

CATEGORY:

Solvent Cleaning Vactube MFG

BACT Size:

BACT Determination Number:	159	BACT Determination Date:	5/1/2017
Equipment Information			
Permit Number: 24618			
Equipment Description:			
Unit Size/Rating/Capacity: Manufacturing Process			
Equipment Location:			
11361 SUNRISE PARK DR RANCHO CORDOVA, CA			
BACT Determination Information			
ROCs	Standard:	789 g/l, 39.7 lb/day or 7.9 lbs/hr	
	Technology Description:	IPA equivalent solvent (789 g/l) with minimization of evaporative losses through management practices. Limit of 39.7 lbs/day or 7.9 lbs/hr	
	Basis:	Achieved in Practice	
NOx	Standard:		
	Technology Description:		
	Basis:		
SOx	Standard:		
	Technology Description:		
	Basis:		
PM10	Standard:		
	Technology Description:		
	Basis:		
PM2.5	Standard:		
	Technology Description:		
	Basis:		
CO	Standard:		
	Technology Description:		
	Basis:		
LEAD	Standard:		
	Technology Description:		
	Basis:		
Comments:			
District Contact:			



**BEST AVAILABLE CONTROL TECHNOLOGY & TOXIC BEST AVAILABLE
CONTROL TECHNOLOGY DETERMINATION**

	DETERMINATION NO.:	159
	DATE:	3-21-2017
	ENGINEER:	Venk Reddy
Category/General Equip Description:	Solvent Cleaning for Vacuum Tube Manufacturing for Aerospace Applications	
Equipment Specific Description:	Solvent cleaning process.	
Equipment Size/Rating:	Minor Source BACT	
Previous BACT Det. No.:	13	

This BACT determination will update Determination #13 for surface cleaning as part of a Vacuum Tube Manufacturing process.

This BACT was determined under the project for A/C 24618 (Teledyne Wireless, LLC).

BACT ANALYSIS

A: ACHIEVED IN PRACTICE (Rule 202, §205.1a)

The following control technologies are currently employed as BACT for surface cleaning as part of a Vacuum Tube Manufacturing process.

District/Agency	Best Available Control Technology (BACT)/Requirements
US EPA	<u>BACT</u> Source: EPA RACT/BACT/LAER Clearinghouse None Identified <u>RULE REQUIREMENTS:</u> None Identified
ARB	<u>BACT</u> Source: ARB BACT Clearinghouse None Identified <u>RULE REQUIREMENTS:</u> None

SMAQMD	BACT	
	FROM SMAQMD BACT #13 issued on 09/04/2003	
	VOC	789 g/l and evaporative loss minimization strategies *
	NOx	No standard
	Sox	No standard
	PM10	No standard
	PM2.5	No standard
	CO	No standard
	* BACT was written to allow for IPA	
	<u>RULE REQUIREMENTS:</u>	
	<u>Rule 441 Organic Solvents</u> - IPA is considered a photochemically reactive solvent. Total emissions of organic compounds containing photochemically reactive substances is limited to 39.7 pounds of organic material during any one day and no more than 7.9 pounds in any one hour.	
	If a solvent that is not photochemically reactive is used, the total emissions of organic compounds containing non photochemically reactive substances is limited to 1,350 pounds of organic material during any one day and no more than 441 pounds in any one hour.	
	The following rule(s) were also evaluated in detail for applicability.	
	<u>Rule 466 Solvent Cleaning</u> - The cleaning of vacuum tube assemblies is considered exempt from this rule per section 110.2 c.	
	<u>Rule 456 Aerospace Assembly and Component Coating Operations</u> - The use of IPA for cleaning of vacuum tubes is not applicable to this rule per section 101 since the cleaning is not part of a coating operation.	

<p>South Coast AQMD</p>	<p><u>BACT</u> None identified</p> <p>Source: SCAQMD BACT Guidelines for Non-Major Polluting Facilities,</p> <p><u>RULE REQUIREMENTS:</u> None Identified</p> <p>The following rule(s) were evaluated in detail for applicability.</p> <p><u>Rule 1171 – Solvent Cleaning Operations</u></p> <p>The provisions of this rule are not subject to this process since it the operation is covered under SCQAMD Rule 1124 per section (g)(2)(D)</p> <p><u>Rule 1124 - Aerospace Assembly And Component Manufacturing Operations</u> – The cleaning of vacuum tube assemblies when considered as avionic equipment (used in airplanes and such) is considered exempt from the VOC limits for solvents per L.12.</p> <p><u>Rule 1145 Plastic, Rubber, Leather, and Glass Coatings</u> – This rule would be considered not applicable since the use of IPA is a cleaning operation not a coating operation.</p>
<p>San Diego County APCD</p>	<p><u>BACT</u> None.</p> <p><u>RULE REQUIREMENTS:</u> None identified</p> <p>The following rule(s) were evaluated in detail for applicability.</p> <p><u>67.6.1 Cold Solvent Cleaning and Stripping Operations.</u> Per section (a)(4) wipe cleaning operations are not subject to this rule. Per the applicant on 10/22/15 IPA is used for wipe cleaning. Since the applicant is using IPA for wipe cleaning, the operation is not covered by this rule.</p> <p><u>66.1 Miscellaneous Surface Coating</u> Operations and other process emitting Volatile Organic Components The cleaning of electronics is exempt per section (b) (1)(xi)</p> <p><u>67.9 Aerospace Coating Operations</u> Per the applicability of the rule under section (a)(1) the surface cleaning of material only is not covered by this rule. The cleaning for the purposes of coating would be covered. Since there is no coating activity after the cleaning, this rule is not applicable.</p>

Bay Area AQMD	<p><u>BACT</u> None</p> <p><u>RULE REQUIREMENTS:</u> None identified</p> <p>The following rule(s) were evaluated in detail for applicability.</p> <p><u>Regulation 8 Organic Compounds Rule 29 Aerospace Assembly And Component Coating Operations</u>, per 8-29-110 the manufacturing of electronic components is exempt from this rule</p> <p><u>Regulation 8 Organic Compounds Rule 16 Solvent Cleaning Operations</u>, section 8-16-123, the cleaning of electronic components is exempt from this rule</p>
San Joaquin Valley APCD	<p><u>BACT</u> Source: <u>SJVAPCD BACT Guideline</u></p> <p>None achieved in practice</p> <p><u>RULE REQUIREMENTS:</u></p> <p><u>Rule 4663 Organic Solvent Cleaning, Storage and Disposal</u> Limit of VOC content of 100 g/l for the manufacturing or apply emission control systems</p> <p>The following rule(s) were also evaluated in detail for applicability.</p> <p><u>Rule 4605 – Aerospace Assembly and Component Coating</u>, Limit of 200 g/l or apply emission control systems per section 5.2. The purpose statement of section 1.0 states “materials associated with the use of aerospace coatings and adhesives...” Since this is a cleaning operation not a coating operation, this rule is not applicable.</p>

The following control technologies have been identified and are ranked based on stringency:

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES		
VOC	100 g/l (A)	SJVAPCD
	789 g/l evaporative loss minimization strategies, 39.7 lbs/day, 7.9 lbs/hr	SMAQMD

- (A) Although SJVAPCD Rule 4663 requires a VOC content of 100 g/l and it does not exempt vacuum tube manufacturing, there are no vacuum tube manufacturing facilities within the jurisdiction of SJVAPCD (See appendix A for SJVAPCD query response.) This is a very specialized manufacturing process and since the Rule 4663 standard has not been demonstrated to be achievable for these types of operations, it will not be considered Achieved in Practice.

The following control technologies have been identified as the most stringent, achieved in

practice control technologies:

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	Standard	Source
VOC	789 g/l Evaporative loss minimization strategies , 39.7 lbs/day, 7.9 lbs/hr	SMAQMD

B. TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (Rule 202, §205.1.b.):

Technologically Feasible Alternatives:

Any alternative basic equipment, fuel, process, emission control device or technique, singly or in combination, determined to be technologically feasible by the Air Pollution Control Officer.

The table below shows the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be “Achieved in Practice” as per Rule 202, §205.1.a.

VOC	Collection system vented to a catalytic thermal incinerator Collection system vented to a thermal oxidizer Collection system vented to a carbon adsorption system Using low VOC solvents or solvents equivalent to SMAQMD Rule 466 Using solvents with a VOC content of 100% IPA or lower and evaporative loss minimization methods
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Cost Effective Determination:

After identifying the technologically feasible control options, a cost analysis is performed to take into consideration economic impacts for all technologically feasible controls identified.

Maximum Cost per Ton of Air Pollutants Controlled

1. A control technology is considered to be cost-effective if the cost of controlling one ton of that air pollutant is less than the limits specified below (except coating operations):

<u>Pollutant</u>	<u>Maximum Cost (\$/ton)</u>
ROG	17,500
NO _x	24,500
PM ₁₀	11,400
SO _x	18,300
CO	TBD if BACT triggered

The applicant has provided information to show that lower VOC solvents use is not possible, and cause a high failure rate in the finished part.. The applicant is restricted to use IPA only in the current permit. As part of the request, the applicant is requesting to remove the IPA name and only list VOC content, to allow for experimentation of solvent cleaners that could be lower than IPA but still higher than what SMAQMD Rule 466 would allow.

SMAQMD completed a cost effective analysis as part of the application for PO 17117. This

analysis assumed that the entire production floor (i.e. entire building) would need to be controlled. With this assumption, an emission rate of 9076.86 lb/yr and a 95% control efficiency, the electrical cost alone would exceed the District's cost effectiveness thresholds.

A more refined analysis was then done for IPA wipe cleaning at the Teledyne facility. This refinement was done to look specifically at where the applicant uses IPA and the equipment that would be needed to control the VOC emissions. The applicant uses IPA throughout the production area of the facility on bench work areas. A walkthrough of the facility identified approximately 227 bench work areas that would require canopy style hoods measuring 2'x3' to capture the IPA used at these stations. Each booth represents an individual employee's work area where IPA is being used. Each work bench represents a location where an employee is actively involved with the manufacturing of the vacuum tube. Each employee is instructed to clean the part at the end of the manufacturing step that occurs at the bench. The use of IPA is considered uniform in the work benches as long as the manufacturing process and the quantity of vacuum tubes remains consistent. The 227 work bench count was derived by counting the employee work areas where there is IPA usage throughout facility identified during the walkthrough, while discussing the need for IPA at each general location with the representative of Teledyne. Once it was mutually determined that a location was identified to need IPA, it was added to the count of needed capture hoods. Adding up the total quantity of work benches where an employee is working and using IPA was equal to 227. Using the EPA Control Cost manual (EPA/452-B-02001), the flow rate for each hood is estimated to be 200 cfm each or about 45,400 CFM total flow of exhaust. (45,000 cfm is used for calculation purposes)

A cost analysis was done to control 45,000 cfm of exhaust at these 227 locations. At the proposed daily limit by the applicant of 54 lbs/day or 6.75 lbs/hr for an 8 hour day, the IPA in the exhaust stream is estimated to have a concentration of 16.027 ppm with a corresponding partial pressure of 2.36E-04 psi. The duct work and control device costs were estimated using the EPA Control Cost Manual (EPA/452-B-02001). Two control technologies were considered, a carbon bed and a thermal incinerator. Onsite carbon replenishment was not considered, due to the high cost.

A thermal incinerator is estimated to cost approximately \$100,000 (1999 dollars) to control 45,000 cfm. Assuming an annual uncontrolled emission rate of 4.31 tons of VOC and a 95% control efficiency, without adding into the cost for energy the cost effectiveness calculation would be in excess of \$18,700. This is in excess of the District's BACT threshold.

The cost for the use of a carbon bed was also analyzed. The analysis assumed that the carbon would be regenerated offsite and the facility would need two vessels, but that one vessel could handle the entire exhaust flow. The initial cost of the carbon, nor the cost to desorb was included. The CFM of the unit is more important to the cost of the vessel than the retention time or pollutant species. The cost of the vessel alone would be about \$95K, the exact cost could not be determined because the constants needed for IPA were not provided in the EPA Control Cost Manual. Taking into account the cost of the vessel alone and the cost for the duct work and hoods, the cost effectiveness calculation would be in excess of \$18,400 per ton, which also exceeds the District's BACT cost effectiveness threshold. Further analysis would be required to better refine the cost per ton controlled, however any refinements of the numbers would only increase the costs. Therefore both technologies exceeded the District's BACT cost effectiveness threshold and as such will not be considered as BACT.

Per the SMAQMD BACT Guidelines (10/16) the interest rate used is the average 6-month yield plus 2 percentage points and rounding up.

	10 Year Treasury Rate
August, 2016	1.56%
September, 2016	1.63%
October, 2016	1.79%
November, 2016	2.14%
December, 2016	2.49%
January, 2017	2.43%
6 month average	2.007%

Per the SMAQMD BACT Guidelines (10/16) the interest rate used is the average 6-month yield plus 2 percentage points and rounding up.

Interest Rate = 2.007% + 2% = 4.007% & rounding up the interest rate is 5%

$$CRF = \frac{0.05(1+0.05)^{10}}{(1+0.05)^{10} - 1} = 0.13$$

	Total Capital Investment of Equipment	Cost Effectiveness to Control 4.31 tons of VOC per year	Cost Effective
Carbon Bed	\$613,561	\$18,436	No
Thermal Oxidation	\$623,060	\$18,721	No


C. SELECTION OF BACT:

BACT FOR VACUUM TUBE MANUFACTURING		
Pollutant	Standard	Source
VOC	IPA equivalent solvent (789 g/l) with minimization of evaporative losses through management practices. Limit of 39.7 lbs/day or 7.9 lbs/hr	SMAQMD

D. SELECTION OF T-BACT:

For coating and/or cleaning operations, the health risks associated with the particular operation is directly related to the toxicity, quantity and emission characteristics of the coating or cleaning solvent being utilized. Therefore TBACT cannot be determined without this knowledge and will need to be determined on a case by case basis.

REVIEWED BY: _____ DATE: _____

APPROVED BY:  _____ DATE: 3/23/17

Attachment A

- 1) Evaluation of Application 17117 with associated BACT determination and associated back up information.**
- 2) E-mail verification from SJVAPCD & SDAQMD of no Vacuum Tube manufactures under permit at this air district**

A/C Evaluation
A/C 17117, Teledyne Electronic Technologies
July, 2003
Page 1

777 12TH STREET, 3RD FLOOR

Sacramento, CA 95814

SACRAMENTO METROPOLITAN
AIR QUALITY MANAGEMENT DISTRICT

AUTHORITY TO CONSTRUCT EVALUATION

APPLICATION NO.:

17117

DATE:

August 1, 2003

ISSUING ENGINEER:

Carla J. Prasetyo Jo

FACILITY NAME:

TELEDYNE ELECTRONIC TECHNOLOGIES

LOCATION OF EQUIPMENT: 11361 SUNRISE PARK DRIVE, RANCHO CORDOVA, CA

PROPOSAL:

Obtain an Authority to Construct for a solvent cleaning operation and request the use of Emission Reduction Credits under Rule 205 (Community Bank) for Alternative Compliance (Rule 107) with Rule 466 Solvent Cleaning.

INTRODUCTION:

The applicant is applying for an Authority to Construct/Permit to Operate a solvent cleaning operation that will be using 100 % Isopropyl Alcohol and Isopropyl Alcohol blends (64% IPA, 36% acetone) solvents. The solvents are used to manufacture traveling wave tubes, which are used for aerospace and non-aerospace purposes. The aerospace use of the cleaning solvent falls under Rule 456, Aerospace Coating Operations, and the remaining usage falls under Rule 466, Solvent Cleaning. Due to the inability to differentiate between aerospace and non-aerospace usage during the cleaning process, Rule 466 is applied to the entire process because it is more restrictive. This solvent cleaning activity falls under Product Cleaning during Manufacturing Process in Rule 466 Section 301.1, with VOC content limit of 500 g/l.

The 100% Isopropyl Alcohol (789 g/l) is used to clean ceramic materials and hafnium grids for its VE encapsulation, packaging and grid sputtering processes. Since the solvent is non-compliant, the applicant has requested the use of credits to comply with the 500 g/l VOC content limit for wipe cleaning operation of Rule 466, that became effective May 22, 2003. They have requested the use of credits from the community bank account for a period of three years (Oct 1, 2003 to Oct 1, 2006).

At present, Rule 466 is not included in the list of applicable district rules in Section 102 of Rule 107 and Rule 205. Staff is in the process of amending Rule 107 and Rule 205 to include Rule 466 in the applicability list. The decision will be made in the September 2003 Board Meeting. Therefore, the request of the use of credit to comply with Rule 466 will only be granted upon the approval on the amendments of Rule 107- Alternative Compliance and Rule 205 - Community Bank and Priority Reserve Bank.

FLOW DIAGRAM: Not applicable

EQUIPMENT DESCRIPTION:

Solvent Cleaning Operation:	100 % Isopropyl Alcohol and Isopropyl Alcohol blends (IPA and acetone)
Application Method:	Hand Application
VOC Content:	789 g/l for 100 % Isopropyl Alcohol

500 g/l for Isopropyl Alcohol blends (64 % IPA and 36 % acetone)

CONTROL EQUIPMENT EVALUATION: Not applicable

PROCESS RATE/SOLVENT USAGE:

Material	Usage (gal/yr)	VOC content (g/L)	Compliant
100 % Isopropyl Alcohol	540	789	No
Isopropyl Alcohol Blend	1324	500	Yes

EMISSIONS CALCULATIONS FOR ALTERNATIVE COMPLIANCE:

The following calculations are for the use of emission reduction credits in lieu of complying with the solvent cleaning requirements of Rule 466. The request will be processed pursuant to Rule 107, ALTERNATIVE COMPLIANCE. The request of the use of credit to comply with Rule 466 will only be granted upon Board's approval on the amendment of Rule 107- Alternative Compliance.

100% Isopropyl Alcohol

$VOC1 = G \times NC_{VOC} = 135 \text{ gal/qtr} \times 789 \text{ g/l} \times 0.008345 \text{ lbs-l/g-gal} = 888.87 \text{ lbs/qtr}$

$VOC2 = G \times C_{VOC} = 135 \text{ gal/qtr} \times 500 \text{ g/l} \times 0.008345 \text{ lbs-l/g-gal} = 563.29 \text{ lbs/qtr}$

Excess Emissions = $888.87 \text{ lbs/qtr} - 563.29 \text{ lbs/qtr} = 325.58 \text{ lbs/quarter}$

ROC Credit needed = $1.1 \times 325.58 = 358 \text{ lbs/quarter}$

	Solvent Usage (gal)	VOC emission (lb)	Excess emission (lb)	Credit needed (lb)
Quarter 1	135	889	326	358
Quarter 2	135	889	326	358
Quarter 3	135	889	326	358
Quarter 4	135	889	326	358
Total ERC required (tpy)				0.72

EMISSIONS CALCULATIONS FOR NEW SOURCE REVIEW:

1. HISTORIC POTENTIAL TO EMIT:

This is a newly permitted unit, no historical Potential to Emit.

2. PROPOSED POTENTIAL TO EMIT:

The proposed emissions from the solvent cleaning operation will be calculated using solvent usage from above.

Solvent	usage (gal/yr)	VOC content (g/l)	VOC emission (lb/yr)	VOC emission (lb/day)
100 % Isopropyl Alcohol	540.00	789.00	3555.47	14.22
Isopropyl Alcohol Blend	1324.00	500.00	5524.39	22.10

Total VOC emission = $9079.86 \text{ lb/yr} = 4.54 \text{ tpy}$

3. CALCULATION OF BACT TRIGGER:

NEI (BACT) = Net Emissions Increase for BACT trigger determination
= Proposed Potential to Emit - Historic Potential to Emit
MPE = Maximum Potential Emissions on any day (24 hrs/day operation)

Pollutant	NEI (BACT) lb/qtr	Is NEI (BACT) >0?	MPE lb/day	Is BACT Required?
ROC	2270	Yes	>10 lbs/day	Yes

4. CALCULATION OF OFFSET TRIGGER:

Pollutant	Potential to Emit (lb/qtr)	Trigger Level (lb/qtr)	Is Offset required?
ROC	2270	7500	No

COMPLIANCE WITH RULES AND REGULATIONS:

1. AB 3205 COMPLIANCE:

The nearest school is approximately 5800 feet away. Therefore, since there is no K-12 school within 1,000 feet of this solvent cleaning operation, H&S Code, §42301.6 does not apply.

2. NSR COMPLIANCE:

Rule 202 - New Source Review

Section 301 - BACT

The proposed potential to emit from the solvent cleaning operation exceeds the BACT threshold for ROC. Therefore, BACT will be required.

Top-Down BACT Analysis:

Step 1 – Identify All Possible Control Technologies.

The following are possible controls for control of VOC from solvent cleaning operation in descending order:

1. Collection system vented to catalytic thermal incinerator
2. Collection system vented to thermal oxidizer
3. Collection system vented to carbon adsorption system
4. Using solvents that comply with Rule 466-Solvent Cleaning
5. Using solvents with a VOC content of 789 g/l or lower and evaporative loss minimization methods, which includes the use of controlled flow solvent dispensers (i.e., squeeze bottle); and all solvents and material contaminated with the solvent not in use kept in closed containers

Step 2 – Eliminate Technologically Infeasible Options

Teledyne has substituted most of the cleaning solvent with compliant solvent except for their grid sputtering, encapsulation and packaging process. Various solvents have been tested in order to obtain a compliant cleaning solvent but has not found a solvent that performs for their grid sputtering, encapsulation and packaging process and meets the Department of Defense specification. Teledyne has attempted to use acetone to remove excess water during their grid sputtering process, but the acetone leaves a film on the surface of the grid assembly, causing it not to adhere. Therefore, using solvents that comply with Rule 466-Solvent Cleaning is considered technologically infeasible.

Due to the nature of the solvents used, which are Isopropyl Alcohol and Acetone, all possible control technologies except option 4 are considered technologically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The ranking of the control option number 5 is considered "Achieved in Practice" and last in control effectiveness amongst the possible control technologies identified.

Ranking of VOC Control Technologies		
Control Method	Overall Control Efficiency (%)	Achieved in Practice
Collection system vented to catalytic thermal incinerator	95	No
Collection system vented to thermal oxidizer	95	No
Collection system vented to carbon adsorption system	95	No
Using solvents with a VOC content of 789 g/l or lower and evaporative loss minimization methods	0	Yes

Step 4 – Cost Effectiveness Analysis

All possible control technologies, except option 5, require a collection system to capture VOC. Based on the current dimension of the building, a calculation is performed to obtain the electric cost for capturing the VOC using a fan.

Electricity cost calculation:

Building Area = 77000 sqft

Height = 18 ft

Assumptions:

Air Turn-over rate = 0.5 per minute

8 hours/day, 5 days/week, 50 weeks/ year operation

Electricity cost = \$ 0.08 per kwh

$$\text{Required flow rate} = (77000 \text{ sqft}) * (18 \text{ ft}) * (0.5 \text{ per minute}) = 693000 \text{ cfm}$$

$$\text{Minimum horsepower requirement} = [(P_1 * V) / (\eta_c * 33000)] \times [\gamma / (\gamma - 1)] \times [((P_2 / P_1)^{((\gamma - 1) / \gamma)}) - 1] \times [1 / \text{LF}]$$

P_1 = inlet pressure = 2117 lbf/ft²

P_2 = outlet pressure = 2138 lbf/ft²

γ = ratio of specific heats = 1.4

η_c = adiabatic efficiency = 0.85

LF = motor loading factor = 0.75

V = required flowrate

$$\text{Minimum horsepower requirement} = 688 \text{ hp} = 513 \text{ kw}$$

$$\text{Total electricity cost} = 8 \text{ hours/day} * 5 \text{ days/week} * 50 \text{ weeks/ year} * 513 \text{ kw} * \$ 0.08 / \text{kwh} = \$ 82080.00 / \text{year}$$

$$\text{VOC emission} = [\text{Solvent Usage, gal/yr}] \times [3.785 \text{ l/gal}] \times [\text{VOC content as applied, g/l}] / [453.6 \text{ grams/lb}]$$

Solvent	usage (gal/yr)	VOC content (g/l)	VOC emission (lb/yr)
100 % Isopropyl Alcohol	540.00	789.00	3555.47
Isopropyl Alcohol Blend	1324.00	500.00	5524.39
Total VOC emission			9079.86

$$\text{Total VOC emission} = 9079.86 \text{ lb/yr} = 4.54 \text{ tpy}$$

$$\begin{aligned} \text{ROG reduced} &= \text{total VOC emission} \times \text{control efficiency} \\ &= 4.54 \text{ tpy} \times 0.95 \\ &= 4.31 \text{ tpy} \end{aligned}$$

$$\begin{aligned} \text{Electricity cost per ton of ROG reduced} &= \$82,080 \text{ per year} / 4.31 \text{ tons of ROG reduced per year} \\ &= \$19,044/\text{tons of ROG reduced} \end{aligned}$$

Per District BACT Policy, 8/23/2002, the maximum cost limit for ROG reduction is \$17,500 per ton of ROG reduced. Since the cost of electricity for the capture system alone exceeds the District cost limit for VOC controls, no further cost analysis will be added. Therefore, the use of these control systems is not cost effective and will not be considered as BACT for this application.

Step 5 – Select BACT

The most effective VOC control technology not eliminated in the previous step is option 5. Therefore, using solvents with a VOC content of 789 g/l or lower and evaporative loss minimization methods, which includes the use of controlled flow solvent dispensers (i.e., squeeze bottle); and all solvents and material contaminated with the solvent not in use kept in closed containers will be the required BACT.

Section 302 - Offsets

As calculated above, the facility does not exceed any of the offset trigger levels. Therefore offsets are not required.

3. PSD COMPLIANCE: Not applicable

4. PROHIBITORY RULES COMPLIANCE

Rule 401 - Ringelmann Chart

Visible emissions are expected to comply with the 20% opacity requirement of this rule.

Rule 402 - Nuisance

The operation of the proposed equipment should not cause a nuisance provided that it is operated in compliance with the permit emission limits.

Rule 466 – Solvent Cleaning

The facility is expected to comply with the emission limitations and record keeping requirements of this rule. Credits will be used in lieu of complying with cleaning solvent VOC content requirement of Rule 466 for

three (3) years, beginning Oct 1, 2003 and continuing until Oct 1, 2006. Credits will only be granted upon the approval of the amendment of Rule 107-Alternative Compliance to include Rule 466, which will take place on September 2003 Board Meeting.

5. **NSPS COMPLIANCE:** Not applicable.
6. **NESHAP COMPLIANCE:** Not applicable
7. **ERC RULES COMPLIANCE**

Rule 107 - Alternative Compliance

The emission reduction credits needed for the use of the non-compliant solvent have been calculated in accordance to this rule. Since Rule 466 is not included in the list of applicable district rules in Section 102 of Rule 107, staff is in the process of amending Rule 107 and Rule 205 to include Rule 466 in the applicability list. The decision will be made in the September 2003 Board Meeting. Therefore the request to use credits to comply with Rule 466 will only be granted upon the Board's approval to the amendment of Rule 107-Alternative Compliance and Rule 205 - Community Bank and Priority Reserve Bank. The total amount of emission reduction credits needed for this application is:

Emission Reduction Credits Needed Reactive Organic Compounds (Pounds)				
Product	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
100% Isopropyl Alcohol	358	358	358	358
TOTAL ERCs NEEDED	358	358	358	358

Credits will be used in lieu of complying with the solvent cleaning requirements of Rule 466 beginning Oct 1, 2003 and continuing until Oct 1, 2006.

Rule 205 - Community and Priority Reserve Bank

The emission reduction credits needed to continue the use of non-compliant cleaning solvent have been calculated in accordance with this rule

RECOMMENDATION:

This source should comply with all applicable District rules and regulations. An Authority to Construct for a solvent cleaning operation and to allow the use of emission reduction credits in lieu of complying with all the requirements of Rule 466 should be issued to Teledyne Electronic Technology with the following condition.

CONDITIONS:

GENERAL

1. THE EQUIPMENT SHALL BE PROPERLY MAINTAINED.
2. THE AIR POLLUTION CONTROL OFFICER AND/OR AUTHORIZED REPRESENTATIVES, UPON THE PRESENTATION OF CREDENTIALS SHALL BE PERMITTED:
 - A. TO ENTER UPON THE PREMISES WHERE THE SOURCE IS LOCATED OR IN WHICH ANY RECORDS ARE REQUIRED TO BE KEPT UNDER THE TERMS AND CONDITIONS OF THIS AUTHORITY TO CONSTRUCT, AND
 - B. AT REASONABLE TIMES TO HAVE ACCESS TO AND COPY ANY RECORDS REQUIRED TO BE KEPT UNDER TERMS AND CONDITIONS OF THIS AUTHORITY TO CONSTRUCT, AND
 - C. TO INSPECT ANY EQUIPMENT, OPERATION, OR METHOD REQUIRED IN AUTHORITY TO CONSTRUCT, AND
 - D. TO SAMPLE EMISSIONS FROM THE SOURCE OR REQUIRE SAMPLES TO BE TAKEN.
3. THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26, PART 4, CHAPTER 3, OF THE HEALTH AND SAFETY CODES OF THE STATE OF CALIFORNIA OR THE RULES AND REGULATIONS OF THE AIR QUALITY MANAGEMENT DISTRICT.
4. A LEGIBLE COPY OF THIS AUTHORITY TO CONSTRUCT SHALL BE MAINTAINED ON THE PREMISES WITH THE EQUIPMENT.

EMISSION LIMITATIONS – GENERAL

5. THE SOLVENT CLEANING OPERATION SHALL NOT DISCHARGE INTO THE ATMOSPHERE ANY VISIBLE AIR CONTAMINANT FOR A PERIOD OR PERIODS AGGREGATING MORE THAN THREE MINUTES IN ANY ONE HOUR, WHICH IS 20% OPACITY OR MORE.
6. EMISSION FROM THE SOLVENT CLEANING OPERATION SHALL NOT EXCEED THE FOLLOWING:

MAXIMUM ALLOWABLE EMISSIONS INCLUDING ALL VOC IN MATERIALS USED* FOR SOLVENT CLEANING OPERATION FOR AEROSPACE AND NON-AEROSPACE PURPOSES				
ROC LBS/QUARTER				ROC LBS/YEAR
1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	9080
2270	2270	2270	2270	

MATERIAL USED* = CLEANING SOLVENT APPLIED + WASTE

THE USAGE OF SOLVENTS FOR SOLVENT CLEANING OPERATION THAT OCCURS OUTSIDE THE MANUFACTURING OPERATION IS NOT INCLUDED IN THE EMISSION LIMITS LISTED ABOVE.

7. COMPLIANCE WITH THE EMISSIONS LIMITATIONS SPECIFIED IN CONDITIONS 6 SHALL BE DETERMINED AS FOLLOWS:

$$\text{ROC EMISSIONS (LBS/QTR)} = [\text{CLEANING SOLVENT USAGE, GAL/QTR}] \times [3.785 \text{ LITERS/GAL}] \times [\text{VOC CONTENT AS APPLIED, GRAMS/LITER}] / [453.6 \text{ GRAMS/LB}]$$

EQUIPMENT OPERATION

8. ALL SOLVENTS AND MATERIAL CONTAMINATED WITH THE SOLVENT SHALL BE STORED IN CLOSED CONTAINERS WHEN NOT IN USE. THE CONTAINER SHALL BE NONLEAKING AND NONABSORBENT.
9. ALL SPENT SOLVENTS SHALL BE DISPOSED OF PROPERLY IN CLOSED CONTAINERS. SPENT CLEANUP SOLVENTS MAY BE CLASSIFIED AS HAZARDOUS WASTE.
10. THE OWNER OR OPERATOR SHALL OBTAIN APPROVAL FROM APPLICABLE LOCAL, STATE, OR FEDERAL WATER POLLUTION CONTROL AGENCY PRIOR TO DISPOSING OF SPENT SOLVENT INTO THE SEWER OR STORM DRAIN SYSTEMS.
11. NO MORE THAN THE FOLLOWING AMOUNTS OF SOLVENTS MAY BE APPLIED UNDER THIS PERMIT:

PRODUCT	QUARTERLY USAGE (GAL/QTR)				ANNUAL USAGE (GAL/YR)
	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
100 % ISOPROPYL ALCOHOL	135	135	135	135	540

12. APPLICATION OF CLEANING SOLVENTS SHALL BE DONE USING ONE OF THE FOLLOWING CLEANING DEVICES OR METHODS:
 1. WIPE CLEANING
 2. NON-PROPELLANT SPRAY BOTTLES OR CONTAINERS
 3. USING CLEANING EQUIPMENT WHICH HAS A SOLVENT CONTAINER THAT IS CLOSED DURING CLEANING OPERATIONS
 4. USING REMOTE RESERVOIR DEGREASER, NON-VAPOR DEGREASER, OR VAPOR DEGREASER
 5. USING SOLVENT FLUSHING METHODS
 6. AN ENCLOSED GUN CLEANER
 7. USING SOLVENTS THAT COMPLY WITH CONDITION 13 AND CLEANING METHODS IN CONDITION 12.5 FOR CLEANING OF APPLICATION EQUIPMENT USED TO APPLY ARCHITECTURAL COATINGS AT THE JOBSITE
 8. SOAKING APPLICATION EQUIPMENT PARTS IN A CLOSED CONTAINER
13. VOC CONTENT LIMITATIONS-SOLVENT CLEANING: EXCEPT AS PROVIDED IN CONDITION 17, A PERSON SHALL NOT APPLY A CLEANING SOLVENT THAT EXCEEDS RULE 466 VOC LIMITS. THE FOLLOWING TABLE CONTAINS VOC CONTENT LIMITS FOR CLEANING SOLVENT.

SOLVENT CLEANING ACTIVITY	VOC CONTENT G/L (LB/GAL)
GENERAL (WIPE CLEANING, MAINTENANCE CLEANING)	50 (0.42)

PRODUCT CLEANING DURING MANUFACTURING PROCESS OR SURFACE PREPARATION FOR COATING, ADHESIVE, SEALANTS, OR INK APPLICATION	
GENERAL	50 (0.42)
ELECTRICAL APPARATUS COMPONENTS AND ELECTRONIC COMPONENTS	500 (4.2)
MEDICAL DEVICES AND PHARMACEUTICALS	800 (6.7)
PLATELETS	800 (6.7)
REPAIR AND MAINTENANCE CLEANING	
GENERAL	50 (0.42)
ELECTRICAL APPARATUS COMPONENTS AND ELECTRONIC COMPONENTS	900 (7.5)
MEDICAL DEVICES AND PHARMACEUTICALS	600 (5.0)
GENERAL WORK SURFACES	800 (6.7)
TOOLS, EQUIPMENT, AND MACHINERY	800 (6.7)
PLATELETS	800 (6.7)
ARCHITECTURAL COATING APPLICATION EQUIPMENT	
WATER BASED COATINGS	50 (0.42)
SOLVENT BASED COATINGS – JOBSITE AND NO ENCLOSED GUN CLEANER	300 (2.5)

RECORD KEEPING – GENERAL

14. THE FOLLOWING RECORD SHALL BE CONTINUOUSLY MAINTAINED. THE RECORD SHALL BE MAINTAINED ON SITE FOR THE MOST RECENT THREE YEARS PERIOD AND SHALL BE MADE AVAILABLE TO THE AIR POLLUTION CONTROL OFFICER UPON REQUEST. MONTHLY, QUARTERLY OR YEARLY RECORDS AS SPECIFIED IN THE TABLE BELOW SHALL BE MADE AVAILABLE FOR INSPECTION WITHIN 30 DAYS FROM THE END OF THE MONTH, QUARTER OR YEAR RESPECTIVELY.

FREQUENCY	INFORMATION TO BE RECORDED
AT ALL TIMES	FOR CURRENTLY USED AND/OR STORED CLEANING SOLVENTS: A. PRODUCT NAME/CODE/MANUFACTURER B. ACTUAL VOC CONTENT AS APPLIED INCLUDING WATER AND EXEMPT COMPOUNDS C. ACTUAL MIXING RATIO FOR THE CLEANING SOLVENT AS APPLIED
MONTHLY	A. QUANTITIES OF EACH CLEANING SOLVENT USED IN GALLON B. SOLVENT CLEANING ACTIVITY ASSOCIATED WITH EACH SOLVENT USED
QUARTERLY	A. QUANTITIES OF EACH CLEANING SOLVENT USED IN GALLON/QTR B. CALCULATION OF VOC EMISSIONS (LBS/QUARTER) FROM SOLVENT CLEANING OPERATION BY METHOD SPECIFIED IN CONDITION 7.
DAILY	IF AT ANYTIME DURING A REPORTING PERIOD A SOURCE USES A CLEANING SOLVENT WHICH DOES NOT COMPLY WITH THE VOC LIMITS. THE SOURCE SHALL KEEP DAILY RECORDS REGARDING THE USE OF THAT NON-COMPLIANT CLEANING SOLVENT DURING THE APPLICABLE REPORTING PERIOD. FOR VOC NON-COMPLIANT MATERIALS THAT USE RULE 107-ALTERNATIVE COMPLIANCE, AS PROVIDED IN CONDITION 17 TO COMPLY WITH VOC LIMITS, DAILY RECORDS ARE NOT REQUIRED.

(THESE EMISSION REDUCTION CREDITS AND ALTERNATIVE COMPLIANCE CONDITIONS ARE ONLY VALID UPON THE APPROVAL OF THE AMENDMENT OF RULE 107-ALTERNATIVE

COMPLIANCE TO INCLUDE RULE 466, WHICH WILL BE DETERMINED ON SEPTEMBER 2003 BOARD MEETING)

EMISSION REDUCTION CREDITS

15. TELEDYNE ELECTRONIC TECHNOLOGIES SHALL SURRENDER THE FOLLOWING EMISSION REDUCTION CREDITS FOR THE SOLVENT CLEANING APPLICATION BEFORE THIS PERMIT TAKES EFFECT.

ROC CREDITS RECEIVED (1) COMMUNITY BANK ACCOUNT POUNDS/QUARTER			
QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
358	358	358	358

(1) THESE CREDITS SHALL RETURN TO THE COMMUNITY BANK IF THE PERMIT TO OPERATE IS SURRENDERED, REVOKED, NOT RENEWED OR OWNERSHIP IS TRANSFERRED.

16. IN ORDER FOR OWNERSHIP OF THIS PROCESS TO BE TRANSFERRED, THE NEW OWNER SHALL PROVIDE REPLACEMENT CREDITS FOR THOSE CREDITS THAT WERE RETURNED PURSUANT TO CONDITION 15.

ALTERNATIVE COMPLIANCE

17. ALTERNATIVE COMPLIANCE TO THE CLEANING SOLVENT REQUIREMENTS OF RULE 466, SOLVENT CLEANING.

THE CLEANING SOLVENT VOC LIMITATIONS PER RULE 466, SOLVENT CLEANING WILL BE ACHIEVED BY PROVIDING EMISSION REDUCTION CREDITS AS SPECIFIED IN CONDITION 15 FOR THE PERIOD OCT 1, 2003 THROUGH OCT 1, 2006 (ALLOWED BY RULE 107-ALTERNATIVE COMPLIANCE). DURING THIS PERIOD, THE CLEANING SOLVENT SHALL NOT EXCEED THE FOLLOWING VOC CONTENT LIMITATIONS:

TYPE OF PRODUCT	VOC CONTENT GRAMS OF VOC PER LITER, AS APPLIED INCLUDING WATER AND EXEMPT COMPOUND
CLEANING SOLVENT	789

18. 100% ISOPROPYL ALCOHOL IS THE ONLY NON-COMPLIANT CLEANING SOLVENT THAT SHALL BE APPLIED UNDER THIS PERMIT.
19. DURING THE PERIOD OCT 1, 2003 THROUGH OCT 1, 2006, THE APPLICATION OF THE CLEANING SOLVENT IN CONDITION 18 SHALL NOT EXCEED THE ROC (VOC) EMISSION LISTED BELOW. COMPLIANCE WITH THE LIMITATION OF CONDITION 6 IS ALSO REQUIRED. AFTER OCT 1, 2006, NON-COMPLIANT SOLVENTS SHALL NOT BE USED.

MAXIMUM ALLOWABLE EMISSIONS FROM 100% ISOPROPYL ALCOHOL USAGE*				
ROC LBS/QTR				ROC LBS/YEAR
1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	
889	889	889	889	3556

MATERIAL USED = CLEANING SOLVENT APPLIED + WASTE

20. COMPLIANCE WITH THE EMISSION LIMITATION SPECIFIED IN CONDITION 19 SHALL BE DETERMINED AS FOLLOWS:

ROC EMISSIONS (LBS/QTR) = [100% ISOPROPYL ALCOHOL USAGE, GAL/QTR] X [3.785 LITERS/GAL] X [VOC CONTENT AS APPLIED, GRAMS/LITER] / [453.6 GRAMS/LB]

21. THE FOLLOWING RECORD SHALL BE CONTINUOUSLY MAINTAINED. THE RECORD SHALL BE MAINTAINED ON SITE FOR THE MOST RECENT FIVE YEARS PERIOD AND SHALL BE MADE AVAILABLE TO THE AIR POLLUTION CONTROL OFFICER UPON REQUEST. MONTHLY, QUARTERLY OR YEARLY RECORDS AS SPECIFIED IN THE TABLE BELOW SHALL BE MADE AVAILABLE FOR INSPECTION WITHIN 30 DAYS FROM THE END OF THE MONTH, QUARTER OR YEAR, RESPECTIVELY.

FREQUENCY	INFORMATION TO BE RECORDED
MONTHLY	QUANTITIES OF CLEANING SOLVENT USED PURSUANT TO RULE 107 – ALTERNATIVE COMPLIANCE IN GALLON
QUARTERLY	A. QUANTITIES OF CLEANING SOLVENT USED PURSUANT TO RULE 107 – ALTERNATIVE COMPLIANCE IN GALLON/QUARTER B. CALCULATION OF ROC (VOC) EMISSION (LB ROC/QUARTER) BY THE METHOD SPECIFIED IN CONDITION 20

YOUR APPLICATION FOR THIS AIR QUALITY PERMIT TO CONSTRUCT WAS EVALUATED FOR COMPLIANCE WITH SACRAMENTO AIR QUALITY MANAGEMENT DISTRICT (AQMD), STATE AND FEDERAL AIR QUALITY RULES. THE FOLLOWING LISTED RULES ARE THOSE THAT ARE MOST APPLICABLE TO THE OPERATION OF YOUR EQUIPMENT. OTHER RULES MAY ALSO BE APPLICABLE.

AQMD RULE NUMBER	RULE TITLE
107	ALTERNATIVE COMPLIANCE
201	GENERAL PERMIT REQUIREMENTS
202	NEW SOURCE REVIEW
401	RINGLEMANN CHART
466	SOLVENT CLEANING

IN ADDITION, THE CONDITIONS ON THIS PERMIT TO CONSTRUCT MAY REFLECT SOME, BUT NOT ALL, REQUIREMENTS OF THESE RULES. THERE MAY BE OTHER CONDITIONS THAT ARE APPLICABLE TO THE OPERATION OF YOUR EQUIPMENT. FUTURE CHANGES IN PROHIBITORY RULES MAY ESTABLISH MORE STRINGENT REQUIREMENTS WHICH MAY SUPERSEDE THE CONDITIONS LISTED HERE. FOR FURTHER INFORMATION PLEASE CONSULT YOUR AQMD RULEBOOK OR CONTACT THE AQMD FOR ASSISTANCE.

PREPARED BY:

Carla Johana Prasetyo Jo

DATE: August 1, 2003

REVIEWED BY:

Alto S. Kennard

DATE: Revised 10/10/03

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT
777 12th Street., 3rd Floor, Sacramento, CA 95814

ADDENDUM TO AUTHORITY TO CONSTRUCT EVALUATION

APPLICATION NO.: 17117

DATE: 11/10/03

EVALUATED BY: Carla Johana Prasetyo Jo

FACILITY NAME: Teledyne Technologies, Incorporated dba Teledyne MEC

LOCATION: 11361 Sunrise Park Drive, Rancho Cordova

PROPOSAL: Obtain an Authority to Construct for a solvent cleaning operation and request the use of Emission Reduction Credits under Rule 205 (Community Bank) for Alternative Compliance (Rule 107) with Rule 466 Solvent Cleaning.

INTRODUCTION:

The purpose of this addendum is to acknowledge that there are other existing emissions from the facility, which would otherwise be exempt, except that they are related to a process that requires a permit (solvent cleaning). These emissions will be incorporated into the Permit to Operate as the facility wide total emission. These are existing emissions and do not reflect any modification. Due to the various processes that occurred in the facility, this addendum will also clarify the processes that are included in the maximum allowable emission limit of condition 6. These processes will be identified in the Permit to Operate as Appendix A.

EQUIPMENT DESCRIPTION:

Solvent Cleaning Operation: 100 % Isopropyl Alcohol and Isopropyl Alcohol blends (IPA and acetone) Application Method: Hand Application
VOC Content: 789 g/l for 100 % Isopropyl Alcohol
500 g/l for Isopropyl Alcohol blends (64 % IPA and 36 % acetone)

EMISSIONS CALCULATIONS:

1. HISTORIC POTENTIAL TO EMIT:

This is a newly permitted unit, no historical Potential to Emit.

2. PROPOSED POTENTIAL TO EMIT:

The proposed emissions from the solvent cleaning operation will be calculated using solvent usage proposed by the applicant.

Solvent	usage (gal/yr)	VOC content (g/l)	VOC emission (lb/yr)	VOC emission (lb/day)
100 % Isopropyl Alcohol	540.00	789.00	3555.47	14.22
Isopropyl Alcohol Blend	1324.00	500.00	5524.39	22.10

Total VOC emission = 9079.86 lb/yr = 4.54 tpy

Maximum allowable emissions including all VOC in materials used* for solvent cleaning operation for aerospace and non-aerospace purposes				
ROC LBS/QUARTER				ROC LBS/YEAR
1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	9080
2270	2270	2270	2270	

Material used* = cleaning solvent applied + waste

Based on the applicant request, additional 1500 lbs/quarter will be incorporated to the present maximum allowable emissions limit for solvent cleaning operation to set the maximum allowable facility wide emissions limit.

Maximum allowable facility wide emissions				
ROC LBS/QUARTER				ROC LBS/YEAR
1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	15080
3770	3770	3770	3770	

PROCESSES:

The processes included in the maximum allowable emissions limit of condition 6 are the following:

- Magnet stacking, where sub-components are manually assembled.
- Product testing, where assembled components are tested electrically.
- Helix winding, which is the manufacturing of spirals metal components through a physical process.
- Vacuum furnace, which is a cleaning process that heats and evacuates foreign matter from assembling.
- Machine shop, where rejected vendor parts, R&D parts are reworked, and TWT base plate is machined.
- Grinding, which is the formation of magnets and other metal components through physical processes.
- Pyrolytic processing, which is the carbon deposition on ceramic rod insulators.
- Metalizing of ceramic substrates and sub-components.
- Pin plating, which is the alodine process to finish electrical connections and for corrosion resistance.

These processes will be identified in the Permit to Operate as Appendix A.

It is recommended that a Permit to Operate be issued with the addition of the facility wide emissions limit and Appendix A.

REVIEWED BY:

Mark S. Santy DATE: 11/10/03

Appendix A
A/C 17117

THE FOLLOWING THE PROCESSES ARE INCLUDED IN THE MAXIMUM ALLOWABLE EMISSIONS LIMIT OF CONDITION 6:

- A. MAGNET STACKING, WHERE SUB-COMPONENTS ARE MANUALLY ASSEMBLED.
- B. PRODUCT TESTING, WHERE ASSEMBLED COMPONENTS ARE TESTED ELECTRICALLY.
- C. HELIX WINDING, WHICH IS THE MANUFACTURING OF SPIRALS METAL COMPONENTS THROUGH A PHYSICAL PROCESS.
- D. VACUUM FURNACE, WHICH IS A CLEANING PROCESS THAT HEATS AND EVACUATES FOREIGN MATTER FROM ASSEMBLING.
- E. MACHINE SHOP, WHERE REJECTED VENDOR PARTS, R&D PARTS ARE REWORKED, AND TWT BASE PLATE IS MACHINED.
- F. GRINDING, WHICH IS THE FORMATION OF MAGNETS AND OTHER METAL COMPONENTS THROUGH PHYSICAL PROCESSES.
- G. PYROLYTIC PROCESSING, WHICH IS THE CARBON DEPOSITION ON CERAMIC ROD INSULATORS.
- H. METALIZING OF CERAMIC SUBSTRATES AND SUB-COMPONENTS.
- I. PIN PLATING, WHICH IS THE ALODINE PROCESS TO FINISH ELECTRICAL CONNECTIONS AND FOR CORROSION RESISTANCE.

Minimum Horsepower Requirements:

Compressor Formula:

(Reference - Fan Engineering p. 133)

$$\text{Motor Horsepower} = \frac{P_1 \times \text{①}}{\eta_c \times 33000} \times \left[\frac{\gamma}{\gamma - 1} \right] \times \left[\left(\frac{P_2}{P_1} \right)^{\frac{\gamma - 1}{\gamma}} - 1 \right] \times \frac{1}{LF}$$

0.07547 3.5 0.002824 1.33

= 1.2857

Where

P_1 = inlet pressure (lbf/ft²)
 P_2 = outlet pressure (lbf/ft²)
 γ = ratio of specific heats
 η_c = adiabatic efficiency
 LF = motor loading factor
 V = required delivery volume (acfm)

Use

$$P_1 = 2117$$

$$P_2 = 2138$$

$$\gamma = 1.4$$

$$\eta_c = 0.85$$

$$LF = 0.75$$

(ambient: 14.7 x 144 in²/ft²)

(assume 4" water pressure drop thus

[4"/(0.0361 psi/inch) + 14.7] x 144 in²/ft²)

typical

typical

typical

Motor Horsepower =

Conclusion:

Proposed horsepower is _____ this is above the theoretical horsepower requirement therefore the proposed blower/compressor is properly sized

ATTACHMENT 2

Table of Sources For Which Teledyne MEC Is Claiming an Exemption From Permitting Pursuant to Rule 201

The following manufacturing support operations are not part of a permitted process and exist to support manufacturing operations through destructive and nondestructive testing (laboratory scale activities per Rule 201, Section 120) and/or are small quantity solvent using activities that include inspection, machining, electrical equipment and facility maintenance (less than two pounds of emissions per day per Rule 201, Section 122). In addition, other Rule 201 exemptions may apply.

These operations all use a variety of aerosol and non-aerosol solvents contained in small containers and used in small amounts. Many of these solvents, especially those containerized are consumer, professional or industrial use products. The remainder are typically the same IPA solvents used in the permitted operation but to a much smaller extent and if feasible, exempt forms of the IPA solvents have been implemented (compliant blend with acetone or dispensing from aerosol cans pursuant to Rule 466's exemption). However, the general basis of the exemption for these sources is the laboratory and/or exempt quantity provisions of Rule 201.

In addition, because all of these operations are dedicated to the facility's aerospace manufacturing (over 50% of total output) only one-half emissions should be considered.

The following is a list of these sources and the basis for the exemption claimed:

Source and Description	Basis for Exemption	Solvent Use Activities
1. Engineering offices with bench top inspection/testing/repair activities.	Laboratory and exempt quantity use.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents.
2. Magnet stacking where sub-components are manually assembled.	Exempt quantity use.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents.
3. Product testing where assembled components tested electrically.	Laboratory and exempt quantity use.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents.
4. Shipping - package completed assemblies for shipment.	Exempt quantity and exemptions under the Rule 460 Adhesives.	Uses spray adhesives, an instant foam system (glycerine - isocyanate) and cleaning materials with some VOCs.
5. Electronic Maintenance and Calibration.	Exempt quantity exemption.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents.
6. Environmental Testing - conducts aggressive physical testing of assembled component.	Laboratory and exempt quantity exemptions.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents.

*Follows Mayne
RSD*

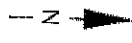
✓

✓

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compliance

Source and Description	Basis for Exemption	Solvent Use Activities
* 7. Wet Chemistry Laboratory – conducts physical/chemical tests on assembly components for QA/QC purposes.	Laboratory exemption.	Various laboratory reagents including solvents.
8. Helix – winding – manufacturing of spirals metal components through a physical process.	Small quantity exemption.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents. ✓
9. Vacuum Furnace – a cleaning process which heats and evacuates foreign matter from assembling.	Small quantity exemption.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents. ✓
10. Machine Shop – Rework of rejected vendor parts, R&D parts, TWT base plate machining.	Small quantity exemption.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents. ✓
11. Grinding – shop which forms magnets and other metal components through physical processes.	Small quantity exemption.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents. ✓
* 12. Chemical Plating – room where metal finishing activities are conducted.	Except for Nitric Acid etching which is permitted (No. 10386), metal finishing activities are exempt per Rule 201, Section 118.1 (surface coating) and small quantity.	Aqueous chemistry
* 13. Analytical Laboratory – conducts analytical chemistry procedures.	Laboratory exemption.	Various laboratory reagents including solvents.
* 14. Quality Assurance Testing Laboratory – conducts a variety of physical tests on assemblies and components.	Laboratory exemption.	Various laboratory reagents including solvents.
15. Pyrolytic Processing – carbon deposition on ceramic rods insulators.	Small quantity exemption.	N/A, Bench top vacuum device in which Heptane is combusted to produce carbon deposits on BEO ceramic substrate. ✓
16. Metalizing of ceramic substrates and subcomponents.	Small quantity exemption.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents. ✓
17. Pin Plating – Alodine process to finish electrical connections and for corrosion resistance.	Metal finishing exemption per Rule 201, Section 118.1 (surface coating) and small quantity for VOCs.	Aqueous chemistry and various IPA, IPA blends, aerosol IPA and other VOC-containing solvents. ✓
* 18. Maintenance Shop – performs equipment repair work for in-house machinery/equipment.	Small quantity exemption and exemption for repair and maintenance under Rule 201, Section 121.	Various IPA, IPA blends, aerosol IPA and other VOC-containing solvents.



Area of manufacturing bldg:
77000 sq ft
ht = 18-20 ft

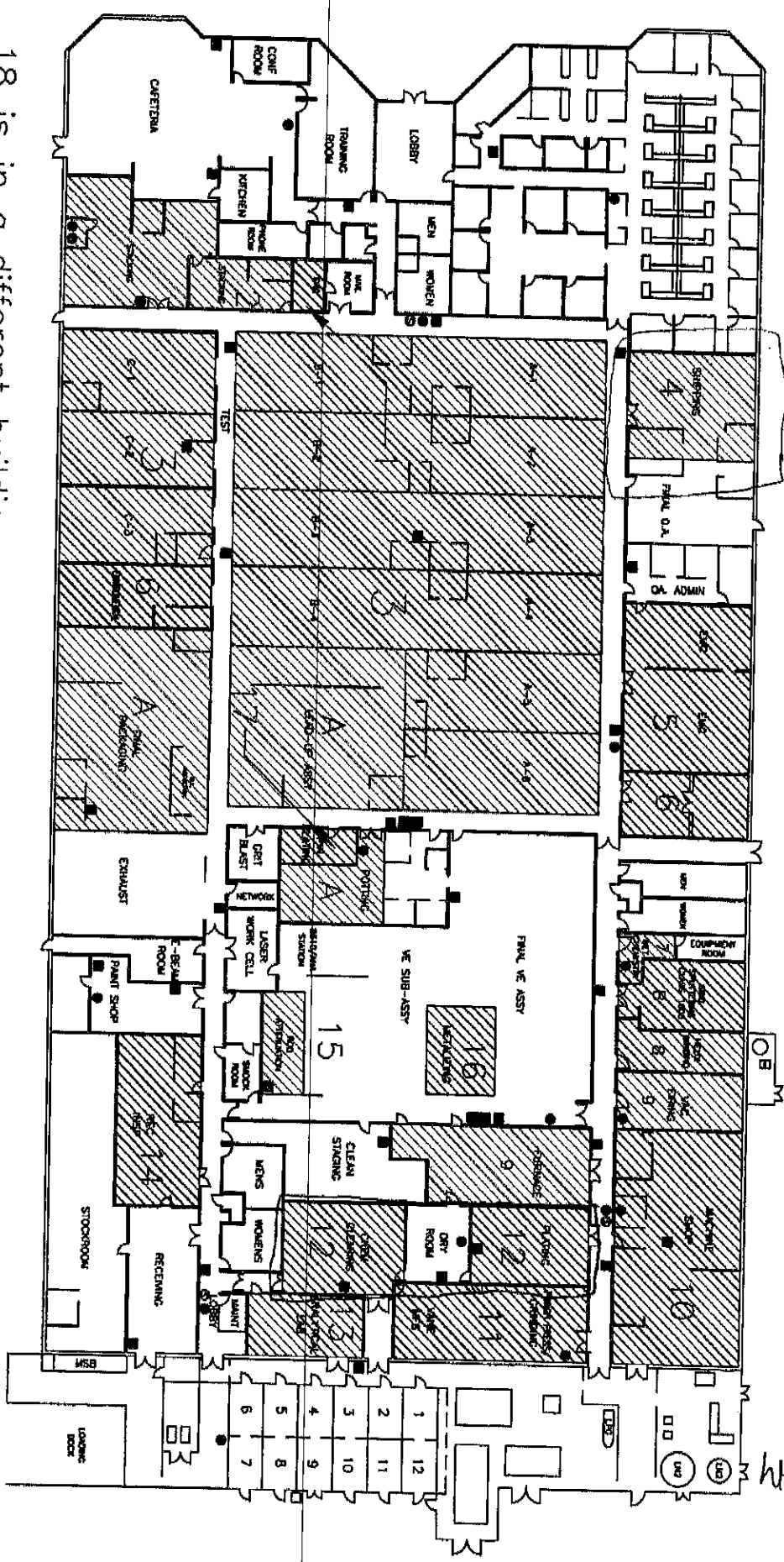
addl
86000 sq ft

Area:
77000 sq Ft
ht = 18-20 ft

18 separate

18 is in a different building

A & B Relate to Attachment 1



ATTACHMENT 1

Permitting Data For Teledyne MEC
Electron Gun Manufacturing Operations^{1,2}

7/8/03

Process and Description	Current VOC (IPA) Emissions	Emissions Exempt Per Rule 456 (aerospace)	Emissions Exempt Per Rule 466 (compliant blended and aerosol)	Current Non-Exempt IPA Emission Per Rule 466	Projected Non-Exempt IPA Emissions Per Rule 466 (assumes a 50% increase in operations)
<i>Lead-up/Packaging:</i> This process involves the attachment of high-voltage wires to the TWT gun assembly. IPA is used to clean the metal tabs and ceramic that encloses the gun in preparation for encapsulation of the assembly.	392 gal/yr	196 gal/yr		196	294
<i>Grid Sputtering:</i> This is a metal deposition process where either hafnium or zirconium is deposited onto a molybdenum grid part. IPA is used to remove any foreign materials do that the sputtered materials adhere to the grid surface. This sputtering (deposition) is performed in a vacuum chamber.	40 gal/yr	20 gal/yr		20 gal/yr	30 gal/yr
All other solvent use in the remaining processes outlined in attachment 2.	662 gal/yr		662 gal/yr ³		
TOTALS	1094 gal/yr	216 gal/yr	662 gal/yr	216 gal/yr	324 gal/yr

¹ All amounts stated in pounds, per year annualized (equal quarterly use assumed).² 6.5 lbs/gal for pure IPA.³ Represents 64% IPA using Acetone IPA blended solvent.

7/18/03

Process and Description	Total Coatings ⁴	Exempt Coatings Per Rule 456 (aerospace)	Exempt Coatings Per Rule 451	Total Wash Primer	Exempt Wash Primer Per Rule 456 (aerospace)	Exempt Wash Primer Per Rule 451	Projected Non-Exempt Coatings and Solvents Per Rule 456 (assumes a 50% increase in operations)	Coatings	Wash Primer
Surface Prep and Painting [description]	74 gal/yr	37 gal/yr is < 750 g/l or 6.3 lbs/gal	37 gal/yr < 55 gal/yr	33.32 gal/yr	16.66 gal/yr is < 780 g/l or 6.5 lbs/gal	16.66 gal/yr < 200 gal/yr	N/A	N/A	N/A

⁴ Based on 2003 use Jan. - Jun annualized.

IPA Usage for 2000, 2001, 2002

Year	IPA Ordered	*IPA Waste	Net Usage
2000	596 gallons	290 gallons	306 gallons
2001	748 gallons	532 gallons	216 gallons
2002	1004 gallons	430 gallons	574 gallons

* Assuming 30% IPA Waste Makeup

7/8/03

TELEDYNE MEC - - RANCHO CORDOVA, CA
APPROXIMATE BUSINESS BREAKDOWN BY END USE

7/8/03

PRODUCT END USE	ACTUAL 2001 SALES (K\$\$)	PERCENT OF TOTAL	ACTUAL 2002 SALES (K\$\$)	PERCENT OF TOTAL	PROJECTED 2003 SALES (K\$\$)	PERCENT OF TOTAL
US DoD (and allied) Airborne Systems	26824.8	69.82%	25693	63.95%	26706.9	60.48%
TOTAL Non-Airborne US DoD, ALLIED MILITARY, NASA, FAA, ETC.	6139.9	15.98%	8772.4	21.83%	11147.1	25.24%
TOTAL COMMERCIAL SURFACE USE	5455.3	14.20%	5711.7	14.22%	6305.36	14.28%
PROJECTED TOTAL SALES	38420	100.00%	40177.1	100.00%	44159.4	100%

5054

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 001
Date Prepared: 01/26/98
Date Printed: 09/04/99
MSDS No: 999.0001444-008.006

ISOPROPYL ALCOHOL CR

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity

Product Name: ISOPROPYL ALCOHOL CR
Product Code: 3500100
General or Generic ID: ALCOHOL

Company

Ashland Chemical Co.
P.O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:

1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
ISOPROPANOL	67-63-0	100.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye

Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin

May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, drying and cracking of skin, and skin burns. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Swallowing

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation

Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Symptoms of Exposure

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), low blood pressure, mild, temporary changes in the liver, effects on heart rate, respiratory depression (slowing of the breathing rate), loss of coordination, confusion, lung edema (fluid buildup in the lung tissue), kidney damage, coma.

Continued on next page

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 002
Date Prepared: 01/26/98
Date Printed: 09/04/99
MSDS No: 999.0001444-008.006

ISOPROPYL ALCOHOL CR

Target Organ Effects

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: mild, reversible liver effects

Developmental Information

This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Cancer Information

Based on the available information, this material cannot be classified with regard to carcinogenicity. This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

Other Health Effects

No data

Primary Route(s) of Entry

Inhalation, Skin absorption, Skin contact, Eye contact.

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Swallowing

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Note to Physicians

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin, lung (for example, asthma-like conditions), kidney.

5. FIRE FIGHTING MEASURES

Flash Point

53.0 F (11.6 C) TCC

Continued on next page

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 003
Date Prepared: 01/26/98
Date Printed: 09/04/99
MSDS No: 999.0001444-008.006

ISOPROPYL ALCOHOL CR

Explosive Limit
(for product) Lower 2.0 Upper 12.0 %

Autoignition Temperature
750.0 F (398.8 C)

Hazardous Products of Combustion
May form: carbon dioxide and carbon monoxide.

Fire and Explosion Hazards
Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Extinguishing Media
alcohol foam, carbon dioxide, dry chemical.

Fire Fighting Instructions
Water may be ineffective. Water may be used to keep fire-exposed containers cool until fire is out. Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating
Health - 1, Flammability - 3, Reactivity - 0

6. ACCIDENTAL RELEASE MEASURES

Small Spill
Absorb liquid on vermiculite, floor absorbent or other absorbent material.

Large Spill
Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal. Per good environmental management practices, prevent run-off to sewers, streams and other bodies of water. Stop spill at the source. Cover sewer grates and dike the spill. Absorb spilled material on to absorbents. Shovel materials into container. Close container tightly and dispose of properly.

7. HANDLING AND STORAGE

Handling
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five-gallon pails and larger metal containers, including tank cars and tank trucks, should be grounded and/or bonded when material is transferred. Warning. Sudden release of hot organic chemical vapors or mists from process equipment operating at
Continued on next page

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 004
Date Prepared: 01/26/98
Date Printed: 09/04/99
MSDS No: 999.0001444-008.005

ISOPROPYL ALCOHOL CR

elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection

Wear resistant gloves (consult your safety equipment supplier). To prevent repeated or prolonged skin contact, wear impervious clothing and boots..

Respiratory Protections

If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Engineering Controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines

Component

ISOPROPANOL (67-63-0)
OSHA VPEL 400.000 ppm - TWA
OSHA VPEL 500.000 ppm - STEL
ACGIH TLV 400.000 ppm - TWA
ACGIH TLV 500.000 ppm - STEL

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point

(for product) 180.0 F (82.2 C) @ 760 mmHg

Vapor Pressure

(for product) 20.800 mmHg @ 68.00 F

Specific Vapor Density

2.070 @ AIR=1

Continued on next page

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 005
Date Prepared: 01/26/98
Date Printed: 09/04/99
MSDS No: 999.0001444-008.006

ISOPROPYL ALCOHOL CR

Specific Gravity

.789 @ 60.00 F

Liquid Density

6.580 lbs/gal @ 60.00 F
.789 kg/l @ 15.60 C

Percent Volatiles

100.0 %

Volatile Organic Compounds (VOC)

100.000 %
789.000 g/l
6.580 lbs/gal

Evaporation Rate

7.70 (ETHYL ETHER)

Appearance

TRANSPARENT

State

LIQUID

Physical Form

NEAT

Color

CLEAR, PT-CO COLOR 10 MAX

Odor

SLIGHT ETHANOL/ACETONE-LIKE

pH

No data

Viscosity

2.4 cps

Freezing Point

-128.0 F (-88.8 C)

Molecular Weight

60.1

Solubility in Water

100%

Octanol/Water Partition Coefficient

1.400

Bulk Density

.880 lbs/ft3

10. STABILITY AND REACTIVITY

Hazardous Polymerization

Product will not undergo hazardous polymerization.

Continued on next page

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 006
Date Prepared: 01/26/98
Date Printed: 09/04/99
MSDS No: 999.0001444-008.006

ISOPROPYL ALCOHOL CR

Hazardous Decomposition

May form: carbon dioxide and carbon monoxide.

Chemical Stability

Stable.

Incompatibility

Avoid contact with: acetaldehyde, acids, chlorine, ethylene oxide, isocyanates
strong oxidizing agents, Do not use with aluminum equipment at temperatures
above 120 degrees F..

11. TOXICOLOGICAL INFORMATION

No data

12. ECOLOGICAL INFORMATION

No data

13. DISPOSAL CONSIDERATION

Waste Management Information

Dispose of in accordance with all applicable local, state and federal
regulations.

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101

DOT Description:

ISOPROPANOL, 3, UN1219, II

Container/Mode:

55 GAL DRUM/TRUCK PACKAGE

NOS Component:

None

RQ (Reportable Quantity) - 49 CFR 172.101

Not applicable

15. REGULATORY INFORMATION

US Federal Regulations

TSCA (Toxic Substances Control Act) Status

TSCA (UNITED STATES) The intentional ingredients of this product are listed.

Continued on next page

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 007
Date Prepared: 01/26/98
Date Printed: 09/04/99
MSDS No: 999.0001444-008.006

ISOPROPYL ALCOHOL CR

CERCLA RQ - 40 CFR 302.4(a)
None listed

SARA 302 Components - 40 CFR 355 Appendix A
None

Section 311/312 Hazard Class - 40 CFR 370.2
Immediate(X) Delayed(X) Fire(X) Reactive() Sudden Release of
Pressure(-)

SARA 313 Components - 40 CFR 372.65
None

OSHA Process Safety Management 29 CFR 1910
None listed

EPA Accidental Release Prevention 40 CFR 68
None listed

International Regulations

Inventory Status

ACQIN (AUSTRALIA) The intentional ingredients of this product are listed.
DSL (CANADA) The intentional ingredients of this product are listed.
ECL (SOUTH KOREA) The intentional ingredients of this product are listed.
EINECS (EUROPE) The intentional ingredients of this product are listed.
ENCS (JAPAN) The intentional ingredients of this product are listed.

State and Local Regulations

California Proposition 65

None

New Jersey RTK Label Information

ISOPROPYL ALCOHOL

67-63-0

Pennsylvania RTK Label Information

2-PROPANOL

67-63-0

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Last page

RECEIVED

OCT 13 2003

 FACILITIES / SAFETY /
 ENVIRONMENTAL

 Norm Covell
 AIR POLLUTION CONTROL OFFICER

October 1, 2003

Ronald Oineza
 EHS Manager
 Teledyne Technologies, Incorporated dba Teledyne MEC
 11361 Sunrise Park Dr.
 Rancho Cordova, CA 95742

Re: ERC Loan No. C034009

Dear Mr. Oineza:

Thank you for your application for an emission reduction credits (ERC) loan. Your ERC loan request has been approved for the amounts indicated below.

ERC LOAN AMOUNT CALCULATION (Pounds Per Quarter)					
ROG	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Tons/Year
Amount Required	326	326	326	326	0.652
Offset Ratio	1.1 to 1.0	1.1 to 1.0	1.1 to 1.0	1.1 to 1.0	
Loan Amount	358	358	358	358	0.716

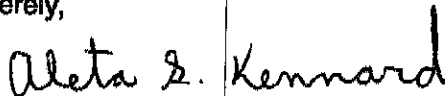
ACCOUNT DATA		
Loan No.		C034009
A/C No.		AC17117
Effective Date		10/1/2003
Due Date		10/1/2006

LOAN FEE CALCULATION		ROG
Two-year Average Fee - Full-term Loan		\$24,839
Fee Per Ton Per Year		\$827.97
Loan Amount (Tons Per Year)		0.716
Term of Loan (Years)		3
Loan Fee		\$1778.47

The loan fee must be received by October 31, 2003. IF THE LOAN FEE IS NOT RECEIVED BY THIS DATE, THE LOAN FEE WILL BE INCREASED BY 25 PERCENT. Upon our receipt of the loan fees and the attached signed terms and conditions, you may use the loaned ERCs. For your information, the SMAQMD requires a loan renewal fee on the yearly anniversary of your ERC loan (October 2004). Currently, this administration fee is \$903.00.

Please contact me at 916/874-4833 if you have any questions regarding your ERC loan.

Sincerely,



Aleta Kennard
 Supervisor, Technical Services

VENK REDDY

From: Erwin, Douglas <Douglas.Erwin@sdcounty.ca.gov>
Sent: Tuesday, October 20, 2015 9:33 AM
To: VENK REDDY
Subject: RE: here I am

From: VENK REDDY [mailto:VReddy@airquality.org]
Sent: Friday, October 16, 2015 10:26 AM
To: Erwin, Douglas
Subject: here I am

Hi Vank,

I have gotten only two brief responses from my colleagues on your question about vacuum tube manufacturers in SD County. Both responses indicated no knowledge of any such manufacturers in SD County. One of these colleagues informed me that Sony manufactured CRTs in SD up until 2002, and that the closure of that operation appeared due to the technological shift away from tubes. Hope this helps.

Regards,
Doug

Douglas L. Erwin, PE
Senior Air Pollution Control Engineer
San Diego Air Pollution Control District
10124 Old Grove Rd.
San Diego, CA 92131
Phone: (858) 586-2717
Fax: (858) 586-2801
www.sdapcd.org

VENK REDDY

From: Wai-Man So <Wai-Man.So@valleyair.org>
Sent: Friday, October 23, 2015 9:10 AM
To: VENK REDDY
Subject: RE: Vacuum Tube manufacturer

Good Morning Venk,

I did some research in our database, but not able to locate any permitted vacuum tube manufacturing operation in our jurisdiction. I also checked with couple engineers in our Modesto office, no one aware of this type of operation as well.

We have couple old BACT guidelines for aerospace & metal parts coating operations, link to our searchable BACT clearinghouse is: <http://www.valleyair.org/busind/pto/bact/bactLoader.htm>

Under the Main Category, select section 4, Evaporative Loss Sources, see screenshot below:

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HOME LINKS GENERAL FEEDBACK ESPAÑOL SITE MAP

Search:

BACT Clearinghouse (Searchable)

INSTRUCTIONS: To filter, enter a search term in "Search Description" and press return, or select a "Main Category" and/or "Sub Category"

Search Description	Main Category	Sub Category
<input type="text"/>	4. Evaporative Loss Sources	All

#	Description
4.1.2	Petroleum Solvent Dry Cleaning (4/8/2004)
4.2.1	Automotive Spray Painting Operation - < 5.0 MMBtu/yr (3/23/2010)
4.2.2	Group II Vehicles Spray Painting Operation - Vehicles requiring a Color Match (7/15/1998)
4.2.3	Mobile Equipment Coating Operation - Multiple Location - < 20,000 lb VOC/year (3/23/2010)
4.2.4	Trailer Coating Operation (12/23/1998)
4.2.5	Limited Aircraft Coating Operation - Maintenance and Refinishing of Metal Parts on Aircraft - < 20 Gallons/day (4/23/2002)
4.2.6	Aerospace Parts Coating Operation (1/16/1997)
4.2.7	Aerospace and Metal Parts Coating Operation - Solid Film Lubricant for computer, medical specialty, and aerospace metal part products (11/12/1998)
4.2.8	Recreational Marine Vessel (Pleasure Craft) Coating (12/5/2003)
4.2.9	Aerospace Parts Coating Operation - Plasma Spray Application (6/11/2001)

Sorry I can't help much, but please feel free to contact me if you have any further questions.

Thank you and have a nice weekend.

Wai-Man So
Air Quality Engineer
San Joaquin Valley Air Pollution Control District
4800 Enterprise Way, Modesto, CA 95356
Phone (209) 557-6449 | Fax (209) 557-6475



HEALTHY AIR LIVING™

www.healthyairliving.com

Make one change for clean air!

From: VENK REDDY [mailto:VReddy@airquality.org]

Sent: Friday, October 23, 2015 8:41 AM

To: Wai-Man So

Subject: Vacuum Tube manufacturer

Hello, I am doing a BACT analysis for a Vacuum Tube manufacturer, Particularly the solvent cleaning of Vacuum Tubes during the manufacturing process. Do you have any Vacuum Tube manufacturers in you jurisdiction?

Thanks

Venk

Permit Engineer SMAQMD

Attachment B

BACT Determination, Staff Reports, Rule Language from SMAQMD, SCAQMD, SJAPCD, SDAQMD Relating To The Proposed Application.

- 1) SMAQMD BACT DETERMINATION 13**
- 2) Excerpt from Staff report regarding IPA usage on Vacuum Tubes (8-25-2008 Pg 21 & 22.**
- 3) Typical MSDS for 100% IPA**
- 4) Regulation 8 Rule 29 Aerospace Assembly and Component Coating Operation - BAAQMD**
- 5) Regulation 8 Rule 16 Solvent Cleaning Operations – BAAQMD**
- 6) Rule 1124 Aerospace Assembly and Component Manufacturing Operations – SCAQMD**
- 7) Rule 4663 Organic Solvent Cleaning, Storage, and Disposal – SJUAPCD**
- 8) Rule 4605 Aerospace Assembly and Component Coating Operations - SJVAPCD**
- 9) Rule 66.1 Miscellaneous Surface Coating Operations and other process emitting Volatile Organic Compounds SDCAPCD**

SMAQMD BACT CLEARINGHOUSE

CATEGORY:

COATING - SOLVENT PREP

BACT Size:

SOLVENT HANDLING

BACT Determination Number:		13	BACT Determination Date:		9/4/2003
Equipment Information					
Permit Number: 17117					
Equipment Description:		SOLVENT HANDLING			
Unit Size/Rating/Capacity:		SURFACE PREP - AEROSPACE/MILITARY APPLICATION			
Equipment Location:		TELEDYNE WIRELESS, LLC DBA TELEDYNE MEC 11361 SUNRISE PARK DR RANCHO CORDOVA, CA			
BACT Determination Information					
ROCs	Standard:	789 G/L			
	Technology Description:	SOLVENT < 789 G/L AND EVAPORATIVE LOSS MINIMIZATION STRATEGIES			
	Basis:	Achieved in Practice			
NOx	Standard:	NA			
	Technology Description:				
	Basis:				
SOx	Standard:	NA			
	Technology Description:				
	Basis:				
PM10	Standard:	NA			
	Technology Description:				
	Basis:				
PM2.5	Standard:				
	Technology Description:				
	Basis:				
CO	Standard:	NA			
	Technology Description:				
	Basis:				
LEAD	Standard:				
	Technology Description:				
	Basis:				
Comments:					
District Contact:					

- with other District rules, and
8. Update the test methods to specify the most current test methods.

Rule 464

Rule 464 limits VOC emissions from organic chemical plants. These are the proposed changes to Rule 464:

1. Lower the solvent VOC limit for maintenance solvent cleaning from 50 g/l to 25 g/l, and
2. Update the test methods to specify the most current test methods.

Rule 465

Rule 465 regulates emissions of VOCs from polyester resin operations, which include bathtub, shower, and sink manufacturers and spa and boat manufacturers. The proposed changes to Rule 465 are listed below.

1. Lower the solvent VOC limit for cleaning materials from 204 g/l to 25 g/l,
2. Increase the overall emissions control efficiency requirements from 85% to 90% to be consistent with the more stringent, feasible requirements in SCAQMD Rule 1162.
3. Revise the duration of records requirement from three to five years to be consistent with other District rules, and
4. Update the test methods to specify the most current test methods.

Rule 466

Rule 466 regulates emissions from solvent cleaning activities, which include repair and maintenance cleaning, architectural coating application equipment cleaning, cleaning during manufacturing, and surface preparation. The proposed amendments require general cleaning to be performed with materials that contain less than 25 grams per liter VOCs as applied. The proposed changes also involve lowering other VOC content limits, with various limits specified for each type of cleaning activity. For some cleaning activities, such as medical devices/pharmaceuticals and platelets, the VOC limits will remain unchanged. The proposed rule still allows the use of air pollution control equipment as an alternative to complying with the VOC limits proposed by the rule, although emission control systems must ensure that emissions are no greater than would have resulted from compliance with the applicable VOC limits. The rule also specifies cleaning method requirements, general equipment requirements, operating requirements, storage and disposal requirements, and recordkeeping requirements.

Staff is proposing to add an exemption for the cleaning of high-voltage microwave vacuum tubes, at the request of a facility within the District that manufactures these devices. Staff has reviewed detailed technical information submitted by this facility and concurs that the use of low-VOC solvents is technically infeasible for this application. The facility conducted testing of various low-VOC solvents and blends over the past three years and has been unable to find a suitable alternative to using 100% isopropyl alcohol for the cleaning of components during the manufacture and repair of high-

Staff Report

Rules 450, 451, 452, 454, 456, 463, 464, 465, 466

August 25, 2008, Page 22

voltage microwave vacuum tubes. The high-vacuum, high-voltage operation of the devices requires an ultra-low level of contamination by organic residues and moisture. Alternative low-VOC solvents were demonstrated to result in unacceptably high failure rates of these devices, which are the principal components of electronic radar-jamming devices. Some of these devices are used in aerospace applications, which are exempt under Rule 456. Staff researched the location of competitors for this source and identified SCAQMD and BAAQMD. Staff reviewed the rules for these districts and contacted SCAQMD staff to discuss the compliance status of these facilities. It was determined that the cleaning of these devices with high VOC solvents is allowed under the existing rules for aerospace assembly operations.

The current exemption in Section 110.2(g) for electrostatic coating application equipment cleaning is being proposed for removal, consistent with the June 30, 2005 sunset of an exemption for this cleaning category in SCAQMD Rule 1171.

Staff also proposes to add a specific exemption from the solvent cleaning requirements for the stripping of cured inks, cured coatings, and cured adhesives. Since the current definition of solvent cleaning already implies that the stripping of such cured materials is exempt, this new exemption is for clarification purposes only.

In the current rule, Section 302.8 allows spray gun nozzles to be soaked in solvent-based materials in a tightly covered container not exceeding 5 gallons in size. Staff proposes to eliminate this section to be consistent with SCAQMD Rule 1171, which currently does not contain such a provision.

The additional proposed changes are specified below.


1. Lower the solvent VOC limits for several cleaning categories, as shown in the following table.

Solvent Cleaning Activity	VOC Content g/l (lb/gal)	
	Prior to (one year after date of adoption)	Effective (one year after date of adoption)
General (wipe cleaning, maintenance cleaning)	50 (0.42)	25 (0.21)
Product Cleaning During Manufacturing Process or Surface Preparation for Coating, Adhesive, Sealants, or Ink Application		
General	50 (0.42)	25 (0.21)
Electrical Apparatus Components and Electronic Components	500 (4.2)	100 (0.83)
Medical Devices and Pharmaceuticals	800 (6.7)	800 (6.7)
Platelets	800 (6.7)	800 (6.7)
Repair and Maintenance Cleaning		
General	50 (0.42)	25 (0.21)
Electrical Apparatus Components and Electronic Components	900 (7.5)	100 (0.83)
Medical Devices and Pharmaceuticals		
General Work Surfaces	600 (5.0)	600 (5.0)
Tools, Equipment, and Machinery	800 (6.7)	800 (6.7)
Platelets	800 (6.7)	800 (6.7)

IPA – Isopropyl Alcohol

TDS # 3205

TYPICAL PRODUCT DATA AND PHYSICAL PROPERTIES

Boiling Point	180°F
Melting Point	-128 °F
Vapor Density (air=1)	> 1
@ 100°F	
Solubility in Water	100%
Specific Gravity (water = 1)	0.79
Evaporation Rate (Ether = 1)	< 1
Appearance	Clear, Colorless Liquid
Surface Tension (dynes/cm @25°C)	22
Flash Point (TCC)	53°F
Non-Volatile Residue	<100 ppm
VOC* Content:	100 % CARB SCAQMD Federal 100 %
RoHS Compliant	
Kauri-Butanol (KB) Number	80
Shelflife	2 years after opening

*Volatile Organic Compound (VOC) information is calculated on a weight basis using the VOC definition of California Air Resources Board (CARB) Consumer Product Regulations, South Coast Air Quality Management District (SCAQMD) Rule 102 and the Federal definition published in 40 CFR 51.100(s).

PRODUCT DESCRIPTION
 IPA – Isopropyl Alcohol is a highly effective, general use cleaning solvent that is used to clean a variety of substrates and remove a variety of soils. This 99% pure IPA is available in a variety of sizes for all types of use.

- Low surface tension
- Effective cleaning agent
- Removes all types of residues, oxides, oils and contaminants
- Better than 99% pure
- Evaporates quickly and leaves no residue
- Safe on most plastics and elastomers
- Contains no CFCs, HCFCs or ODP's

TYPICAL APPLICATIONS
 IPA – Isopropyl Alcohol effectively removes oils, dirt and dust from:

- Commercial Tape, Record/Players
- Industrial Tape, Record/Players
- Compact disk laser readers
- Electronic contacts
- Tools
- Electronic devices
- Hard surfaces

COMPATIBILITY
 IPA – Isopropyl Alcohol is generally compatible with most materials used in electronics. As with any chemical product used, component compatibility must be determined on a non-critical area prior to use. Do not use with energized equipment.

TECHNICAL & APPLICATION ASSISTANCE

Chemtronics® provides a technical hotline to answer your technical and application related questions. The toll free number is: 1-800-TECH-401.

ENVIRONMENTAL IMPACT DATA

ENVIRONMENTAL IMPACT DATA			
CFC	0.0%	VOC	100%
HCFC	0.0%	HFC	0.0%
CL Solv.	0.0%	ODP	0.0

CFC, HCFC, CL, SOLV., VOC, and HFC numbers shown are the content by weight. Ozone depletion potential (ODP) is determined in accordance with the Montreal Protocol and U.S. Clean Air Act of 1990. The ODP of this product is 0.0. It is the sum of the ODP of the substances that may contribute to the depletion of stratospheric ozone, based upon the weight of each substance in the product's formulation.

NOTE: This information is believed to be accurate. It is intended for professional end users having the skills to evaluate and use the data properly. CHEMTRONICS® does not guarantee the accuracy of the data and assumes no liability in connection with damages incurred while using it.

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MANUFACTURED BY:

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KENNESAW, GA 30152
1-770-424-4888
REV. B (06/10)

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Compatibility

Aluminum	Excellent
Buna-N	Good
CPVC	Excellent
Epoxy	Excellent
Neoprene	Good
Noryl®	Excellent
Phenolic	Excellent
Cross-Linked PE	Good
Polycarbonate	Poor
Polypropylene	Good
Polystyrene	Poor
PVC	Fair
Teflon™	Excellent
Tygon™	Good
Viton™	Excellent

USAGE INSTRUCTIONS

For industrial use only.
Read MSDS carefully prior to use.
No special surface preparation is required prior to applying IPA – Isopropyl Alcohol. For optimum results, apply using Chamois Tips™ to quickly and safely remove oxides, dust and other contaminants. Use 6709 Econowipes™ for lint-free wiping of large areas.

AVAILABILITY

ES820L	8 fl. oz. Liquid
ES3205	32 fl. oz. Liquid
ES105	1 Gallon
ES505	5 Gallon
ES5505	55 Gallon

**REGULATION 8
ORGANIC COMPOUNDS
RULE 29
AEROSPACE ASSEMBLY AND COMPONENT COATING OPERATIONS**

INDEX

8-29-100 GENERAL

8-29-101	Description
8-29-110	Exemption, Electronic Industries
8-29-111	Exemption, Printed Circuit Boards
8-29-112	Exemption, Low Usage Coatings
8-29-113	Deleted February 3, 1993
8-29-114	Exemption, Paper-Fabric-Film Coating
8-29-115	Exemption, Tank-type Stripper
8-29-116	Exemption, Adhesives
8-29-117	Exemption, Aerosol Cans
8-29-118	Exemption, Stencil Coatings
8-29-119	Exemption, Solid Film Lubricant
8-29-120	Exemption, Test Panels
8-29-121	Exemption, Satellite Coatings
8-29-122	Exemption, High-Temperature-Curing Adhesive Bonding Primer
8-29-123	Exemption, Spray Application Equipment
8-29-124	Limited Exemption, Coating Records

8-29-200 DEFINITIONS

8-29-201	Aerospace Component
8-29-202	Adhesive Bonding Primer
8-29-203	Deleted November 1, 1989
8-29-204	Electric or Radiation Effect Coatings
8-29-205	Flight Test Coating
8-29-206	Fuel Tank Coating
8-29-207	Maskant for Chemical Processing
8-29-208	Pretreatment Wash Primer
8-29-209	Primer
8-29-210	Deleted November 1, 1989
8-29-211	Stripper
8-29-212	Temporary Protective Coating
8-29-213	Topcoat
8-29-214	Tank-type Stripper
8-29-215	Interior Topcoat
8-29-216	Electrostatic Spray
8-29-217	Extreme Performance Interior Topcoat
8-29-218	Fire Insulation Coating
8-29-219	High-Temperature Coating
8-29-220	High-Volume, Low-Pressure (HVLP) Spray
8-29-221	Sealant
8-29-222	Self-priming Topcoat
8-29-223	Transfer Efficiency
8-29-224	Volatile Organic Compound
8-29-225	Solid Film Lubricant
8-29-226	Sealant Bonding Primer
8-29-227	Structural Adhesive
8-29-228	Satellite

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REGULATION 8
ORGANIC COMPOUNDS
RULE 29
AEROSPACE ASSEMBLY AND COMPONENT COATING OPERATIONS

(Adopted August 4, 1982)

8-29-100 GENERAL

8-29-101 Description: The purpose of this Rule is to limit the emission of volatile organic compounds from the surface preparation and coating of aerospace components and cleanup of aerospace coating equipment. (Amended November 1, 1989)

8-29-110 Exemption, Electronic Industries: The requirements of 8-29-305 and 306 shall not apply to fabrication of electronic components, including but not limited to microprocessors, control systems and instrumentation. (Amended February 3, 1993)

8-29-111 Exemption, Printed Circuit Boards: The requirements of this Rule shall not apply to coatings applied to assembled printed circuit boards. This coating operation is subject to Regulation 8, Rule 4. (Amended February 3, 1993)

8-29-112 Exemption, Low Usage Coatings: The requirements of Section 302 shall not apply to coatings with separate formulations that are used in volumes of less than 20 gallons per calendar year, provided the requirements of Section 8-29-402 are satisfied. No more than 200 gallons of low usage coating may be used per facility per calendar year. Records of coating usage shall be maintained as per Section 8-29-501. (Amended November 1, 1989; February 3, 1993; June 1, 1994)

8-29-113 Deleted February 3, 1993

8-29-114 Exemption, Paper-Fabric-Film Coating: The requirements of this Rule shall not apply to any source which is subject to and complies with the provisions of Regulation 8, Rule 12.

8-29-115 Exemption, Tank-type Stripper: The requirements of Section 8-29-305 shall not apply to a tank-type stripper employing a sealing fluid at least four inches in depth which floats on the stripper surface and which consists of:

115.1 Water, or

115.2 A fluid with a true vapor pressure of less than 10 mmHg (0.19 psia) at actual usage temperature. (Adopted December 7, 1983)

8-29-116 Exemption, Adhesives: The requirements of this Rule shall not apply to the application of adhesives. Application of adhesive is subject to the requirements of Regulation 8, Rule 4. (Adopted November 1, 1989)

8-29-117 Exemption, Aerosol Cans: The requirements of this Rule shall not apply to non-refillable handheld aerosol cans. Application of coating from aerosol cans is subject to the requirements of Regulation 8, Rule 49.

(Adopted November 1, 1989, Amended June 20, 1990)

8-29-118 Exemption, Stencil Coatings: The requirements of this Rule shall not apply to the application of coatings by template or hand in order to add designs, letters and/or numbers to the products. Stencil Coating is subject to the requirement of Regulation 8, Rule 4. (Adopted November 1, 1989)

8-29-119 Exemption, Solid Film Lubricant: The provisions of this Rule shall not apply to any solid film lubricant (anti-chafe coating). The application of solid film lubricant is subject to the requirements of Regulation 8, Rule 4. (Adopted November 1, 1989)

8-29-120 Exemption, Test Panels: The provisions of this Rule shall not apply to coating test panels used to evaluate coating performance. Such coating is subject to the requirements of Regulation 8, Rule 4. (Adopted November 1, 1989)

8-29-121 Exemption, Satellite Coatings: The provisions of Section 8-29-302 shall not apply to the coating of satellites or satellite components, provided records are maintained as per Section 8-29-501. Application of satellite coating is subject to the requirements of Regulation 8, Rule 4. (Adopted November 1, 1989)

8-29-122 Exemption, High-Temperature-Curing Adhesive Bonding Primer: The provisions of Section 8-29-302 and 310 shall not apply to the use of adhesive

bonding primer that has a cure temperature in excess of 325°F, provided records are maintained as per Section 8-29-501. Application of high-temperature-curing adhesive bonding primer is subject to the requirements of Regulation 8, Rule 4.

(Adopted November 1, 1989; Amended February 3, 1993)

8-29-123 Exemption, Spray Application Equipment: The requirements of Section 8-29-310 shall not apply to the following provisions:

123.1 The application of coatings to surface areas with limited access due to visual impairment which require a 360° spray-gun nozzle extension.

123.2 The application of waterborne extreme performance interior topcoat coatings.

123.3 The application of adhesive bonding primers and pretreatment wash primers.

123.4 The application of a textured finish coat. (Adopted February 3, 1993)

8-29-124 Limited Exemption, Coating Records: The requirements of Subsection 501.2 shall not apply to individual source operations using less than 75.7 liters (20 gal) of coating in any calendar year, unless otherwise specified in permit conditions pursuant to Regulation 2-1-403. A person shall maintain monthly records of coating usage under this exemption. (Adopted February 3, 1993)

8-29-200 DEFINITIONS

8-29-201 Aerospace Component: The fabricated part, assembly of parts or completed unit of any aircraft, helicopter, missile or space vehicle. For the purposes of this Rule, an aerospace component shall include any aerospace prototype or test model.

(Amended November 1, 1989)

8-29-202 Adhesive Bonding Primer: A coating applied in a very thin film to aerospace metal for the primary purpose of providing a primer for a subsequent coat of structural adhesive.

(Amended November 1, 1989)

8-29-203 Deleted November 1, 1989

8-29-204 Electric or Radiation Effect Coatings: Electrical conductive or insulative coatings and coatings used on radar and antennae enclosures. (Amended November 1, 1989)

8-29-205 Flight Test Coating: The coating applied to test aircraft to protect the test aircraft from corrosion and to provide required marking during flight test evaluation.

8-29-206 Fuel Tank Coating: A coating applied to the interior of a fuel tank or fuel-wetted areas of aircraft to protect it from corrosion. (Amended November 1, 1989)

8-29-207 Maskant for Chemical Processing: A coating applied directly to an aerospace component to protect surface areas when chemical milling, anodizing, aging, bonding, plating, etching and/or performing other chemical operations on the surface of the component.

8-29-208 Pretreatment Wash Primer: A coating which contains a minimum of 0.5% acid by weight for surface etching and is applied directly to bare metal surfaces to provide corrosion resistance and adhesion. (Amended November 1, 1989)

8-29-209 Primer: A coating applied directly to the aerospace component for purposes of corrosion prevention, protection from the environment, functional fluid resistance and adhesion of subsequent coatings. (Amended November 1, 1989)

8-29-210 Deleted November 1, 1989

8-29-211 Stripper: An organic compound mixture applied to remove temporary protective coating, maskant for chemical processing, surface coating or coating residue.

(Amended February 3, 1993)

8-29-212 Temporary Protective Coating: A coating applied to an aerospace component to protect it from any mechanical or environmental damage during manufacturing.

(Amended February 3, 1993)

8-29-213 Topcoat: Coatings applied over a primer or intermediate coating for purposes such as appearance, identification or protection. (Amended November 1, 1989)

8-29-214 Tank-type Stripper: A tank employing a stripping solution where parts are immersed for removal of temporary protective coating, maskant for chemical processing, surface coating or coating residue.

(Adopted December 7, 1983; Amended February 3, 1993)

- 8-29-215 Interior Topcoat:** A topcoat used in interior habitable spaces of aircraft.
(Adopted November 1, 1989; Amended February 3, 1993)
- 8-29-216 Electrostatic Spray:** Equipment used to apply coating by charging atomized particles that are deposited by electrostatic attraction.
(Adopted November 1, 1989; Amended February 3, 1993)
- 8-29-217 Extreme Performance Interior Topcoat:** A topcoat used in interior spaces of aircraft areas requiring fluid, stain or nicotine barrier. (Adopted November 1, 1989)
- 8-29-218 Fire Insulation Coating:** A coating used to provide a layer of insulation in the event of an aircraft or engine fire. (Adopted November 1, 1989)
- 8-29-219 High-Temperature Coating:** A coating that, during normal use, must withstand temperatures in excess of 350oF. (Adopted November 1, 1989)
- 8-29-220 High-Volume, Low-Pressure (HVLP) Spray:** Equipment used to apply coating by means of a gun that operates between 0.1 and 10 psig air atomizing pressure.
(Adopted November 1, 1989; Amended February 3, 1993)
- 8-29-221 Sealant:** A coating applied for the purpose of filling voids and providing a barrier against penetration of water, fuel or other fluids or vapors.
(Adopted November 1, 1989)
- 8-29-222 Self-priming Topcoat:** A coating applied directly to the aerospace component that is not subsequently overcoated. (Adopted November 1, 1989)
- 8-29-223 Transfer Efficiency:** The ratio of the amount of coating solids adhering to an object being coated to the total amount of coating solids used in the application process, expressed as a percentage. (Adopted November 1, 1989)
- 8-29-224 Volatile Organic Compound:** Any organic compound (excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which would be emitted during use, application, curing or drying of a solvent, surface coating, or stripper.
- 224.1 For purposes of calculating VOC content of a coating, any water or any of the following non-precursor organic compounds shall not be considered to be part of the coating:
- methylene chloride
 - 1,1,1 trichloroethane
 - trichlorotrifluoroethane (CFC-113)
 - trichlorofluoromethane (CFC-11)
 - dichlorodifluoromethane (CFC-12)
 - dichlorotetrafluoroethane (CFC-114)
 - chloropentafluoroethane (CFC-115)
 - acetone
 - parachlorobenzotrifluoride (PCBTF)
 - cyclic, branched or linear completely methylated siloxanes (VMS)
- 224.2 For purposes of calculating the VOC content of a stripper, methylene chloride and water shall not be considered a part of the VOC content of the stripper.
(Adopted November 1, 1989; Amended February 3, 1993, December 20, 1995)
- 8-29-225 Solid Film Lubricant:** A very thin coating consisting of an organic binder system containing as its chief pigment material one or more of molybdenum disulfide, graphite, polytetrafluoroethylene (PTFE) or other solids that act as a dry lubricant between faying surfaces. (Adopted November 1, 1989; February 3, 1993)
- 8-29-226 Sealant Bonding Primer:** A coating applied in a very thin film to an aerospace component for the purpose of providing a primer for a subsequent coat of silicone sealant. (Adopted November 1, 1989)
- 8-29-227 Structural Adhesive:** A coating which is applied for the purpose of bonding structural components together. (Adopted November 1, 1989)
- 8-29-228 Satellite:** A device intended to orbit the earth above the earth's atmosphere.
(Adopted November 1, 1989)
- 8-29-229 Detailing Gun:** Small air-spray equipment, including air brushes, that operate at no greater than 5 cfm air flow and no greater than 50 psig air pressure.
(Adopted February 3, 1993)

8-29-230 Approved Emission Control System: A system for reducing emissions to the atmosphere, consisting of an abatement and a collection system, which achieves the abatement efficiency specified in the applicable standards at all times during the operation and meets the requirements of Regulation 2, Rule 1.

(Adopted February 3, 1993)

8-29-231 Textured Finish Coat: Any non-smooth, patterned surface that is intentionally produced and applied as a final coat by spraying drops of coating over a previously applied base coating.

(Adopted February 3, 1993)

8-29-232 Mold Release Coating: A temporary protective coating with a solids content of less than 120 grams solids per liter (1 pound solids per gallon) that reduces or prevents adhesion between the mold surface and the surface being molded.

(Adopted February 3, 1993)

8-29-233 Key System Operating Parameter: An emission control system operating parameter, such as temperature, flow rate or pressure, that ensures operation of the abatement equipment within manufacturer specifications and compliance with the standards in Sections 8-29-302, 306.1, and 310.

(Adopted June 1, 1994)

8-29-300 STANDARDS

8-29-301 Deleted November 1, 1989

8-29-302 Coating Limitations: A person shall not apply to aerospace components any coating with a VOC content in excess of the following limits, expressed as grams VOC per liter (lbs/gal) of coating as applied, excluding water, unless emissions to the atmosphere are controlled to an equivalent level by air pollution abatement equipment with an abatement device efficiency of at least 85 percent that meets the requirements of Regulation 2, Rule 1.

302.1	Primer	350 (2.9)
302.2	Adhesive bonding primer	850 (7.1)
302.3	Interior Topcoat	340 (2.8)
302.4	Electric or Radiation Effect Coating	800 (6.7)
302.5	Extreme Performance Interior Topcoat	420 (3.5)
302.6	Fire Insulation Coating	600 (5.0)
302.7	Fuel Tank Coating	720 (6.0)
302.8	High-Temperature Coating	720 (6.0)
302.9	Sealant	600 (5.0)
302.10	Self-priming Topcoat	420 (3.5)
302.11	Topcoat	420 (3.5)
302.12	Pretreatment Wash Primer	420 (3.5)
302.13	Sealant Bonding Primer	720 (6.0)
302.14	Temporary Protective Coating	250 (2.1)

(Amended November 1, 1989; February 3, 1993)

8-29-303 Deleted November 1, 1989

8-29-304 Solvent Evaporative Loss Minimization: Any person using organic solvent for surface preparation and cleanup or mixing, using or disposing of coating or stripper containing organic solvent:

- 304.1 Shall use closed containers for the storage or disposal of cloth or paper used for solvent surface preparation and cleanup.
- 304.2 Shall not use organic compounds for the cleanup of spray equipment including paint lines unless equipment for collecting the cleaning compounds and minimizing their evaporation to the atmosphere is used.
- 304.3 Shall close containers of stripper subject to this Rule, coating, catalyst, thinner, or solvent when not in use.

(Amended November 1, 1989; February 3, 1993)

8-29-305 Stripper Limitations: A person shall not use a stripper unless it complies with one or both of the following:

- 305.1 The stripper contains less than 400 grams/liter (3.3 lbs/gal) of precursor organic compounds.

- 305.2 The stripper has a true vapor pressure of less than 10 mmHg (0.19 psia) at actual usage temperature. (Amended December 7, 1983)
- 8-29-306 Maskant for Chemical Processing Limitations:** A person shall not apply any maskant for chemical processing to aerospace components unless:
- 306.1 The VOC emissions from coating operations are reduced by 85 percent, or
- 306.2 The coating contains less than 600 grams of VOC per liter of coating excluding water, as applied. (Amended December 4, 1985, November 1, 1989)
- 8-29-307 Deleted November 1, 1989**
- 8-29-308 Prohibition of Specification:** No person shall require for use or specify the application of a coating subject to this Rule if such use or application results in a violation of any of the provisions of this Rule. The prohibition of this Section shall apply to all written or oral contracts under the terms of which any coating is to be applied to any aerospace component at any physical location within the District. (Adopted November 1, 1989)
- 8-29-309 Compliance Statement Requirement:** The manufacturer of coatings subject to this Rule shall provide on the coating container or as an accompanying data sheet a designation of VOC (as defined in Section 8-29-224), expressed in grams per liter or pounds per gallon of coating. Effective September 1, 1993, the designation shall include the VOC content of the coating as supplied and at the maximum recommended thinning ratio to maintain compliance with the VOC limits of this Rule. (Adopted November 1, 1989; Amended February 3, 1993)
- 8-29-310 Spray Application Equipment Limitations:** Effective July 1, 1994, a person who uses spray application equipment to apply coatings to aerospace components within the District shall use one or more of the following high transfer efficiency application methods, unless emissions to the atmosphere are controlled by an approved emission control system with an overall abatement efficiency of at least 85%.
- 310.1 High-Volume, Low-Pressure (HVLP) Spray, operated in accordance with manufacturer's recommendations, or
- 310.2 Electrostatic Spray, operated in accordance with manufacturer's recommendations, or
- 310.3 Detailing Gun, or
- 310.4 Any other coating spray application which has been demonstrated to the satisfaction of the APCO to achieve an equivalent transfer efficiency compared to the spray application methods listed in Subsections 310.1 through 310.3. Prior written approval from the APCO shall be obtained for each alternative method used. (Adopted February 3, 1993)
- 8-29-400 ADMINISTRATIVE REQUIREMENTS**
- 8-29-401 Deleted November 1, 1989**
- 8-29-402 Low Usage Coating Petition:** Any person seeking to satisfy the requirements of Section 8-29-112 shall comply with the following requirements:
- 402.1 The user or specifier shall notify the APCO in writing of coatings to be qualified pursuant to this exemption.
- 402.2 Such notification shall be repeated on an annual basis.
- 402.3 The notification shall contain volumes and maximum VOC levels of coatings to be used.
- 402.4 Records must be maintained as in Section 8-19-501. (Adopted November 1, 1989; Amended June 1, 1994)
- 8-29-403 Methylene Chloride Reduction Plan:** By January 1, 1995, any person using stripper subject to this Rule shall submit a methylene chloride reduction plan. The plan shall include the following:
- 403.1 Methylene chloride emissions inventory by source
- 403.2 Description of reduction measures to be implemented
- 403.3 Implementation schedule for the reduction measures
- 403.4 Anticipated emission reductions and projected costs for each reduction measure (Adopted February 3, 1993)

8-29-500 MONITORING AND RECORDS

- 8-29-501 Records:** Any person subject to Sections 8-29-302, 305 and/or 306 shall:
- 501.1 Maintain current data necessary to evaluate compliance, including the following information as applicable:
 - a. coating stripper, catalyst, and reducer used
 - b. VOC content of coating and stripper as applied
 - 501.2 Record coating usage on a weekly basis including the following information, as applicable, unless otherwise specified in permit conditions imposed per Regulation 2-1-403:
 - a. coating and mix ratio of components in the coating used as applied
 - b. quantity of each coating applied
 - 501.3 Record on a daily basis coating usage and key system operating parameters when air pollution abatement equipment is used to comply with the requirements of Sections 302, 306, or 310.
 - 501.4 Record cleanup solvent usage on a monthly basis the type and amount of solvent used for cleanup and surface preparation, unless otherwise specified in permit conditions imposed per Regulation 2-1-403.
 - 501.5 Records on a monthly basis the amount of stripper used, unless otherwise specified in permit conditions imposed per Regulation 2-1-403. A person using a tank-type stripper shall maintain records on a monthly basis showing the amount of stripper added to each tank.
 - 501.6 Records shall be retained and available for inspection by the APCO for the previous 24-month period
 - 501.7 The requirements of Section 8-29-501.2, 501.4 and 501.5 shall not apply to any person who complies with an alternate recordkeeping plan that provides for an enforceable daily record which meets the following requirements:
 - a. The APCO must be petitioned in writing that complying with Sections 8-29-501.2, 501.4 and 501.5 would constitute an undue burden.
 - b. A list of coatings and solvents subject to the plan.
 - c. A description of the calculation methodology, and estimated annual usage for coatings and solvent.
 - d. Effective August 1, 1994 and annually thereafter, any facility operating under this provision must submit an update to the plan that identifies any changes in coating and solvent usage, and the annual usage for the preceding year.
 - e. A violation of Sections 8-29-302, 305 or 306 within the reporting period, as established by the plan, shall be considered a violation for each day of the reporting period.
- (Adopted 11/1/89; Amended February 3, 1993; October 6, 1993; June 1, 1994)

8-29-600 MANUAL OF PROCEDURES

- 8-29-601 Analysis of Coating Samples:** Samples of volatile organic compounds as specified in Sections 8-29-302 and 306 shall be analyzed as prescribed in the Manual of Procedures, Volume III, Method 21 or 22.
(Amended November 1, 1989; February 3, 1993)
- 8-29-602 Determination of Emissions:** Emissions of volatile organic compounds as specified in Section 8-29-302, 306, and 310 shall be measured as prescribed by any of the following methods : 1) BAAQMD Manual of Procedures, Volume IV, ST-7, 2) EPA Method 25 or 25A. When either EPA Method 25 or 25A is used control device equivalency shall be determined as prescribed in 55 FR 26865 (June 29, 1990). A source shall be considered in violation if the VOC emissions measured by any of the referenced test methods exceed the standard of the rule.
(Amended November 1, 1989; February 3, 1993; June 1, 1994)
- 8-29-603 Analysis of Stripper Samples:** Samples of volatile organic compounds of stripper as specified in Section 8-29-305 shall be analyzed as prescribed in the Manual of Procedures, Volume III, Method 31.
(Adopted November 1, 1989)

- 8-29-604 Determination of Acid Content:** Measurement of acid content as specified in Section 8-29-208 shall be determined in accordance with ASTM Method D-1613-85.
(Adopted February 3, 1993)
- 8-29-605 Analysis of Mold Release Coating Samples:** Samples of mold release coatings containing volatile organic compounds as specified in Section 8-29-302 shall be analyzed as prescribed in the Manual of Procedures, Volume III, Method 31.
(Adopted February 3, 1993)

**REGULATION 8
ORGANIC COMPOUNDS
RULE 16
SOLVENT CLEANING OPERATIONS**

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**REGULATION 8
ORGANIC COMPOUNDS
RULE 16
SOLVENT CLEANING OPERATIONS**

(Adopted March 7, 1979)

8-16-100 GENERAL

8-16-101 Description: The purpose of this Rule is to limit emissions from solvent cleaning operations as defined in Section 8-16-220. Any operation which is determined to be exempt from the provisions of this Rule shall be subject to the provisions of Rule 4, if not already subject to another Rule of Regulation 8.

(Amended 7/3/85; 8/2/89; 9/16/98)

8-16-110 Deleted, September 16, 1998

8-16-111 Exemption, Wipe Cleaning: The requirements of Section 8-16-301 through 304 of this Rule shall not apply to any solvent cleaning operation using only wipe cleaning. In addition to any VOC limitations in other Regulation 8 rules, wipe cleaning is subject to the requirements of Section 8-16-501.3, and may be subject to VOC limitations in other Regulation 8 rules.

(Amended 7/3/85; 9/16/98; 10/16/02)

8-16-112 Exemption, Semiconductor Solvent Cleaners: The requirements of this Rule shall not apply to solvent sinks with less than 10 gallons of capacity, enclosed solvent cleaners or solvent vapor dryers at semiconductor manufacturing operations, which are subject to the requirements of Regulation 8, Rule 30.

(Adopted 7/3/85; Amended 3/16/88; 8/2/89; 9/16/98)

8-16-113 Exemption, Aerospace Stripping Operations: The requirements of this Rule shall not apply to stripping operations in aerospace assembly and component coating operations, which are subject to the requirements of Regulation 8, Rule 29.

(Adopted July 3, 1985)

8-16-114 Exemption, Emulsion or Solution Cleaners: The requirements of this rule shall not apply to solvent cleaning operations which employ only emulsion or solution cleaners, each containing less than one percent of volatile organic compounds by weight.

(Adopted 3/16/88; Amended 8/2/89; 9/16/98; 10/16/02)

8-16-115 Limited Exemption, Small, Unheated Solvent Cleaning Equipment: Except for the requirements in subsections 8-16-303.1, 303.3.1, and 303.3.2, the requirements of this Rule shall not apply to equipment or operations that use unheated solvent and that contain less than 3.785 liters (1 gal) of solvent, including volume in any remote reservoir, or have an evaporative area of less than 929 cm² (144 in² or 1 ft²).

(Adopted 3/16/88; Amended 8/2/89; 9/16/98; 10/16/02)

8-16-116 Exemption, Vapor Phase Solder Reflow Operations: The requirements of this Rule shall not apply to vapor phase solder reflow operations in printed circuit board manufacture and assembly operations, which are subject to the requirements of Regulation 8, Rule 4.

(Adopted March 16, 1988)

8-16-117 Exemption, Dry Cleaning Operations: The requirements of this Rule shall not apply to dry cleaning operations subject to Regulation 8, Rule 17 or Regulation 11, Rule 16.

(Adopted 8/2/89; Amended 9/16/98)

8-16-118 Limited Exemption, Compounds with Low Volatility: Solvent cleaning operations utilizing a compound with low volatility shall not be subject to the following requirements:

118.1 Conveyorized Solvent Cleaners: Subsections 302.3, and 302.5.

118.2 Cold Cleaners: Subsection 303.4.

(Adopted 8/2/89; Amended 10/16/02)

8-16-119 Limited Exemption, Sealed Chamber Solvent Cleaners: The requirements of subsections 302.1.6 and 302.3.2 shall not apply to the sealed chamber portion of conveyorized solvent cleaners.

- (Adopted August 2, 1989)*
- 8-16-120 Exemption, Stripping Operations:** The requirements of this Rule shall not apply to stripping operations such as dry film stripping operations in printed circuit board manufacturing. These operations are subject to the requirements of Regulation 8, Rule 4. Tank type stripping operations in aerospace assembly and component coating operations are subject to the requirements of Regulation 8, Rule 29.
- (Adopted September 16, 1998)*
- 8-16-121 Limited Exemption, Single Cold Cleaner:** Until June 1, 2003, the VOC content limitation in Section 8-16-303.5 for cleaning solutions used in cold cleaners does not apply to one cold cleaner per facility, provided that annual solvent loss from that cold cleaner does not exceed 20 gallons per year.
- (Adopted 9/16/98; Amended 10/16/02)*
- 8-16-122 Limited Exemption, Permitted Cold Cleaners:** Until June 1, 2003, the VOC content limitation in Section 8-16-303.5 for cleaning solutions used in cold cleaners does not apply to any cold cleaner for which a District permit to operate has been obtained pursuant to Regulation 2, Rule 1.
- (Adopted 9/16/98; Amended 10/16/02)*
- 8-16-123 Limited Exemption, Specific Cleaning Operations:** Effective June 1, 2003, Section 8-16-303.5 shall not apply to (i) the cleaning of aerospace components, electrical and electronic components, precision optics, medical devices, or cleaning of resin, coating, ink and adhesive mixing, molding and application equipment; or (ii) cleaning associated with research and development operations; performance testing to determine coating, adhesive or ink performance; or testing for quality control or quality assurance purposes.
- (Adopted October 16, 2002)*
- 8-16-124 Limited Exemption, Low VOC Cleaning Operations:** The recordkeeping requirements of Section 8-16-501 shall not apply to any cold cleaners that comply with Section 8-16-303.5.1. However, they are subject to Section 8-16-502.
- (Adopted October 16, 2002)*
- 8-16-200 DEFINITIONS**
- 8-16-201 Approved Emission Control Device:** A device for reducing emissions of volatile organic compounds (VOC) to the atmosphere, consisting of a control device and a collection system, which meets the requirements of Regulation 2, Rule 1 and which satisfies the following conditions:
- 201.1 The control device shall achieve the control efficiency specified in the applicable standards section at all times during normal operation of the equipment being controlled.
 - 201.2 The collection system shall have a ventilation rate of 15-20 m³/min per m² (49.2-65.6 ft³/min per ft²) of solvent cleaner opening unless necessary to meet OSHA requirements and have one or more inlets for collection of emissions or meet the requirements of Regulation 2, Rule 1.
 - 201.3 The collection system shall be designed and operated in accordance with good engineering practice for maximum collection of emissions.
- (Adopted 8/2/89; Amended 9/16/98)*
- 8-16-202 Airless Solvent Cleaner:** Any enclosed solvent cleaner that is automatically operated, seals at a differential pressure of 26 torr or less prior to the introduction of solvent vapor into the cleaning chamber, and maintains differential pressure under vacuum during all cleaning and drying cycles.
- (Adopted September 16, 1998)*
- 8-16-203 Airtight Solvent Cleaner:** Any enclosed solvent cleaner that is automatically operated and seals at a differential pressure no greater than 0.5 psi during all cleaning and drying cycles.
- (Adopted September 16, 1998)*
- 8-16-204 Cold (Non-boiling) Cleaner:** Any solvent cleaner excluding conveyORIZED solvent cleaners and vapor solvent cleaners, including, but not limited to, spray sinks, spray booths, spray gun washers and batch-loaded dip tanks.
- (Amended 7/3/85; 8/2/89; 9/16/98)*

- 8-16-205 Compounds with Low Volatility:** For the purpose of this rule, solvents with an initial boiling point (IBP) greater than 120°C (248°F) and where the initial boiling point exceeds the maximum operating temperature of a solvent cleaning operation by at least 100°C (180°F), shall be considered a low-volatile solvent.
(Adopted August 2, 1989)
- 8-16-206 Condenser Flow Switch:** A safety switch which shuts off sump heat if condenser water fails to circulate or rises above the designated operating temperature.
(Adopted July 3, 1985)
- 8-16-207 Conveyorized Solvent Cleaner:** Any continuously loaded, conveyorized cold or vapor solvent cleaner, including but not limited to gyro, vibra, monorail, cross-rod, mesh, belt and strip cleaners. Strip cleaners clean material by drawing the strip itself through the unit for cleaning prior to coating or other fabrication processes.
(Amended 3/16/88; 8/2/89)
- 8-16-208 Enclosed Solvent Cleaner:** A solvent cleaner consisting of sealed tanks and a drained spray chamber including, but not limited to, spray gun cleaners, closed loop processors, and spray processors.
(Adopted September 16, 1998)
- 8-16-209 Evaporative Area:**
- 209.1 Cold Cleaner:
 - 1.1 General: The surface area of the top of the solvent.
 - 1.2 Enclosed Reservoir: The surface area of the solvent sink or work area.
 - 209.2 Vapor Solvent Cleaner: The surface area of the top of the solvent vapor-air interface.
 - 209.3 Conveyorized Solvent Cleaner:
 - 3.1 Cold Cleaner: Definition in subsection 209.1.
 - 3.2 Vapor Solvent Cleaner: Definition in subsection 209.2.
- (Adopted August 2, 1989)
- 8-16-210 Freeboard Chiller:**
- 210.1 Cold Cleaners: A condenser mounted in the freeboard area which provides a chilled air blanket above the solvent to reduce emissions.
 - 210.2 Vapor Solvent Cleaner: A secondary condenser mounted above the primary condenser which provides a chilled air blanket above the solvent vapor air-interface to reduce emissions.
 - 210.3 Conveyorized Solvent Cleaner:
 - 3.1 Cold Cleaner: Definition in subsection 210.1.
 - 3.2 Vapor Solvent Cleaner: Definition in subsection 210.2.
- (Adopted August 2, 1989)
- 8-16-211 Freeboard Height:**
- 211.1 Cold Cleaner: The vertical distance from the top of the evaporative area to the top of the cold cleaner.
 - 211.2 Vapor Solvent Cleaner: The vertical distance from the evaporative area (solvent vapor-air interface) to the top of the solvent cleaner.
 - 211.3 Conveyorized Solvent Cleaner: The vertical distance from the top of the evaporative area to the bottom of the lowest opening in the solvent cleaner.
- (Amended August 2, 1989)
- 8-16-212 Freeboard Ratio:** The freeboard height divided by the smaller of the length or width of the solvent cleaner evaporative area.
(Amended August 2, 1989)
- 8-16-213 Initial Boiling Point:** Boiling point of a solvent as defined by ASTM-D-1078-93.
(Adopted 8/2/89; Amended 9/16/98)
- 8-16-214 Liquid Solvent Leak:** A liquid leak of 3 or more drops per minute.
(Adopted 8/2/89; Amended 10/16/02)
- 8-16-215 Makeup Solvent:** Makeup solvent is solvent added to the solvent cleaning operation less the amount of solvent collected from the solvent cleaning operation.
(Adopted 7/3/85; Amended 8/2/89; 9/16/98)
- 8-16-216 National Emission Standards for Hazardous Air Pollutants (NESHAP):**
Halogenated Solvent Cleaners: Any solvent cleaner using any of the following six

halogenated solvents: methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride and chloroform.

- 8-16-217 **Remote Reservoir:** A liquid solvent tank which is completely enclosed except for a solvent return opening no larger than 100 cm² which allows used solvent to drain into it from a separate solvent sink or work area and which is not accessible for soaking parts. *(Adopted September 16, 1998)*
- 8-16-218 **Sealed Chamber Solvent Cleaner:** A conveyORIZED solvent cleaner in which all spraying and most vapor generating activity is fully contained inside the machine and completely isolated from the outside environment. *(Adopted 3/16/88; Amended 8/2/89; 9/16/98)*
- 8-16-219 **Solvent:** Organic compounds which are used as diluents, thinners, dissolvers, viscosity reducers, cleaning agents or for other similar uses. *(Adopted August 2, 1989)*
- 8-16-220 **Solvent Cleaning Operations:** For the purpose of this rule, a solvent cleaning operation is any process, including wipe cleaning, used to clean or dry metal and non-metal surfaces typically using a cold, vapor or conveyORIZED solvent cleaner. *(Adopted August 2, 1989)*
- 8-16-221 **Solvent Loss:** All solvent emitted to atmosphere including, but not limited to, carry out, drag out, working and idling emissions. *(Adopted September 16, 1998)*
- 8-16-222 **Solvent Vapor Dryer:** A vapor solvent cleaner in which solvents are volatilized to displace water in precision parts drying. *(Adopted September 16, 1998)*
- 8-16-223 **Spray Gun Cleaner:** A solvent cleaner used to clean spray application equipment. *(Adopted September 16, 1998)*
- 8-16-224 **Spray Safety Switch:** A safety switch which cuts off the pump of the spray applicator if the vapor level drops below a specified level. *(Adopted September 16, 1998)*
- 8-16-225 **Stripping:** The removal of cured coatings, inks, adhesives or maskants. Examples include, but are not limited to wood furniture stripping, metal parts stripping and dry film stripper operations. *(Adopted July 3, 1985)*
- 8-16-226 **Vapor Concentration Exhaust Sensor:** A sensor in the exhaust duct that causes the controller to shut down the unit based on the vapor concentration level registering in the duct. *(Adopted September 16, 1998)*
- 8-16-227 **Vapor Level Control Thermostat:** A safety switch which turns off the sump heater if the thermostat senses the temperature rising above the designed operating level at the air-vapor interface. *(Adopted September 16, 1998)*
- 8-16-228 **Vapor Solvent Cleaner:** Any solvent cleaner that cleans through the condensation of hot solvent vapor on colder parts and boils liquid solvent producing solvent vapor that is used during the cleaning or drying cycle. *(Adopted 7/3/85; Amended 3/16/88)*
- 8-16-229 **Volatile Organic Compound (VOC):** Any organic compound of carbon (excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which would be emitted during use, processing, application, or drying of a solvent, or other material. The test methods specified in Section 8-16-602 shall be used to determine compliance with the VOC content standards in Section 8-16-303.5.1. *(Amended 8/2/89; 9/16/98)*
- 8-16-230 **Waste Solvent Residue:** Sludge which may contain dirt, oil, metal parts, and/or other undesirable waste products concentrated after heat distillation of the waste solvent either in the solvent cleaner itself or after distillation in a separate still. *(Adopted 8/2/89; Amended 10/16/02)*
- 8-16-231 **Water Flow Loss Sensor:** A sensor that indicates loss of incoming water flow to the condenser and stops processing to solvent vapor dryers. It is equivalent to a condenser flow switch. *(Adopted 7/3/85; Amended 8/2/89)*

- 8-16-232 **Wipe Cleaning:** That method of cleaning which utilizes a material such as a rag wetted with a solvent, coupled with a physical rubbing process to remove contaminants from surfaces. *(Adopted September 16, 1998)*
- 8-16-233 **Repair and Maintenance Cleaning:** Cleaning of a part or object that occurs after its original manufacture or after its intended use and that is intended to repair, maintain, or return the object or part to use. Cleaning of equipment that is used in a manufacturing process is considered repair and maintenance cleaning. Facilities that perform repair and maintenance cleaning include, but are not limited to, automotive repair facilities. *(Amended July 3, 1985)*
- 8-16-234 **Automotive Repair Facility:** A facility which repairs or services automobiles or other motor vehicles, including, but not limited to, motorcycle, industrial truck, farm equipment, earth moving equipment, or other mobile equipment. Repair activities include, but are not limited to, exhaust systems repair, tire retreading and/or repair, glass replacement, transmission repair, general maintenance and/or repair, and automotive equipment parts and components repair. For the purposes of this Rule, automotive painting is not considered a repair activity. *(Adopted October 16, 2002)*
- 8-16-235 **Aerospace Components:** The fabricated part, assembly of parts or completed unit of any aircraft, helicopter, missile or space vehicle. For the purposes of this Rule, an aerospace component shall include any aerospace prototype or test model. *(Adopted October 16, 2002)*
- 8-16-236 **Electrical and Electronic Components:** Components and assemblies of components that generate, convert, transmit, or modify electrical energy. Electrical and electronic components include, but are not limited to, wires, windings, stators, rotors, magnets, contacts, relays, printed circuit boards, printed wire assemblies, wiring boards, integrated circuits, resistors, capacitors and transistors. Cabinets in which electrical and electronic components are housed are not considered electrical and electronic components. *(Adopted October 16, 2002)*
- 8-16-237 **Precision Optics:** The optical elements used in electro-optical devices that are designed to sense, detect, or transmit light energy, including specific wavelengths of light energy and changes of light energy levels. *(Adopted October 16, 2002)*
- 8-16-238 **Medical Devices:** An instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent or other similar article, including any component or accessory that is (i) intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of diseases, or (ii) is intended to affect the structure or any function of the body, or (iii) is defined in the National Formulary or the United States Pharmacopoeia or any supplement to it. *(Adopted October 16, 2002)*
- 8-16-239 **Key System Operating Parameter:** An operating parameter of an approved emission control device, such as temperature, flow rate or pressure, that ensures operation of the equipment within manufacturer specifications and compliance with the standards in subsections 8-16-301.4.3, 302.5.3, or 303.4.4. *(Adopted October 16, 2002)*
- 8-16-300 **STANDARDS**
- 8-16-301 **Vapor Solvent Cleaner Requirements:** Any person who operates a vapor solvent cleaning device shall conform to the following requirements:
- 301.1 General Operating Requirements:
- 1.1 The vapor solvent cleaning equipment and emission control device shall be operated and maintained in proper working order.
 - 1.2 Liquid solvent leaks shall be repaired immediately or the equipment shall be shut down.

- 1.3 Solvent, including waste solvent, shall not be stored or disposed of in a manner that will cause or allow evaporation into the atmosphere.
- 1.4 Waste solvent residues shall be disposed of by one of the following methods:
 - a. Where residues are treated prior to further offsite treatment, such residues shall be stored in covered containers to minimize evaporation prior to service pick-up.
 - b. Where residues are treated prior to final disposal at an appropriate waste disposal facility, such residues shall not contain more than 10 percent solvent by volume and shall be stored in covered containers.
- 1.5 Devices designed to cover the solvent shall not be removed except to process work or to perform maintenance.
- 1.6 Solvent carry-out shall be minimized by the following methods:
 - a. Rack parts for best drainage,
 - b. Vertical speed of a powered hoist, if one is used, shall not be more than 3.3 m/min (11 ft/min) when lowering and raising the parts,
 - c. Retain the workload in the vapor zone until condensation ceases,
 - d. For manual loading/unloading tip out any pools of solvent on the cleaned parts before removal, and
 - e. Do not remove parts from the solvent cleaner until visually dry.
- 1.7 If a solvent spray is utilized, all spraying must be done at least 10 cm (4 in) below the top of the vapor level or the spray must be totally enclosed during the washing, rinsing, and drying process. The stream pressure shall be low enough to prevent liquid splashing outside the container.
- 1.8 Ventilation fans shall not be positioned in such a way to disturb the vapor zone.
- 1.9 If a water separator is present, water shall not be visually detectable in the solvent returning from the water separator to the solvent cleaner.
- 1.10 The solvent cleaning of porous or absorbent materials in vapor solvent cleaners is prohibited.
- 1.11 The workload shall not occupy more than half the solvent cleaner's evaporative area.
- 301.2 Vapor Solvent Cleaner General Equipment Requirements shall include all of the following:
 - 2.1 A container for the solvent and the articles being cleaned.
 - 2.2 An apparatus, cover, or enclosed reservoir which reduces solvent evaporation when not processing work in the solvent cleaner. The cover must be designed to easily open and close without disturbing the vapor zone. Where a solvent cleaner is subject to Section 301.4.1 and the evaporative area is greater than 1.0 m² (10.8 ft²), the cover must be powered.
 - 2.3 A method for draining cleaned parts, so that drained solvent is returned to the container
 - 2.4 A permanent, conspicuous label summarizing the applicable operating requirements contained in subsection 301.1.
- 301.3 Excluding enclosed solvent cleaners, Vapor Solvent Cleaner safety switches shall include all of the following:
 - 3.1 Condenser flow switch (except where non-water refrigerant is used) or a water flow loss sensor,
 - 3.2 Deleted September 16, 1998
 - 3.3 Spray safety switch when a spray wand is used.
 - 3.4 Vapor level control thermostat, or a vapor concentration exhaust sensor.

- 301.4 Vapor Solvent Cleaners shall not operate without one of the following control devices:
- 4.1 A physically verifiable, freeboard ratio greater than or equal to 0.75.
 - 4.2 A freeboard chiller where the chilled air blanket temperature measured in °F at the coldest point on the vertical axis in the center of the solvent cleaner shall be no greater than 30 percent of the initial boiling point of the solvent used or 40°F.
 - 4.3 An approved emission control device with a control efficiency of 90 percent or more on a mass basis.
 - 4.4 An enclosed design in which the cover or door opens only when the dry part is entering or exiting the solvent cleaner unless the cleaner is an airless or airtight solvent cleaner.

301.5 Deleted March 16, 1988

(Amended 1/8/86; 3/16/88; 8/2/89; 6/15/94; 9/16/98; 10/16/02)

8-16-302 Conveyorized Solvent Cleaner Requirements: Any person who operates a conveyorized solvent cleaning device shall conform to the following requirements:

302.1 General Operating Requirements:

- 1.1 The solvent cleaning equipment and emission control shall be operated and maintained in proper working order.
- 1.2 Liquid solvent leaks shall be repaired immediately or the equipment shall be shut down.
- 1.3 Solvent, including waste solvent, shall not be stored or disposed of in a manner that will cause or allow evaporation into the atmosphere.
- 1.4 Waste solvent residues shall be disposed of by one of the following methods:
 - a. Where residues are treated prior to further offsite treatment such residues shall be stored in covered containers to minimize evaporation prior to service pick-up.
 - b. Where residues are treated prior to final disposal at an appropriate waste disposal facility, such residues shall not contain more than 10 percent solvent by volume and shall be stored in covered containers.
- 1.5 Devices designed to cover the solvent shall not be removed except to process work or to perform maintenance.
- 1.6 If a solvent spray is utilized in a conveyorized vapor solvent cleaner, all spraying must be done within the vapor zone. If a solvent flow is utilized in a conveyorized cold solvent cleaner, only a continuous fluid stream shall be used (not a fine, atomized, or shower type spray) unless an approved emission control device is used with a control efficiency of 90 percent or more on a mass basis. The stream pressure used in either type of conveyorized degreaser shall be low enough to prevent liquid splashing outside the container.
- 1.7 Solvent carry out shall be minimized by using one or more of the following methods, where applicable:
 - a. For Strip Cleaners:
 - (1) vertical conveyor speed shall be less than 3.3 m/min (11 ft/min), or
 - b. For Non-strip cleaners:
 - (1) vertical conveyor speed shall be less than 3.3 m/min (11 ft/min), and
 - (2) parts shall be racked for best drainage.
- 1.8 Other Operating Requirements for Conveyorized Solvent Cleaners:
 - a. Ventilation fans shall not be positioned in such a way as to direct air flow over the solvent cleaner openings.
 - b. Water shall not be visually detectable in solvent returning from the water separator to the solvent cleaner.

- 1.9 The solvent cleaning of porous or absorbent materials in conveyorized degreasers is prohibited.
- 302.2 Conveyorized Solvent Cleaner General Equipment Requirements shall include all of the following:
 - 2.1 A container for the solvent and the articles being cleaned.
 - 2.2 An apparatus, cover, or enclosed reservoir which reduces solvent evaporation when not processing work in the degreaser.
 - 2.3 A method for draining cleaned parts, so that drained solvent is returned to the container.
 - 2.4 A permanent, conspicuous label summarizing the applicable operating requirements contained in subsection 302.1.
- 302.3 Conveyorized Solvent Cleaners using a volatile solvent shall include all of the following safety switches:
 - 3.1 Condenser flow switch except where non-water refrigerant is used.
 - 3.2 Spray safety switch.
 - 3.3 Vapor level control thermostat.
- 302.4 Conveyorized Solvent Cleaner Control Devices shall include the following:
 - 4.1 A drying tunnel or other means, such as a rotating basket, sufficient to prevent cleaned parts from carrying out solvent liquid or vapor, and
 - 4.2 Minimized entrances and exits which silhouette the work loads such that the average clearance between parts being conveyed and the edge of the solvent cleaner opening is less than 10 cm (4 in) or less than 10 percent of the opening width.
 - 4.3 Down-time covers for closing off the entrance and exit during shutdown hours, or an equivalent device that covers at least 90 percent of the opening.
- 302.5 Conveyorized Solvent Cleaners shall not operate without one of the following control devices:
 - 5.1 A freeboard ratio greater than or equal to 0.75.
 - 5.2 A freeboard chiller where the chilled air blanket temperature measured in °F at the coldest point on the vertical axis in the center of the solvent cleaner shall be no greater than 30 percent of the initial boiling point of the solvent used or 40°F.
 - 5.3 An approved emission control device with a control efficiency of 90 percent or more on a mass basis.
 - 5.4 Deleted August 2, 1989
- 302.6 Deleted March 16, 1988

(Adopted 7/3/85; Amended 1/8/86; 3/16/88; 8/2/89; 6/15/94; 9/16/98; 10/16/02)

8-16-303 Cold Cleaner Requirements: Any person who operates a cold solvent cleaning device shall conform to the following requirements.

- 303.1 General Operating Requirements:
 - 1.1 The solvent cleaning equipment and emission control shall be operated and maintained in proper working order.
 - 1.2 Liquid solvent leaks shall be repaired immediately or the equipment shall be shut down.
 - 1.3 Solvent, including waste solvent, shall not be stored or disposed of in a manner that will cause or allow evaporation into the atmosphere.
 - 1.4 Waste solvent residues shall be disposed of by one of the following methods:
 - a. Where residues are treated prior to further offsite treatment such residues shall be stored in covered containers to minimize evaporation prior to service pick-up.
 - b. Where residues are treated prior to final disposal at an appropriate waste disposal facility, such residues shall not contain more than 10 percent solvent by volume and shall be stored in covered containers.

- 1.5 Devices designed to reduce solvent evaporation shall not be removed except to process work or to perform maintenance. Where a compound with low volatility or a VOC content that does not exceed 50 g/l (0.42 lb/gal) is being used, enclosed (remote) reservoirs are deemed equivalent equipment to closed covers.
- 1.6 If a solvent flow is utilized, only a continuous fluid stream shall be used (not a fine, atomized, or shower type spray), unless an approved emission control device is used with a control efficiency of 90 percent or more on a mass basis, or unless the solvent spray is totally enclosed during the washing, rinsing and drying process.
- 303.2 Cold Cleaner Operating Requirements:
 - 2.1 Cleaned parts shall be drained until dripping ceases.
 - 2.2 Solvent agitation shall be accomplished only by pump recirculation or by means of a mixer. Air agitation shall not be used.
 - 2.3 The solvent cleaning of porous or absorbent materials in cold cleaners is prohibited.
- 303.3 Cold Cleaner General Equipment Requirements shall include all of the following:
 - 3.1 A container for the solvent and the articles being cleaned.
 - 3.2 An apparatus, cover, or enclosed (remote) reservoir which reduces solvent evaporation when not processing work in the solvent cleaner. If a compound with low volatility or a VOC content that does not exceed 50 g/l (0.42 lb/gal) is not being used or the solvent is agitated or heated, the cover must be designed so that it can be operated with one hand.
 - 3.3 A method for draining cleaned parts, so that drained solvent is returned to the container. If a compound with low volatility or a VOC content that does not exceed 50 g/l (0.42 lb/gal) is not being used, then the drainage facility must be internal so that the parts are enclosed while draining. The drainage facility may be external where the internal type cannot fit into the cleaning system.
 - 3.4 A permanent, conspicuous label summarizing the applicable operating requirements contained in subsection 303.1.
- 303.4 Except as provided in Section 8-16-303.5, cold cleaners shall not operate without one of the following control devices:
 - 4.1 A freeboard ratio greater than or equal to 0.75 where the maximum solvent reservoir capacity is clearly marked by a suitable mechanical or physical means.
 - 4.2 A water cover, provided the solvent is insoluble in and heavier than water.
 - 4.3 A freeboard chiller where the chilled air blanket temperature measured in °F at the coldest point on the vertical axis in the center of the solvent cleaner shall be no greater than 30 percent of the initial boiling point of the solvent used or 40°F.
 - 4.4 An approved emission control device which has a control efficiency of 90 percent or more on a mass basis.
 - 4.5 An enclosed design in which the cover or door opens only when the dry part is entering or exiting the cold cleaner unless the cleaner is an airtight solvent cleaner.
- 303.5 Any person using a cold cleaner for repair and maintenance cleaning shall comply with one of the following requirements:
 - 5.1 The VOC content of the cleaning solution shall not exceed 50 g/l (0.42 lb/gal); or
 - 5.2 The cleaning solution shall be branched, cyclic, or linear completely methylated siloxane (VMS); or
 - 5.3 The portion of the cleaning solution that is not VMS shall not exceed a VOC content of 50 g/l (0.42 lb/gal); or

5.4 The source complies with subsection 8-16-303.4.4.

(Adopted 7/3/85; Amended 1/8/86; 3/16/88; 8/2/89; 9/16/98; 10/16/02)

8-16-304 National Emission Standards for Hazardous Air Pollutants (NESHAP): Halogenated Solvent Cleaner Requirements: In addition to the requirements of this Rule, solvent cleaning equipment that contains any one or a combination of the halogenated solvents specified in Section 8-16-216 at a total concentration of 5 percent or more by weight is also subject to the federal requirements contained in 40 Code of Federal Regulations, Part 63, Subpart T. Buckets, pails, or beakers with capacities of 2 gallons or less are not subject to the federal requirements.

(Amended, Renumbered 7/3/85; Amended 3/16/88; 9/16/98)

8-16-305 Compliance Statement Requirement: The manufacturer of any solution used to comply with subsection 8-16-303.5 shall provide, on the container or as an accompanying data sheet, a designation of VOC content of the solvent (as defined in Section 8-16-229), including any dilution ratio necessary to achieve compliance with the standards in subsection 8-16-303.5.

(Adopted October 16, 2002)

8-16-400 ADMINISTRATIVE REQUIREMENTS

8-16-401 Deleted March 16, 1988

8-16-402 Deleted March 16, 1988

8-16-403 Deleted September 16, 1998

8-16-404 Deleted August 2, 1989

8-16-500 MONITORING AND RECORDS

8-16-501 Solvent Records: Any person subject to the requirements of this Rule shall keep the following records:

501.1 Deleted September 16, 1998

501.2 On a facility-wide, monthly basis, records showing the type and total amount of make-up solvent used in all solvent cleaning operations subject to this rule regardless of the number of cleaning operations involved.

501.3 On a monthly basis, records showing the type and amount of solvent subject to Section 8-16-111.

501.4 For solvent vapor dryers and enclosed solvent cleaners, monthly records of the type and total amount of makeup solvent on a per source basis.

501.5 Records shall be retained and available for inspection by the APCO for the previous 24-month period.

501.6 Information, such as purchase orders or hazardous waste manifests, that will allow the APCO to verify compliance with the solvent loss limitation in Section 8-16-121.

(Adopted 7/3/85; Amended 3/16/88; 8/2/89; 9/16/98; 10/16/02)

8-16-502 Burden of Proof: Any person claiming exemption pursuant to Section 8-16-114, 115, or 118 or a recordkeeping exemption pursuant to Section 8-16-124 shall have information available such as product data or material safety data sheets that would allow the APCO to verify the eligibility for the exemption.

(Adopted October 16, 2002)

8-16-503 Approved Emission Control Device, Recordkeeping Requirements: Any person operating air pollution abatement equipment to comply with subsections 8-16-301.4.3, 302.5.3 or 303.4.4 shall record applicable key system operating parameters on a daily basis.

(Adopted October 16, 2002)

8-16-600 MANUAL OF PROCEDURES

8-16-601 Determination of Emissions: Emissions of organic compounds as specified in subsections 301.4.3, 302.5.3, or 303.4.4 shall be measured as prescribed by any of the following methods: 1) BAAQMD Manual of Procedures, Volume IV, ST-7, 2) EPA

Method 25 or 25A. A source shall be considered in violation if the VOC emissions measured by any of the referenced test methods exceed the standards of this rule.

(Amended 7/3/85; 3/16/88; 6/15/94; 9/16/98)

8-16-602 Analysis of Samples: Samples of organic compounds shall be analyzed using EPA Method 24, by the following applicable methods:

- 602.1 Manual of Procedures, Volume III, Method 31 for the determination of percent VOC by weight and VOC content as specified in Sections 8-16-114, and 303.5.
- 602.2 Manual of Procedures Volume III, Method 21 or 22 for the determination of percent solvent by volume as specified in subsections 8-16-301.1.4, 302.1.4 and 303.1.4.
- 602.3 ASTM D-1078-93 for the determination of initial boiling point as specified in Section 8-16-205.
- 602.4 Manual of Procedures, Volume III, Method 43 for the determination of volatile methylsiloxanes (VMS) as specified in subsections 8-16-303.5.2 and 303.5.3.

(Adopted 7/3/85; Amended 3/16/88; 8/2/89; 9/16/98; 10/16/02)

(Adopted July 6, 1979)(Amended May 7, 1982)(Amended January 6, 1984)
(Amended June 1, 1984)(Amended January 9, 1987)(Amended February 6, 1987)
(Amended April 3, 1987)(Amended May 5, 1989)(Amended March 2, 1990)
(Amended April 6, 1990)(Amended June 1, 1990)(Amended November 2, 1990)
(Amended December 7, 1990)(Amended August 2, 1991)(Amended March 6, 1992)
(Amended December 4, 1992)(Amended December 10, 1993)
(Amended January 13, 1995)(Amended Dec. 13, 1996)(Amended September 21, 2001)

**RULE 1124. AEROSPACE ASSEMBLY AND COMPONENT
MANUFACTURING OPERATIONS**

(a) Purpose and Applicability

The purpose of Rule 1124 is to reduce volatile organic compound (VOC) emissions from aerospace assembly and component manufacturing operations. This rule applies to any operation associated with manufacturing and assembling products for aircraft and space vehicles for which an aerospace material is used. The affected industries include commercial and military aircraft, satellite, space shuttle and rocket manufacturers and their subcontractors. The rule also applies to maskant applicators, aircraft refinishers, aircraft fastener manufacturers, aircraft operators, and aircraft maintenance and service facilities

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

- (1) ADHESION PROMOTER is a primer that is used to promote wetting and form a chemical bond with a subsequently applied sealant or other elastomer.
- (2) ADHESIVE is any substance that is used to bond one surface to another surface by attachment
- (3) ADHESIVE BONDING PRIMER is a primer that is applied to an aerospace component to increase adhesive or adhesive film bond strength. Adhesive bonding primers are of two types: those that cure at or below 250°F and those that cure above 250°F.
- (4) AEROSOL COATING PRODUCT is a pressurized coating product containing pigments or resins that is dispensed by means of a propellant, and is packaged in a disposable can for hand-held application.
- (5) AEROSPACE COMPONENT is the raw material, partial or completed fabricated part, assembly of parts, or completed unit of any aircraft or

space vehicle and includes integral equipment such as models, mock-ups, prototypes, molds, jigs, tooling, hardware jackets, and test coupons.

- (6) AEROSPACE MATERIAL is any coating, primer, adhesive, sealant, maskant, lubricant, stripper or hand-wipe cleaning or clean-up solvent used during the manufacturing, assembly, refinishing, maintenance or service of an aerospace component. For the purposes of this rule material shall mean aerospace material.
- (7) AIRCRAFT is any machine designed to travel through the air, without leaving the earth's atmosphere, whether heavier or lighter than air, including airplanes, balloons, dirigibles, helicopters, and missiles.
- (8) ANTICHAFFE COATING is a coating applied to areas of moving aerospace components which may rub during normal operation.
- (9) ANTI-WICKING WIRE COATING is the outer coating of a wire which prevents fluid wicking into insulation of the wire.
- (10) BARRIER COATING is a coating applied in a thin film to fasteners to inhibit dissimilar metal corrosion and to prevent galling.
- (11) CHEMICAL MILLING is the removal of metal by chemical action of acids or alkalis.
- (12) CLEAR TOPCOAT is a topcoat that contains no visible pigments and is uniformly transparent when applied.
- (13) COATING APPLICATION EQUIPMENT is equipment used for applying coating to a substrate. Coating application equipment includes coating distribution lines, coating hoses, pressure-pots, spray guns, and hand-application equipment, such as hand-rollers, brushes, daubers, spatulas, and trowels.
- (14) CONFORMAL COATING is a coating applied to electrical conductors and circuit boards to protect them against electrical discharge damage and/or corrosion.
- (15) DRY LUBRICATIVE MATERIALS are coatings 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.
- (16) ELECTRIC- or RADIATION-EFFECT COATINGS include electrically conductive coatings and radiation effect coatings, the uses of which may include prevention of radar detection.

- (17) ELECTRONIC WIRE COATING is the outer electrical insulation coating applied to tape insulation of a wire specifically formulated to smooth and fill edges.
- (18) ELECTROSTATIC DISCHARGE PROTECTION COATING is a coating applied to space vehicles, missiles, aircraft radomes, and helicopter blades to disperse static energy.
- (19) EPOXY BASED FUEL-TANK COATING is a coating which contains epoxy resin that is applied to a fuel tank of an aircraft to protect it from corrosion and/or bacterial growth.
- (20) EXEMPT COMPOUNDS: As defined in Rule 102.
- (21) FACILITY is all the buildings, equipment and materials on one contiguous piece of property.
- (22) FASTENER MANUFACTURER is a facility that coats aircraft fasteners, such as pins, collars, bolts, nuts, and rivets, with solid-film lubricants for distribution to other facilities.
- (23) FIRE-RESISTANT COATING is a cabin interior coating that meets for civilian aircraft the Federal Aviation Administration-required Ohio State University Heat Release, Fire and Burn Tests; for military aircraft, Aircraft Structural Integrity Program in MIL-STD-1530A and MIL-A-87221 (Northrop's MS-445-3.3.2.1 and MS-445-3.3.2.2).
- (24) FLIGHT-TEST COATING is 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.
- (25) FUEL-TANK ADHESIVE is an adhesive used to bond components exposed to fuel and must be compatible with fuel-tank coatings.
- (26) FUEL-TANK COATING is a coating applied to a fuel tank of an aircraft to protect it from corrosion and/or bacterial growth.
- (27) GRAMS OF VOC PER LITER OF COATING, LESS WATER AND LESS EXEMPT COMPOUNDS is the weight of VOC per combined volume of VOC and coating solids and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where: W_s = weight of volatile compounds in grams

Ww	=	weight of water in grams
Wes	=	weight of exempt compounds in grams
Vm	=	volume of material in liters
Vw	=	volume of water in liters
Ves	=	volume of exempt compounds in liters

For aerospace materials that contain reactive diluents the grams of VOC per Liter of Coating Less Water and Less Exempt Compounds shall be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:	Ws	=	weight of volatile compounds evolved during curing and analysis, in grams
	Ww	=	weight of water evolved during curing and analysis, in grams
	Wes	=	weight of exempt compounds evolved during curing and analysis, in grams
	Vm	=	volume of the material prior to reaction, in liters
	Vw	=	volume of water evolved during curing and analysis, in liters
	Ves	=	volume of exempt compounds evolved during curing and analysis, in liters

- (28) GRAMS OF VOC PER LITER OF MATERIAL is the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{W_s - W_w - W_{es}}{V_m}$$

Where:	Ws	=	weight of volatile compounds in grams
	Ww	=	weight of water in grams
	Wes	=	weight of exempt compounds in grams
	Vm	=	volume of material in liters

- (29) HAND APPLICATION METHOD is the application of materials by manually held, non-mechanically operated equipment. Such equipment includes paint brushes, hand rollers, caulking guns, trowels, spatulas, syringe daubers, rags, and sponges.

- (30) HIGH-TEMPERATURE COATING is a coating that must withstand temperatures of more than 350oF.
- (31) HIGH-VOLUME, LOW-PRESSURE (HVLP) SPRAY is a material application system which is operated at air pressure of between 0.1 and 10 pounds per square inch gauge (psig).
- (32) IMPACT-RESISTANT COATING is a flexible coating that protects aerospace components, such as aircraft landing gear, and landing gear compartments, and other surfaces subject to impact and abrasion from runway debris.
- (33) LINE-SEALER MASKANT is a maskant used to cover scribe lines in maskant in order to protect against etchant in multi-step etching processing.
- (34) LONG TERM PRIMER (METAL TO STRUCTURAL CORE BONDING) is an adhesive bonding primer that has met the aircraft manufacturers' required performance characteristics following 6000 hours testing, used for metal to structural core bonding, and with an adhesive that is specified to be cured at 350oF \pm 10°F.
- (35) LOW-SOLIDS ADHESIVE, COATING, PRIMER OR SEALANT is an adhesive, coating, primer or sealant which has less than one pound of solids per gallon of material. Such solids are the non-volatiles remaining after a sample is heated at 110oC for one hour.
- (36) LOW-SOLIDS CORROSION RESISTANT PRIMER is a corrosion resistant polyurethane compatible primer with enhanced adhesion and rain erosion resistance which contains no more than 45 percent solids, by weight, as applied.
- (37) MASKANT FOR CHEMICAL MILLING is a coating applied directly to an aerospace component to protect surface areas when chemical milling the component.
- (38) MASKANT FOR CHEMICAL PROCESSING is a coating applied directly to an aerospace component to protect surface areas when anodizing, aging, bonding, plating, etching, and/or performing other chemical surface operations on the component.
- (39) METALLIZED EPOXY COATING is a coating that contains relatively large quantities of flake pigmentation for appearance and/or added protection.

- (40) MOLD RELEASE COATING is a coating applied to the surface of a mold to prevent the molded component from sticking to the mold as it is removed.
- (41) NON-STRUCTURAL ADHESIVE is an adhesive that bonds non-load-carrying aircraft components in non-critical applications and is not covered in any other specialty adhesive categories.
- (42) OPTICAL ANTI-REFLECTION COATING is 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.
- (43) PHOTOLITHOGRAPHIC MASKANT is a coating applied by photoresist operation(s) directly to printed circuit boards, and ceramic and similar substrates to protect surface areas from chemical milling or chemical processing.
- (44) PHOTORESIST OPERATION is a process for the application or development of photoresist masking solution on a substrate, including preparation, soft bake, develop, hard bake, and stripping, and can be generally subdivided as follows:
 - (A) Negative Photoresist Operation is a process where the maskant hardens when exposed to light and the unhardened maskant is stripped, exposing the substrate surface for chemical milling or chemical processing.
 - (B) Positive Photoresist Operation is a process where the maskant softens when exposed to light and the softened maskant is stripped, exposing the substrate surface for chemical milling or chemical processing.
- (45) PRETREATMENT PRIMER is a primer which contains no more than 12 percent solids by weight, and at least ½-percent acid by weight, to provide surface etching and is applied directly to metal surfaces to provide corrosion resistance, adhesion, and ease of stripping.
- (46) PRIMER is a coating applied directly to an aerospace component for purposes of corrosion prevention, protection from the environment, functional fluid resistance and/or adhesion of subsequent coatings, adhesives, or sealants.
- (47) PRIMER COMPATIBLE WITH RAIN EROSION RESISTANT COATING is a primer to which rain erosion resistant topcoat is applied.

- (48) RAIN EROSION-RESISTANT COATING is a coating that protects leading edges, flaps, stabilizers, and engine inlet lips against erosion caused by rain impact during flight.
- (49) REPAIR COATING is a coating used to recoat portions of a product which has sustained mechanical damage to the coating following normal painting operations.
- (50) REMANUFACTURED AIRCRAFT PARTS are aerospace components that are built as spare parts or replacement parts subject to an existing commercial aircraft specification.
- (51) REPAIR MASKANT is a maskant used to cover imperfections in the maskant coat.
- (52) REWORK is the inspection, repair, and reconditioning of aerospace components subject to this rule.
- (53) RUBBER SOLUTION FUEL-TANK COATING is a fuel-tank coating which performs as a sealant and protects the tank from corrosion and/or bacterial growth and is formulated with a butadiene acrylonitrile copolymer.
- (54) SCALE INHIBITOR is a coating that is applied to the surface of a part prior to thermal processing to inhibit the formation of tenacious scale.
- (55) SEALANTS are viscous semisolid materials that fill voids in order to seal out water, fuel, and other liquids and solids, and in some cases, air movement.
- (56) SHORT TERM PRIMER (METAL TO STRUCTURAL CORE BONDING) is an adhesive bonding primer that has met the manufacturers' required performance characteristics following 1000 hours testing, used for metal to metal and metal to structural core bonding, and with an adhesive which is specified to be cured at a temperature of 350°F \pm 10°F.
- (57) SOLID-FILM LUBRICANT is 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.
- (58) SONIC AND ACOUSTIC APPLICATIONS are the use of aerospace materials on aerospace components that are subject to mechanical vibration and/or sound wave cavitation.

- (59) SPACE-VEHICLE is a vehicle designed to travel beyond the earth's atmosphere.
- (60) STENCIL COATING is an ink or a coating that is rolled, sprayed with an airbrush or a touch-up gun, or brushed, while using a template to add identifying letters and/or numbers to aerospace components.
- (61) STRIPPER is a volatile liquid applied to remove cured aerospace materials or their residues.
- (62) STRUCTURAL ADHESIVE - AUTOCLAVABLE is an adhesive used to bond load-carrying aircraft components and is cured by heat and pressure in an autoclave.
- (63) STRUCTURAL ADHESIVE - NON-AUTOCLAVABLE is an adhesive cured under ambient conditions and is used to bond load-carrying aircraft components or other critical functions, such as nonstructural bonding in the proximity of engines.
- (64) TEMPORARY MARKING COATING is an ink or a coating used to make identifying markings, and is removed prior to delivery of the aerospace component and/or assembly.
- (65) TEMPORARY PROTECTIVE COATING is a coating applied to an aerospace component to protect it from mechanical and environmental damage during manufacturing.
- (66) TOPCOAT is a coating applied over a primer for purposes such as appearance, identification, or protection.
- (67) TOUCH-UP COATING is a coating used to cover minor coating imperfections appearing after the main coating operation.
- (68) TOXICITY-WEIGHTED EMISSION REDUCTION EFFICIENCY is the difference between the uncontrolled and the controlled toxicity-weighted total emissions divided by the uncontrolled toxicity-weighted total emissions and multiplied by 100. Toxic organic solvent and toxic particulate matter toxicity-weighted emission reduction efficiencies are calculated separately and are represented by the following equation:

$$\eta = \frac{T_u - T_c}{T_u} \times 100$$

Where: η = The toxicity-weighted emission reduction efficiency
 T_u = The uncontrolled toxicity-weighted total emissions

T_c = The controlled toxicity-weighted total emissions

- (69) TOXICITY-WEIGHTED TOTAL EMISSIONS is the sum of the product of the mass emissions and the unit risk factor for each toxic component of aerospace material used per year. There are two toxicity-weighted total emission values, one for uncontrolled emissions and the other for controlled emissions. Toxicity-weighted total emissions for toxic organic solvents and toxic particulate matter are calculated separately and are represented by the following equations:

$$T_u = \sum_{i=1}^n m_i U_i$$

$$T_c = \sum_{i=1}^n (1 - E_i)(m_i U_i) + \sum_{j=1}^m (1 - E_j)(m_j U_j)$$

Where:

- T_u = The uncontrolled toxicity-weighted total emissions
- T_c = The controlled toxicity-weighted total emissions
- m_i = Baseline mass emissions of each toxic organic solvent or toxic particulate matter as established in a District approved Health Risk Assessment in pounds per year
- U_i = Unit risk factor for each toxic organic solvent or toxic particulate matter in inverse micrograms per cubic meter $(\mu\text{g}/\text{m}^3)^{-1}$
- E_i = Overall control efficiency of the add-on control equipment for which aerospace materials containing toxic organic solvent or toxic particulate matter are vented to
- m_j = Additional mass emissions of each toxic organic solvent or toxic particulate matter to the baseline mass emissions that established a District approved Health Risk Assessment in pounds per year
- U_j = Unit risk factor for each toxic organic solvent or toxic particulate matter in inverse micrograms per cubic meter $(\mu\text{g}/\text{m}^3)^{-1}$
- E_j = Overall control efficiency of the add-on control equipment for which additional aerospace materials containing toxic organic solvent or toxic particulate matter will be vented to

- (70) TOXIC ORGANIC SOLVENT is any volatile compound that has a finalized unit risk factor assigned by the Office of Environmental Health Hazard Assessment.
- (71) TOXIC PARTICULATE MATTER is any non-volatile compound that has a finalized unit risk factor assigned by the Office of Environmental Health Hazard Assessment.
- (72) TRANSFER EFFICIENCY is the ratio of the weight or volume of coating solids adhering to an object to the total weight or volume, respectively, of coating solids used in the application process, expressed as a percentage.
- (73) TYPE I ETCHANT is a chemical milling etchant that contains varying amounts of dissolved sulfur and does not contain amines.
- (74) TYPE II ETCHANT is a chemical milling etchant that is a strong sodium hydroxide solution containing amines.
- (75) UNICOAT is a coating which is applied directly to an aerospace component for purposes of corrosion protection, environmental protection, and functional fluid resistance that is not subsequently topcoated.
- (76) VOC COMPOSITE PARTIAL PRESSURE is the sum of the partial pressures of the compounds defined as VOCs.

VOC Composite Partial Pressure is calculated as follows:

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

Where:

W_i	=	Weight of the "i"th VOC compound, in grams
W_w	=	Weight of water, in grams
W_e	=	Weight of exempt compound, in grams
MW_i	=	Molecular weight of the "i"th VOC compound, in grams per gram-mole
MW_w	=	Molecular weight of water, in grams per gram-mole
MW_e	=	Molecular weight of exempt compound, in grams per gram-mole
Pp_c	=	VOC composite partial pressure at 20°C, in mm Hg
Vp_i	=	Vapor pressure of the "i"th VOC compound at 20°C, in mm Hg

- (77) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102.
- (78) WING COATING is a corrosion-resistant coating that is resilient enough to withstand the flexing of the wings.
- (79) WIRE INK is the surface identification stripe and mark on aerospace wire or cable that serves as an electrical insulator in the presence of high humidity.
- (80) WIRE PREBONDING ETCHANT is a non-additive surface treatment process to provide bondability of aerospace wire coatings to the underlying insulation layer.

(c) Requirements

- (1) VOC Content of Aerospace Materials
 - (A) A person shall not apply to aerospace components any materials, including any VOC-containing materials added to the original material supplied by the manufacturer, which contain VOC in excess of the limits specified below:

VOC Limit			
Grams of VOC per Liter, Less Water and Less Exempt Compounds			
Primers	Current VOC Limit	VOC Limit Effective 1-1-03	VOC Limit Effective 1-1-05
General Primer	350	350	350
Low-Solids Corrosion Resistant Primer	350	350	350
Pretreatment Primer	780	780	780
Rain Erosion-Resistant Coating Compatible Primer	850	850	850
Adhesion Promoter	850	850	250
Adhesive Bonding Primer			
New Commercial Aircraft	805	250	250
All Military Aircraft	805	805	805
Remanufactured Commercial Aircraft Parts	805	805	805
Sonic and Acoustic Applications	805	805	805
Adhesive Bonding Primer			
Long Term	250	250	250
Short Term	250	250	250

Coatings	Current VOC Limit	VOC Limit Effective 3-01-02
Topcoat	420	420
Clear Topcoat	520	520
Unicoat	420	420
Wing Coating	750	750
Impact Resistant Coating	420	420
High-Temperature Coating	850	850
Antichafe Coating	600	420
Rain Erosion-Resistant Coating	800	800
Conformal Coating	750	750
Optical Anti-Reflective Coating	700	700
Scale Inhibitor	880	880
Metallized Epoxy Coating	700	700

Coatings (cont'd)	Current VOC Limit	VOC Limit Effective 3-01-02
Electric or Radiation Effect Coating	800	800
Temporary Protective Coating	250	250
Fuel Tank Coatings	420	420
Mold Release Coatings	780	780
Flight Test Coatings		
Used on Missiles or Single Use Target Craft	420	420
All Other	840	840
Fire Resistant Coatings		
Commercial	650	650
Military	970	800
Wire Coatings		
Phosphate Ester Resistant Ink	925	925
Other	420	420
Space Vehicle Coatings		
Electrostatic Discharge Protection Coating	800	800
Other	1000	1000

Adhesives	Current VOC Limit
Non-Structural Adhesive	250
Structural Adhesive	
Autoclavable	50
Non-Autoclavable	850
Space Vehicle Adhesive	800
Fuel Tank Adhesive	620

Sealants	Current VOC Limit	VOC Limit Effective 3-01-02
Fastener Sealant	675	675
Extrudable, Rollable or Brushable Sealant	600	280
Other	600	600

Maskants	Current VOC Limit
For Chemical Processing	250
For Chemical Milling	
Type I	250
Type II	160
Photolithographic	850
Touch-up, Line Sealer Maskants	750

Lubricants	Current VOC Limit
Fastener Installation	
Solid-Film Lubricant	880
Dry Lubricative Materials	675
Fastener-Lubricative Coatings, Fastener Manufacturing	
Solid Film Lubricant	250
Dry Lubricative Materials	120
Barrier Coating	420
Non-Fastener Lubricative Coatings, Fastener Manufacturing	
Solid Film Lubricant	880
Dry Lubricative Materials	675

VOC LIMIT	
Grams of VOC per Liter of Material	
Cleaning Solvents and Strippers	Current VOC Limit
Cleaning Solvents	200 g/L or 45 mm Hg VOC Composite Partial Pressure
Strippers	300 g/L or 9.5 mm Hg VOC Composite Partial Pressure

- (B) Documents shall be provided to the Executive Officer or his designee demonstrating that unicoat is being used in lieu of the application of a primer and topcoat, and the applicant must receive written approval for the use of unicoat specifying the conditions of application from the Executive Officer or his designee.
- (C) For low-solids adhesives, coatings, primers or sealants, the appropriate limits in subparagraph (c)(1)(A) shall be expressed in grams of VOC per liter of material.

(2) Solvent Cleaning Operations; Storage and Disposal of VOC-Containing Materials

(A) Cleaning of material application equipment and storage of solvent laden cloth and paper shall comply with provisions of Rule 1171.

(B) A person shall not atomize any solvent into open air.

(3) Transfer Efficiency

A person or facility shall not apply aerospace materials unless they are applied with properly operating equipment or controlled, according to operating procedure specified by the equipment manufacturer or the Executive Officer or his designee, and by the use of one of the following methods:

(A) electrostatic application; or

(B) flow coater; or

(C) roll coater; or

(D) dip coater; or

(E) high-volume, low-pressure (HVLP) spray; or

(F) hand application methods; or

(G) such other alternative application methods as are demonstrated to the Executive Officer, using District-approved procedures, to be capable of achieving at least equivalent transfer efficiency to method (c)(3)(E) and for which written approval of the Executive Officer has been obtained; or

(H) Approved air pollution control equipment under paragraph (c)(4).

(4) Control Equipment

Owners and/or operators may comply with provisions of paragraphs (c)(1) and (c)(3) by using approved air pollution control equipment provided that the VOC emissions from such operations and/or materials are reduced in accordance with provisions of (A) and (B).

(A) The control device shall reduce emissions from an emission collection system by at least 95 percent, by weight, or the output of the air pollution control device is less than 50 PPM calculated as carbon with no dilution.

(B) The owner/operator demonstrates that the system collects at least 90 percent, by weight, of the emissions generated by the sources of emissions.

(d) Recordkeeping Requirements

Records shall be maintained pursuant to the requirements of Rule 109.

(e) Determination of VOC Content

The VOC content of materials subject to the provisions of this rule shall be determined by the following methods:

- (1) EPA Reference Method 24 (Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coatings, Code of Federal Regulations Title 40, Part 60, Appendix A). Analysis done according to EPA Method 24 shall utilize Procedure B of ASTM Method D-2369, referenced in EPA Method 24. The exempt solvent content shall be determined using SCAQMD Test Methods 302 and 303 (SCAQMD "Laboratory Methods of Analysis for Enforcement Samples" manual) or;
- (2) SCAQMD Test Methods 302, 303, and 304 (SCAQMD "Laboratory Methods of Analysis for Enforcement Samples" manual).

The following classes of compounds: cyclic, branched, or linear, completely fluorinated alkanes; cyclic, branched, or linear, completely fluorinated ethers with no unsaturations; cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine, will be analyzed as exempt compounds for compliance with subdivision (c), only at such time as manufacturers specify which individual compounds are used in the coating formulations and identify the test methods, which, prior to such analysis, have been approved by the USEPA and the SCAQMD, that can be used to quantify the amounts of each exempt compound.

(f) Test Methods

- (1) Efficiency of the control device shall be determined according to EPA Method 25, 25A, SCAQMD Test Method 25.1, or SCAQMD Test Method 25.3. Emissions determined to exceed any limits established by this rule through the use of either of the above-referenced test methods shall constitute a violation of this rule.
- (2) The capture efficiency of the emissions collection system shall be determined by the USEPA method cited in 55 FR (Federal Register)

26865, June 29, 1990 or any other method approved by the USEPA, the California Air Resources Board, and the SCAQMD.

- (3) The transfer efficiency of alternative application methods shall be determined in accordance with the SCAQMD method "Spray Equipment Transfer Efficiency Test Procedure for Equipment User, May 24, 1989".
- (4) The identity and quantity of components in solvents shall be determined in accordance with SCAQMD test method 308 (Quantitation of Compounds by Gas Chromatography) contained in the SCAQMD "Laboratory Methods of Analysis for Enforcement Samples" manual. The VOC composite partial pressure is calculated using the equation in paragraph (b)(72).
- (5) **Multiple Test Methods**
When more than one test method or set of test methods are specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of the rule.
- (6) All test methods shall be those referenced in this section or any other applicable method approved by the USEPA, the California Air Resources Board, and the SCAQMD.

(g) Rule 442 Applicability

Any material, operation, or facility which is exempt from all or a portion of this rule, shall comply with the provisions of Rule 442.

(h) Prohibition of Solicitation of Violations

- (1) A person shall not solicit or require any other person to use, in the District, any material or combination of materials to be applied to any aircraft component subject to the provisions of this rule that does not meet the limits and requirements of this rule, or of an Alternative Emission Control Plan (AECPP) approved pursuant to the provisions of subdivision (i).
- (2) The requirements of this paragraph shall apply to all written or oral agreements executed or entered into after April 3, 1987.

(i) Alternative Emission Control Plans

An owner/operator may comply with the provisions of paragraph (c)(1) by means of an Alternative Emission Control Plan pursuant to Rule 108.

(j) Reporting Requirements

Persons who perform qualification acceptance testing on materials with a future compliance date for use in the District shall, beginning July 1, 1994 and at 6-month intervals thereafter, submit a status report describing the progress toward the development of materials which satisfy future compliance dates. These reports shall contain, at a minimum:

- (1) Manufacturer, product number, VOC content, and applicable material category for each of the test candidates;
- (2) Test expenditures for the period;
- (3) Progress on candidates tested during this period.
- (4) Approvals received for materials which comply with future compliance dates.
- (5) Volume of materials used in each material category for which there is a future compliance date.

Facilities testing materials in the same material category may submit joint status reports. Once compliance with future compliance dates is achieved and a status report is submitted documenting such, no further status reports need be submitted.

(k) Air Toxics

In lieu of complying with subdivisions (e), (f), (h), and (i) of Rule 1402 - Control of Toxic Air Contaminants from Existing Sources, a facility may submit a compliance plan to the District for the Executive Officer's approval within 180 days from the date of Health Risk Assessment approval that demonstrates how a toxicity-weighted emissions reduction efficiency of at least 90.0 percent for toxic organic solvents and at least 99.0 percent for toxic particulate matter emissions has been achieved and will be maintained in the future.

(l) Exemptions

- (1) The provisions of paragraph (c)(1) of this rule shall not apply to materials, exclusive of adhesives, with separate formulations that are used in volumes of less than 20 gallons per year provided that the total of such formulations applied annually by a facility is less than 200 gallons.
- (2) The provisions of subdivision (c) of this rule shall not apply to a facility which uses a total of less than three gallons of VOC-containing materials on each and every day of operation.

- (3) The provisions of paragraphs (c)(1) and (c)(3) of this rule shall not apply to incidental corrosion maintenance repair coating operations at military facilities, provided that the coating use at any maintenance repair location within the facility does not exceed 1.5 gallons per day, and the total coating usage for such operations at the facility does not exceed five gallons per day.
- (4) The VOC limits for solvents and strippers shall not apply to space vehicle manufacturing.
- (5) The provisions of paragraph (c)(1) shall not apply to clear or translucent coatings applied on clear or transparent substrates.
- (6) The provisions of paragraph (c)(3) shall not apply to touch-up and stencil coatings.
- (7) The provisions of paragraph (c)(1) shall not apply to the recoating of assembled aircraft at rework facilities if original coating formulations are used.
- (8) The provisions of paragraph (c)(1) shall not apply to adhesives with separate formulations that are used in volumes of less than ten gallons per year.
- (9) The provisions of paragraph (c)(3) shall not be applied to the application of materials marking coatings.
- (10) The provisions of subdivision (c) shall not apply to laboratories which apply materials to test specimens for purposes of research, development, quality control, and testing for production-related operations.
- (11) The provisions of subdivision (c) shall not apply to the application of temporary marking coatings.
- (12) The VOC limits for solvents shall not apply to the surface cleaning of solar cells, fluid systems, avionic equipment, and laser optics.
- (13) The provisions of subdivision (d) and paragraph (c)(3) shall not apply to the application of materials that contain less than 20 g/L of VOC per liter of material.
- (14) The provisions of paragraph (c)(3) shall not apply to the use of materials dispensed from airbrush operations.
- (15) The provisions of this rule shall not apply to aerosol coating products.
- (16) Until January 1, 2005, the VOC limit for fuel tank coatings shall not apply to non-spray rubber solution fuel-tank coating, containing less than 710 g/L of VOC per liter of coating, used on fuel tanks with maximum

capacity of 35 gallons and where the total facilitywide usage of this coating is less than 150 gallons per year. Records shall be maintained pursuant to the requirements of Rule 109 to establish eligibility for this exemption.

RULE 4663 ORGANIC SOLVENT CLEANING, STORAGE, AND DISPOSAL (Adopted December 20, 2001; Amended September 20, 2007)

1.0 Purpose

The purpose of this rule is to limit the emissions of volatile organic compounds (VOCs) from organic solvent cleaning and from the storage and disposal of solvents and waste solvent materials.

2.0 Applicability

The provisions of this rule shall apply to any organic solvent cleaning performed outside a degreaser during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or in general work areas at stationary sources. The rule shall also apply to the storage and disposal of all solvents and waste solvent materials at stationary sources.

3.0 Definitions

- 3.1 Aerosol Product: a hand-held, non-refillable container that expels a pressurized solvent-containing product by means of a propellant-induced force.
- 3.2 APCO: as defined in Rule 1020 (Definitions).
- 3.3 Application Equipment: a device, including, but not limited to, a spray gun, brush, and roller, used to apply adhesives, coatings, or inks.
- 3.4 ARB: California Air Resources Board.
- 3.5 ASTM: American Society for Testing and Materials.
- 3.6 Bench Scale Project: a project (other than at a research and development facility) that is operated on a small scale, such as one capable of being located on a laboratory bench top.
- 3.7 CFR: Code of Federal Regulations.
- 3.8 Coating: a material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.
- 3.9 Cured Adhesive, Cured Coating, or Cured Ink: an adhesive, coating, or ink that is dry to the touch.

- 3.10 Degreaser: a tank, tray, drum or other container in which objects to be cleaned are exposed to a solvent or solvent vapor in order to remove contaminants. The objects to be cleaned include, but are not limited to, parts, products, tools, machinery, and equipment. An enclosed spray application equipment cleaning system is not a degreaser.
- 3.11 Dissolver: an organic solvent that is added to an adhesive, coating, or ink in order to melt or to liquefy solid particles.
- 3.12 Electrical Apparatus or Electrical Components: all internal components such as wires, windings, stators, rotors, magnets, contacts, relays, energizers, and connections in an apparatus that generates or transmits electrical energy including but not limited to generators, transformers, and electric motors.
- 3.13 Electronic Components: all portions of an assembly such as circuit cards, printed wire assemblies, printed wiring boards, soldered joints, ground wires, bus bars, magnetic tapes and tape drive mechanisms, and other electronic fixtures, except the cabinet in which the components are housed.
- 3.14 EPA: United States Environmental Protection Agency.
- 3.15 Exempt Compound: an organic compound not classified as a volatile organic compound (VOC), as listed in the definition of volatile organic compound in Rule 1020 (Definitions).
- 3.16 Grams of VOC per liter of Material: the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per liter of material} = \frac{W_s - W_w - W_{ec}}{V_m}$$

Where:

W_s = 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 material, in liters

- 3.17 High Precision Optics: optical elements used in electro-optical devices which are designed to sense, detect, or transmit light energy, including specific wavelengths of light energy and changes in light energy levels.
- 3.18 Janitorial Cleaning: the cleaning of building or stationary source components such as floors, ceilings, walls, windows, doors, stairs, bathrooms, etc., excluding work areas where maintenance or manufacturing are performed.

- 3.19 Liquid Leak: a visible solvent leak from a container at a rate of more than three drops per minute, or a visible liquid mist.
- 3.20 Maintenance Cleaning: the cleaning of tools, forms, molds, jigs, machinery, and equipment (except coating application equipment, ink application equipment, or adhesive application equipment), and the cleaning of work areas where maintenance or manufacturing occurs.
- 3.21 Manufacturing Process: the process of making goods or articles by hand or by machine.
- 3.22 Medical Device: an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent or other similar article, including any component or accessory that meets the following conditions:
- 3.22.1 is intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of diseases; or
 - 3.22.2 is intended to affect the structure or any function of the body; or
 - 3.22.3 is defined in the National Formulary or the United States Pharmacopeia, or any supplement to it.
- 3.23 Non-Absorbent Container: a container made of non-porous material that does not allow the migration of solvents through it.
- 3.24 Non-Atomized Solvent Flow: solvents in the form of a liquid stream without the introduction of any propellant.
- 3.25 Non-Leaking Container: a container without liquid leak.
- 3.26 Normal Business Hours: Monday through Friday, 8:00 am to 5:00 pm.
- 3.27 Organic Solvent: the same as "Solvent."
- 3.28 Organic Solvent Cleaning: an activity, or operation, or process, (including surface preparation, cleanup, or wipe cleaning), performed outside of a degreaser, that uses organic solvent to remove uncured adhesives, uncured coatings, uncured inks or other contaminants, including, but not limited to, dirt, soil, oil, lubricants, coolants, moisture, fingerprints, and grease, from parts, products, tools, machinery, application equipment and general work areas. Cleaning spray equipment used for the application of coatings, adhesives, or ink, is also considered to be organic solvent cleaning.

- 3.29 Propellant: any gas, including air, in a pressure container for expelling the contents when the pressure is released.
- 3.30 Repair Cleaning: a solvent cleaning operation or activity carried out during a repair process.
- 3.31 Repair Process: the process of returning a damaged object or an object not operating properly to good condition.
- 3.32 Research and Development: a facility or portion thereof used to further the development of useful materials, devices, systems, or methods, including, but not limited to, design, development, and improvement of prototypes and processes. Research and development does not include the manufacturing process itself.
- 3.33 Rolling, Consecutive 365-Day Period: any given date plus the immediate, previous 364 days.
- 3.34 SCAQMD: South Coast Air Quality Management District.
- 3.35 Scientific Instruments: instruments (including the components, assemblies, and subassemblies used in their manufacture) and associated accessories and reagents which are used for the detection, measurement, analysis, separation, synthesis, or sequencing of various compounds.
- 3.36 Solvent: any liquid containing a volatile organic compound or combination of volatile organic compounds, which is used as a diluent, thinner, dissolver, viscosity reducer, cleaning agent, or for other similar uses. These liquids are principally derived from petroleum and include petroleum distillates, chlorinated hydrocarbons, chlorofluorocarbons, ketones, and alcohols. Effective through September 20, 2008, solutions, emulsions, and dispersions of water and soap, or water and detergent, that contain 50 grams of VOCs per liter or less, as used, are not considered to be organic solvents. Effective on and after September 21, 2008, solutions, emulsions, and dispersions of water and soap, or water and detergent, that contain 25 grams of VOCs per liter or less, as used, are not considered to be organic solvents.
- 3.37 Solvent Flushing: the use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of equipment by flushing solvent, by a non-atomized solvent flow, through the equipment.
- 3.38 Stationary Source: as defined in Rule 2201 (New and Modified Stationary Source Review Rule).

- 3.39 Stripping: the use of solvent to remove material such as cured adhesives, cured inks, cured or dried paint, cured or dried paint residue or temporary protective coating.
- 3.40 Surface Preparation: the removal of contaminants from a surface prior to the application of coatings, inks, or adhesives or before proceeding to the next step of a manufacturing process.
- 3.41 Thinner: a solvent that is used to dilute coatings to reduce viscosity, color strength, and solids, or to modify drying conditions.
- 3.42 Viscosity Reducer: an organic solvent which is added to an adhesive, coating or ink to make it more fluid.
- 3.43 Volatile Organic Compound (VOC): as defined in Rule 1020 (Definitions).
- 3.44 Waste Solvent Material: any solvent which may contain dirt, oil, metal particles, sludge, and/or waste products, or wiping material containing VOCs including, but not limited to, paper, cloth, sponge, rag, or cotton swab used in organic solvent cleaning.
- 3.45 Wipe Cleaning: a solvent cleaning activity performed by hand rubbing an absorbent material such as a rag, paper, sponge, brush, or cotton swab containing solvent.

4.0 Exemptions

The provisions of this rule shall not apply to:

- 4.1 Janitorial cleaning, including graffiti removal.
- 4.2 Stripping of cured coatings, cured adhesives, and cured inks, except the stripping of such materials from spray application equipment.
- 4.3 Any source operation that is subject to or specifically exempted by any of the following rules:
 - 4.3.1 Rule 4602 (Motor Vehicle and Mobile Equipment Coating Operations).
This exemption shall apply through December 31, 2008,
 - 4.3.2 Rule 4603 (Surface Coating of Metal Parts and Products),
 - 4.3.3 Rule 4604 (Can and Coil Coating Operations),
 - 4.3.4 Rule 4605 (Aerospace Assembly and Component Coating Operations),

- 4.3.5 Rule 4606 (Wood Products Coating Operations),
- 4.3.6 Rule 4607 (Graphic Arts),
- 4.3.7 Rule 4612 (Motor Vehicle and Mobile Equipment Coating Operations – Phase II). This exemption shall apply on and after January 1, 2009,
- 4.3.8 Rule 4623 (Storage of Organic Liquids),
- 4.3.9 Rule 4652 (Coatings and Ink Manufacturing),
- 4.3.10 Rule 4653 (Adhesives),
- 4.3.11 Rule 4662 (Organic Solvent Degreasing Operations),
- 4.3.12 Rule 4672 (Petroleum Solvent Dry Cleaning Operations),
- 4.3.13 Rule 4684 (Polyester Resin Operations), or
- 4.3.14 Rule 4691 (Vegetable Oil Processing Operations).
- 4.4 Except for the records required in Section 6.2.4, the provisions of Section 5.1 shall not apply to an operator using 55 gallons or less of organic solvent products in all source operations subject to Rule 4663 in a stationary source, in any rolling, consecutive 365-day period.
- 4.5 The provisions of Table 1 shall not apply to the following applications:
 - 4.5.1 Cleaning of solar cells, laser hardware, scientific instruments, or high precision optics.
 - 4.5.2 Cleaning in laboratory tests and analyses, or bench scale or research and development projects.
 - 4.5.3 Cleaning of clutch assemblies where rubber is bonded to metal by means of an adhesive.
 - 4.5.4 Cleaning of paper-based gaskets.
- 4.6 The provisions of Table 1 Category C shall not apply to the cleaning of application equipment used to apply coatings on satellites and radiation effect coatings.

- 4.7 Until September 20, 2008, the provisions of Table 1 and Section 5.3 shall not apply to the cleaning of architectural coating application equipment provided that the cleaning solvent used does not exceed 950 grams of VOC per liter. Effective on and after September 21, 2008, such cleaning shall be performed in accordance with all provisions of the rule. An operator using solvent to clean architectural coating application equipment is exempt from the provisions of this rule if the facility meets the specifications of Section 4.4.
- 4.8 Cleaning with aerosol products shall not be subject to the VOC content limits of Table 1 and the work practices of Section 5.2.2 if 160 fluid ounces or less of non-compliant aerosol products are used per day, per facility. The use of such product shall comply with ARB regulations.

5.0 Requirements

5.1 Organic Solvent VOC Content Limits

An operator shall not use organic solvents for cleaning operations that exceed the VOC content limits specified in Table 1, in accordance with the corresponding effective date.

Table 1 – Organic Solvent VOC Content Limits

Type of Solvent Cleaning Operation	Effective November 15, 2003 through September 20, 2008	Effective on and after September 21, 2008
	VOC Content Limit Grams of VOC/liter of material (lb/gal)	VOC Content Limit Grams of VOC/liter of material (lb/gal)
A. Product Cleaning During Manufacturing Process or Surface Preparation for Coating, Adhesive, or Ink Application		
1. General	50 (0.42)	25 (0.21)
2. Electrical Apparatus Components and Electronic Components	500 (4.2)	100 (0.84)
3. Medical Devices and Pharmaceuticals	800 (6.7)	800 (6.7)
B. Repair and Maintenance Cleaning		
1. General	50 (0.42)	25 (0.21)
2. Electrical Apparatus Components and Electronic Components	900 (7.5)	100 (0.84)
3. Medical Devices and Pharmaceuticals	800 (6.7)	800 (6.7)
3.1 Tools, Equipment, and Machinery		
3.2 General Work Surfaces	600 (5.0)	600 (5.0)
C. Cleaning of Coating or Adhesive Application Equipment	550 (4.6)	25 (0.21)

5.2 Cleaning Methods

- 5.2.1 Sections 5.2.2 through 5.2.8 shall apply to operators performing solvent cleaning operations outside the control of a VOC emission control system and the cleaning operations are not Table 1 Category A.1 or Table 1 Category B.1.
- 5.2.2 Until September 20, 2008, an operator performing cleaning operations from Table 1 (other than Category A.1 or Category B.1) and using solvent with VOC content greater than 50 g/L shall meet the requirements of Sections 5.2.5 through 5.2.7 in addition to meeting the applicable VOC content limits of Table 1.
- 5.2.3 On and after September 21, 2008, an operator performing cleaning operations from Table 1 (other than Category A.1, Category B.1 or Category C) and using solvent with VOC content greater than 25 g/L shall meet the requirements of Sections 5.2.5 through 5.2.7 in addition to meeting the applicable VOC content limits of Table 1.

- 5.2.4 Sections 5.2.5 through 5.2.7 shall not apply to operators performing Table 1 Category C cleaning operations outside the control of a VOC emission control system on and after September 21, 2008.
- 5.2.5 Cleaning activities that use solvents shall be performed by one or more of the following methods:
- 5.2.5.1 Wipe cleaning; or
 - 5.2.5.2 Application of solvent from hand-held spray bottles from which solvents are dispensed without a propellant-induced force; or
 - 5.2.5.3 Non-atomized solvent flow method in which the cleaning solvent is collected in a container or a collection system which is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container; or
 - 5.2.5.4 Solvent flushing method in which the cleaning solvent is discharged into a container that is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container. The discharged solvent from the equipment must be collected into containers without atomizing into the open air. The solvent may be flushed through the system by air or hydraulic pressure, or by pumping.
- 5.2.6 Solvent shall not be atomized into the open air unless it is vented to a VOC emission control system that complies with Section 5.4. This provision shall not apply to the cleaning of nozzle tips of automated spray equipment systems, except for robotic systems, and cleaning with spray bottles or containers described in Section 5.2.5.2.
- 5.2.7 An operator shall not use VOC-containing materials to clean spray equipment used for the application of coatings, adhesives, or ink, unless an enclosed system or equipment that is proven to be equally effective at controlling emissions is used for cleaning. If an enclosed system is used, it must totally enclose spray guns, cups, nozzles, bowls, and other parts during washing, rinsing and draining procedures, and it must be used according to the manufacturer's recommendations and must be closed when not in use.

- 5.3 In lieu of complying with the VOC content limits of Table 1 or complying with the provisions of Sections 5.2, an operator may control VOC emissions from solvent cleaning operations with a VOC emission control system that meets the requirements of Section 5.5.

5.4 Storage and Disposal of Solvents

An operator shall store or dispose of fresh or spent solvents, waste solvent cleaning materials such as cloth, paper, etc., coatings, adhesives, catalysts, and thinners in closed, non-absorbent and non-leaking containers. The containers shall remain closed at all times except when depositing or removing the contents of the containers or when the container is empty.

5.5 VOC Emission Control System

- 5.5.1 In lieu of complying with the requirements in Section 5.1 or Section 5.2, an operator may comply with this rule by using a VOC emission control system in association with the solvent cleaning operation, provided that during emission-producing activities, the system complies with Sections 5.5.4 and 5.5.5 and either Section 5.5.2 or Section 5.5.3, as applicable.

- 5.5.2 The VOC emission control system's collection device(s) has a capture efficiency of at least 90 percent, by weight, of the emissions generated by the solvent cleaning operation and one of the following requirements:

5.5.2.1 The VOC emission control system's control device(s) has a control efficiency of at least 95 percent, by weight, or

5.5.2.2 The VOC emission control system has an output of less than 50 parts per million by weight (ppm) calculated as carbon with no dilution; or,

- 5.5.3 If the solvent cleaning activity is associated with operations subject to Rule 4661 (Organic Solvents), the VOC emission control system shall meet the VOC emission control system overall capture and control efficiency requirements as specified in Rule 4661 (Organic Solvents).

- 5.5.4 The VOC emission control system shall be approved by the APCO.

- 5.5.5 In no case shall compliance through use of a VOC emission control system result in VOC emissions in excess of the VOC emissions which would result from compliance with Section 5.1 or Section 5.2, as applicable.

6.0 Administrative Requirements

6.1 Compliance Statement Requirements

Manufacturers of any solvents subject to this rule shall indicate on the solvent container, or on a separate product data sheet or material safety data sheet, the name of the solvent, manufacturer's name, the VOC content, and density of the solvent, as supplied. The VOC content shall be expressed in units of gm/liter or lb/gallon.

6.2 Recordkeeping Requirements

An operator shall comply with the following recordkeeping requirements:

6.2.1 The operator shall retain the records specified in Sections 6.2.2 through 6.2.6, as applicable, on site for a period of five years, make the records available on site during normal business hours to the APCO, ARB, or EPA, and submit the records to the APCO, ARB, or EPA upon request.

6.2.2 Keep a copy of the manufacturer's product data sheet or material safety data sheet of the solvents used for organic solvent cleaning activities.

6.2.3 Maintain a current list of solvents that are being used for organic solvent cleaning activities at the stationary source. The list shall include the following information:

6.2.3.1 The name of the solvent and its manufacturer's name.

6.2.3.2 The VOC content of the solvent expressed in grams/liter or lb/gallon.

6.2.3.3 When the solvent is a mixture of different materials that are blended by the operator, the mix ratio of the batch shall be recorded and the VOC content of the batch shall be calculated and recorded in order to determine compliance with the specified limits of VOC content, as applied.

6.2.3.4 The type of cleaning activity for each solvent that is being used at the stationary source in accordance with the applicable cleaning category specified in Table 1 of this rule.

6.2.4 On and after September 20, 2007, the quantity of solvents used in solvent cleaning operations shall be recorded on a daily basis.

6.2.5 An operator claiming exemption under Section 4.4 shall keep records of any additional information necessary to confirm that 55 gallons or less of organic solvent products are used in all source operations subject to this rule at the stationary source in any rolling, consecutive 365-day period. An operator shall maintain usage records of non-compliant solvents on the days that non-compliant solvents are used.

6.2.6 VOC Emission Control System Records

6.2.6.1 An operator using a VOC emission control system pursuant to Section 5.5 as a means of complying with this rule shall maintain daily records of the VOC emission control system's key operating parameters during periods of emission-producing operations. Key system operating parameters are those necessary to ensure compliance with VOC limits. The parameters may include, but are not limited to, temperatures, pressures, and flow rates.

6.2.6.2 An operator shall keep records describing all maintenance work on the VOC emission control system that requires the VOC emission control system to be shut down.

6.3 Test Methods

6.3.1 Determination of VOC Content

6.3.1.1 The VOC content of solvents and organic materials shall be determined by using EPA Test Method 24 or 24A, or SCAQMD Method 304 (Determination of Volatile Organic Compounds in Various Materials), or by using the manufacturer's product formulation data and the formula for "Grams of VOC per liter of Material" in Section 3.0.

6.3.1.2 The content of exempt halogenated VOCs shall be determined by using the ARB Method 432 or SCAQMD Method 303 (Determination of Exempt Compounds).

6.3.2 Determination of Overall Capture and Control Efficiency of a VOC Emission Control System

6.3.2.1 The capture efficiency of a VOC emission control system's collection device(s) shall be determined according to EPA's "Guidelines for Determining Capture Efficiency," January 9, 1995 and 40 CFR 51, Appendix M, Methods 204-204F, as

applicable, or any other method approved by EPA, ARB, and the APCO.

6.3.2.2 The control efficiency of a VOC emission control system's control device(s) shall be determined using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Methods 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the VOC emission control system's control device. EPA Method 18 or ARB Method 422 shall be used to determine the emissions of exempt compounds.

6.3.2.3 For VOC emission control systems that consist of a single VOC emission collection device connected to a single VOC emission control device, the overall capture and control efficiency shall be calculated by using the following equation:

$$CE_{\text{CAPTURE AND CONTROL}} = [CE_{\text{CAPTURE}} \times CE_{\text{CONTROL}}] / 100 \%$$

Where:

$CE_{\text{CAPTURE AND CONTROL}}$ = Overall Capture and Control Efficiency, in percent

CE_{CAPTURE} = Capture Efficiency of the collection device, in percent, as determined in Section 6.3.2.1

CE_{CONTROL} = Control Efficiency of the control device, in percent, as determined in Section 6.3.2.2.

6.3.3 Determination of Solvent Losses from Spray Gun Cleaning Systems

The passive and active solvent losses from spray gun cleaning systems shall be determined by using SCAQMD "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems" dated October 3, 1989. The test solvent for this determination shall be lacquer thinner with a minimum vapor pressure of 105 mm Hg at 20°C. The minimum temperature shall be 15°C.

6.4 Multiple Test Methods

When more than one test method or set of test methods is specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of this rule.

6.5 Version of Test Methods

All ASTM test methods referenced in Section 6.0 are the most recently EPA-approved version that appears in the CFR as Materials Approved for Incorporation by Reference.

RULE 4605 AEROSPACE ASSEMBLY AND COMPONENT COATING OPERATIONS
(Adopted December 19, 1991; Amended May 21, 1992; Amended December 17, 1992; Amended March 31, 1993; Amended February 17, 1994; Amended December 19, 1996; Amended December 20, 2001; Amended September 20, 2007; Amended June 16, 2011)

1.0 Purpose

The purpose of this rule is to limit the emissions of volatile organic compounds (VOCs) from aerospace coatings and adhesives, from the organic solvent cleaning, and the storage and disposal of solvents and waste solvent materials associated with the use of aerospace coatings and adhesives and to provide the administrative requirements for recording and measuring the emissions.

2.0 Applicability

This rule shall apply to the manufacturing, assembling, coating, masking, bonding, paint stripping, surface cleaning, service, and maintenance of aerospace components, the cleanup of equipment, and the storage and disposal of solvents and waste solvent materials associated with these operations.

3.0 Definitions

- 3.1 Ablative Coating: a coating that chars when exposed to open flame or extreme temperatures, as would occur during the failure of an engine casing or during aerodynamic heating. The ablative char surface serves as an insulative barrier, protecting adjacent components from the heat or open flame.
- 3.2 Adhesion Promoter: a coating applied to a substrate in a monomolecular thickness to promote wetting and form a chemical bond with the subsequently applied material.
- 3.3 Adhesive: a substance that is used to bond one surface to another.
- 3.4 Adhesive Bonding Primer: a coating applied in a very thin film to aerospace adhesive bond detail components for corrosion inhibition and adhesion.
- 3.5 Aerosol Coating: a mixture of pigments, resins, and liquid and gaseous solvents and propellants packaged in a disposable container for hand-held application.
- 3.6 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.

- 3.7 Aerospace Material: any coating, primer, adhesive, sealant, maskant, lubricant, stripper or hand-wipe cleaning or clean-up solvent used during the manufacturing, assembly, refinishing, maintenance or service of an aerospace component.
- 3.8 Antichafe Coating: a coating applied to areas of moving aerospace components which may rub during normal operation.
- 3.9 Anti-wicking Wire Coating: the outer coating of a wire which prevents fluid wicking into the insulation of the wire.
- 3.10 APCO: as defined in Rule 1020 (Definitions).
- 3.11 ARB: California Air Resources Board.
- 3.12 ASTM: American Society for Testing and Materials.
- 3.13 Barrier Coating: a coating applied in a thin film to fasteners to inhibit dissimilar metal corrosion and to prevent galling.
- 3.14 Bearing Coating: a coating applied to an antifriction bearing, a bearing housing, or the area adjacent to such a bearing in order to facilitate bearing function or to protect the base material from excessive wear. A material shall not be classified as a bearing coating if it can also be classified as a dry lubricative material or a solid film lubricant.
- 3.15 Brush Coating: manual application of coatings using brushes and rollers.
- 3.16 Caulking and Smoothing Compounds: a semi-solid materials which are applied by hand application methods and are used to aerodynamically smooth exterior vehicle surfaces or fill cavities such as bolt hole accesses. A material shall not be classified as a caulking and smoothing compound if it can also be classified as a sealant.
- 3.17 Chemical Agent-resistant Coating (CARC): an exterior topcoat designed to withstand exposure to chemical warfare agents or the decontaminants used on these agents.
- 3.18 Chemical Milling: the removal of metal by chemical action of acids or alkalis.
- 3.19 Clear Topcoat: a clear or semi-transparent coating applied over a primer for purposes such as appearance, identification, or protection.

- 3.20 Coating: a material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.
- 3.21 Commercial Exterior Aerodynamic Structure Primer: a primer utilized for the purpose of extended corrosion protection, which is only used on the exterior of passenger and cargo doors, supporting door structures, aerodynamic components, and structures of commercial aircraft which protrude from the fuselage, such as wings and attached components, control surfaces, horizontal stabilizer, vertical fins, wing-to-body fairings, antennae, landing gear and landing gear doors.
- 3.22 Conformal Coating: a coating applied to electrical conductors and circuit boards to protect them against electrical discharge damage and/or corrosion.
- 3.23 Composite Partial Pressure: the sum of the partial pressures of the VOC compounds in a solvent. The VOC composite partial pressure is calculated as follows:

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

Where:

- W_i = Weight of the "i"th VOC compound, in grams
 W_w = Weight of water, in grams
 W_e = Weight of exempt compound, in grams
 MW_i = Molecular weight of the "i"th VOC compound, in grams per gram-mole
 MW_w = Molecular weight of water, in grams per gram-mole
 MW_e = Molecular weight of the "e"th exempt compound, in grams per gram-mole
 PP_c = VOC composite partial pressure at 20°C (68°F), in mm Hg
 VP_i = Vapor pressure of the "i"th VOC compound at 20°C (68°F), in mm Hg

- 3.24 Decorative Laminate Primer: an adhesive bonding primer which is applied to a substrate to enhance adhesion between the decorative laminate and the subsequently applied substrate, and is cured at a maximum temperature of 250°F.
- 3.25 Dip Coating: the process in which a substrate is immersed in a solution (or dispersion) containing the coating and then withdrawn.

- 3.26 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.
- 3.27 Electric-effect Coating: an electrically-conductive coating.
- 3.28 Electrodeposition: a dip coating application method where the paint solids are given an electrical charge which is then attracted to a substrate.
- 3.29 Electromagnetic Interference (EMI) Coating: a coating applied to space vehicles, missiles, aircraft radomes, and helicopter blades to disperse static energy or reduce electromagnetic interference.
- 3.30 Electronic Wire Coating: the outer electrical insulation coating applied to tape insulation of a wire specifically formulated to smooth and fill edges.
- 3.31 Electrostatic Application: a sufficient charging or atomized paint droplets to cause deposition principally by electrostatic attraction. This application shall be operated at a minimum 60 KV power.
- 3.32 EPA: United States Environmental Protection Agency.
- 3.33 Epoxy Based Fuel Tank Coating: a coating which contains epoxy resin that is applied to integral fuel tank components of aircraft to protect the fuel tank from corrosion and the by-products of bacterial growth.
- 3.34 Fastener Sealant: a sealant applied to a device used to join two or more parts together.
- 3.35 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.
- 3.36 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.
- 3.37 Flow Coating: a coating application system with no air supplied to the nozzle and where paint flows over the part and the excess coating drains back into a collection system.
- 3.38 Fuel Tank Adhesive: an adhesive used to bond components continuously exposed to fuel and which must be compatible with and used with fuel tank coatings.

- 3.39 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.
- 3.40 Grams of VOC per Liter of Coating, Less Water and Exempt Compounds: the weight of VOC content per combined volume of VOC and coating solids and can be calculated by the following equation:

$$\begin{array}{l} \text{Grams of VOC per liter of} \\ \text{coating, less water and} \\ \text{exempt compounds} \end{array} = \frac{W_s - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

Where,

W_s = weight of volatile compounds (grams)
 W_w = weight of water (grams)
 W_{ec} = weight of exempt compounds (grams)
 V_m = volume of material (liters)
 V_w = volume of water (liters)
 V_{ec} = volume of exempt compounds (liters)

- 3.41 Grams of VOC per Liter of Material: the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per liter of material} = \frac{W_s - W_w - W_{ec}}{V_m}$$

Where,

W_s = weight of volatile compounds (grams)
 W_w = weight of water (grams)
 W_{ec} = weight of exempt compounds (grams)
 V_m = volume of material (liters)

- 3.42 Hand Application Methods: the application of coatings, sealants, or adhesives, by non-mechanical hand-held equipment including but not limited to paint brushes, hand rollers, caulking guns, trowels, spatulas, syringe daubers, rags and sponges.
- 3.43 High Temperature Coating: a coating that is certified to withstand temperatures of more than 350°F.
- 3.44 High-Volume, Low-Pressure (HVLV) Spray Equipment: equipment used to apply materials by means of a spray gun which is designed and intended to be operated, and which is operated, between 0.1 and 10.0 psig of air atomizing pressure measured dynamically at the center of the air cap and at the air horns, measured dynamically at the center of the air cap and the air horns.

- 3.45 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.
- 3.46 Intermediate Release Coating: a thin coating applied beneath topcoats to assist in removing the topcoat in depainting operations and generally to allow the use of less hazardous depainting methods.
- 3.47 Lacquer: a clear or pigmented coating formulated with a nitrocellulose or synthetic resin to dry by evaporation without a chemical reaction. Lacquers are resolvable in their original solvent.
- 3.48 Liquid Leak: a visible solvent leak from a container at a rate of more than three drops per minute, or a visible liquid mist.
- 3.49 Long Term Adhesive Bonding Primer (Metal to Structural Core Bonding): an adhesive bonding primer that has met the aircraft manufacturers' required performance characteristics following 6000 hours testing, used for metal to structural core bonding, and with an adhesive that is specified to be cured at $350^{\circ}\text{F} \pm 10^{\circ}\text{F}$.
- 3.50 Maskant for Chemical Milling: a coating applied directly to an aerospace component to protect surface areas when chemical milling such component.
- 3.51 Metalizing Epoxy Coating: a coating that contains relatively large quantities of metallic pigmentation for appearance and/or added protection.
- 3.52 Mold Release: a coating applied to a mold surface to prevent the molded piece from sticking to the mold as it is removed.
- 3.53 Non-Absorbent Container: a container made of non-porous material that does not allow the migration of solvents through it.
- 3.54 Non-Leaking Container: a container without liquid leak.
- 3.55 Non-Structural Adhesive: an adhesive that bonds non-load carrying aircraft component in non-critical applications.
- 3.56 Normal Business Hours: Monday through Friday, 8:00 am to 5:00 pm.
- 3.57 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.

- 3.58 Organic Solvent: the same as "Solvent."
- 3.59 Organic Solvent Cleaning: as defined in Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal).
- 3.60 Part Marking Coating: coatings or inks used to make identifying markings on materials, components, and/or assemblies. These markings may be either permanent or temporary.
- 3.61 Phosphate Ester Resistant Wire Ink Coating: a coating that is used for surface identification or mark on aerospace wire or cable and which inhibits the corrosion caused by contact with phosphate ester type hydraulic fluids.
- 3.62 Pretreatment Coating: a coating which contains no more than 12 percent solids by weight, and at least one-half (0.5) percent acid, by weight, to provide surface etching, and is applied directly to metal surfaces to provide corrosion resistance, adhesion and ease of stripping.
- 3.63 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, adhesives, or sealants.
- 3.64 Radiation-Effect Coating: a coating which helps in the prevention of radar detection.
- 3.65 Rain Erosion Resistant Coating: a coating that protects leading edges, flaps, stabilizers, and engine inlet lips against erosion caused by rain during flight.
- 3.66 Remanufactured Aircraft Part: an aerospace component that is built as a spare part or replacement part subject to an existing commercial aircraft specification.
- 3.67 Rocket Motor Nozzle Coating: a catalyzed epoxy coating system used in elevated temperature applications on rocket motor nozzles.
- 3.68 Roll Coating: application of coatings from a paint trough to a flat surface by mechanical series of rollers.
- 3.69 Scale Inhibitor: a coating that is applied to the surface of a part prior to thermal processing to inhibit the formation of tenacious scale.
- 3.70 SCAQMD: South Coast Air Quality Management District.
- 3.71 Screen Print Ink: an ink used in screen printing processes during fabrication of decorative laminates and decals.

- 3.72 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, and is applied with a syringe, caulking gun, or spatula.
- 3.73 Silicone Insulation Material: an insulating material applied to exterior metal surfaces for protection from high temperatures caused by atmospheric friction or engine exhaust. These materials differ from ablative coatings in that they are not "sacrificial".
- 3.74 Short Term Adhesive Bonding Primer: an adhesive bonding primer that has met the manufacturers' required performance characteristics following 1000 hours testing, used for metal to metal and metal to structural core bonding, and with an adhesive which is specified to be cured at a temperature of $350^{\circ}\text{F} \pm 10^{\circ}\text{F}$.
- 3.75 Solid Film Lubricant: a very thin coating consisting of a binder system containing as its chief pigment material one (1) or more of the following: molybdenum disulfide, graphite, polytetrafluoroethylene (PTFE) or other solids that act as a dry lubricant between closely-fitting surfaces.
- 3.76 Solvent: as defined in Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal).
- 3.77 Sonic and Acoustic Applications: the use of aerospace materials on aerospace components that are subject to mechanical vibration and/or sound wave cavitation.
- 3.78 Space Vehicle Coating: a coating applied to vehicles designed to travel and operate beyond earth's atmosphere.
- 3.79 Specialized Function Coating: a coating that fulfills specific engineering requirements that are limited in application and are characterized by low volume usage. This category excludes coatings covered in other Specialty Coating categories.
- 3.80 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.
- 3.81 Structural Adhesive - Autoclavable: an adhesive used to bond load-carrying aircraft components and is cured by heat and pressure in an autoclave.
- 3.82 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.

- 3.83 Surface Cleaning: any method of cleaning outside of a degreaser, including, but not limited to, wipe cleaning and equipment flushing.
- 3.84 Temporary Protective Coating: a coating applied to an aerospace component to protect it from mechanical and environmental damage during manufacturing or shipping.
- 3.85 Thermal Control Coating: a coating formulated with specific thermal conductive or radiative properties to permit temperature control of the substrate.
- 3.86 Topcoat: a coating applied over a primer for purposes such as appearance, identification, or protection.
- 3.87 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.
- 3.88 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.
- 3.89 Volatile Organic Compounds (VOCs): as defined in Rule 1020 (Definitions).
- 3.90 Waste Solvent Material: any solvent which may contain dirt, oil, metal particles, sludge, and/or waste products, or wiping material containing VOCs including, but not limited to, paper, cloth, sponge, rag, or cotton swab used in organic solvent cleaning.
- 3.91 Wet Fastener Installation Coating: a primer or sealant applied by dipping, brushing, or daubing to fasteners that are installed before the coating is cured.
- 3.92 Wing Coating: a coating that is corrosion resistant and is resilient enough to withstand the flexing of wings.
- 3.93 Wire Prebonding Etchant: a non-additive surface treatment process to provide bondability of aerospace wire coatings to the underlying insulation layer.

4.0 Exemptions

- 4.1 Jet engine or rocket engine flushing operations using any solvent other than trichloroethylene are exempt from this rule.

- 4.2 Except for the recordkeeping provisions of Sections 6.1.1 and 6.1.4, the requirements of Section 5.0 shall not apply to aerospace assembly and component coating operations using not more than four (4) gallons of products containing VOCs per day. Solvent-containing materials used in operations subject to Rule 4662 (Organic Solvent Degreasing Operations), shall not be included in this determination.
- 4.3 Except for the provisions of Section 6.0, Section 5.0 shall not apply to laboratories which apply coatings, solvents, and adhesives to test specimens for purpose of research, development, quality control, and testing for production-related operations. Any person claiming this exemption shall provide operational records, data and calculations, as determined by the APCO to be necessary, to substantiate this claim.
- 4.4 The provisions of Section 5.1 of this rule shall not apply to:
- 4.4.1 Coatings or aerosols with separate formulations that are used in volumes of less than one (1) gallon on any day or 20 gallons in any calendar year at an aerospace assembly and component coating stationary source, or
- 4.4.2 Adhesives with separate formulations that are used in volumes of less than one half (0.5) gallon on any day or ten (10) gallons in any calendar year at an aerospace assembly and component coating stationary source.

Any operator seeking to claim the exemption in Section 4.4 shall notify the APCO in writing that substitute compliant coatings are not available.

- 4.5 The provisions of Section 5.5 shall not apply to the application of coatings that:
- 4.5.1 Contain less than 20 grams of VOC per liter of coating less water and exempt compounds, or
- 4.5.2 Are dispensed from hand-held aerosol cans.

5.0 Requirements

- 5.1 Aerospace Coatings and Adhesives: After the applicable effective date indicated in Table 1, an operator shall not apply to any aerospace component any coating, aerosol or adhesive with a VOC content, less water and exempt compounds, as applied, in excess of the limits in Table 1.

Table 1 – VOC Content Limits (Grams of VOC Per Liter of Coating [g/l], Less Water and Exempt Compounds)		
Product (VOC Containing Material)	Before January 1, 2013	On and After January 1, 2013
1. Ablative	n/a	600 ¹
2. Adhesion Promoter	850	850
3. Adhesives		
a. Non-Structural	250	250
b. Structural		
i. Autoclavable	50	50
ii. Nonautoclavable	850	850
4. Adhesive Bonding Primers		
a. New Commercial Aircraft	250	250
b. All Military Aircraft	805	805
c. Remanufactured Commercial Aircraft Parts	805	805
d. Sonic and Acoustic Applications	805	805
e. Long Term	250	250
f. Short Term	250	250
5. Antichafe Coatings	600	600
6. Barrier Topcoat	420	420
7. Bearing Coating	n/a	620 ¹
8. Caulking and Smoothing Compounds	n/a	850 ¹
9. Chemical Agent Resistant Coating	n/a	550 ¹
10. Clear Topcoat	520	520
11. Conformal Coating	750	750
12. Dry Lubricative Materials		
a. Fastener Manufacturing	120	120
b. Nonfastener Manufacturing	675	675
13. Electric/Radiation Effect Coatings	800	800
14. Electromagnetic Interference Coating	n/a	800 ¹
15. Fastener Sealants	675	600 ²
16. Fire Resistant Coatings		
a. Civilian (Interior)	650	650

Table 1 – VOC Content Limits (Grams of VOC Per Liter of Coating [g/l], Less Water and Exempt Compounds) continued		
Product (VOC Containing Material)	Before January 1, 2013	On and After January 1, 2013
17. Flight Test Coatings Used on		
a. Missiles or Single-Use Target Craft	420	420
b. All others	600	600
18. Fuel Tank Coatings		
a. General	420	420
b. Epoxy	420	420
19. Fuel Tank Adhesives	620	620
20. High Temperature Coating	850	850
21. Impact Resistant Coating	420	420
22. Intermediate Release Coating	n/a	750 ¹
23. Lacquer	n/a	830 ¹
24. Maskants - Chemical Milling	250	250
25. Metalized Epoxy Coating	n/a	740 ¹
26. Mold Release	n/a	780 ¹
27. Optical Anti-Reflective Coating	700	700
28. Part Marking Coating	n/a	850 ¹
29. Pretreatment Coatings	780	780
30. Primers		
a. General	350	350
b. Commercial Exterior Aerodynamic Structure	350	350
31. Rain Erosion Resistant Coating	800	800
32. Rocket Motor Nozzle Coating	n/a	660 ¹
33. Scale Inhibitor	880	880
34. Screen Print Ink	840	840
35. Sealant (Extrudable/Rollable/Brushable)	600	280 ³
36. Silicone Insulation Material	n/a	850 ¹
37. Solid Film Lubricants		
a. Fastener Manufacturing	250	250
b. Fastener Installation	880	880
c. Nonfastener Manufacturing	880	880
38. Space Vehicle Coatings		
a. Electrostatic Discharge Protection	800	800

Table 1 – VOC Content Limits (Grams of VOC Per Liter of Coating [g/l], Less Water and Exempt Compounds) continued		
Product (VOC Containing Material)	Before January 1, 2013	On and After January 1, 2013
b. Other Space Vehicle Coatings	1000	1000
c. Adhesives	800	800
39. Specialized Function Coating	n/a	890 ¹
40. Temporary Protective Coatings	250	250
41. Thermal Control Coating	n/a	800 ¹
42. Topcoats	420	420
43. Epoxy Polyamide	n/a	660 ¹
44. Unicoats (Self Priming Topcoats)	420	420
45. Wet Fastener Installation Coating	n/a	675 ¹
46. Wing Coating	750	750
47. Wire Coatings		
a. Electronic	420	420
b. Anti-Wicking	420	420
c. Pre-Bonding Etching	420	420
d. Phosphate Ester Resistant Ink	925	925
¹ Coatings that have been designated as “classified” by the Department of Defense or coatings that are used on space vehicles are exempt from these coating limits. ² Coatings that have been designated as “classified” by the Department of Defense or coatings that are used on space vehicles are exempt from the 600 g/l limit, but must comply with a 675 g/l limit. ³ Coatings that have been designated as “classified” by the Department of Defense or coatings that are used on space vehicles are exempt from the 280 g/l limit, but must comply with a 600 g/l limit.		

5.2 Evaporative Loss Minimization

5.2.1 Surface Cleaning: No operator shall use a solvent for surface cleaning, clean-up, or jet engine or rocket engine gas path cleaning or flushing, not exempt under Section 4.0 of this rule, excluding stripping coatings or cleaning coating application equipment, unless:

5.2.1.1 the solvent contains less than 200 grams of VOC per liter (1.67 lb/gal) of material, as applied; or

5.2.1.2 the VOC composite vapor pressure of the solvent is less than or equal to 45 mm Hg (0.87 psia) at a temperature of 68°F.

5.2.2 Coating Application Equipment Cleaning

An operator shall not use VOC-containing materials to clean spray equipment used for the application of coatings, adhesives, or ink, unless an enclosed system or equipment that is proven to be equally effective at controlling emissions is used for cleaning. If an enclosed system is used, it must totally enclose spray guns, cups, nozzles, bowls, and other parts during washing, rinsing and draining procedures, and it must be used according to the manufacturer's recommendations and must be closed when not in use.

5.2.3 In lieu of compliance with Sections 5.2.1 or 5.2.2, an operator may control VOC emissions from surface cleaning operations or from cleaning coating application equipment with a VOC emission control system that meets the requirements of Section 5.6.

5.3 Coating Strippers

5.3.1 No operator shall use or specify for use within the District a coating stripper unless it contains less than 300 grams of VOC per liter (2.5 lb/gal), as applied, or unless it has a VOC composite vapor pressure of 9.5 mm Hg (0.18 psia) or less at 68°F.

5.3.2 In lieu of compliance with Section 5.3.1, an operator may control emissions from coating stripper operations with a VOC emission control system that meets the requirements of Section 5.6.

5.4 Storage and Disposal of VOC Containing Materials: An operator shall store or dispose of fresh or spent solvents, waste solvent cleaning materials such as cloth, paper, etc., coatings, adhesives, catalysts, and thinners in closed, non-absorbent and non-leaking containers. The containers shall remain closed at all times except when depositing or removing the contents of the containers or when the container is empty.

5.5 Application Equipment Requirements: No operator shall apply coatings subject to the provisions of this rule unless one (1) of the following methods is used:

5.5.1 Electrostatic application;

5.5.2 Electrodeposition;

5.5.3 High-Volume, Low- Pressure (HVLP) spray,

5.5.3.1 High-Volume, Low-Pressure (HVLP) spray equipment shall be operated in accordance with the manufacturer's recommendations.

5.5.3.2 For HVLP spray guns manufactured prior to January 1, 1996, the end user shall demonstrate that the gun meets HVLP spray equipment standards. Satisfactory proof will be either in the form of manufacturer's published technical material or by a demonstration using a certified air pressure tip gauge, measuring the air atomizing pressure dynamically at the center of the air cap and at the air horns.

5.5.3.3 A person shall not sell or offer for sale for use within the District any HVLP spray gun without a permanent marking denoting the maximum inlet air pressure in psig at which the gun will operate within the parameters specified in Section 3.0.

5.5.4 Flow coating;

5.5.5 Roll coating;

5.5.6 Dip coating;

5.5.7 Brush coating.

5.5.8 In lieu of compliance with Sections 5.5.1 through 5.5.7, an operator may control VOC emissions from application equipment with a VOC emission control system that meets the requirements of Section 5.6.

5.6 VOC Emission Control System

As an alternative to meeting the requirements of Sections 5.1, 5.2, 5.3, or 5.5, an operator may install a VOC emission control system provided that the VOC emission control system meets all of the following requirements:

5.6.1 The VOC emission control system shall be approved by the APCO.

5.6.2 The VOC emission control system shall comply with the requirements of Sections 5.6.3 through 5.6.5 during periods of emission-producing activities.

5.6.3 The VOC control system's VOC control device shall have a control efficiency of at least 95 percent, by weight.

5.6.4 The VOC emission control system's VOC collection device(s) shall have a capture efficiency of at least 90 percent by weight.

5.6.5 In no case shall compliance through the use of a VOC emission control system result in VOC emissions in excess of the VOC emissions which would result from compliance with applicable provisions of Sections 5.1, 5.2, 5.3, or 5.5.

5.6.6 The minimum required overall capture and control efficiency of an emission control system at which an equivalent or greater level of VOC reduction will be achieved shall be calculated by using the following equation:

$$CE = \left[1 - \left(\frac{VOC_{LWc}}{VOC_{LWn,Max}} \times \frac{1 - (VOC_{LWn,Max} / D_{n,Max})}{1 - (VOC_{LWc} / D_c)} \right) \right] \times 100$$

Where:

CE = Minimum Required Overall Capture and Control Efficiency, percent

VOC_{LWc} = VOC Limit, less water and exempt compounds

VOC_{LWn,Max} = Maximum VOC content of noncompliant coating used in conjunction with a control device, less water and exempt compounds

D_{n,Max} = Density of solvent, reducer, or thinner contained in the noncompliant 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.

5.7 Prohibition of Solicitation: No person shall solicit, specify, or require an operator to use any coating, solvent, spray equipment, or VOC emission control system that does not meet the limits or requirements of this rule.

6.0 Administrative Requirements

6.1 Recordkeeping

6.1.1 An operator subject to the requirements of this rule shall have coating manufacturer's specifications, either listed on the coating container, product data sheet, or on Material Safety Data Sheets (MSDS), available for review and shall maintain daily records which show the following information as applicable:

6.1.1.1 manufacturer name and type for each coating, solvent, thinner, reducer or stripper used,

- 6.1.1.2 mix ratio, by volume, of components added to the original material prior to application,
 - 6.1.1.3 grams of VOC per liter of each coating, solvent, thinner, reducer or stripper, less water and exempt compounds, as applied,
 - 6.1.1.4 grams of VOC per liter of each solvent, thinner, reducer, or stripper,
 - 6.1.1.5 volume and method of application of each coating, solvent, thinner, reducer or stripper applied, and
 - 6.1.1.6 vapor pressure of solvents used.
- 6.1.2 An operator shall maintain records to support that the following coatings have been specified for their intended application.
- 6.1.2.1 adhesion promoter.
 - 6.1.2.2 antichafe coating.
 - 6.1.2.3 electric/radiation effect.
 - 6.1.2.4 fuel tank adhesive.
 - 6.1.2.5 high temperature coating.
 - 6.1.2.6 impact resistant coating.
 - 6.1.2.7 optical anti-reflective coating.
 - 6.1.2.8 rain erosion resistant wing coating.
- 6.1.3 An operator using a VOC emission control system pursuant to Section 5.6 as a means of complying with this rule shall maintain daily records of key system operating parameters and maintenance procedures which will demonstrate continuous operation and compliance of the VOC emission control system during periods of emission-producing activities. Key system operating parameters are those necessary to ensure compliance with VOC limits. The parameters may include, but are not limited to, temperatures, pressures, and flow rates.
- 6.1.4 An operator shall retain records for a minimum of five (5) years, make the records available on site during normal business hours to the APCO, ARB, or EPA, and submit the records to the APCO, ARB, or EPA upon request.
- 6.2 Test Methods
- 6.2.1 Coating VOC content and solvent VOC content shall be determined using EPA Method 24 or its constituent methods. The VOC content of coatings

containing exempt halogenated VOCs shall be determined by using the ARB Method 432 or SCAQMD Method 303 (Determination of Exempt Compounds).

- 6.2.2 The solid content of pretreatment coatings shall be determined using EPA Method 24. The acid content of pretreatment coatings shall be determined using ASTM Method D1613 06 (Standard Test for Acidity of Volatile Solvents and Chemical Intermediates used in Paint, Varnish, Lacquer and Related Products).
- 6.2.3 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.
- 6.2.4 The VOC composite vapor pressure of a blended solvent shall be determined by quantifying the amount of each organic compound in the blend using gas chromatographic analysis SCAQMD Test Method 308 (Quantitation of Compounds by Gas Chromatography) and by calculating the VOC composite vapor pressure of the solvent by summing the product of the vapor pressure of each pure component and its molar fraction. For the purpose of this calculation, the blend shall be assumed to be an ideal solution where Raoult's Law applies. The vapor pressure of each pure component shall be obtained from published reference manuals or handbooks.
- 6.2.5 The VOC emissions from enclosed systems used to clean coating application equipment shall be determined by the manufacturer using the SCAQMD General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems.
- 6.2.6 The control efficiency of a VOC emission control system's control device(s) shall be determined using EPA Methods 2, 2A, 2C, or 2D for measuring flow rates and EPA Methods 25, 25A, or 25B for measuring the total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or ARB Method 422 shall be used to determine the emissions of exempt compounds.
- 6.2.7 The capture efficiency of a VOC emission control system's collection device(s) shall be determined according to EPA's "Guidelines for Determining Capture Efficiency," January 9, 1995 and 40 CFR 51, Appendix M, Methods 204-204F, as applicable, or any other method approved by EPA, ARB, and the APCO.

- 6.2.8 When more than one test method or set of test methods are specified for any emissions testing, a violation of any test established in Section 6.2 shall constitute a violation of the rule.

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**RULE 66.1 MISCELLANEOUS SURFACE COATING OPERATIONS AND
OTHER PROCESSES EMITTING VOLATILE ORGANIC
COMPOUNDS (Adopted 2/24/10)**

(a) APPLICABILITY

(1) This rule is applicable to all surface coating, solvent cleaning or other operations or processes that may result in emissions of VOCs and are not subject to or exempt from, the following rules:

- 67.0 - Architectural Coatings;
- 67.2 - Dry Cleaning Equipment Using Petroleum Based Solvents;
- 67.3 - Metal Parts and Products Coating Operations;
- 67.4 - Metal Container, Metal Closure and Metal Coil Coating Operations;
- 67.5 - Paper, Film and Fabric Coating Operations;
- 67.6.1 - Cold Solvent Cleaning and Stripping Operations;
- 67.6.2 - Vapor Degreasing Operations;
- 67.9 - Aerospace Coating Operations;
- 67.10 - Kelp Processing and Bio-Polymer Manufacturing Operations;
- 67.11 - Wood Products Coating Operations;
- 67.11.1 - Large Coating Operations for Wood Products;
- 67.12 - Polyester Resin Operations;
- 67.15 - Pharmaceutical and Cosmetic Manufacturing Operations;
- 67.16 - Graphic Arts Operations;
- 67.18 - Marine Coating Operations;
- 67.19 - Coatings and Printing Inks Manufacturing Operations;
- 67.20 - Motor Vehicle and Mobile Equipment Refinishing Operations;
- 67.21 - Adhesive Materials Application Operations;
- 67.24 - Bakery Ovens;
- 61.1 through 61.8 – Vapor Recovery Rules;
- 68 through 69.4.1 – Rules Regulating Combustion Sources.

(2) Section (g) of this rule is applicable to any manufacturer, seller or supplier of any coating, coating component, solvent cleaning material, or any other VOC containing material that is used in an operation that may be subject to this rule.

(b) EXEMPTIONS

(1) This rule shall not apply to the following:

(i) Surface coatings, surface preparation or solvent cleaning materials applied using hand-held non-refillable aerosol spray containers.

(ii) Any surface coating operation where 20 gallons or less of surface coatings are applied per consecutive 12-month period. To claim applicability of this exemption monthly coating usage records shall be maintained on site for three years and made available to the District upon request.

(iii) Any surface coating or other VOC emitting operation where the total VOC emissions, excluding emissions from cleaning or surface preparation materials, are 150 lbs or less per consecutive 12-month period. To claim applicability of this exemption all records necessary to calculate VOC emissions shall be maintained on site for three years and made available to the District upon request.

(iv) The use of pesticides, including insecticides, rodenticides or herbicides.

(v) Research and development operations or testing for quality control or quality assurance purposes.

(vi) Operations involved in the manufacture of biotechnology pharmaceutical and bio-agricultural products that are exempt from the District permit to operate requirements by Rule 11, Section (d).

(vii) Laboratory operations located at secondary schools, colleges, or universities and used exclusively for instruction.

(viii) Touch-up operations.

(ix) Stripping of cured inks, coatings and adhesives.

(x) Digital printing operations.

(xi) Any solvent cleaning, including wipe cleaning, or surface preparation of electrical or electronic components, medical devices, laser optics or precision optics components.

(2) Subsection (d)(2) and Section (f) shall not apply to

(i) Any solvent cleaning, including wipe cleaning, of aerospace components not associated with a surface coating operation and provided that the cleaning material complies with the requirements of Rule 67.9, Subsection (d)(4).

(ii) Any solvent cleaning, including wipe cleaning, performed in conjunction with welding of 5XXX series aluminum structures for Navy ships and in accordance with quality assurance standards for such structures.

(iii) Any cleaning or surface preparation operation, including wipe cleaning, necessary to achieve the required purity of surfaces for precision welding or thermal spray operations used in the manufacture of gas turbine engines, provided that the combined total amount of such cleaning materials used for these operations at the stationary source does not exceed 50 gallons per consecutive 12-months.

(iv) Any cleaning or surface preparation operation, including wipe cleaning, where not more than 20 gallons of cleaning materials are used per consecutive 12-months, provided that the total amount of non-compliant cleaning materials used at the stationary source does not exceed 20 gallons per consecutive 12-months; or

(v) Any cleaning or surface preparation operation, including wipe cleaning, where the VOC emissions from cleaning materials do not exceed 150 lbs per consecutive 12-months, provided that the total VOC emissions from non-compliant cleaning materials used at the stationary source do not exceed 150 lbs per consecutive 12-months.

To claim the applicability of the exemptions in Subsection (b)(2), all records of monthly purchase or usage of cleaning materials, their VOC content, vapor pressure, or any other data necessary to calculate VOC emissions, as applicable, shall be maintained on site for three years and made available to the District upon request.

(c) **DEFINITIONS**

For the purpose of this rule the following definitions shall apply:

(1) **"Aerospace Component"** means any raw material, partial or completed fabricated part, assembly of parts or completed unit of any aircraft, helicopter, missile or space vehicle, including mockups, test panels and prototypes.

(2) **"Air-Dried Coating"** means any coating that is not heated above 90°C (194°F) for the purpose of curing or drying.

(3) **"Baked Coating"** means any coating that is cured or dried in an oven where the oven air temperature exceeds 90°C (194°F).

(4) **"Coating"** means a material which can be applied as a thin layer to a substrate, and which either dries or cures to form a continuous solid film or impregnates a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, lacquers, and stains but exclude adhesives.

(5) **"Digital Printing Operation"** means an operation that uses a printing device guided by a computer-driven machine to transfer an electronic image to a substrate through the use of inks, toners, or other graphic materials. Digital printing operations also include associated surface preparation, solvent cleaning, and the cleaning of application equipment.

(6) **"Dip Coat"** means a coating application method accomplished by dipping an object into the coating material.

(7) **"Electrical Components"** means internal components such as wires, windings, stators, rotors, magnets, contacts, relays, energizers, and connections in an apparatus that generate or transmit electrical energy including, but not limited to, generators, transformers, and electric motors.

(8) **"Electronic Components"** means components or assemblies of components including, but not limited to, circuit card assemblies, printed wire assemblies, printed circuit boards, soldered joints, ground wires, bus bars, and other electrical fixtures, except for the cabinet in which the components are to be housed.

(9) **"Electrostatic Spray"** means a coating application method accomplished by charging atomized paint particles for deposition by electrostatic attraction.

(10) **"Exempt Compound"** means the same as defined in Rule 2.

(11) **"Existing Operation or Process"** means a surface coating operation or other process emitting VOCs for which a complete application for an Authority to Construct in San Diego County was submitted before February 24, 2010. Wipe cleaning operations that are exempt from permit requirements per Rule 11 before February 24, 2010, are considered existing operations.

(12) **"Flow Coat"** means a coating application method accomplished by flowing a stream of coating over an object.

(13) **"Hand Application Method"** means a coating application method accomplished by applying a coating by manually held, non-mechanically operated equipment. Such equipment includes, but is not limited to, paintbrushes, hand rollers, rags and sponges.

(14) **"High-Volume Low-Pressure (HVL) Spray"** means a coating application method which uses pressurized air at a permanent pressure between 0.1 and 10.0 psig, not to exceed 10.0 psig, measured at the air cap of the coating application system.

(15) **"Low-Solids Coating"** means a coating containing one pound of solids or less per gallon of material, as supplied.

(16) **"Medical Device"** means an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent or other similar article including any component or accessory, that is intended for use in the diagnosis of disease or other conditions or in the cure, mitigation, treatment, or prevention of disease, or is intended to affect the structure or any function of the body.

(17) **"New Operation or Process"** means a surface coating operation or other process emitting VOCs for which a complete application for an Authority to Construct in San Diego County was submitted on or after February 24, 2010.

(18) **"Organic Solvent"** means any substance containing an organic compound or combination of organic compounds which is liquid at atmospheric pressure and ambient temperature and which is used as a reactant, diluent, thinner, dissolver, viscosity reducer, or cleaning agent, or for other similar purposes.

(19) **"Operation"** means any process that includes one or more pieces of equipment linked by the process flow and resulting in a product that cannot be made if any piece of equipment is removed or not functioning.

(20) **"Precision Optics Components"** means the components used to create high resolution images in optical devices.

(21) **"Research and Development Operation"** means a small scale operation for the purpose of creating new or improved processes or products, that is conducted by technically trained personnel under the supervision of a research director, and is not used in the manufacture of products for sale or exchange for commercial profit, other than the first-article deliverable product.

(22) **"Roll Coat"** means a coating application method accomplished by rolling a coating onto a flat surface using a roll applicator.

(23) **"Solvent"** means any organic solvent.

(24) **"Source"** means any article, machine, equipment, contrivance, operation or a group of such articles, machines, equipment, contrivances or operations that emits or may emit volatile organic compounds.

(25) **"Solvent Cleaning"** means the removal of uncured adhesives, inks, coatings, and other contaminants such as dirt, soil, and grease from parts, products, tools, machinery, equipment or general work area.

(26) **"Surface Preparation"** means the cleaning of surfaces by utilizing cleaning materials containing VOCs prior to coating, further treatment, sale or intended use.

(27) **"Surface Coating" or "Surface Coating Operation"** means all steps involved in the application, drying and curing of coatings.

(28) **"Touch-up Operation"** means the portion of a surface coating operation which is incidental to the main coating process but necessary to cover minor imperfections or minor mechanical damage incurred prior to intended use.

(29) **"Volatile Organic Compound (VOC)"** means the same as defined in Rule 2.

(30) **"VOC Content per Volume of Coatings, Less Water and Exempt Compounds"** means the weight of VOC per combined volume of VOC and coating solids and is calculated by the equation provided in Rule 2.

(31) **"VOC Content per Volume of Cleaning Material or Low-Solids Coating"** means the weight of VOC per volume of cleaning material or low-solids coating and is calculated by the equation provided in Rule 2.

(32) **"Wipe Cleaning"** means a method of surface preparation or solvent cleaning that is not conducted in a container but performed by physically rubbing the surface with a material such as a rag, paper, sponge or cotton swab moistened with a cleaning material.

(d) **STANDARDS**

(1) Surface Coating and Other Operations

A person shall not conduct any surface coating or other operation, excluding surface preparation and solvent cleaning operations, that may result in emissions of volatile organic compounds unless one of the following requirements is satisfied:

(i) VOC emissions from such operation are less than 5 tons per calendar year, excluding emissions from cleaning operations; or

(ii) VOC emissions are reduced by air pollution control equipment in compliance with all the applicable requirements of Section (e); or

(iii) a surface coating operation is conducted by using air-dried coatings with a VOC content not higher than 420 grams/liter (3.5 lbs/gal) of coating, less water and exempt compounds, as applied, or by using baked coatings with a VOC content not higher than 360 grams/liter (3.0 lbs/gal) of coating, less water and exempt compounds, as applied.

(2) Surface Preparation and Solvent Cleaning Operations

A person shall not conduct a surface preparation or solvent cleaning operation, including wipe cleaning but excluding cleaning of coating application equipment, unless the VOC content of cleaning material is 50 grams/liter (0.42 lbs/gal), or less as used, or the total VOC vapor pressure of cleaning material is 8 mm Hg at 20°C (68°F) or less.

(3) Application Equipment for Surface Coating Operations.

(i) Coating Application Methods.

No surface coatings shall be applied unless one of the following application methods is used:

(A) Hand application method, or

(B) Dip coat, or

(C) Roll coat, or

(D) Flow coat, or

(E) Electrostatic spray, or

(F) High-volume low-pressure (HVLP) spray. Facilities using HVLP spray shall have available on site pressure gauges in proper operating conditions to measure air pressure at the air cup, or have manufacturer's information regarding the correlation between the air cap pressure and the handle inlet pressure, or

G) Other coating application methods that are demonstrated to have a transfer efficiency equal at a minimum to one of the above application methods, and which are used in such a manner that the parameters under which they were tested are permanent features of the method. Such coating application methods shall be approved in writing by the Air Pollution Control Officer prior to use.

(ii) **Cleaning of Coating Application Equipment**

A person shall not use VOC containing materials for the cleaning of coating application equipment used in operations subject to this rule unless:

(A) The cleaning material contains 50 grams or less of VOC per liter of material; or

(B) The cleaning material is flushed or rinsed through the application equipment in a contained manner that will minimize evaporation into the atmosphere; or

(C) The application equipment or equipment parts are cleaned in a container which is open only when being accessed for adding, cleaning, or removing application equipment or its parts and provided that the cleaned equipment or its parts are drained to the container until dripping ceases; or

(D) A system is used that totally encloses the component parts being cleaned during the washing, rinsing, and draining processes.

(e) **CONTROL EQUIPMENT**

(1) In lieu of complying with the provisions of Section (d) of this rule, an owner/operator may use an air pollution control system which:

(i) Has been installed in accordance with an Authority to Construct; and

(ii) Has a combined emissions capture and control device efficiency of at least 85% by weight.

(2) A person electing to use control equipment pursuant to Subsection (e)(1) shall submit to the Air Pollution Control Officer for approval an Operation and Maintenance plan for the proposed emission control device and emission collection system and receive approval prior to operation of the control equipment. Thereafter, the plan can be modified, with Air Pollution Control Officer approval, as necessary to ensure compliance. Such plan shall:

(i) Identify all key system operating parameters. Key system operating parameters are those necessary to ensure compliance with Subsection (e)(1)(ii), such as temperature, pressure and/or flow rate; and

(ii) Include proposed inspection schedules, anticipated ongoing maintenance, and proposed recordkeeping practices regarding the key system operating parameters.

(3) Upon approval by the Air Pollution Control Officer, a person subject to the requirements of Section (e) shall implement the Operation and Maintenance plan and shall comply thereafter with the provisions of the approved plan.

(f) RECORDKEEPING REQUIREMENTS

(1) Any person conducting operations subject to this rule shall maintain a current list of each coating, solvent, or other VOC containing material in use, which provides the VOC content and all other data necessary to evaluate compliance, including but not limited to:

(i) Manufacturer name and identification for each material containing VOCs; and

(ii) For coatings, other than low-solid coatings, the VOC content expressed in grams per liter (lbs/gal), less water and exempt compounds, as applied and mix ratio of components, if applicable; and

(iii) Actual oven drying temperature, if applicable; and

(iv) For surface preparation and cleaning materials or for low-solid coatings, the VOC content expressed in grams per liter (lbs/gal) of cleaning material or low-solids coating as used, and density and mix ratio of components, if applicable; and

(v) For other materials containing VOCs, other than surface coatings, surface preparation or cleaning materials, the VOC concentration per weight or volume of material.

(2) In addition, any person conducting operations subject to this rule shall:

(i) Maintain monthly records of the amount of each coating used; and

(ii) Maintain monthly inventory, purchasing or dispensing records for each surface preparation and cleaning material or other VOC containing materials used.

(3) In addition, any person using control equipment pursuant to Section (e) of this rule shall maintain daily records of key system operating parameters as approved in the Operation and Maintenance plan pursuant to Subsection (e)(2). Such records shall be sufficient to document continuous compliance with Subsection (e)(1)(ii) during periods of emission producing activities.

(4) All records shall be retained onsite for at least three years and made available to the District upon request.

(g) MANUFACTURER AND SUPPLIER INFORMATION

Any person, who manufactures, sells, offers for sale, or supplies to users in San Diego County any coating, coating component, solvent cleaning material, or any other VOC containing material that is used in an operation that may be subject to this rule shall provide the following information to customers:

(1) The manufacturer's name and identification of each coating or coating component, surface preparation material, equipment cleaning material or any other material containing VOCs; and

(2) The VOC content of coatings, as supplied, expressed in grams per liter or pounds per gallon, less water and exempt compounds; and

(3) The VOC content of low-solid coatings, as supplied, surface preparation or solvent cleaning materials or any other materials containing VOCs in grams per liter or pounds per gallon; and

(4) Any other necessary information enabling a user to comply with the requirements of Section (d) of this rule.

(h) TEST METHODS

When more than one test method or set of test methods are specified in this Section, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of the rule.

(1) The VOC content of coatings containing more than 50 grams of VOC per liter of material shall be determined by the Environmental Protection Agency (EPA) Reference Method 24 (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings, 40 CFR Part 60, Appendix A) or by the South Coast Air Quality Management District Method 304 (Determination of Volatile Organic Compounds in Various Materials) as they exist on February 24, 2010.

(2) The VOC content of solvents or coatings containing 50 grams of VOC per liter of material or less shall be determined by the South Coast Air Quality Management District (SCAQMD) Method 313 (Determination of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry), SCAQMD Method 308 (Quantification of Compounds by Gas Chromatography) as they exist on February 24, 2010, or any other alternative test methods approved by EPA, California Air Resources Board, and the Air Pollution Control Officer.

(3) The content of methyl acetate, acetone and parachlorobenzotrifluoride shall be determined in accordance with the ASTM Test Method D6133-02 (2008) (Standard Test Method for Acetone, p-Chlorobenzotrifluoride, Methyl Acetate or t-Butyl Acetate Content of Solventborne and Waterborne Paints, Coatings, Resins, and Raw Materials by Direct Injection Into a Gas Chromatograph), or its most current version.

(4) Calculation of total VOC vapor pressure for materials subject to Subsection (d)(2) of this rule shall be conducted in accordance with the District's "Procedures for Estimating the Vapor Pressure of VOC Mixtures." If the vapor pressure of the liquid mixture, as calculated by this procedure, exceeds the limits specified in Subsection (d)(2), the vapor pressure shall be determined in accordance with ASTM Standard Test Method D2879-97(2007) (Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope), or its most current version.

(5) Measurements of transfer efficiency pursuant to Subsection (d)(3)(i)(G) of this rule shall be conducted in accordance with the SCAQMD "Spray Equipment Transfer Efficiency Test Procedure for Equipment User," as it exists on February 24, 2010. The equivalency of coating application equipment pursuant to Subsection (d)(3)(i)(G) shall be determined by the SCAQMD "Guidelines for Demonstrating Equivalency with District Approved Transfer Efficient Spray Guns" as they exist on February 24, 2010.

(6) The overall control efficiency of air pollution control equipment operated pursuant to Subsection (e)(1)(ii) shall be determined by multiplying the capture efficiency of the emission collection system by the control efficiency of the air pollution control device. The control efficiency of the air pollution control device shall be determined using EPA Test Methods 25A and/or 18 (40 CFR Part 60, Appendix A) and in accordance with a protocol approved by the Air Pollution Control Officer.

(7) Capture efficiency shall be determined according to EPA Test Method 204 and technical document, "Guidelines for Determining Capture Efficiency," dated January 9, 1995. Subsequent to the initial compliance demonstration period, appropriate key system operating parameters as approved by the Air Pollution Control Officer may be used as indicators of the performance of the emission control system.

(i) COMPLIANCE SCHEDULE

(1) All new operations or processes subject to this rule shall comply with all applicable requirements upon initial startup.

(2) All existing operations or processes subject to this rule shall comply with all applicable requirements no later than February 24, 2011.

(3) The owner or operator of an existing operation that chooses to comply with the rule by installing air pollution control equipment pursuant to Section (e) of this rule shall:

(i) By August 24, 2010, submit to the Air Pollution Control Officer an application for an Authority to Construct and a Permit to Operate an air pollution control system as specified in Section (e).

(ii) By August 24, 2011, comply with all applicable rule requirements.