VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT

RULE 74.13 - AEROSPACE ASSEMBLY AND COMPONENT MANUFACTURING OPERATIONS

(Adopted 4/15/86, Revised 10/13/87, 1/22/91, 9/10/96, 11/11/03, 09/11/12)

A. Applicability

This rule is applicable to the manufacturing, assembling, coating, masking, bonding, paint stripping, and surface cleaning of aerospace components and the cleanup of equipment associated with these operations. Where Rule 74.12, Surface Coating of Metal Parts and Products, applies to the coating or cleaning of metal parts, including but not limited to tooling operations, this rule shall not apply.

B. Requirements

1. Aerospace Coatings and Adhesives: No person shall apply to any aerospace component, any coating, or adhesive with an ROC content in excess of the following limits, as applied:

	Limits Grams of ROC Per Liter, or Pounds per Gallon of Coating (or Adhesive), Less Water and Exempt Organic Compounds	
COATING or ADHESIVE	Grams per Liter	Pounds per Gallon
Adhesion Promoter	850	7.1
Adhesives		
Non-Structural	250	2.1
Structural		
Autoclavable	50	0.4
Nonautoclavable	850	7.1
Adhesive Bonding Primers	780	6.5
Antichafe Coating	600	5.0
Barrier Coatings	420	3.5
Clear Topcoat	520	4.3
Conformal Coating	750	6.3
Dry Lubricative Materials		
Fastener Manufacturing	250	2.1
Nonfastener Manufacturing	880	7.3
Electric/Radiation Effect Coatings	800	6.7
Fastener Sealants	675	5.6
Fire Resistant Coatings		
Civilian (Interior)	650	5.4

COATING or ADHESIVE	Grams per Liter	Pounds per Gallon
Flight Test Coatings Used on Missiles		
or Single-Use Target Craft	420	3.5
All Others	600	5.0
Fuel Tank Coatings	420	3.5
Fuel Tank Adhesives	620	5.2
High Temperature Coating	850	7.1
Impact Resistant Coating	420	3.5
Maskants - Chemical Milling	250	2.1
Optical Anti-Reflective Coating	700	5.8
Pretreatment Coatings	780	6.5
Primers Not Resistant		
To Phosphate Esters	350	2.9
Phosphate Ester-		
Resistant Primers	350	2.9
Rain Erosion-Resistant Coating	420	3.5
Scale Inhibitor	880	7.3
Sealant	600	5.0
Solid Film Lubricants		
Fastener Manufacturing	250	2.1
Solid Film Lubricants		
Fastener Installation	880	7.3
Nonfastener Manufacturing	880	7.3
Space Vehicle Coatings		
Electrostatic Discharge Protection	800	6.7
Other Space Vehicle Coatings	1000	8.3
Space Vehicle Adhesives	800	6.7
Temporary Protective Coatings	250	2.1
Topcoats	420	3.5
Unicoats (Self-Priming Topcoats)	420	3.5
Wing Coating	420	3.5
Wire Coatings		
Electronic	420	3.5
Anti-Wicking	420	3.5
Pre-Bonding Etching	420	3.5
Phosphate Ester Resistant Ink	925	7.7

2. Solvent Cleaning:

a. Solvent Cleaning: No person shall use a solvent for solvent cleaning, or engine gas path cleaning excluding stripping coatings or cleaning coating application equipment unless:

1) The solvent contains less than 200 grams of ROC per liter of material, as applied, or

2) The ROC composite partial pressure of the solvent is less than or equal to 25 mm Hg at a temperature of 20^{o} C.

b. Coating Application Equipment Cleaning:

No person shall use materials containing ROC for the cleaning of equipment used in coating operations unless an enclosed system or enclosed gun washer is used according to the manufacturer's recommendations and is closed when not in use.

No person shall use materials containing ROC for the cleaning of coating application equipment unless:

1) An enclosed gun washer or "low emission spray gun cleaner" that has been approved in writing by the APCO is properly used for spray equipment cleaning, and

2) The ROC composite partial pressure of solvent cleaner used is less than 5 mm Hg at 20^{o}C, or the ROC content of the solvent cleaner is 25 grams per liter (0.21 lb/gal) or less (Effective Dec 1, 2012).

3. Coating Strippers: No person shall use a coating stripper unless it contains less than 300 grams of ROC per liter, as applied, or unless its ROC composite partial pressure is 9.5 mm Hg or less at 20 ^{o}C.

4. Storage of ROC Containing Materials: All ROC-containing materials including, but not limited to, surface coatings, cleanup solvents, or surface preparation materials shall be stored in closed containers which are nonabsorbent and do not leak. These storage containers shall be closed except when filling or emptying.

5. Coating Transfer Efficiency: No person shall apply coatings except by using properly operated coating application devices and by using:

a. Electrostatic application operated at a minimum of 60 kV,

b. Flow coat application,

c. Dip coat application,

d. Hand application methods,

e. High volume, low pressure spraying (HVLP): If a spray gun is used, the end user shall demonstrate that the spray gun meets the definition of HVLP in design and use. HVLP equipment shall be identified by either

test air cap measurements or an inlet pressure measurement that, when used with specifications published by the manufacturer that reference the corresponding spray nozzle size, establishes that the gun is being operated as specified in Subsection G.27.

f. Alternative Application Method: Any other alternative method that achieves a transfer efficiency equivalent to, or higher than one of the application methods listed in Subsections B.5.a, B.5.b, B.5.c, B.5.d, or B.5.e. Written approval of the APCO shall be obtained for each alternative method prior to use.

6. Add-on Control Equipment Option: A person may comply with provisions of Subsection B.1 or Subsection B.2 by using air pollution control equipment provided that:

a. The combined capture and control efficiency reduces emissions by at least 85 percent by weight, and

b. Written approval for such equipment in the form of an Authority to Construct and Permit to Operate is received from the APCO.

7. Prohibition of Solicitation: No person shall solicit, specify or require any other person to use in the District any coating, adhesive, solvent, spray equipment, or control equipment that does not meet the limits or requirements of this rule.

8. Coating Compliance Statement: The manufacturer of coatings subject to this rule shall designate on product labels or data sheets, the ROC content or the Volatile Organic Compounds (VOC) content of coatings including coating reducers and catalysts, as supplied. This designation shall include recommendations regarding thinning, reducing, or mixing with any other ROC containing materials, and express the coating ROC or VOC content on an as applied basis when used in accordance with the manufacturer's recommendations. All letters and numbers used to designate ROC or VOC content on product labels shall be visible and legible.

9. Liquid Cleaning Material Compliance Statement: The manufacturer of liquid cleaning materials used in coating operations shall designate on product labels or data sheets the ROC content and ROC Composite Partial Pressure of cleaning materials as supplied. This designation shall include recommendations regarding mixing with any other ROC containing materials, and express the cleaning material ROC content when used in accordance with the manufacturer's recommendations. All letters and numbers used to designate ROC or VOC content on product labels shall be visible and legible.

10. Low-Solids Adhesives, Coatings, Primers or Sealant: The appropriate ROC limits in Subsection B.1 shall be expressed in grams of ROC per liter of material as defined in Subsection G.30.

C. Exemptions

1. This rule, except section B.7, shall not apply to any stationary source that emits less than 200 pounds of ROC in every rolling period of 12 consecutive calendar months from aerospace assembly and component manufacturing operations. Emissions from cold cleaners, vapor degreasers, and aerosol products, shall not be included in this determination.

   Any person claiming this exemption shall provide operational records, data and calculations, as determined by the APCO to be necessary, to substantiate this claim.

2. Subsection B.1 of this rule shall not apply to any one coating or adhesive provided:

   a. No complying coating or adhesive is available, and

   b. Any coating with separate formulations used in volumes of less than 20 gallons in any calendar year at a stationary coating source provided that the total usage of all noncomplying coatings (excluding noncomplying adhesives) has not exceeded 200 gallons annually, or

   c. Any adhesive with separate formulations used in volumes of less than 10 gallons in any calendar year at a stationary coating source.

   Any person claiming this exemption shall demonstrate the lack of an available coating or adhesive to the APCO on an annual basis.

3. The provisions of Subsection B.2.a of this rule shall not apply to the cleaning of aerospace assembly and subassembly surfaces that are exposed to strong oxidizers or reducers such as nitrogen tetroxide, liquid oxygen or hydrazine.

4. The provisions of Subsection B.5 shall not apply to the application of coatings that contain less than 20 grams of ROC per liter of coating less water and less exempt organic compounds.

5. This rule shall not apply to aerosol coating products.

6. This rule shall not apply to solvent cleaning conducted inside of a degreaser. Solvent cleaning inside of a degreaser shall be subject to the requirements of Rule 74.6 or Rule 74.6.1, as applicable.

D. Recordkeeping

1. Any person subject to this rule shall:

   a. Maintain a current list of all coatings and adhesives that provides all information necessary to evaluate compliance, including the following, as applicable:

      1) The name and manufacturer of each coating and adhesive and any catalysts and reducers used with each coating or adhesive
      2) Mix ratio of components used
      3) ROC content , as applied (Less Water and Exempt Organic Compounds except for Low-Solids Coatings or Adhesives, which are expressed as Grams of ROC per liter of Material)
      4) Category from Subsection B.1

   b. Maintain records which show the following for each ROC containing material used for cleanup, including equipment cleaning, and each ROC containing material used for solvent cleaning:

      1) Type
      2) ROC content in grams per liter of material
      3) Composite ROC partial pressure of organic solvent (where applicable)

   c. Maintain records of the monthly volume of each complying coating, adhesive, and ROC-containing liquid used for solvent cleaning or stripping, and daily volume of each noncompliant coating , adhesive, stripper, or cleaning solvent. Any person claiming the coating or adhesive small-use exemption in Subsection C.2 shall maintain records of each exempt coating or adhesive used on a monthly basis.

   d. Any person using an emission control system as a means of complying with this rule shall maintain daily records of key system operating and maintenance procedures which will demonstrate continuous operation and compliance of the emission control device during periods of emission producing activities.

2. Any person subject to this rule shall record any coating or adhesive intended for use in any of the specialty categories listed below. This record shall be available for review and shall include the manufacturer name, product ID number, specialty category, ROC limit as applied, and information to support that the specialty coating or adhesive has been specified for the intended application.

Adhesion Promoter Coating	Antichafe Coating
Electric/Radiation Effect Coating	Fuel Tank Adhesive
High Temperature Coating	Optical Anti-Reflective Coating

3. Such records shall be maintained for a minimum of two (2) years and shall be available for inspection by the APCO. A longer period of time for record retention may be specified by a permit condition.

E. Test Methods

1. Coating ROC content and solvent ROC content shall be determined using EPA Reference Method 24 or its constituent methods. The ROC content of coatings or solvents containing exempt organic compounds shall be determined by CARB Test Method 432.

2. The solid content of pretreatment coatings shall be determined using ASTM Method D2369-95, "Standard Test for Volatile Content of Coatings." The acid content of pretreatment coatings shall be determined using ASTM Method D1639-90(1996)e1, Standard Test Method for Acid Value of Organic Coating Material."

3. The test method for determining the fire resistance of an interior coating shall be Federal Aviation Administration required Ohio State University Heat Release, Fire and Burn Tests.

4. ROC composite pressure of a solvent or stripper shall be calculated using a widely accepted published source such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973), Perry's Chemical Engineer's Handbook, McGraw-Hill Book Company, CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-87), and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985). The true vapor pressure of a component in a solvent mix may be determined by ASTM Method D2879-97, "Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope." The ROC composite pressure of a solvent mix consisting entirely of ROC may be determined by ASTM Method D2879-97.

5. The active and passive solvent losses from spray gun cleaning systems shall be determined using South Coast Air Quality Management District'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 105 mm Hg at 20 ^{o}C. The minimum test temperature shall be 15 ^{o}C.

6. Transfer efficiency shall be determined in accordance with the South Coast Air Quality Management District method entitled "Spray Equipment Transfer Efficiency Test Procedure for Equipment Users" (May 24, 1989). Spray equipment HVLP equivalency shall be determined by using South Coast AQMD's "Guidelines for Demonstrating Equivalency with District Approved Transfer Efficient Spray Guns" (September 26, 2002).

7. The capture and control device efficiency of any air pollution control equipment shall be determined according to EPA's technical document, "Guidelines for Determining Capture Efficiency," January 9, 1995, and40 CFR 51, Appendix M, Methods 204-204F, as applicable:
Methods 204, Criteria for and Verification of a Permanent or Temporary Total Enclosure
Method 204A, VOC content in Liquid Input Stream
Method 204B, VOC Emissions in Captured Stream
Method 204C, VOC Emissions in Captured Stream (Dilution Technique)
Method 204D, VOC Emissions in Un-captured Stream from Temporary Total Enclosure
Method 204E, VOC Emissions in Un-captured Stream from Building Enclosure, and
Method 204F, VOC Content in Liquid Input Streams (Distillation Approach)
The calculation of control device efficiency shall be determined only during periods of continuous coating operations and shall be averaged over the duration of the coating operation not to exceed 24 hours.

F. Violations

Failure to comply with any provision of this rule, including the requirement to maintain records, shall constitute a violation of this rule.

G. Definitions

1. "Adhesion Promoter": A primer used to promote wetting and form a chemical bond with the subsequently applied sealant or other elastomer.

2. "Adhesive": A substance that is used to bond one surface to another surface by attachment.

3. "Adhesive Bonding Primer": A primer applied to aerospace componentsto increase adhesive or adhesive film bond strength.

4. "Aerosol Coating Product"; A pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable can for hand held application, or for use in specialized equipment for ground traffic/marking applications.

5. "Aerospace Component": Any raw material, partial or completed fabricated part, assembly of parts, or completed unit of any aircraft, helicopter, missile, or space vehicle, including mockups and prototypes.

6. "Antichafe Coating": A coating applied to areas of moving aerospace components which may rub during normal operation.

7. "Anti-Wicking Wire Coating": The outer coating of a wire which prevents fluid wicking into the insulation of the wire.

8. "Barrier Coating": A coating applied in a thin film to fasteners to inhibit dissimilar metal corrosion and to prevent galling.

9. “Capture Efficiency”: The percentage of ROC used, emitted, evolved, or generated by the operation, that is collected and directed to an air pollution control device.

10. "Coating": A material which is applied to a surface and which forms a film in order to beautify and/or protect such surface.

11. "Conformal Coating": A coating applied to electrical conductors and circuit boards to protect them against electrical discharge damage and/or corrosion.

12. “Degreaser”: A container for solvent and articles being cleaned that includes a facility for draining solvent from surfaces such that the drained solvent is returned to the container.

13. "Dry Lubricative Coating": A coating consisting of lauric acid, cetyl alcohol, waxes, or other non-cross linked or resin-bound materials which act as a dry lubricant or protective coat.

14. "Electric- or Radiation-Effect Coating": An electric-effect coating is electrically conductive. A radiation-effect coating helps in the prevention of radar detection.

15. "Electronic Wire Coating": The outer electrical insulation coating applied to tape insulation of a wire specifically formulated to smooth and fill edges.

16. "Electrostatic Application": A sufficient charging of atomized paint droplets to cause deposition principally by electrostatic attraction. This application shall be operated at a minimum 60 KV.

17. "Exempt Organic Compounds": As defined in Rule 2, of these rules.

18. "Fire Resistant Coating - Civilian (Interior)": A cabin interior coating that passes Federal Aviation Administration standards using the Ohio State University Heat Release, Fire and Burn Tests.

19. "Flight Test Coating": A coating applied to an aircraft prior to flight testing to protect the aircraft from corrosion and to provide required marking during flight test evaluation.

20. "Fuel Tank Adhesive": An adhesive used to bond components exposed to fuel and which must be compatible with fuel tank coatings.

21. "Fuel Tank Coating": A coating applied to the interior of a fuel tank or areas of an aircraft that are continuously wetted by fuel to protect it from corrosion and/or bacterial growth.

22. "Grams of ROC per liter of Coating, less water and exempt organic compounds": The weight of ROC per combined volume of ROC and coating solids, calculated using the following equation:

$$\text{Grams of ROC per Liter of Coating Less Water and Exempt Organic Compound} = \frac{Ws - Ww - Wes}{Vm - Vw - Ves}$$

Where:
- Ws = Weight of volatile compounds (grams)
- Ww = Weight of water (grams)
- Wes = Weight of exempt organic compounds (grams)
- Vm = Volume of material (liters)
- Vw = Volume of water (liters)
- Ves = Volume of exempt organic compounds (liters)

23. "Grams of ROC per Liter of Material": The weight of ROC per volume of material calculated as follows:

$$\text{Grams of ROC per Liter of Material} = \frac{Ws - Ww - Wes}{Vm}$$

Where:
- Ws = Weight of volatile compounds (grams)
- Ww = Weight of water (grams)
- Wes = Weight of exempt organic compounds (grams)
- Vm = Volume of material (liters)

24. "Gun Washer": Electrically or pneumatically operated system that is designed to clean spray application equipment while enclosed. A gun washer may also be

considered a gun cleaning system that consists of spraying solvent into an enclosed container using a snug fitting.

25. "Hand Application Methods": The application of coatings, sealants, or adhesives, by nonmechanical hand-held equipment including but not limited to paint brushes, hand rollers, caulking guns, trowels, spatulas, syringe daubers, rags and sponges.

26. "High Temperature Coating": A coating that must withstand temperatures of more than 350^{o}F.

27. "High Volume Low Pressure Application (HVLP)": Equipment used to apply coatings by means of a spray gun designed to be operated and operated between 0.1 and 10 psig air pressure measured dynamically at the center of the air cap and at the air horns.

28. "Impact Resistant Coating": A flexible coating that protects aerospace components, such as aircraft landing gear, and landing gear compartments, and other surfaces subject to abrasive impacts from runway debris.

29. "Low emission spray gun cleaner": Any properly used spray equipment cleanup device which has passive solvent losses of no more than 0.6 grams per hour and has active solvent losses of no more than 15 grams per operating cycle as defined by the test method in Subsection E.5.

30. “Low-Solids Adhesive, Coating, Primer or Sealant”: An adhesive, coating, primer, or sealant that has less than one pound of solids per gallon of material (120 grams of solids per liter of material). Such solids are the non-volatiles remaining after a sample is heated at 110^{o}C for one hour.

31. "Maskant for Chemical Milling": A coating applied directly to an aerospace component to protect surface areas when chemical milling such component.

32. "Non-Structural Adhesive": An adhesive that bonds non-load carrying aircraft components in noncritical applications.

33. "Optical Anti-Reflective Coating": A coating with a low reflectance in the infrared and visible wavelength range and is used for anti-reflection on or near optical and laser hardware.

34. "Phosphate Ester Resistant Wire Ink Coating": A coating that is used for surface identification or mark on aerospace wire or cable which inhibits the corrosion caused by contact with phosphate ester type hydraulic fluids.

35. "Pretreatment Coating": A coating which contains no more than 12 percent solids by weight, and at least one-half percent acid, by weight, to provide surface

etching, and is applied directly to metal surfaces to provide corrosion resistance, adhesion and ease of stripping.

36. "Primer": A coating applied directly to an aerospace component for purposes of corrosion prevention, protection from the environment, functional fluid resistance and adhesion of subsequent coatings.

37. "Rain Erosion Resistant Coating": A coating that protects leading edges, flaps, stabilizers, and engine inlet lips against erosion caused by rain during flight.

38. "Reactive Organic Compounds (ROC)": As defined in Rule 2.

39. ROC Composite Partial Pressure": The sum of the partial pressures of the compounds defined as ROCs. ROC composite partial pressure is calculated as follows:

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

Where:

W_i = Weight of the "i"th ROC compound, in grams
W_w = Weight of water, in grams
W_e = Weight of the "e"th exempt organic compound, in grams
MW_i = Molecular weight of the "i"th ROC compound, in g/(g-mole)
MW_w = Molecular weight of water, in g/(g-mole)
MW_e = Molecular weight of the "e"th exempt compound, in g/(g-mole)
PP_c = ROC composite partial pressure at 20 C, in mm Hg
VP_i = Vapor pressure of the "i"th ROC compound at 20 C, in mm Hg.

40. "Scale Inhibitor": A coating that is applied to the surface of a part prior to thermal processing to inhibit the formation of tenacious scale.

41. "Sealant": A viscous semisolid material that fills voids in order to seal out water, fuel, and other liquids and solids, and in some cases air movement.

42. "Solid Film Lubricant": A very thin coating consisting of a binder system containing as its chief pigment material one or more of the following: molybdenum disulfide, graphite, polytetrafluoroethylene (PTFE) or other solids that act as a dry lubricant between faying surfaces.

43. "Space Vehicle Coating": A coating applied to vehicles designed to travel beyond earth's atmosphere, including but not limited to, rocket or satellite coatings.

44. "Stripper": A volatile liquid applied to remove a maskant for chemical processing, cured or dried paint, cured or dried paint residue or temporary protective coating.

45. "Structural Adhesive - Autoclavable": An adhesive used to bond load-carrying aircraft components and is cured by heat and pressure in an autoclave.

46. "Structural Adhesive - Nonautoclavable": An adhesive cured under ambient conditions and is used to bond load-carrying aircraft components or other critical functions, such as nonstructural bonding near engines.

47. “Solvent Cleaning”: The use of solvent to remove loosely held uncured adhesive, uncured ink, uncured coating, uncured resin, or other contaminants which include, but are not limited to, dirt, soil, lubricants, coolant, moisture, grease, and fingerprints from parts, products, tools, machinery, equipment, or general work areas.

48. "Temporary Protective Coating": A coating applied to an aerospace component to protect it from mechanical and environmental damage during manufacturing or shipping.

49. "Topcoat": A coating applied over a primer for purposes such as appearance, identification, or protection.

50. "Transfer Efficiency": The ratio of the weight or volume of coating solids adhering to the part being coated to the weight or volume of coating solids used in the application process, expressed as a percentage.

51. "Unicoat": A coating that is applied directly to an aerospace component for purposes of corrosion protection, environmental protection and functional fluid resistance that is not subsequently topcoated. A unicoat is used in lieu of the application of a primer and a topcoat.

52. "Wing Coating": A coating that is corrosion resistant and is resilient enough to withstand the flexing of wings.

53. "Wire Prebonding Etchant": A nonadditive surface treatment process to provide bondability of aerospace wire coatings to the underlying insulation layer.