESIVES AND SEALANTS – ADMINISTRATIVE REQUIREMENTS

- 746.1 Each person subject to §§ 743 through 749 shall maintain records demonstrating compliance with the regulations, including, but not limited to, the following information:
- (a) A list of each adhesive, sealant, adhesive primer, sealant primer cleanup solvent, and surface preparation solvent in use and in storage;
 - (b) A data sheet or material list that provides the material name, manufacturer identification, and material application;
 - (c) Catalysts, reducers, or other components used and the mix ratio;
 - (d) The VOC content of each product as supplied;
 - (e) The final VOC content or vapor pressure, as applied; and
 - (f) The monthly volume of each adhesive, sealant, adhesive primer, sealant primer, cleanup or surface preparation solvent used.

- 746.2 Any person who complies with § 744.2 through the use of add-on air pollution control equipment shall record the key operating parameters for the control equipment, including, but not limited to, the following information:
- (a) The volume used per day of each adhesive, sealant, adhesive primer, sealant primer, or solvent that is subject to a VOC content limit in the Table of Standards in § 744.2 and that exceeds such a limit;
 - (b) On a daily basis, the combustion temperature, inlet and exhaust gas temperatures, and control device efficiency, as appropriate, pursuant to § 744.5;
 - (c) Daily hours of operation; and
 - (d) All maintenance performed, including the date and type of maintenance.
- 746.3 All records made to determine compliance with this chapter shall be maintained for five (5) years from the date such record is created and shall be made available to the District of Columbia within ninety (90) days of a request.
- 746.4 For adhesives, sealants, adhesive primers, and sealant primers subject to the laboratory testing exemption pursuant to § 745.1(a), the person conducting the testing shall make and maintain records of all such materials used, including, but not limited to, the product name, the product category of the material or type of application, and the VOC content of each material.
- 747 ADHESIVES AND SEALANTS – COMPLIANCE PROCEDURES AND TEST METHODS**
- 747.1 Except as provided in § 747.3 through 747.5, the VOC and solids content of all non-aerosol adhesives, adhesive primers, surface preparation solvents, and clean-up solvents shall be determined using U.S. EPA Reference Method 24 (40 C.F.R. Part 60, Appendix A or SCAQMD Method 304).
- 747.2 The organic content of exempt organic compounds shall be determined using ASTM D4457-85, as applicable.
- 747.3 The VOC content of any plastic welding cement adhesive or primer shall be determined using SCAQMD Method 316A.
- 747.4 To determine if a diluent is a reactive diluent, the percent of the reactive organic compound that becomes an integral part of the finished materials shall be determined using SCAQMD Method 316A.
- 747.5 The composite vapor pressure of organic compounds in cleaning materials shall be determined by quantifying the amount of each compound in the blend using gas chromatographic analysis (ASTM E 260-91) for organics and ASTM D3792-79 for water content, as applicable, and the following equation:

$$Pp_c = \frac{\sum_{i=1}^n (W_i)(VP_i)/Mw_i}{W_w/Mw_w + \sum_{i=1}^n W_e/Mw_e + \sum_{i=1}^n W_i/Mw_i}$$

where:

- Pp_c = VOC composite partial pressure at twenty degrees Celsius (20° C) or sixty-eight degrees Fahrenheit (68° F), in millimeters of mercury (mm. Hg);
- W_i = Weight of the "i"th VOC compound, in grams, as determined by ASTM E 260-91;
- W_w = Weight of water, in grams as determined by ASTM D 3792-86;
- W_e = Weight of the "i"th exempt compound, in grams, as determined by ASTM E 260-91;
- Mw_i = Molecular weight of the "i"th VOC compound, in grams per g-mole, as given in chemical reference literature;
- Mw_w = Molecular weight of water, eighteen grams (18 g.) per g-mole;
- Mw_e = Molecular weight of the "i"th exempt compound, in grams per g-mole, as given in chemical reference literature; and
- Vp_i = Vapor pressure of the "i"th VOC compound at twenty degrees Celsius (20° C) or sixty-eight degrees Fahrenheit (68° F), in millimeters of mercury (mm. Hg), as determined by § 747.6.

747.6 The vapor pressure of each single component compound may be determined from ASTM D2879-86 or may be obtained from a published source approved by the District, such as the sources referenced in 40 C.F.R. § 52.741, or any of the following sources:

- (a) The most recent edition of *The Vapor Pressure of Pure Substances*, Boublik, Fried, and Hala; Elsevier Scientific Publishing Company, New York;
- (b) The most recent edition of *Perry's Chemical Engineer's Handbook*, McGraw-Hill Book Company;
- (c) The most recent edition of *CRC Handbook of Chemistry and Physics*, Chemical Rubber Publishing Company;
- (d) The most recent edition of *Lange's Handbook of Chemistry*, John Dean, editor, McGraw-Hill Book Company; or
- (e) Additional sources approved by the SCAQMD or other California Air districts.

747.7 If air pollution control equipment is used to meet the requirements of §§ 743 to 749, the owner or operator shall make the following determinations:

- (a) The measurement of capture efficiency shall be conducted and reported in accordance with the U.S. EPA Technical Document, "*Guidelines for Determining Capture Efficiency*," issued January 9, 1995, or a District capture efficiency determination method approved by the U.S. EPA; and
- (b) The measurement of control efficiency shall be in accordance with U.S. EPA Methods 25, 25A, 25B, or CARB Method 100.

747.8 The active and passive solvent losses from spray gun cleaning systems shall be determined using SCAQMD's "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems," dated October 3, 1989. The test solvent for this determination shall be any lacquer thinner with a minimum vapor pressure of one hundred and five millimeters of mercury (105 mm. Hg) at twenty degrees Celsius (20° C) or sixty-eight degrees Fahrenheit (68° F), and the minimum test temperature shall be fifteen degrees Celsius (15° C) or fifty-nine degrees Fahrenheit (59° F).

747.9 For adhesives that do not contain reactive diluents, grams of VOC per liter of adhesive, less water and exempt compounds, shall be calculated according to the following equation:

$$\text{Grams of VOC per liter of adhesive} = \frac{W_s - W_w - W_e}{V_m - V_w - V_e}$$

where:

W_s = weight of volatile compounds, in grams;

W_w = weight of water, in grams;

W_e = weight of exempt compounds, in grams;

V_m = volume of material, in liters;

V_w = volume of water, in liters; and

V_e = volume of exempt compounds, in liters.

747.10 For adhesives that contain reactive diluents, the VOC content of the adhesive is determined after curing. The grams of VOC per liter of adhesive, less water and exempt compounds, shall be calculated according to the following equation:

$$\text{Grams of VOC per liter of adhesive} = \frac{W_{rs} - W_{rw} - W_{re}}{V_{rm} - V_{rw} - V_{re}}$$

where:

W_{rs} = weight of volatile compounds not consumed during curing, in grams;

W_{rw} = weight of water not consumed during curing, in grams;

W_{re} = weight of exempt compounds not consumed during curing, in grams;

V_{rm} = volume of material not consumed during curing, in liters;

V_{rw} = volume of water not consumed during curing, in liters; and

V_{re} = volume of exempt compounds not consumed during curing, in liters.

747.11 Grams of VOC per liter of material shall be calculated according to the following equation:

$$\text{Grams of VOC per liter of materials} = \frac{W_s - W_w - W_e}{V_m}$$

where:

W_s = weight of volatile compounds, in grams;

W_w = weight of water, in grams;

W_e = weight of exempt compounds, in grams; and

V_m = volume of material, in liters.

747.12 Percent VOC (% VOC) by weight shall be calculated according to the following equation:

$$\% \text{ VOC by weight} = [(W_v / W)] \times 100$$

where:

W_v = weight of VOCs in grams; and

W = weight of material in grams.

748 ADHESIVES AND SEALANTS – CONTAINER LABELING

748.1 Each manufacturer of an adhesive, sealant, adhesive primer, or sealant primer subject to §§ 743 to 749 shall display the following information on the product container or label:

- (a) A statement of the manufacturer's recommendation regarding thinning, reducing, or mixing of the product, except that:
 - (1) This requirement does not apply to the thinning of a product with water; and
 - (2) If thinning of the product before use is unnecessary, the recommendation must specify that the product is to be applied without thinning;
- (b) The maximum or the actual VOC content of the product in accordance with § 747, as supplied, displayed in grams of VOC per liter of product; and
- (c) The maximum or the actual VOC content of the product in accordance with § 747, which includes the manufacturer's maximum recommendation for thinning, as applied, displayed in grams of VOC per liter of product.

749

ADHESIVES AND SEALANTS – APPLICATION METHODS

749.1

A person shall not apply a VOC-containing adhesive, adhesive primer, sealant, or sealant primer at a stationary source unless applied by one (1) of the following application methods using equipment operated in accordance with the specifications of the equipment manufacturer:

- (a) Electrostatic application;
- (b) High volume low pressure (HVLP) spraying;
- (c) Flow coating;
- (d) Roller coating or hand application methods, including non-spray application methods similar to hand or mechanically powered caulking gun, brush coating, or direct hand application methods;
- (e) Dip coating (including electrodeposition coating);
- (f) Airless spraying;
- (g) Air-assisted airless spraying; or
- (h) Other adhesive application method that a person has demonstrated and the Department has determined achieves a transfer efficiency equivalent to or better than that achieved by HVLP spraying.