

Chapter 129 -- Standards for Sources

SOURCES OF VOCs

§ 129.73. Aerospace manufacturing and rework.

Except as provided in paragraph (1), this section applies to the manufacture or rework of commercial, civil or military aerospace vehicles or components at any facility which has the potential to emit 25 tons per year of VOCs or more.

(1) This section does not apply to cleaning and coating of aerospace components and vehicles as follows:

(i) At any source conducting research and development for the research and development activities.

(ii) For quality control and laboratory testing.

(iii) For production of electronic parts and assemblies (except for cleaning and coating of completed assemblies).

(iv) For rework operations performed on antique aerospace vehicles or components.

(2) Paragraph (3) does not apply to cleaning and coating of aerospace components and vehicles in the following circumstances:

(i) The use of touchup, aerosol and Department of Defense “classified” coatings.

(ii) The coating of space vehicles.

(iii) At facilities that use separate formulations in volumes less than 50 gallons per year to a maximum exemption of 200 gallons per year of all the coatings in aggregate for these formulations.

(3) Beginning April 10, 1999, a person may not apply to aerospace vehicles or components, aerospace specialty coatings, primers, topcoats and chemical milling maskants including VOC-containing materials added to the original coating supplied by the manufacturer, that contain VOCs in excess of the limits specified in Table II.

(i) Aerospace coatings that meet the definitions of the specific coatings in Table II shall meet those allowable coating VOC limits.

(ii) All other aerospace primers, aerospace topcoats and chemical milling maskants are subject to the general coating VOC limits for aerospace primers, aerospace topcoats and aerospace chemical milling maskants.

TABLE II
Allowable Content of VOCs in Aerospace Coatings
Allowable VOC Content
Weight of VOC Per Volume of Coating (Minus Water and Exempt Solvents)

<i>LIMIT</i>		
<i>COATING TYPE</i>	<i>POUNDS PER GALLON</i>	<i>GRAMS PER LITER</i>
Specialty Coatings		
(1) Ablative Coating	5.0	600
(2) Adhesion Promoter	7.4	890
(3) Adhesive Bonding Primers:		
(a) Cured at 250°F or below	7.1	850
(b) Cured above 250°F	8.6	1,030
(4) Adhesives:		
(a) Commercial Interior Adhesive	6.3	760
(b) Cyanoacrylate Adhesive	8.5	1,020
(c) Fuel Tank Adhesive	5.2	620
(d) Nonstructural Adhesive	3.0	360
(e) Rocket Motor Bonding Adhesive	7.4	890
(f) Rubber-Based Adhesive	7.1	850
(g) Structural Autoclavable Adhesive	0.5	60
(h) Structural Nonautoclavable Adhesive	7.1	850
(5) Antichafe Coating	5.5	660

(6) Chemical Agent-Resistant Coating	4.6	550
(7) Clear Coating	6.0	720
(8) Commercial Exterior Aerodynamic Structure Primer	5.4	650
(9) Compatible Substrate Primer	6.5	780
(10) Corrosion Prevention Compound	5.9	710
(11) Cryogenic Flexible Primer	5.4	645
(12) Cryoprotective Coating	5.0	600
(13) Electric or Radiation-Effect Coating	6.7	800
(14) Electrostatic Discharge and Electromagnetic Interference (EMI) Coating	6.7	800
(15) Elevated Temperature Skydrol Resistant Commercial Primer	6.2	740
(16) Epoxy Polyamide Topcoat	5.5	660
(17) Fire-Resistant (Interior) Coating	6.7	800
(18) Flexible Primer	5.4	640
(19) Flight-Test Coatings:		
(a) Missile or Single Use Aircraft	3.5	420
(b) All Other	7.0	840
(20) Fuel-Tank Coating	6.0	720
(a) High-Temperature Coating	7.1	850

(21) Insulation Covering	6.2	740
(22) Intermediate Release Coating	6.2	750
(23) Lacquer	6.9	830
(24) Maskants:		
(a) Bonding Maskant	10.2	1,230
(b) Critical Use and Line Sealer Maskant	8.6	1,020
(c) Seal Coat Maskant	10.2	1,230
(25) Metallized Epoxy Coating	6.2	740
(26) Mold Release	6.5	780
(27) Optical Anti-Reflective Coating	6.2	750
(28) Part Marking Coating	7.1	850
(29) Pretreatment Coating	6.5	780
(30) Rain Erosion-Resistant Coating	7.1	850
(31) Rocket Motor Nozzle Coating	5.5	660
(32) Scale Inhibitor	7.3	880
(33) Screen Print Ink	7.0	840
(34) Sealants:		
(a) Extrudable/Rollable/Bru shable Sealant	2.0	240
(b) Sprayable Sealant	5.0	600
(35) Self-Priming Topcoat	3.5	420
(36) Silicone Insulation Material	7.1	850
(37) Solid Film Lubricant	7.3	880

(38) Specialized Function Coating	7.4	890
(39) Temporary Protective Coating	2.7	320
(40) Thermal Control Coating	6.7	800
(41) Wet Fastener Installation Coating	5.6	675
(42) Wing Coating	7.1	850
Aerospace Primers, Aerospace Topcoats and Aerospace Chemical Milling Maskants		
(1) Primers	2.9	350
(2) Topcoats	3.5	420
(3) Chemical Milling Maskants (Type I/II)	1.3	160

(4) The mass of VOC per combined volume of VOC and coating solids, less water and exempt compounds shall be calculated for each coating by the following equation:

$$\text{VOC} = \frac{(W_v - W_w - W_{ex})(D_c)}{100\% - (W_w)(D_c/D_w) - (W_{ex})(D_c/D_{ex})}$$

Where:

VOC = VOC content in grams per liter (g/l) of each coating less water and exempt solvents,

W_v = Weight of total volatiles, % (100%-Weight % Nonvolatiles),

W_w = Weight of water, %,

W_{ex} = Weight of exempt solvent, %,

D_c = Density of coating, g/l at 25°C,

D_w = Density of water, 0.997×10^3 g/l at 25°C, and

D_{ex} = Density of exempt solvent, g/l, at 25°C.

To convert from grams per liter (g/l) to pounds per gallon (lb/gal), multiply the result (VOC content) by 8.345×10^3 (lb/gal/g/l).

(5) Except as provided in paragraph (6), beginning April 10, 1999, a person shall use one or more of the following application techniques in applying primer or topcoat to aerospace vehicles

or components:

- (i) Flow/curtain coat.
- (ii) Dip coat.
- (iii) Roll coating.
- (iv) Brush coating.
- (v) Cotton-tipped swab application.
- (vi) Electrodeposition (DIP) coating.
- (vii) High volume low pressure (HVLP) spraying.
- (viii) Electrostatic spray.

(6) The following situations are exempt from application equipment requirements listed in paragraph (5):

(i) Any situation that normally requires the use of an airbrush or an extension on the spray gun to properly apply coatings to limited access spaces.

(ii) The application of specialty coatings.

(iii) The application of coatings that contain fillers that adversely affect atomization with HVLP spray guns and that the applicant has demonstrated and the Department has determined cannot be applied by any of the application methods specified in paragraph (5).

(iv) The application of coatings that normally have a dried film thickness of less than 0.0013 centimeter (0.0005 in.) when the applicant has demonstrated and the Department has determined cannot be applied by any of the application methods specified in paragraph (5).

(v) The use of airbrush application methods for stenciling, lettering and other identification markings.

(vi) The use of hand-held spray can application methods.

(vii) Touch-up and repair operations.

(7) Except as provided in paragraph (8), beginning April 10, 1999, a person may not use solvents for hand-wipe cleaning of aerospace vehicles or components unless the cleaning

solvents do one of the following:

- (i) Meet the definition of “aqueous cleaning solvent” in § 121.1 (relating to definitions).
 - (ii) Have a VOC composite vapor pressure less than or equal to 45 millimeters (mmHg) at 20°C.
 - (iii) Is composed of a mixture of VOCs and has a maximum vapor pressure of 7 millimeters (mmHg) at 20°C (3.75 inches water at 68°F) and contains no hazardous air pollutants (HAP) or ozone depleting compounds.
- (8) The following aerospace vehicle and component solvent cleaning operations are exempt from paragraph (7):
- (i) Cleaning during the manufacture, assembly, installation, maintenance or testing of components of breathing oxygen systems that are exposed to the breathing oxygen.
 - (ii) Cleaning during the manufacture, assembly, installation, maintenance or testing of parts, subassemblies or assemblies that are exposed to strong oxidizers or reducers (for example, nitrogen tetroxide, liquid oxygen, hydrazine).
 - (iii) Cleaning and surface activation prior to adhesive bonding.
 - (iv) Cleaning of electronics parts and assemblies containing electronics parts.
 - (v) Cleaning of aircraft and ground support equipment fluid systems that are exposed to the fluid, including air-to-air heat exchangers and hydraulic fluid systems.
 - (vi) Cleaning of fuel cells, fuel tanks and confined spaces.
 - (vii) Surface cleaning of solar cells, coated optics and thermal control surfaces.
 - (viii) Cleaning during fabrication, assembly, installation and maintenance of upholstery, curtains, carpet and other textile materials used in or on the interior of the aircraft.
 - (ix) Cleaning of metallic and nonmetallic materials used in honeycomb cores during the manufacture or maintenance of these cores, and cleaning of the completed cores used in the manufacture of aerospace vehicles or components.
 - (x) Cleaning of aircraft transparencies, polycarbonate or glass substrates.
 - (xi) Cleaning and solvent usage associated with research and development, quality control or laboratory testing.

(xii) Cleaning operations, using nonflammable liquids, conducted within 5 feet of any alternating current (AC) or direct current (DC) electrical circuit on an assembled aircraft once electrical power is connected, including interior passenger and cargo areas, wheel wells and tail sections.

(xiii) Cleaning operations identified in an essential use waiver under section 604(d)(1) of the Clean Air Act (42 U.S.C.A. § 7671c(d)(1)) or a fire suppression or explosion prevention waiver under section 604(g)(1) of the Clean Air Act which has been reviewed and approved by the EPA and the voting parties of the International Montreal Protocol Committee.

(9) Cleaning solvents, except for semiaqueous cleaning solvents, used in the flush cleaning of aerospace vehicles, components, parts, and assemblies and coating unit components, shall be emptied into an enclosed container or collection system that is kept closed when not in use or captured with wipers which comply with the housekeeping requirements of paragraph (11). Aqueous cleaning solvents are exempt from these requirements.

(10) Spray guns used to apply aerospace coatings shall be cleaned by one of the following:

(i) An enclosed spray gun cleaning system that is kept closed when not in use. Leaks, including visible leakage, misting and clouding, shall be repaired within 14 days from when the leak is first discovered. Each owner or operator using an enclosed spray gun cleaner shall visually inspect the seals and all other potential sources of leaks at least once per month. The results of each inspection shall be recorded, and the record shall indicate the date of the inspection, the person who conducted the inspection and whether components were leaking. Records of the inspections shall be maintained for at least 2 years. Each inspection shall occur while the spray gun cleaner is in operation. If the leak is not repaired by the 15th day after detection, the solvent shall be removed and the enclosed cleaner shall be shut down until the leak is repaired or its use is permanently discontinued.

(ii) Unatomized discharge of solvent into a waste container that is kept closed when not in use.

(iii) Disassembly of the spray gun and cleaning in a vat that is kept closed when not in use.

(iv) Atomized spray into a waste container that is fitted with a device designed to capture atomized solvent emissions.

(11) The owner or operator of an affected facility shall implement the following housekeeping measures for cleaning solvents:

(i) Fresh and used cleaning solvents, except aqueous and semiaqueous cleaning solvents, used in solvent cleaning operations shall be stored in nonabsorbent, nonleaking containers. The containers shall be kept closed at all times except when filling or emptying.

(ii) Cloth and paper, or other absorbent applicators, moistened with cleaning solvents, except aqueous cleaning solvents, shall be stored in closed, nonabsorbent, nonleaking containers. Cotton-tipped swabs used for very small cleaning operations are exempt.

(iii) Handling and transfer procedures shall minimize spills during filling and transferring the cleaning solvent, except aqueous cleaning solvents, to or from enclosed systems, vats, waste containers and other cleaning operation equipment that holds or stores fresh or used cleaning solvents.

(12) The owner or operator of an affected facility may comply with this section by using approved air pollution control equipment provided that the following exist:

(i) The control system has combined VOC emissions capture and control equipment efficiency of at least 81% by weight.

(ii) The owner or operator received approval from the Department of a monitoring plan that specifies the applicable operating parameter value, or range of values, to ensure ongoing compliance with this section. The monitoring device shall be installed, calibrated, operated and maintained in accordance with the manufacturer's specifications, good air pollution control practices that minimize VOC emissions, and the Department's approval.

(iii) The owner or operator shall record monitoring parameters as specified in the approved monitoring plan.

(13) The owner or operator of an affected facility shall maintain records in accordance with §§129.51 and 129.52 (relating to general; and surface coating processes) including:

(i) A current list of coatings in use categorized in accordance with Table II showing VOC content as applied and usage on an annual basis.

(ii) A current list of cleaning solvents used and annual usage for hand wiping solvents including the water content of aqueous and semiaqueous solvents and the vapor pressure and composite vapor pressure of all vapor pressure compliant solvents and solvent blends.

(iii) A current list and annual usage information for exempt hand-wipe cleaning solvents with a vapor pressure greater than 45 millimeters of mercury (mmHg) used in exempt hand-wipe cleaning operations.