SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Staff Report

Proposed Amended Rule 1124 – Aerospace Assembly and Component Manufacturing Operations

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EXECUTIVE SUMMARY

Rule 1124 – Aerospace Assembly and Component Manufacturing Operations (Rule 1124) was adopted in July 1979 to limit Volatile Organic Compound (VOC) emissions from aerospace coatings, adhesives, sealants lubricants, maskants, and cleaning solvents used in manufacturing, and maintenance. This rule applies to facilities that use aerospace materials in the production, repair, and servicing of aerospace components, including commercial and military aircraft, satellites, space shuttles, and rocket manufacturers and their subcontractors. Over time, Rule 1124 has been amended to reduce VOC limits, align with the United State Environmental Protection Agency (U.S EPA) National Aerospace Coating Rule, and support South Coast Air Quality Management District (South Coast AQMD) overall VOC emission reduction efforts.

To meet increasingly stringent VOC limits, aerospace materials have been reformulated using VOC-exempt solvents, most notably *para*-chlorobenzotrifluoride (pCBtF; Chemical Abstracts Service Registration Number (CAS RN): 98-56-6) and *tert*-butyl acetate (t-BAc; CAS RN: 540-88-5). Subsequent toxicological evaluations conducted by the Office of Environmental Health Hazard Assessment (OEHHA) determined that both compounds have toxic endpoints, with cancer potency values comparable to or greater than other compounds already prohibited in South Coast AQMD rules. In response to the findings, the South Coast AQMD Stationary Source Committee directed staff to address these two toxic solvents. PAR 1124 proposes to phase out pCBtF and t-BAc from aerospace coating materials while providing feasible compliance pathways for the aerospace industry. In addition, PAR 1124 partially implements 2022 Air Quality Management Plan (AQMP) control measure CTS-01 – Further Emission Reductions from Coatings, Solvents, Adhesives, and Lubricants.

To determine the extent of pCBtF and t-BAc use in aerospace material, staff conducted a manufacturer survey which showed pCBtF usage in four categories: primers, topcoats, sealants and maskants, whereas t-BAc is used in a smaller subset of topcoat categories. Adhesives, lubricants, and cleaning solvents did not report any use of exempt solvents. Industry stakeholders expressed concern regarding coating reformulation efforts, which have significant challenges for aerospace coatings including rigorous qualification and recertification processes to meet military or original equipment manufacturer (OEM) specifications. Coating manufacturers stated reformulations efforts can take decades.

To address the challenges and balance public health protection, staff is proposing a two-tiered alternative compliance framework which will classify the aerospace materials used into two levels. Level I materials are those that do not rely on pCBtF or t-BAc or have readily available alternatives; Level II materials are those that do rely on pCBtF or t-BAc in their formulation. Level I materials will be subject to a future effective prohibition with allowed sell-through and use-through periods to address stranded asset concerns in the supply chain. Level II materials containing pCBtF or t-BAc will be permitted to be sold and used in the South Coast AQMD, and local shops that apply aerospace materials will be provided three compliance pathways designed to protect public health but allow for the use of certain critical aerospace coatings that contain pCBtF or t-BAc.

The three proposed compliance options for Level II materials are summarized below.

- **Option 1 – Air Pollutions Control System:** Allows for continued use of Level II materials if emissions are fully vented to an air pollution control device that achieves a minimum of

95 percent control efficiency and complies with receptor-based annual usage limits specified in the rule.

- **Option 2 – Low-Use Provision:** Provide a low-use pathway for facilities that apply small quantities of Level II materials. Facilities may either limit total Level II usage to 1.25 gallons per year or obtain an annual usage limits specified in the rule.
- **Option 3 – Phase-out of pCBtF and t-BAc:** Facilities may elect to transition to aerospace materials that do not contain pCBtF- and/or t-BAc- within a specified prohibition and use-through timeframe. Unless a facility applies for Option 1 or Option 2, it will default to this phase-out compliance option**.**

CHAPTER 1 : BACKGROUND

INTRODUCTION
REGULATORY HISTORY
AFFECTED INDUSTRIES
PUBLIC PROCESS

Introduction

Rule 1124 – Aerospace Assemble and Component Manufacturing Operations is a source specific rule that was originally adopted on July 6, 1979, to reduce emissions of volatile organic compounds (VOCs) from aerospace manufacturing and coating applications. Rule 1124 establishes VOC content limits for eight primary categories and 55 subcategories which include adhesives, sealants, lubricants, maskants, and solvent cleaning materials used in aerospace manufacturing, rework, and maintenance. The rule applies to any person or facility that uses, supplies, sells, or applies aerospace materials within the South Coast Air Basin during the production, repair, or servicing of aerospace components, including military, commercial, and space-related operations.

Over time, amendments to Rule 1124 have aligned VOC limits with U.S. EPA's National Aerospace Coating Rule, military and original equipment manufacturer (OEM) material specifications, and South Coast AQMD's broader VOC reduction initiatives. To meet increasingly stringent VOC limits, manufacturers have relied on exempt solvents, particularly pCBtF and t-BAc. These solvents are considered as exempt because they are excluded from the definition of VOC; therefore, their use does not count toward the VOC content of an aerospace material, allowing manufacturers to formulate products that comply with VOC limits.

In April 2017, the South Coast AQMD Stationary Source Committee recommended a precautionary approach when considering exempt compounds with potential toxic endpoints by prioritizing reducing toxic exposure over reduction VOC emissions. The California Office of Environmental Health Hazard Assessment (OEHHA) determined pCBtF and t-BAc, have toxic endpoints; therefore, the South Coast AQMD has been working to phase out of, or minimize the exposure to, pCBtF and t-BAc. The current rule development has two primary goals: 1) phase-out of pCBtF and t-BAc in aerospace materials where feasible, and 2) to limit the use of, or require add-on air pollution control systems, for materials where phasing out of pCBtF and t-BAc is not feasible.

Regulatory History

Rule 1124 was adopted on July 6, 1979, and has been subsequently amended 19 times, most recent amendment occurred in 2001 and included updates to support the continued implementation of VOC limits across a broad range of aerospace materials. Earlier amendments were adopted to incorporate scheduled VOC content reductions, clarify applicability, and align the rule with advances in low emission coating technologies and evolving federal requirements, including the U.S. EPA National Aerospace Coating Rule. Previous amendments, most notably those adopted in 1992, 1993, and 1996, were designed to facilitate the transition toward lower-emitting materials by allowing the continued use of then-existing compliant technologies while industry reformulated products to meet future limits.

Background on t-BAc and pCBtF

pCBtF was originally exempted from the definition of a VOC by the U.S. EPA in 1994, and in 2004, South Coast AQMD added pCBtF as an exempt VOC compound under Rule 102. This exemption means that pCBtF is not considered a VOC for any application within the South Coast AQMD. In the same year, the U.S. EPA also exempted t-BAc from the VOC definition. However, due to toxicity concerns, the South Coast AQMD did not grant a full Rule 102 exemption for t-BAc and instead allowed for limited use in source-specific rules such as Rules 1113 and 1151.

Stakeholders representing the regulated industry continued seeking to expand the exemption status for t-BAc; in 2014, staff paused VOC rule amendments to focus on assessing the health risk posed by t-BAc. In 2016, staff initiated a public process and released a final **Draft t-BAc Assessment White Paper**. In 2017, staff presented the toxicity concerns for t-BAc and the lack of a toxicity evaluation for pCBtF to the Stationary Source Committee. The Stationary Source Committee directed staff to take a precautionary approach for exempt compounds identified by OEHHA to have toxic endpoints and asked staff to request OEHHA evaluate pCBtF. In 2018, OEHHA finalized the assessment of t-BAc, identifying it as a potential carcinogen and in 2020, OEHHA also identified pCBtF as a potential carcinogen.

South Coast AQMD staff began amending VOC rules in 2022, beginning with Rule 1168 – Adhesive and Sealant Applications (Rule 1168), and modeling confirmed that pCBtF and t-BAc would pose health risks to sensitive receptors near adhesive application projects, specifically for roofing projects. Further, staff concluded that both pCBtF and t-BAc exhibit toxicities comparable to chemicals that are already prohibited in some VOC rules; therefore, proposed prohibiting their use. Since Rule 1168, staff also amended Rule 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operation; Rule 1171 – Solvent Cleaning Operations; and Rule 1107 – Coating of Metal Parts and Products to phase out the use of pCBtF and t-BAc and is currently working to address their use in all the South Coast AQMD VOC rules.

Affected Industries

This rule is applicable to any person who supplies, sells, offers for sale, markets, manufactures, blends, packages, repackages, possesses, or distributes any aerospace material for use within the South Coast AQMD, as well as any person who uses, applies, or solicits the use or application of any aerospace material within the South Coast AQMD. The affected industries include commercial and military aircraft, satellites, and 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.

To determine the number of facilities subject to Rule 1124, staff conducted an analysis using an internal database, which identified 393 facilities within the South Coast AQMD jurisdiction that were permitted to use materials subject to Rule 1124. Table 1-1 – Rule 1124 facilities, shows the distribution of these facilities across the four counties. These facilities encompass a range of industries, including but not limited to commercial and military aircraft manufacturing, aircraft maintenance and repair operations, space vehicle and satellite production, aerospace component and subassembly fabrication, surface treatment and finishing operations, and precision manufacturing activities that support the broader aerospace supply chain.

Table 1-1: Rule 1124 Facilities

County	Active Facilities	Percentage
Los Angeles	259	66%
Orange	92	23%
Riverside	18	4%
San Bernardino	24	6%
Total	393	100%

Process Description

Rule 1124 is applicable to any operation associated with manufacturing and assembling products for Aircraft and Space Vehicles for which an Aerospace Material is used

Aerospace materials are integral to the production, repair, maintenance, and servicing of aircraft, spacecraft, satellites, and related components. These materials serve a variety of functions, including corrosion protection, structural bonding, environmental sealing, surface preparation, and surface finishing, all of which are critical to ensuring the safety, performance, and longevity of aerospace systems.

A key aspect of aerospace manufacturing is the use of military specification (mil-spec) materials, which are formulated to meet highly specialized performance, safety, and durability requirements defined under federal procurement standards (e.g., MIL-PRF, MIL-DTL, and AMS specifications). These materials must undergo rigorous qualification and certification processes to demonstrate compliance and as such many aerospace platforms, including commercial aircraft, military vehicles, and space systems, rely on materials qualified under these specifications.

Public Process

The current rule amendment process began in July 2024. Staff conducted five working group meetings and multiple individual meetings with industry stakeholders and representatives. In addition, staff distributed a survey to the coating manufacturers requesting product data for each aerospace material category. The table below summarizes the key topics discussed at each of the Working Group Meetings; presentations from those meetings are posted on the South Coast AQMD's website.[1]

[1] http://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1124

Table 1-2: Working Group Meetings

Meeting title	Date	Highlights
Working Group Meeting #1	July 3, 2024	• Rule background • Key amendment objectives • Exempt solvent background
Working Group Meeting #2	August 16, 2024	• Amendment progress update • Coating manufacturer survey
Working Group Meeting #3	December 6, 2024	• Amendment progress update • Coating manufacturer survey data analysis
Working Group Meeting #4	September 5, 2025	• Amendment progress update • Initial Rule Concepts • VOC control technology
Working Group Meeting #5	November 19, 2025	• Amendment progress update • Rule concepts • Initial Preliminary Draft Rule Language

Additionally, staff conducted several site visits where various topics were discussed, including the types of aerospace materials used in the South Coast AQMD to gain a deeper understanding of aerospace industry operations and logistics. A summary of the site visits is provided in the table below.

Table 1-3: Site Visits

Stakeholder	Date
Denmac Industries Inc	July 25, 2024
The Boeing Company	July 21, 2024
Northrop Grumman	August 13, 2024
Hyatt Die Cast	August 22, 2024
United Airlines Inc	September 12, 2024
Raytheon Company	October 2, 2024
The Boeing Company	January 10, 2025
Precision Aerospace Corporation	March 26, 2025
Aviation Equipment Processing	April 23, 2025
Anadite Inc	May 14, 2025
Ducommun Aerostructures	June 17, 2025

CHAPTER 2 : TECHNOLOGY ASSESSMENT

AEROSPACE MATERIALS MANUFACTURER pCBtF and t-BAc SURVEY

AEROSPACE MATERIALS AND USE of pCBtF and t-BAc

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Aerospace Materials Manufacturer pCBtF and t-BAc Survey

To understand the extent of the use of pCBtF and t-BAc to comply with the VOC limits in Rule 1124, staff conducted a survey, in August 2024, of manufacturers who sell aerospace materials subject to Rule 1124. The main compounds of interest in the survey were pCBtF and t-BAc. The results of the survey were used to help evaluate VOC content limits, VOC emissions, a potential prohibition timeline, and future effective VOC content limits. The table below shows the survey questions.

Table 2-1: Aerospace Materials Survey Questions

Requested Information	
1.	Company name, contact person, and an email address
2.	Product name
3.	Product category
4.	VOC content of product (regulatory and actual)
5.	Is the product water or solvent based
6.	Percent content of pCBtF and/or t-BAc
7.	Annual sold volume and if that volume represents South Coat AQMD or California

In total, three aerospace materials manufacturers responded to the survey distributed as part of the PAR 1124 rule development process including PPG, AkzoNobel, and 3M. Rule 1124 currently includes eight main categories encompassing 55 subcategories, covering topcoats, primers, adhesives, sealants, lubricants, maskants, and cleaning solvents. The following summarizes the major findings of the survey:

- A total of 329 aerospace products were reported to be sold within the South Coast AQMD jurisdiction. The table below summarizes the main product categories identified in the survey and the number of products reported within each category.

Table 2-2: Summary of the Number of Products Reported in Survey

Category	# of Products Reported
Primer	27,122
Topcoats	418
Sealants	9,922
Adhesives	154

- Three of the eight aerospace material categories were reported to contain pCBtF and/or t-BAc including primers, topcoats, and sealants. After the survey deadline, staff was contacted by a maskant manufacturer, who reported that certain maskant formulations also contain pCBtF expanding the number to four main categories.

- pCBtF was present in three of these main categories; primers, topcoats, and sealants, while t-BAc was reported only in topcoats.

- Within the primer category, both general primers and adhesion promoters were reported to contain pCBtF and no t-BAc. Approximately 51 percent of general primers contained pCBtF, representing the largest reported sales volume among all subcategories, while adhesion promoters were sold in low volumes but also relied on pCBtF to meet VOC limits. The figure below compares the sales volume of products containing pCBtF to those formulated without this solvent.

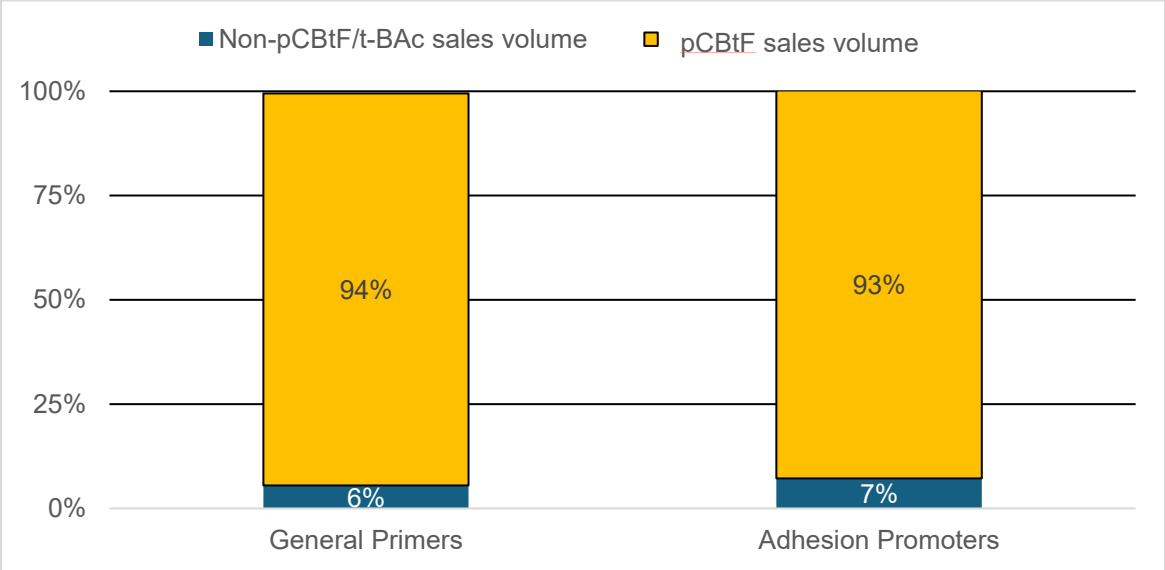

Figure 2-1 Sales Volume Percentage of pCBtF and non-pCBtF Products for Primer Category

For topcoats, approximately 71 percent of the reported products contained pCBtF, and 22 percent contained t-BAc. pCBtF was reported as the predominant exempt solvent in topcoat formulations. The chart below compares the products that contain pCBtF versus the ones that do not contain this solvent by sales volume.

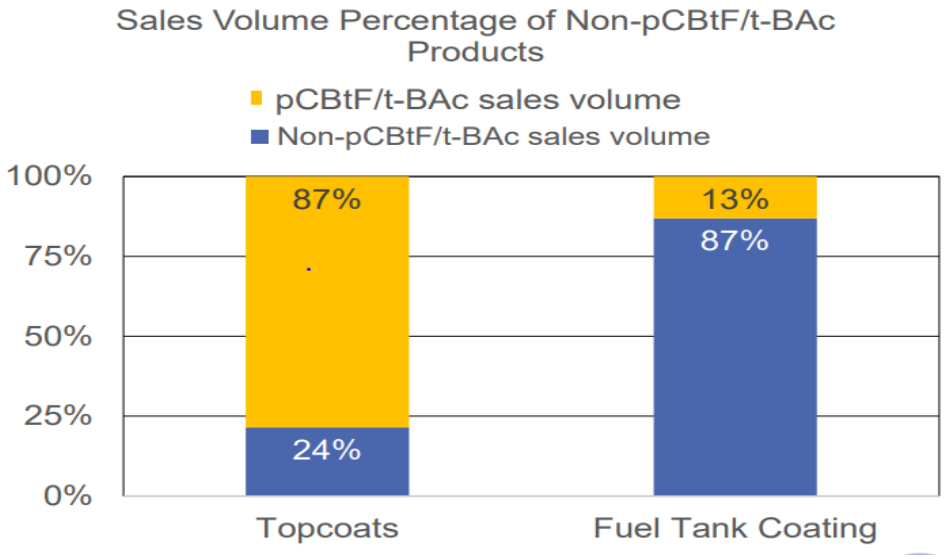

Figure 2-2 Sales Volume Percentage of pCBtF and non-pCBtF Products for Topcoat Category

As shown in Figure 2-2, pCBtF was the predominant exempt solvent in topcoat formulations by sales volume, whereas its use in other aerospace material categories was substantially more limited, particularly for sealants.

- Sealants (extrudable, rollable, and brushable types) showed limited use of pCBtF (about 2 percent of products) and no use of t-BAc.
- Adhesives (structural and non-structural) were reported to contain neither pCBtF nor t-BAc.
- Maskants, lubricants, and cleaning solvents were not represented in the original survey responses; however, a maskant manufacturer later informed staff that certain maskant formulations also contain pCBtF.

To provide a clearer understanding of the distribution of pCBtF across categories, the aggregate results are summarized in Table 2-3 below.

Table 2-3: pCBtF Usage Reported by Aerospace Material Category

Category	Volume Sold (gal)	Range of wt% pCBtF	Average pCBtF
General Primer	27,122	4.4-42	~ 21
Adhesion Promoter	418	31-96.3	~ 70

Category	Volume Sold (gal)	Range of wt% pCBtF	Average pCBtF
Topcoats	9,922	0.7-26.7	~ 9.1
Sealants	154	0.5-10.8	~ 5.5

As shown in Table 2-3, general primers accounted for the largest sales volume reported, representing more than 70 percent of the total, while topcoats accounted for approximately 25 percent. Adhesion promoters, though sold in smaller volumes, contained the highest average pCBtF concentration (nearly 70 percent). Sealants showed minimal overall sales and limited pCBtF content. Although maskants were not represented in the survey responses summarized in Table 2-3, during the rule development process, staff identified that certain maskant formulations contain pCBtF concentration averaging 70 percent.

Survey participants indicated that pCBtF is used to meet performance and durability requirements established under military and OEM specifications. By contrast, t-BAc use is limited due to narrower formulation compatibility in aerospace systems.

Industry stakeholders emphasized that transitioning away from pCBtF will require extensive reformulation, requalification, and certification testing. Reformulation challenges are particularly acute for materials subject to military specifications, which undergo rigorous, multi-stage qualification testing before field approval, significantly extending the time and resources required for substitution.

Overall, the survey results indicate that pCBtF is the most prevalently used exempt solvent in aerospace materials regulated under Rule 1124, particularly in primer and topcoat formulations, while t-BAc use remains minimal and confined to a few specialty applications. Manufacturers and end users emphasized that transitioning away from pCBtF would require extensive reformulation, requalification, and certification testing due to the rigorous verification processes mandated under military and OEM specifications. Consequently, reformulation timelines are expected to be lengthy, often spanning decades according to the coating manufacturers, and for main coating categories (e.g., primers and topcoats) there are not compliant, pCBtF-free alternatives.

Aerospace Materials and Use of pCBtF and t-BAc

Following the results of the manufacturer survey and discussions with industry stakeholders, staff determined that the use of pCBtF and t-BAc across aerospace materials subject to Rule 1124 varies substantially by category and product type.

The survey revealed that pCBtF use is most prevalent in general primers, adhesion promoters, and topcoats, with average pCBtF concentrations of approximately 21 percent, 70 percent, and 9 percent, respectively. These materials also represent the highest reported sales volumes within the South Coast Air Basin. In contrast, sealants contained low concentrations of pCBtF (~5 percent), while adhesives, lubricants, and cleaning solvents were reported to contain none.

Following the survey, additional stakeholder input revealed that certain maskant formulations, particularly those used for chemical milling and etching, also contain pCBtF. Although maskants

were not represented in the original survey responses, manufacturers later confirmed that pCBtF is used as a solvent component in some formulations to achieve desired viscosity, film integrity, and peel performance.

Industry stakeholders emphasized that for topcoats, and primers subject to military, OEM, or aerospace material specifications, reformulation is not a straightforward substitution process. The extensive qualification, requalification, and recertification requirements for these materials make reformulation cycles long and resource intensive. These constraints make a phase out of pCBtF and t-BAc infeasible for certain primers and topcoats, especially when used for military aircraft.

To protect public health and reduce exposure to pCBtF and t-BAc, staff developed a two-level regulatory framework that phases out the use of pCBtF and t-BAc in some aerospace materials while providing feasible compliance pathways for specific material categories. This structure prioritizes risk reduction and exposure prevention ensuring that the most pCBtF-reliant materials transition through enforceable mechanisms, such as add-on controls, phase-out schedules, or low-risk exemptions. The two-level approach reflects the urgency to eliminate toxic exempt solvents from widespread use and the practical realities of reformulation in highly regulated aerospace applications.

Level I and Level II Materials

The two-level structure separates aerospace materials into categories based on their readiness to transition away from pCBtF or t-BAc:

- Level I Materials: Aerospace materials that either do not rely on pCBtF or t-BAc to meet current VOC limits or have readily available alternative formulations that can be adopted without extensive qualification testing.
- Level II Materials: Aerospace materials that rely on pCBtF or t-BAc, particularly those subject to military or OEM performance specifications requiring multi-year requalification.

Level I Materials

Level I materials include categories identified as having little or no dependance on pCBtF or t-BAc or for which non-toxic alternatives are already available. Table 2-4 outlines which categories and subcategories were identified as Level I materials.

Table 2-4: Categories and Subcategories in Level I Materials

Category	Subcategory
Primers	• Adhesion Promoter
Adhesives	• Non-Structural Adhesive • Structural Adhesive (Autoclavable and Non-Autoclavable) • Space vehicle Adhesive • Fuel Tank Adhesive
Sealants	• Fastener Sealant

Category	Subcategory
	• Extrudable, Rollable, or Brushable Sealant • Other
Maskants	• For Chemical Processing • For Chemical Milling (Type I Etchant and Type II Etchant) • Photolithographic • Touch-up, Line Sealer Maskants
Lubricants	• Fastener Installation (Solid-Film Lubricant and Dry Lubricative Materials) • Fastener-Lubricative Coatings, Fastener Manufacturing (Solid Film Lubricant Dry Lubricative Materials and Barrier Coating) • Non-Fastener Lubricative Coatings, Fastener Manufacturing (Solid-Film Lubricant and Dry Lubricative Materials)
Cleaning Solvents and Strippers	

For these aerospace materials, staff is proposing a prohibition for pCBtF and t-BAc that includes sell-through and use-through periods for materials already in the supply chain to address stranded assets associated with existing inventory. The sell-through and use-through is for any materials that are manufactured prior to the proposed prohibition date. The following table provides a summary of the proposal for Level I Materials:

Table 2-5: Level I Materials pCBtF and t-BAc Prohibition Schedule

Categories and Applicable Subcategories	Final Manufacture Date	Sell-Through Date	Use-Through Date
Adhesives	September 6, 2026	March 6, 2027	March 6, 2028
Sealants			
Lubricants			
Cleaning Solvents			
Strippers			
Adhesion Promoters	March 6, 2028	December 6, 2028	March 6, 2029
Maskants	March 6, 2028	March 6, 2029	March 6, 2030

This approach mirrors existing South Coast AQMD rules such as, Rule 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations and Rule 1171 – Solvent Cleaning Operations, where categories with viable reformulated options are transitioned providing reductions in pCBtF and t-BAc emissions.

Adhesion Promoters

Adhesion promoters are coatings applied directly to uncoated or previously coated plastic, composite, or metallic surfaces to enhance the bond strength of subsequently applied primers or topcoats. They are typically low-solids, single-component coatings applied at low film thickness to improve surface wetting and film uniformity.

Survey results show that adhesion promoters are formulated with very high concentrations of pCBtF, often exceeding 70 percent by weight. These materials are sold and used in very low volumes, primarily as specialty products for surface-preparation or bonding applications.

Currently, these coatings achieve the 250 g/L VOC limit using pCBtF as an exempt solvent. To facilitate a feasible transition away from pCBtF while ensuring product performance, staff is proposing to increase the VOC content limit for adhesion promoters from 250 g/L to 750 g/L, similar to the recent phase-out approach adopted under Rule 1151.

Also, similarly to Rule 1151, PAR 1124 also includes an alternative Product-Weighted Maximum Incremental Reactivity (PW-MIR) VOC limit of 2.00 g O3/g product for adhesion promoters. Traditional mass-based VOC limits treat all VOCs equal, other than water and exempt compounds which are excluded. However, research has shown that different solvents have varying potentials to form ground-level ozone. The MIR scale measures the relative ozone-forming potential of VOCs, offering a more nuanced approach than traditional mass-based limits. By using a PW-MIR VOC limit, one can account for the differences in reactivity, ensuring that products with more reactive VOCs are more strictly regulated, while less reactive VOCs are afforded some flexibility. The California Air Resources Board (CARB) published MIR values for various VOCs, which have been instrumental in developing the limit.

Staff relied on the analysis conducted for Rule 1151 which utilized survey data and online searches to identify adhesion promoters sold within the South Coast AQMD, identifying 15 such products. To gather detailed VOC information for each product, staff reviewed the Safety Data Sheets for all 15 adhesion promoters. Using the CARB MIR values, staff calculated the PW-MIR for each product. In cases where VOC compounds were reported as a range of concentrations, by weight percent, staff calculated the average PW-MIR based on the mid-point of the reported solvent weight percent, as well as an upper range PW-MIR using the highest weight percent of solvent listed on the Safety Data Sheets. After calculating the average and upper range PW-MIR values for all the products, staff performed a statistical analysis to propose the 2.00 g O_3/g product PW-MIR limit for adhesion promoters. In addition to that assessment, staff worked with a manufacturer of an adhesion promoter who provided data on their potential future non-pCBtF/t-BAc formulation and indicated it could achieve a PW-MIR of between 2.0 – 2.5 g O_3/g Product, which supports staff's assessment and proposed limit.

The proposed PW-MIR limit is designed to achieve equal or greater reductions in ground-level ozone compared to traditional mass-based VOC limits because manufacturers can limit solvents with higher ozone forming potential rather than treating each solvent equally, offering more flexibility in product reformulation. Additionally, PW-MIR limits are particularly beneficial for coatings with low solids content. For these coatings, there are limited options to reduce VOC content, especially when compounds such as pCBtF and t-BAc are no longer allowed for use.

Maskants

Maskants are temporary protective coatings used to protect specific areas of a part during manufacturing or rework operations. In aerospace applications, maskants are commonly applied

during surface treatment and chemical milling to protect metallic or composite components. These materials are designed to be removed after processing without damaging the underlying substrate.

Chemical milling maskants are generally categorized as Type I or Type II based on the type of chemical etchant used and the performance required. Type I chemical milling maskants are used with Type I etchants, which contain sulfur compounds and do not contain amines. These maskants are typically brush- or spray-applied and are used for shorter or less aggressive chemical milling operations, most commonly on stainless steels.

Type II chemical milling maskants are used with Type II etchants, which contain sodium hydroxide and amines. These maskants are designed for longer exposure to more aggressive etching conditions and must provide greater durability and chemical resistance. As a result, maskants used for Type II etchants generally require higher solvent content to achieve the necessary film properties and performance and are used most commonly on aluminum alloys.

Based on the manufacturer survey results and discussions with manufacturers and end users in the South Coast AQMD, it was indicated that maskants are formulated with very high concentrations of pCBtF, often exceeding 70 percent by weight. These products are typically applied using dip tanks or spray applications.

Currently, most maskants sold for use in the South Coast AQMD and nationally comply with existing mass-based VOC content limits through the use of pCBtF as an exempt solvent, particularly chemical milling maskants, for which the current VOC limits are 250 g/L for Type I and 160 g/L for Type II materials. With the proposed classification of maskants as Level I materials and the associated prohibition on the use of pCBtF, staff evaluated alternative compliance approaches that would maintain environmental benefits while preserving technical feasibility for a broad range of maskant types. Staff estimated what PW-MIR limit would be equivalent to the current mass-based VOC limit to determine equivalent potential to form ozone. Existing formulations are zero g/L because they rely on pCBtF. To estimate the PW-MIR equivalent limit to a 160 g/L mass-based Type II maskant limit, staff considered a coating formulated with toluene, as toluene is a solvent compatible with maskant and has been used in their formulation. The following is an example of the equivalency calculation:

Table 2-6: Equivalent PW-MIR Demonstration

All pCBtF Formulation				**Example Toluene Based Formulation**		
Component	Percent	MIR		**Component**	**Percent**	**MIR**
pCBtF	70	0.11		**toluene**	16	4
resin	30	0		**pCBtF**	54	0.11
				resin	30	0
PWMIR		0.077		**PWMIR**		0.6994
g/L		0		**g/L**		160

Based on this analysis, staff is proposing to establish an alternative PW-MIR VOC limit of 0.70 g O_3/g product to be equivalent in ozone-forming impact to the existing 160 g/L VOC limit for Level II mass-based maskants, while providing additional compliance flexibility. Under this approach, all maskants, including higher-VOC formulations, may comply by meeting the alternative PW-MIR limit rather than the mass-based VOC content limit. The alternative PW-MIR VOC limit for maskants is designed to be equivalent to the 160 g/L VOC limit applicable to Type II chemical

milling maskants; therefore, no increase in VOC emissions is expected. For other subcategories of maskants with higher mass-based VOC limits, reformulation to meet the PW-MIR VOC limit would be anticipated to result in a lower ozone-forming potential.

Level II Materials

Level II Materials are aerospace materials that rely on pCBtF or t-BAc to achieve existing VOC limits and for which compliant alternative formulations are not available and will be very challenging to formulate. The two primary categories and their subcategories for Level II materials are summarized on the table below.

Table 2-7: Categories and Subcategories in Level II Materials

Category	Subcategory
Primers	• General Primer • Low-Solids Corrosion Resistant Primer • Pretreatment Primer • Rain Erosion-Resistant Coating Compatible Primer • Adhesive Bonding Primer (New Commercial Aircraft, All Military Aircraft, Remanufactured Commercial Aircraft Parts, Sonic and Acoustic Applications) • Adhesive Bonding Primer (Long and Short Term)

Category	Subcategory
Topcoats	• General Topcoat • Clear Topcoat • Wing Coating • Impact Resistant Coating • High-Temperature Coating • Antichafe Coating • Rain Erosion-Resistant Coating • Conformal Coating • Optical Anti-Reflective Coating • Scale Inhibitor • Metallized Epoxy Coating • Electric or Radiation Effect Coating • Temporary Protective Coating • Fuel Tank Coatings • Mold Release Coatings • Flight Test Coatings (Used on Missile or Single Use Target Craft, and all other) • Fire Resistant Coatings (Commercial and Military) • Wire Coatings (Phosphate Ester Resistant Ink and other) • Space Vehicle Coatings (Electrostatic Discharge Protection coating and other)

To ensure any continued use of pCBtF or t-BAc containing materials can be used in a manner that protects public health, staff analyzed and developed three compliance pathways for Level II materials. summarized in the table below:

Table 2-8: Summary of different Compliance Pathways for Level II Materials

Compliance Pathway	Description
Option 1 – Air Pollution Control System	Allows continued usage of pCBtF or t-BAc containing Level II materials if spray booth, curing oven, or application area is vented to an approved air pollution control device
Option 2 – Low-Use Provision	Facility limits use of pCBtF and t-BAc containing coatings to levels that are health protective
Option 3 – Phase out of pCBtF or t-BAc	Facility-level phase out where the facility opts to only apply materials that do not contain pCBtF or t-BAc

These options are meant to allow facilities to select the most appropriate approach based on operational needs while protecting public health.

Option 1 – Air Pollution Control Systems

The objective of this option is to reduce pCBtF and t-BAc exposure to sensitive receptors while providing flexibility when coating reformulation is not feasible. Under this compliance pathway, facilities may continue using pCBtF and t-BAc-containing Level II materials, provided that emissions are captured and controlled through an approved air pollution control system. This option supports compliance through a health-protective engineering control that achieves meaningful reductions in toxic emissions while allowing continued use of critical aerospace materials.

Air pollution control systems are already used for certain aerospace coating operations, such as spray booths equipped with dry filters designed to capture and remove particulate matter, including overspray solids. However, dry filters are not effective for capturing or destroying gaseous toxic compounds like pCBtF, which remain in the vapor phase after coating application. To address this limitation, staff evaluated control technologies capable of achieving high control efficiency. Two technologies were analyzed and evaluated for applicability to aerospace coating operations: Carbon Adsorption Systems and Thermal Oxidizers.

1. Carbon Adsorption Systems

Carbon adsorption systems utilize beds of activated carbon to capture and remove VOCs and toxic air contaminants from process exhaust streams. Through physical adsorption, organic vapors adhere to the porous surface of the carbon media, removing gaseous pollutants prior to discharge to the atmosphere.

To evaluate the feasibility of these systems for aerospace coating operations, staff consulted with a carbon adsorber manufacturer and conducted a site visit at a local facility currently operating such a system. The manufacturer confirmed that their systems can achieve 95 percent or greater control efficiency for pCBtF, t-BAc, and similar organic compounds, provided the system is properly designed, maintained, and operated within its design parameters.

Carbon adsorbers can be configured as fixed-bed or dual-bed systems and are available in capacities of up to 40,000 cubic feet per minute (CFM). Key design parameters include airflow rate, compound concentration, humidity, and exhaust temperature, all of which influence adsorption efficiency and carbon media life. Systems can also be equipped with sampling ports to facilitate source testing and mist eliminators to address humidity or particulate loading and can be fitted depending in space restrictions of the facility.

A typical system designed for a 20,000 CFM exhaust flow would have an approximate diameter of 12 to 24 feet and a height of 10 to 20 feet, containing up to 45,000 pounds of activated carbon. The estimated capital cost for such system ranges from $80,000 to $150,000, depending on design configuration and integration requirements. However, carbon replacement represents the most significant ongoing cost, as spent carbon must be managed as hazardous waste. Replacement and disposal costs can reach up to $200,000 per changeout, depending on carbon loading and solvent concentration.

Staff evaluated a conservative replacement scenario assuming a spray booth with a VOC emission limit of 25 pounds per day, operating continuously (24 hours per day, 365 days per year). Under

this assumption, annual carbon replacement would likely be necessary to maintain performance and prevent breakthrough. Actual replacement frequency will vary depending on throughput, exhaust flow, and the concentration of organics in the air stream.

In addition, as part of this evaluation, staff visited a local aerospace coating facility operating a carbon adsorption system controlling perchloroethylene emissions from a 16,666-gallon enclosed dip tank used for maskant application. The process tank is fully enclosed, and all exhaust gases are routed to the carbon adsorption unit. The system has been in continuous operation for over 25 years, demonstrating long-term reliability and effectiveness in controlling emissions.

The carbon adsorber manufacturer also confirmed another installation at a military aerospace coating facility in the Bay Area, where a spray booth is equipped with a similar carbon adsorption system for VOC and toxic air contaminant control. These examples demonstrate that carbon adsorption is a technically feasible, field-proven, and reliable control technology for aerospace coating operations.

2. Thermal Oxidizers

Thermal Oxidizers are combustion devices that control VOC, and volatile toxics air contaminant emissions by combusting them to carbon dioxide and water. Thermal oxidizers are similar to catalytic oxidizers (catalytic oxidizers use a catalyst to promote the oxidation reaction). Important design factors include temperature (a temperature high enough to ignite the organic constituents in the waste stream), residence time (sufficient time for the combustion reaction to occur), and turbulence or mixing of the combustion air with the waste gas. Thermal Oxidizers can achieve destruction efficiencies exceeding 98 percent and some configurations are used to achieve similar control efficiencies at lower temperatures.

While technically feasible for aerospace coating operations, the application of thermal oxidizers for pCBtF and t-BAc emissions control presents challenges. The biggest concern is that pCBtF is a chlorinated and fluorinated compound, and thermal oxidation of this compound produces acidic byproducts, including hydrochloric acid (HCl) and hydrofluoric acid (HF). To comply with emission standards and prevent corrosion, thermal oxidizer systems would require the addition of a scrubber to neutralize acid gases before release, further increasing system complexity, cost, and operational requirements.

Given these factors, thermal oxidizers, while technically capable of destruction of pCBtF and t-BAc emissions, are not the most practical or sustainable control option for most aerospace coating operations subject to Rule 1124.

In contrast, carbon adsorption systems offer a more adaptable and scalable solution for typical aerospace coating application in the South Coast AQMD, where emissions are variable, and coating operations occur intermittently. Carbon adsorbers provide similar toxic compound removal efficiency without generating secondary combustion emissions and are more readily integrated into existing spray booth or enclosure systems.

Health Risk and Usage Modeling

To support the development of usage-based limits for facilities electing Option 1, staff conducted health risk assessments (HRA) using conservative assumptions representative of aerospace coating operations and evaluated emissions using the South Coast AQMD Health Risk Assessment Tool.

The modeling was based on a Tier 2 assessment using a primer formulation containing 20 weight-percent pCBtF, which reflects the average pCBtF content reported for the primer category, as reported in the manufacturer survey. Emission rates were calculated assuming a continuous operation scenario where the exhaust stream is captured in an air pollution control system operating at 95 percent control efficiency.

Meteorological data from KHHR – Northrop Field was used because many facilities subject to PAR 1124 are located in the vicinity of this station. The remaining parameters and assumptions used in the modeling are listed below.

- Control Factor: 95 percent
- Meteorological Data: KHHR – Northrop Field
- Spray Booth: Without burner; stack height between 16 and 24 feet
- Operating Hours: 24 hours/day, 7 days/week, 52 weeks/yea
- Toxic Air Contaminant Emission Rates: Variable, modeled at 20 percent by weight pCBtF
- Sensitive Receptor Distance: Variable

These inputs intentionally use conservative assumptions to ensure that resulting usage thresholds remain health-protective under a wide range of real-world conditions.

Based on these assumptions, staff developed receptor-based annual usage limits that scale with the distance to the nearest sensitive receptor. These limits form the basis of the enforceable usage restrictions for facilities using Option 1. The proposed usage limits are shown below:

Table 2-9: Usage Limits for Level II Materials Option 1

Sensitive Receptor Distance (meter)	Annual Usage Limits (Gallons Per Year)
0 to 25	250
26 to 50	1,000
51 to 75	1,700
76 to 100	2,500
101 to 125	3,200
126 to 150	3,800
151to 175	6,000
176 or Greater	10,000

Usage limits increase with distance and are structured to ensure emissions remain controlled when routed through a properly operated 95-percent efficient air pollution control system. These limits apply per air pollution control system and are enforceable through facility permit conditions.

Overall, the modeling demonstrated that when a 95 percent efficient air pollution control system is combined with enforceable usage limits, facilities can continue limited use of Level II materials containing pCBtF and t-BAc. This approach allows facilities with limited options to transition to non-pCBtF/t-Bac materials to continue to operate.

Option 1 - Timeline

Under Option 1, a facility electing to continue the use of Level II Materials containing pCBtF or t-BAc must install and operate an approved Air Pollution Control System in accordance with a defined compliance schedule. Within six months of rule adoption, the owner or operator is required to submit a complete South Coast AQMD permit application that includes permit conditions demonstrating a minimum of 95 percent VOC control efficiency, as verified by source testing, and establishing enforceable annual usage limits for Level II Materials. These usage limits must be based on either the distance from the control system stack to the nearest Sensitive Receptor, the default limit of 250 gallons per year per Air Pollution Control System, or a facility-wide Health Risk Assessment demonstrating a maximum individual cancer risk of 10 in one million or less. Upon issuance of the Permit to Construct, the facility must limit the use of Level II Materials consistent with the permitted usage limits and operate the materials only within the Air Pollution Control System. Upon issuance of the Permit to Operate, continued use of Level II Materials is restricted to operation within the permitted Air Pollution Control System, with ongoing maintenance and recordkeeping requirements. To ensure timely implementation, any facility that elects this option but does not obtain an approved Permit to Operate within four years of submitting a complete permit application is required to discontinue the use of Aerospace Materials containing pCBtF or t-BAc unless compliance under an alternative provision is achieved. This framework provides a clear and enforceable pathway for continued operation while maintaining health-protective emission controls.

The rule also contains a pathway for Option 1 for a facility that opts to use pCBtF/t-BAc coatings in the future. In that scenario, the facility cannot use the coatings until the air pollution control system is permitted, installed, and in operation.

Option 2 – Low-Use

Option 2 provides a compliance pathway for facilities that use very limited quantities of topcoats and primers. This option is intended to provide flexibility for smaller facilities or those performing infrequent specialty work that cannot feasibly reformulate or justify the installation of an air pollution control system.

Under this option, a facility may continue to use Level II materials containing pCBtF or t-BAc only if total annual usage remains below enforceable, health-based limits. Facilities electing Option 2 must either comply with the 1.25 gallons a year limit demonstrated through recordkeeping or submit a complete permit application no later than six months after rule adoption (or prior to the use of any Level II materials after that date). The permit includes conditions that cap the facility's annual usage of Level II materials to receptor-based usage limits shown in the table below:

Table 2-10: Usage limits for Level II Materials, Option 2

Sensitive Receptor Distance (m)	Annual Usage Limits (Gallons Per Year)
0 to25	1.25
26 to 50	4.5
51 to 75	7.5
76 to 100	11
101 to 125	14.5
126 to 150	18
151 to 175	26.5
176 or Greater	46

To develop these usage limits, staff conducted a similar evaluation to the analysis used for Option 1. This assessment evaluated the relationship between usage and potential off-site exposure using conservative assumptions. Inputs included continuous operation, an uncontrolled spray booth without a burner, and meteorological data from KHHR – Northrop Field, reflecting conditions present in areas where many affected aerospace facilities are located. These assumptions ensure that the resulting usage limits remain health-protective across a wide range of operating conditions.

The analysis assumed no other toxic air contaminants were present and calculated emissions on an hourly basis. For example, a facility using 10 gallons per year of a primer containing 20 wt% pCBtF would emit approximately 0.00392 pounds of pCBtF per hour. You can see the example calculation below:

$$\left[\frac{10\ gallons\ of\ primer}{year}\right] * \left[\frac{11.45\ lbs\ of\ primer}{gallon\ of\ primer}\right] * \left[\frac{0.20\ lb\ of\ pCBtF}{1\ lb\ of\ primer}\right] = \frac{22.9\ lb\ of\ pCBtF}{year}$$

$$\left[\frac{22.9\ lb\ of\ pCBtF}{year}\right] * \left[\frac{1\ year}{8760\ hours}\right] = .0026\ \frac{lb\ of\ pCBtF}{hour}$$

The resulting receptor-based usage limits establish progressively higher allowable annual usage at greater distances from sensitive receptors. This structure ensures that low-use facilities can continue to conduct limited coating operations while maintaining health-protective outcomes. Facilities located closer to receptors are limited to the lowest usage levels, while those situated farther away may be permitted higher annual volumes consistent with Table 2-9.

Facilities electing Option 2 must operate in full compliance with the usage limits specified in their permit beginning on the date the Permit to Operate is issued. Ongoing recordkeeping and usage tracking are required to verify compliance, and records must be made available to South Coast AQMD upon request.

Overall, Option 2 provides a flexible compliance pathway for facilities with minimal usage of Level II materials, allowing continued operations without installing an air pollution control system or transitioning immediately to reformulated products.

Option 3 – Phase-out of pCBtF and t-BAc

Option 3 provides a compliance pathway for facilities that can fully eliminate the use of pCBtF and t-BAc in Level II materials. This option applies to facilities that either do not perform work requiring coatings formulated with pCBtF or t-BAc or have transitioned or will transition to compliant, reformulated products that no longer contain these compounds.

Under Option 3, affected materials will be subject to a phased prohibition of pCBtF and t-BAc use, sale, and distribution, consistent with the timelines established for Level II materials. This structured approach ensures an orderly transition while preventing stranded inventory and providing adequate time for reformulation, qualification, and certification of alternative products.

Similar to Level I materials, a use-through provision will apply for any materials manufactured prior to the effective prohibition date. These provisions ensure supply continuity during the transition period while maintaining progress toward the complete elimination of toxic exempt solvents from aerospace coating operations. The proposed schedule for the Level II materials phase-out is shown below.

Table 2-11: Level II Materials, Option 3 pCBtF and t-BAc Prohibition Schedule

Prohibition Date	Use-Through Date
March 6, 2028	March 6, 2029

Facilities electing this compliance pathway must ensure that no pCBtF or t-BAc containing products are applied, possessed, or stored on-site after the applicable use-through date. Unless a facility has applied for compliance under Option 1 (Air Pollution Control System) or Option 2 (Low-Use), the facility will default to Option3 and must comply with the prohibition schedule provided in Table 2-11.

CHAPTER 3 : SUMMARY OF PROPOSALS

Introduction

The objective of PAR 1124 is to reduce the health risk from the use of pCBtF and t-BAc in aerospace materials, as directed by the South Coast AQMD's Stationary Source Committee, due to toxicity concerns.

Staff is proposing the following amendments to Rule 1124. The proposed amendments primarily pertain to the prohibition of pCBtF and t-BAc use in the regulated products and the introduction of alternative compliance pathways, including the installation of air pollution control systems and a low-use, risk-based provision. Some other amendments are for the purpose of rule clarification or streamlining. The proposed revised rule structure and key provisions are discussed in the following sections.

Proposed Amended Rule Structure

(a) Purpose
(b) Applicability
(c) Definitions
(d) Requirements
(e) Alternative Compliance Options
(f) Prohibition of Possession, Specification, Sale or Use
(g) Administrative Requirements
(h) Source Testing
(i) Test Methods
(j) Rule 442 Applicability
(k) Exemptions
Attachment A

Proposed Amended Rule 1124

Purpose [Subdivision (a)]

The purpose of this rule is to reduce VOC emissions from aerospace assembly and component manufacturing operations.

No significant revisions were made to this subdivision. The subdivision previously combined with the following Applicability subdivision; however, staff separated the two into separate subdivisions to be consistent with the structure of similar rules. Staff capitalized defined terms to indicate that definitions for the associated terms can be found in the Definitions subdivision.

Applicability [Subdivision (b)]

Subdivision (b) updates the applicability section to align with the structure and terminology used in other South Coast AQMD VOC rules. The revisions clarify that PAR 1124 applies to any person who supplies, sells, offers for sale, markets, manufactures, blends, packages, repackages, possesses, or distributes any aerospace material or associated solvent for use within the South Coast AQMD, as well as any owner or operator of a facility who uses, applies, or solicits the use or application of such materials.

Staff updated applicability for consistency across other VOC rules. Staff also capitalized defined terms to indicate that definitions for the associated terms can be found in the definition's subdivision.

Definitions [Subdivision (c)]

To provide clarity, definitions are used in the proposed amended rule as a proper noun to better distinguish defined terms from common terms. Refer to PAR 1124 for a complete list of definitions.

During rule development process, staff removed definitions that are no longer applicable, including those associated with provisions that have been removed from the rule and products that are no longer being used in the South Coast AQMD jurisdiction. Removed definitions include anti-wicking wire coating, coating application equipment, electronic wire coating, epoxy-based fuel tank coating, fuel-tank adhesive, toxicity-weighted emissions reduction efficiency, toxicity-weighted total emissions, toxic organic solvent, toxic particulate matter, unicoat, and wire ink.

The following are new definitions for Proposed Amended Rule 1124. For all definitions, refer to the rule language released with the staff report. The following definitions below will be added:

AIR POLLUTION CONTROL DEVICE in paragraph (c)(8), which means:

"is equipment installed for the purpose of reducing VOC and/or toxic emissions."

AIR POLLUTION CONTROL DEVICE EFFICIENCY in paragraph (c)(9), which means:

"in percent, is the ratio of the weight of the VOC removed by the control device from the effluent stream entering the control device to the weight of VOC in the effluent stream exiting the control device, both measured simultaneously, and can be calculated by the following equation:

$$Control\ Device\ Efficiency = \frac{W_c - W_a}{W_c} \times 100$$

Where: W_c = *Weight of VOC entering control device*

W_a = *Weight of VOC discharged from the control device"*

AIR POLLUTION CONTROL SYSTEM in paragraph (c)(10), which means:

"is either an enclosed spray booth, an enclosed application area, or a Permanent Total Enclosure venting to an Air Pollution Control Device, installed to collect and reduce emissions from exhaust streams, including, but not limited to, spray booths, Curing ovens, or application areas."

CHEMICAL ABSTRACTS SERVICE REGISTRATION NUMBER (CAS RN) in paragraph (c)(13), which means:

"is a unique numerical identifier, assigned to a single chemical substance, to ensure unambiguous identification."

CLEANING SOLVENT in paragraph (c)(15), which means:

"is a VOC-containing liquid substance used to perform solvent cleaning."

CURING in paragraph (c)(18), which means:

"the process of drying and hardening of an Aerospace Material."

EXECUTIVE OFFICER in paragraph (c)(22), which means:

"is as defined in Rule 102 – Definition of Terms (Rule 102)."

INK JET MARKING SYSTEM in paragraph (c)(35), which means:

"a non-contact, computer-controlled ink-jet system used to apply Stencil Coatings onto coated or uncoated aerospace parts."

LEVEL I MATERIALS in paragraph (c)(36), which means:

"are Aerospace Materials identified in Table 1 – Table of Standards (Table 1) or Table 2 - Table of Standards for Low-Solids Materials, Cleaners, and Strippers (Table 2) as Level I Materials where the use of para-chlorobenzotrifluoride (pCBtF; CAS RN: 98-56-6) and tert-butyl acetate (t-BAc; CAS RN: 540-88-5) will be phased out."

LEVEL II MATERIALS in paragraph (c)(37), which means:

"are Aerospace Materials identified in Table 1 or Table 2 as Level II Materials where the use of pCBtF and t-BAc will conditionally be allowed."

MAXIMUM INCREMENTAL REACTIVITY (MIR) in paragraph (c)(44), which means:

"the measure of the photochemical reactivity of a VOC, which estimates the weight of ozone produced from a weight of VOC expressed as gram of ozone per gram of VOC (g O3/g VOC). MIR values for individual VOCs are specified in Sections 94700 and 94701, Title17, California Code of Regulations."

PERMANENT TOTAL ENCLOSURE in paragraph (c)(49), which means:

"a permanent building or containment structure, enclosed with a floor, walls, and a roof to prevent exposure to the elements, (e.g., precipitation, wind, run-off) that has limited openings to allow access for people and vehicles, that is free of breaks or deterioration that could cause or result in fugitive emissions, and has been evaluated to meet the design requirements set forth in United States Environmental Protection Agency (U.S EPA) Method 204."

PERSON in paragraph (c)(50), which means:

"is as defined in Rule 102."

PRODUCT-WEIGHTED MIR (PW-MIR) in paragraph (c)(56), which means:

"the sum of all weighted-MIR for all ingredients in a Reducer or Thinner. The PW-MIR is the total product reactivity expressed to hundredths of a gram of ozone formed per gram of product (excluding container and packaging) and calculated according to the following equations:

Weighted MIR (Wtd-MIR) ingredient = MIR x Weight fraction ingredient,)

And,

$$PW\text{-}MIR = (Wtd\text{-}MIR)_1 + (Wtd\text{-}MIR)_2 + \ldots + (WtdMIR)_n$$

Where:

MIR	=	*ingredient MIR*
1,2, 3..., n	=	*each ingredient in the product up to the total n ingredients in the product."*

REACTIVE DILUENT in paragraph (c)(58), which means:

> *"is a liquid which is a VOC during application and one in which through chemical or physical reactions such as polymerization, becomes an integral part of a finished coating."*

SCHOOL in paragraph (c)(65), which means:

> *"any public or private school, including juvenile detention facilities with classrooms, used for the education of more than 12 children at the school in kindergarten through grade 12. School also means an Early Learning and Developmental Program by the U.S. Department of Education or any state or local early learning and development programs such as preschools, Early Head Start, Head Start, First Five, and Child Development Centers. A school does not include any private school in which education is primarily conducted in private homes. The term includes any building or structure, playground, athletic field, or other area of school property*

SENSITIVE RECEPTOR in paragraph (c)(67), which means:

> *"any residence including private homes, condominiums, apartments, and living quarters; Schools as defined in paragraph (c)(65); daycare centers; and health care facilities such as hospitals or retirement and nursing homes. Sensitive Receptor includes long term care hospitals, hospices, prisons, and dormitories or similar live-in housing."*

SOUTH COAST AQMD TEST METHOD in paragraph (c)(71), which means:

> *"a test method included in the manual of "Laboratory Methods of Analysis for Enforcement Samples" which can be found on the South Coast AQMD website and are referenced in subdivision (h)."*

In addition to new definitions, several definitions were revised to improve clarity, consistency with other South Coast AQMD rules, and enforceability. The revised definitions can be found below.

FIRE RESISTANT COATING in paragraph (c)(26), which means:

> *"Is a coating that:*
>
> *(A) For Commercial Aircraft, Fire-Resistant Coatings are used on passenger cabin interior parts that are subject to the Federal Aviation Administration fireworthiness requirements; and*
>
> *(B) For Military Aircraft, Fire-Resistant Coatings are used on parts that are subject to the flammability requirements of MIL-STD-1630A and MIL-A-87721."*

This definition was revised to be consistent with the definition in the national rule and the definitions adopted by other air districts.

HIGH-VOLUME, LOW-PRESSURE (HVLP) in paragraph (c)(33), which means:

> *"is a material application system used to apply coatings by means of a spray gun which is designed to be operated, and which is operated at air pressure between 0.1 and 10 pounds*

per square inch gauge measured dynamically at the center of the air cap and at the air horns."

This definition was revised to be consistent with other South Coast AQMD VOC rules.

LOW-SOLIDS MATERIALS in paragraph (c)(40), which means:

"are Aerospace Materials, other than Low-Solids Corrosion Resistant Primers, which contain less than one pound of solids per gallon of material, where the solids are determined pursuant to ASTM D 2369 – Standard Test Method for Volatile Content of Coatings (ASTM D 2369)."

This definition was revised to clarify the test method required to determine solids content.

LOW-SOLIDS CORROSION RESISTANT PRIMER in paragraph (c)(41), which means:

"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, where the solids are determined pursuant to ASTM D 2369."

This definition was revised to clarify the test method required to determine solids content in this category.

METALLIZED EPOXY COATING in paragraph (c)(45), which means:

"is an epoxy coating that contains at least 0.4 pounds of Metal Particles, which are pieces of an elemental pure metal or a combination of elemental metals, per gallon of coating (48 grams/liter), as applied, for appearance and/or added protection."

This definition was revised to improve enforceability and align with other South Coast AQMD rules.

STRUCTURAL ADHESIVE – NON-AUTOCLAVABLE, in paragraph (c)(76), which means:

"is an Adhesive cured and is used to bond load-carrying Aircraft components or other critical functions, such as nonstructural bonding in the proximity of engines."

This definition was revised to remove the phrase "under ambient conditions." The term does not clearly encompass curing methods that involve elevated temperatures, such as oven curing, which could create ambiguity for certain non-autoclave processes. The revised definition clarifies that all non-autoclave curing methods are included and improves regulatory clarity and consistency.

Requirements [Subdivision (d)]

This subdivision contains provisions for any person or facility that applies any aerospace material to any operation associated with manufacturing and assembling products for Aircraft and Space-Vehicles.

Paragraph (d)(1) – VOC Limits for Aerospace Materials

In paragraph (d)(1), PAR 1124 establishes VOC content limits for aerospace materials by category and subcategories, as summarized in PAR 1124 Table 1 – Table of Standards. Staff is not proposing to modify the existing VOC content limits for most categories; however, an amendment is proposed for the adhesion promoter's subcategory to facilitate the phase-out of pCBtF from 250 g/L to 750 g/L.

All other aerospace material categories will retain their current VOC content limits but will be subject to new prohibitions on pCBtF and t-BAc. Depending on whether materials are classified as Level I or Level II, different prohibition schedules will apply. Under this framework, products formulated to comply with existing VOC limits will no longer be permitted to contain these compounds after the applicable prohibition dates pursuant to subdivision (f) – Prohibition of Possession, Specification, Sale or Use.

Paragraph (d)(1) also removes references to Unicoat requirements, as no applications of these materials were identified during the rule development process. In conjunction with this revision, the associated VOC limit of 420 g/L has been removed from Table 1. These updates streamline the rule by eliminating provisions for materials that are not currently used within the South Coast AQMD.

Additionally, the coatings category has been renamed topcoats for consistency with other South Coast AQMD coating rules. The table below summarizes the VOC limits for each category and subcategory under PAR 1124, as well as their corresponding Level I or Level II classification.

Lastly, the column previously labeled “VOC Limit” has been renamed “Regulatory VOC g/L-Coating” to clarify that the limits apply to the regulatory VOC content of materials, as opposed to actual VOC content.

Table 3-1: Summary of the Regulatory VOC Content Limits and Material Level Consideration

Categories	Regulatory VOC g/L-Coating	Level I	Level II
Primers			
General Primer	350		✓
Pretreatment Wash Primer	780		✓
Rain Erosion-Resistant Coating Compatible Primer	850		✓
Adhesion Promoter	750	✓	
Adhesive Bonding Primer			
New Commercial Aircraft	250		✓
All Military Aircraft	805		✓
Remanufactured Commercial Aircraft Parts	805		✓
Sonic and Acoustic Applications	805		✓
Adhesive Bonding Primer			
Long Term	250		✓
Short Term	250		✓
Topcoats			
General Topcoat	420		✓
Clear Topcoat	520		✓
Wing Coating	750		✓
Impact-Resistant Coating	420		✓
High-Temperature Coating	850		✓
Antichafe Coating	420		✓
Rain Erosion-Resistant Coating	800		✓
Conformal Coating	750		✓
Optical Anti-Reflective Coating	700		✓
Scale Inhibitor	880		✓
Metallized Epoxy Coating	700		✓

Categories	Regulatory VOC g/L-Coating	Level I	Level II
Electric or Radiation Effect Coating	800		✓
Temporary Protective Coating	250		✓
Fuel Tank Coatings	420		✓
Mold Release Coatings	780		✓
Flight-Test Coatings			
Used on Missiles or Single Use Target Craft	420		✓
All Other	840		✓
Fired Resistant Coatings			
Commercial	650		✓
Military	800		✓
Wire Coatings			
Phosphate Ester Resistant Ink	925		✓
Other	420		✓
Space-Vehicle Coatings			
Electrostatic Discharge Protection Coating	800		✓
Other	1000		✓
Adhesives			
Non-Structural Adhesive	250	✓	
Structural Adhesive			
Autoclavable	50	✓	
Non-Autoclavable	850	✓	
Space-Vehicle Adhesive	800	✓	
Fuel Tank Adhesive	620	✓	
Sealants			
Fastener Sealant	675	✓	
Extrudable, Rollable, or Brushable Sealant	280	✓	

Categories	Regulatory VOC g/L-Coating	Level I	Level II
Other	600	✓	
Maskants			
For Chemical Processing	250	✓	
For Chemical Milling			
Type I Etchants	250	✓	
Type II Etchants	160	✓	
Photolithographic	850	✓	
Touch-up, Line Sealer Maskants	750	✓	
Lubricants			
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	✓	

Paragraph (d)(2) – VOC Limits for Low-Solids Materials, Cleaners, and Strippers

Paragraph (d)(2) is a new paragraph that consolidates the VOC requirements for low-solids materials, cleaning solvents, and strippers into a single section to clarify that these categories are subject to actual VOC limits rather than regulatory VOC limits. This paragraph also incorporates the alternative VOC composite vapor pressure limits for cleaning solvents and strippers. The intent of this reorganization is to improve readability and to clearly distinguish low-solids material requirements from other coating categories.

Table 3-2 Summary of Compliance Limits and Material Level Consideration for cleaning Solvents, Strippers, and Low-Solids Materials

Categories	Actual VOC Limit (g/L-Material)	VOC Composite Partial Pressure (mmHg)		Level I Materials	Level II Materials
Low-Solids Solvents					
Cleaning Solvents		200	45	✓	
Strippers		300	9.5	✓	
Low-Solids Coatings					
Adhesives, Coatings, Primers or Sealants		120	N/A	✓	
Corrosion Resistant Primer		350	N/A	✓	

Paragraph (d)(3) – Alternative PW-MIR VOC Limits

Paragraph (d)(3) establishes an alternative compliance option for adhesion promoters and maskants by allowing compliance with a PW-MIR VOC limit of 2.0 g O_3/g product and 0.70 g O_3/g product respectively, in lieu of the Table 1 regulatory VOC content limit in paragraph (d)(1). This provision allows the manufacture, supply, sell, offer for sale, market, blend, distribute, package, or repackage and use of adhesion promoters and maskants that meet the alternative PW-MIR limit, including any VOC-containing materials added to the original aerospace material, and is intended to facilitate the transition away from pCBtF. The alternative PW-MIR VOC limits were developed to be equivalent to the mass-based VOC limits with no increase in ozone formation. The 0.70 g O_3/g product for maskants is intended to be equivalent to the Tier II etchant 160 g/L mass-based limits. All other maskant subcategories have higher mass-based limits so the proposed alternative PW-MIR VOC limit would be anticipated to result in lower ozone formation; therefore, alternative PW-MIR limits will apply to all maskant categories.

Paragraph (d)(4) – Solvent Cleaning Operations; Storage, and Disposal

Paragraph (d)(4) replaces former paragraph (c)(2) and updates the solvent-cleaning provisions by revising rule references and clarifying applicability. Rule 1124 is intended to regulate cleaning activities associated with the preparation and cleaning of aerospace parts or components subject to coating under this rule. Cleaning of material application equipment, general work surfaces, and other ancillary operations is subject to Rule 1171. This paragraph also clarifies that cleaning solvents shall not be atomized unless the activity is vented to an approved Air Pollution Control Device.

Paragraph (d)(5) – Transfer Efficiency

Paragraph (d)(5) replaces former paragraph (c)(3) and retains the same provisions. It updates language to reflect revised rule references and numbering to ensure consistency to other South Coast AQMD Rules. Additionally, it adds ink jet marking system to the methods that need to comply with the provisions in paragraph (d)(5).

Paragraph (d)(6) – Air Pollution Control System to Control VOC Emissions

Paragraph (d)(6) replaces former paragraph (c)(4) and updates the language to reflect revised rule references and numbering for consistency with the reorganized structure of the rule. This paragraph clarifies the requirements for facilities choosing to comply with the VOC limits in Table 1, Table 2, and/or the transfer efficiency requirements in subparagraph (d)(5) using an approved air pollution control system. This provision streamlines the requirements by specifying that the air pollution control system must achieve a minimum overall VOC control efficiency of 95 percent by weight, based on combined capture and control efficiency. The definition of an air pollution control system specifies a combination of an enclosed spray booth, enclosed application area, or Permanent Total Enclosure vented to an air pollution control device.

Paragraph (d)(6) is intended to maintain existing VOC control requirements for facilities with existing control equipment and is not intended to introduce new compliance obligations that could place facilities out of compliance on date of rule adoption. While VOC reductions remain important, the proposed amendments place greater emphasis on reducing toxic emissions. Accordingly, the proposed rule distinguishes between the continued VOC control requirements in paragraph (d)(6) and the new toxic emission reduction requirements established in paragraphs (e)(2) and (e)(4), which address health risk considerations and include additional requirements such as source testing and usage limitations.

Alternative Compliance Options [Subdivision (e)]

Subdivision (e) reorganizes the provisions that were in formerly subdivision (i) – Alternative Emission Plans and consolidates the requirements related to compliance flexibility for regulated facilities. This subdivision also establishes the alternative compliance options available for Level II Materials. The reorganization improves clarity and flow by grouping all alternative Level II Material compliance provisions into a single subdivision.

Paragraph (e)(1)

Paragraph (e)(1) contains the provisions for any person or facility that elects to comply with the requirements of paragraphs (d)(1) and/or (d)(2) through the use of an approved air pollution control system. This paragraph replaces former subdivision (i) – Alternative Emission Plans and retains the same substantive requirements, with updates limited to revised rule references and numbering for consistency with the reorganized structure of the rule.

Paragraph (e)(2) – Air Pollution Control Systems for Level II Materials containing pCBtF and t-BAc

Paragraph (e)(2) establishes an alternative compliance option for facilities that elect to continue using Level II Materials containing pCBtF or t-BAc through the installation of an approved Air Pollution Control System, in lieu of complying with the Level II Material prohibition in paragraph

(f)(3). Facilities electing this option must submit a complete South Coast AQMD permit application within six months after the date of rule adoption.

The permit application must include conditions requiring: (1) an Air Pollution Control Device efficiency of at least 95 percent removal of VOC emissions, or equivalent mass emissions calculated as carbon with no dilution, as demonstrated by a source test pursuant to subdivision (h); (2) the use or curing of any Level II Materials containing pCBtF and t-BAc to be conducted within an Air Pollution Control System; and (3) an annual usage limit for Level II Materials containing pCBtF and t-BAc, as specified in paragraph (e)(2)(B).

Facilities that elect to establish an alternative usage limit pursuant to paragraph (e)(2)(B)(iii) must submit a complete, facility-wide HRA with the permit application. The HRA must be prepared in accordance with Rule 1401 – *New Source Review of Toxic Air Contaminants* and based on the toxic air contaminants pursuant to Rule 1402 – *Control of Toxic Air Contaminants from Existing Sources*, and must demonstrate that the maximum individual cancer risk does not exceed 10 in one million.

Upon issuance of the Permit to Construct, facilities must limit the use of Level II Materials containing pCBtF and t-BAc in each Air Pollution Control System to one of the following: (A) 250 gallons per year; (B) the receptor-based annual usage limits listed in Table A-1 in Attachment A of the rule; or (C) the annual usage limits specified in the South Coast AQMD permit based on the approved facility-wide HRA.

Upon issuance of the Permit to Operate, facilities may only use Level II Materials containing pCBtF and t-BAc within an approved Air Pollution Control System and must continue to operate in compliance with the permitted usage limits. Continued compliance with applicable maintenance and recordkeeping requirements pursuant to paragraph (g)(4) is also required.

Paragraph (e)(3) – Compliance Deadline for pCBtF or t-BAc Air Pollution Control Systems

Paragraph (e)(3) establishes a compliance deadline for facilities electing to install an air pollution control system under paragraphs (e)(2). Facilities that have not obtained a Permit to Operate for the approved control system within four years of submitting a complete permit application will no longer be allowed to use Level II materials. This provision ensures timely implementation of control measures and prevents indefinite reliance on pending applications. Facilities that do not meet this deadline cease using Level II materials containing pCBtF or t-BAc but may submit a new permit application in accordance with paragraph (e)(4) requirements prior to resuming the use of Level II materials containing pCBtF or t-BAc.

Paragraph (e)(4) – Future Effective Timeline for Air Pollution Control Systems for Level II Materials containing pCBtF or t-BAc

Paragraph (e)(4) provides an additional compliance pathway for facilities that elect to install an air pollution control system after the initial six-month permit application window. This provision allows facilities to transition to the control-based option at a later date, provided that no Level II materials are used until a complete permit application is submitted and approved. Paragraph (e)(4) mirrors the requirements of paragraph (e)(2), including control efficiency, capture, and usage-limit provisions, and differs only in the timing of when the permit application must be submitted.

Paragraph (e)(5) – Low-Use Provision for Level II Materials containing pCBtF or t-BAc

Paragraph (e)(5) establishes a low-use compliance option for facilities that use very limited quantities of Level II materials. This provision allows facilities to continue using Level II materials containing pCBtF or t-BAc under one of two pathways: (1) limiting total facility usage to no more than 1.25 gallons per year and maintaining records pursuant to paragraph (g)(5) without the need of a permit application, or (2) obtaining South Coast AQMD permit conditions that cap annual usage based on the receptor-based limits specified in Table A-2 – Annual Usage Limits for Facilities without an air pollution control system. Facilities electing the second pathway must submit a complete permit application within six months of rule adoption and must operate in full compliance with the permitted usage limits upon issuance of the Permit to Operate. This option provides flexibility for small-volume users and facilities conducting infrequent specialty work.

Paragraph (e)(6) – Future Effective Timeline for Low-Use Provision for Level II Materials containing pCBtF or t-BAc

Paragraph (e)(6) provides a compliance pathway for facilities electing the low-use compliance pathway after the initial six-month permit application period. This provision allows facilities the low-use option at a later date provided that no Level II materials containing pCBtF ot t-BAc are used until a complete permit application is submitted and a usage limit has been established. Paragraph (e)(6) mirrors the requirements of paragraph (e)(5) and ensures that any use under the low-use provision occurs only after permit conditions are established.

Paragraph (e)(7)

Paragraph (e)(7) establishes a mechanism to address a facility that exceeds the low-use limits in paragraphs (e)(5) and (e)(6). If a facility exceeds the low-use levels, they will have to cease using the Level II materials containing pCBtF or t-BAc or install an air pollution control system pursuant to (e)(4).

Prohibition of Possession, Specification, Sale or Use [Subdivision (f)]

This subdivision contains the provisions for any person or facility that applies, possesses, solicits the use or application of, supplies, sells, offers for sale, markets, blends, packages, repackages or distributes aerospace materials for use within the South Coast AQMD for Level I and Level II materials.

Paragraph (f)(1) – Level I Material pCBtF and t-BAc Prohibition

Paragraph (f)(1) prohibits the manufacture, sale, distribution, possession, and use of Level I materials containing more than 0.01 percent by weight of pCBtF or t-BAc that were manufactured after the applicable prohibition dates specified in Table 4 – Level I Materials pCBtF and t-BAc Prohibition Schedule in PAR 1124. This prohibition applies to all Level I aerospace material categories listed in Table 1 and Table 2.

The provision ensures that all Level I materials supplied or used within the South Coast AQMD transition to non-toxic formulations by the specified effective dates, eliminating pCBtF and t-BAc from product formulations where viable alternatives exist.

Paragraph (f)(2) – Level I Material Sell-Through and Use-Through

Paragraph (f)(2) provides sell-through and use-through allowances for Level I materials containing more than 0.01 percent by weight of pCBtF or t-BAc that were manufactured prior to the applicable prohibition dates listed in Table 4 – Level I Materials pCBtF and t-BAc Prohibition Schedule.

This provision allows such materials to be sold, supplied, or offered for sale until the corresponding sell-through date, and used until the applicable use-through date specified in Table 3-3. These allowances are intended to prevent stranded inventory and facilitate the transition to compliant materials. The prohibition, sell-through, and use-through schedule are shown in the table below.

Table 3-3: Level I Materials pCBtF and t-BAc Prohibition Schedule

Categories and their Applicable Subcategories	Final Manufacture Date	Sell-Through Date	Use-Through Date
Adhesives	[*Six Months from Date of Rule Adoption*]	[*12 Months from Date of Rule Adoption*]	[*24 Months from Date of Rule Adoption*]
Sealants			
Lubricant			
Cleaning Solvents			
Strippers			
Adhesion Promoters	*[24 Month from Date of Rule Adoption]*	*[32 Months from Date of Rule Adoption]*	*[36 Months from Date of Rule Adoption]*
Maskants	[*24 Months from Date of Rule Adoption*]	[*36 Months from Date of Rule Adoption*]	[*48 Months from Date of Rule Adoption*]

Paragraph (f)(3) – Level II Material pCBtF and t-BAc Prohibition

Paragraph (f)(3) establishes a prohibition on the possession and use of Level II materials containing more than 0.01 percent by weight of pCBtF or t-BAc that were manufactured after [24 months after the date of rule adoption], unless an alternative compliance option pursuant to subdivision (e) has been approved by the Executive Officer. This provision applies to all Level II materials and ensures that facilities either transition to compliant, reformulated products or operate under an approved alternative compliance pathway.

Paragraph (f)(4) – Level II Material Use-Through

Paragraph (f)(4) provides a limited use-through allowance for Level II materials containing more than 0.01 percent by weight of pCBtF or t-BAc that were manufactured prior to [24 months after the date of rule adoption]. Such materials may continue to be possessed or applied until [36 months

after the date of rule adoption]. This provision allows facilities additional time to use existing inventory and transition to compliant products or approved alternative compliance options.

Administrative and Recordkeeping Requirements [Subdivision (g)]

Subdivision (g) outlines the administrative requirements including recordkeeping for VOC emissions pursuant to Rule 109 – Recordkeeping for Volatile Organic Compound Emissions, emission control systems, and for any person who supplies, sells, offers for sale, markets, blends, packages, repackages or distributes any aerospace materials for use within South Coast AQMD that do not meet the applicable VOC limits but are intended for use at a facility that utilizes an approved emission control system; a facility that operates in accordance with an approved alternative emissions control plan; or are exempt under subdivision (k). In addition, subdivision (g) establishes labeling requirements for adhesion promoters and maskants that choose to comply with paragraph (d)(3) using the alternative PW-MIR VOC limits.

This subdivision was restructured to streamline and better organize the rule provisions. Most of the changes are minor, defined terms were capitalized and the existing Rule 1124 reporting requirements subdivision (j) was moved and updated to paragraphs (g)(1) and (g)(2).

Source Testing [Subdivision (h)]

Subdivision (h) specifies the source testing requirements for owners or operators that elect to operate an air pollution control system pursuant to paragraph (e)(2) or (e)(4). These provisions establish the schedule, procedural requirements, and recordkeeping standards necessary to verify and maintain compliance with the applicable control efficiency requirements for systems controlling emissions of pCBtF and t-BAc.

Paragraph (h)(1) – Source Test Protocol & paragraph (h)(2)

Paragraph (h)(1) establishes the procedural requirements for submitting and conducting source test protocols for facilities required to conduct source testing pursuant to paragraphs (e)(2) or (e)(4). Owners or operators must submit a source test protocol to the Executive Officer for approval within 90 days of issuance of a Permit to Construct or Permit to Operate and must provide written notification to the Executive Officer at least two weeks prior to the scheduled source test. All source tests must be conducted in accordance with the most recently approved protocol and the applicable testing schedule specified in paragraph (h)(3).

Paragraph (h)(2) clarifies that, unless requested by the South Coast AQMD, facilities are not required to resubmit a source test protocol after the initial protocol has been approved, except in cases where the air pollution control device has been altered in a manner that requires a permit application submittal or when the source test contractor has changed. This provision is intended to streamline administrative requirements while ensuring the continued validity and integrity of source testing procedures.

Paragraph (h)(3) – Source Test Schedule

Paragraph (h)(3) establishes the required schedule for conducting source tests for any facility operating an air pollution control device pursuant to paragraphs (e)(2) or (e)(4). Facilities must complete an initial source test within 180 days of beginning operation of the control device or within 30 days of receiving an approved source test protocol, whichever occurs later. Subsequent testing is required every 36 months to verify ongoing compliance with the applicable control efficiency requirements.

Test Methods [Subdivision (i)]

This provision specifies the approved test methods for determining the VOC content of aerospace materials, to quantify amounts of exempt perfluorocarbon compounds in aerospace materials, acid content of pretreatment wash primers, efficiency of emission control systems, transfer efficiency, VOC composite partial pressure, and establishes criteria for multiple test methods, and equivalent test methods.

This provision combines former subdivisions (i) and (j) and staff removed outdated test methods that are no longer used by the South Coast AQMD laboratory and corrected a separate referenced test method name. The structure and numbering have been amended and streamlined.

Rule 442 Applicability [Subdivision (j)]

This provision clarifies that any aerospace materials that are exempt from all or a portion of the VOC limits of subdivision (d), shall comply with Rule 442 – Usage of Solvents. This subdivision was not changed other than to capitalize defined terms and moved from subdivision (g) for consistency with other South Coast AQMD rules.

Exemptions [Subdivision (k)]

This provision provides conditional exemptions to various subdivisions of this rule. Staff is proposing the removal of paragraph (l)(16) as it is no longer applicable, but no more removals are proposed. Staff updated the capitalized defined terms and updated rule's references

Former subdivision (k) – Air Toxics has been removed because it is outdated and no longer serves a functional regulatory purpose. The provision was originally added to address concerns identified during the 2001 amendment; however, it lacks sufficient specificity to be enforceable under current rule structure. Consistent with its removal, the associated definitions that applied exclusively to this subdivision have also been removed.

Paragraph (k)(9)

Paragraph (k)(9) establishes an exemption from the provisions of paragraphs (c)(3) and (d)(5) for the application of marking coatings. Paragraph (k)(9) was revised to clarify the meaning of marking coatings.

Paragraph (k)(10) – Laboratory Exemption

Paragraph (k)(10) specifies that the provisions of subdivisions (d) and (f) do not apply to laboratories that apply materials to test specimens for purposes of research, development, quality control, or testing related to production operations. This exemption was updated to address industry concerns related to ongoing research activities.

Paragraph (k)(15)

Paragraph (k)(15) clarifies the applicability of the rule. This provision was revised to specify that aerospace materials that are expressly and exclusively offered for sale, sold, or manufactured for use outside of the South Coast AQMD jurisdiction are not subject to the rule. This revision addresses manufacturer concerns regarding products intended solely for use outside the district and avoids unintended regulation of out-of-jurisdiction activities.

Paragraph (k)(16)

This provision clarifies that the prohibitions on possessing and repackaging aerospace materials in paragraphs (f)(1), (f)(3), and (f)(4) do not apply to aerospace materials that are shipped into the South Coast AQMD solely for reformulation or repackaging for sale and use outside the District, or that are temporarily stored at a facility and clearly marked for use outside the South Coast AQMD jurisdiction. This clarification addresses concerns regarding the treatment of in-transit materials.

Attachment A – Usage Limits for Level II Materials containing pCBtF or t-BAc

Attachment A provides the receptor-based annual usage limits that apply to facilities electing alternative compliance pathways under subdivision (e). These limits were developed to ensure that continued use of Level II materials remains within health-protective and enforceable thresholds based on proximity to the nearest sensitive receptor.

Table A-1 – Annual Usage Limits for Facilities with an approved air pollution control system, establishes the allowable annual usage for facilities operating an approved air pollution control system pursuant to paragraph (e)(2) and (e)(4). Facilities with an operational system meeting the required control and capture efficiencies may use Level II materials up to the specified gallon-per-year limits, which increase with greater distance from the nearest sensitive receptor.

Table A-2 – Annual Usage Limits for Facilities without an air pollution control system, establishes the allowable annual usage for facilities electing the low-use option without an air pollution control system pursuant to paragraph (e)(5) and (e)(6). These limits apply only to facilities operating under approved permit conditions or those limiting use to 1.25 gallons per year. The allowable usage increases with distance from the nearest sensitive receptor, providing additional flexibility for facilities located farther from sensitive receptors.

CHAPTER 4 : IMPACT ASSESSMENT

EMISSIONS IMPACT

COST-EFFECTIVENESS AND INCREMENTAL COST-EFFECTIVENESS

SOCIOECONOMIC IMPACT ASSESSMENT

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

COMPARATIVE ANALYSIS

Emission Impacts

PAR 1124 establishes a prohibition and compliance schedule for the phase out of pCBtF and t-BAc without changing current VOC limits for most aerospace material categories, except for adhesion promoters; therefore, no decrease in VOC emissions are expected. Manufacturer survey data indicated that adhesion promoters are heavily reliant on pCBtF or t-BAc to meet the current VOC limit of 250 g/L. The adhesion promoter category, on average, contains up to 70 percent pCBtF or t-BAc and some products can contain up to 96 percent by volume, so meeting the 250 g/L with the use of exempt compounds is not likely feasible. Staff is proposed to increase the VOC limit for adhesion promoters to 750 g/L to facilitate the elimination of pCBtF.

To estimate the potential VOC emission increase for the adhesion promoter category, staff used VOC content and sales data reported in the South Coast AQMD Coating Manufacturer Survey. From the survey, three manufacturers reported sales volume by product category into the South Coast AQMD along with the VOC content of each coating product sold. In addition to the survey, the aerospace industry also submitted a list of coatings products used at their facilities which showed that the three aerospace coating manufacturers that responded to South Coast AQMD Coating Manufacturer Survey account for a majority of the aerospace coatings sold within the South Coast AQMD. The annual volume of adhesion promoters reported sold is low and cannot be disclosed due to the limited number of manufacturers reporting sales per year is low. For the emissions calculations, the VOC of material or actual VOC was used; the VOC actual was estimated based on the survey data provided by the manufacturers. PAR 1124 has an estimated VOC emissions increase of approximately 0.004 tons per day.

PAR 1124 affects approximately 393 facilities; 374 non-Title V facilities and 17 Title V facilities. In order to estimate VOC emissions, staff relied on South Coast AQMD Coating Manufacturer Survey and facility reported usage to estimate VOC emissions. Staff used the sales weighted average for each category from the survey, reported sales volume from the survey, and facility usage volumes (where available) to estimate VOC emissions. The table below shows the estimated VOC emissions for each reported aerospace coating category used in South Coast AQMD.

Table 4-1: Estimated VOC Emissions by Category Reported in Manufacturer Survey

Category	Emissions (tpd)
Topcoat	0.05
Fuel Tank Coating	0.0006
High-Temperature Coating	0.0021
General Coating	0.10
Adhesion Promoter	0.0004
Structural Adhesive (Non-Autoclavable)	0.0005
Structural Adhesive (Autoclavable)	0.0005
Non-Structural	0.0012
Extrudable, Rollable, or Brushable	0.0005
Total	0.16
Adjusted VOC Emissions (tpd)	**0.2**

The baseline VOC emissions from PAR 1124 are estimated to be approximately 0.16 tons per day, however, not all manufacturers submitted survey responses. Based on staff's evaluation, facility site visits, and discussion with aerospace coating manufacturers, staff adjusted the emissions by 25 percent to capture potentially unreported volumes at used at smaller facilities engaging in aerospace coating operations. The adjusted baseline VOC emissions is approximately 0.2 tons per day. The maskants category was not included in the table because it was not reported in the submitted manufacturer survey. A maskant manufacturer reached out to staff and coordinate several site visits to local aerospace facilities to better understand maskant usage. Staff's evaluation of the maskants primarily used in South Coast AQMD indicated that maskants used contain up to 95 percent pCBtF by volume and contain a VOC content of zero grams per liter. Therefore, the VOC emissions contribution from the maskants category is negligible. Similarly, for other coating categories not reported in the survey or by aerospace facilities, staff assumed the usage and VOC emissions to be zero. Staff's evaluation of the 17 Title V facilities indicated an average annual usage per facility is approximately 150 gallons which equates to 2,850 gallons for all Title V facilities; the topcoats and general primers category accounting for the largest usage. Further evaluation showed that the average actual VOC content for the topcoats and general primers category are approximately 379 g/L. The total VOC emissions from all 17 Title V facilities is approximately 0.012 tons per day

Control Technology Cost and Overall Emissions Impacts

Compliance with PAR 1124 is primarily expected to be met through manufacturers reformulating regulated products by substituting certain chemicals with other chemicals that contain less VOCs, less or no toxics, and no stratospheric ozone-depleting compounds. The manufacturers will have flexibility to use any compliant alternative reformulation to meet the VOC limits in PAR 1124. For certain categories, there are existing or alternative replacement products that meet the current or proposed VOC content limits; therefore, product reformulation is technically feasible. Some end-users, primarily large facilities, may comply with the rule using alternative options such as control devices (e.g., carbon adsorbers emission or thermal oxidizer). The latter options may have the highest cost for most facilities, so it is anticipated that most smaller facilities will comply using

alternative products that do not contain pCBtF or t-BAc in the future or obtain an annual usage limit specified in the rule.

Cost of Control Device

The primary focus of PAR 1124 is to control and reduce emissions of pCBtF and t-BAc which are considered toxic compounds and not criteria pollutants or their precursors, thus a cost-effectiveness analysis is not required. However, the 17 Title V facilities impacted by PAR 1124 are generally classified as large facilities and typically perform coating operations in a total enclosure such as a spray booth. Staff anticipates that these facilities will be primarily the ones installing controls and thus will have cost impacts associated with reducing pCBtF and t-BAc emissions. Of the two potential control device technologies staff evaluated, a carbon adsorption system is perhaps the most likely technology to be chosen by facilities due to the lower annual operating cost and high removal efficiency. Carbon adsorption systems remove all VOC emissions and not just specifically pCBtF and t-BAc. Carbon adsorption systems are typically customed designed based a facility's site-specific conditions. Staff estimates that a typical spray booth or total enclosure would have an exhaust flow rate of 20,000 CFM and require 45,000 pounds of activated carbon to achieve a 95 percent control efficiency. In addition to the bed of activated carbon, new ducting, flow meters, upgraded blower, and monitoring equipment will also be required. Based on estimates form control device manufacturer of actual real-world installations, the total installed cost for a typical carbon adsorption system is estimated to be approximately $80,000 to $150,000 depending on overall requirements. Larger carbon adsorption systems that require a new total enclosure can range approximately from $250,000 to $1 million. In addition, facilities will have to consider carbon replacement cost where the spent carbon must be treated as hazardous waste. Cost for carbon replacements can be as high as $200,000 per changeout. Based discussions with control technology manufacturers, staff assumed electricity and recurring source testing cost to be approximately five percent of the catalyst changeout cost which equates to approximately $10,000 annually.

Product Reformulation Cost

Some adhesion promoters and maskants will need to be reformulated to phase out of the pCBtF in the formulations sold into the South Coast AQMD. For adhesion promoters, the Regulatory VOC limit is proposed to be increased to allow existing product formulations, complying with national VOC limits, to be sold and used in the South Coast AQMD. Reformulation costs are not anticipated; however, testing and certification for new product systems may be required, which will take time. Maskants containing pCBtF will require reformulations and manufacturers may elect to comply with the proposed alternative PW-MIR VOC limits. For level II materials, manufacturers may elect to reformulate to transition away from pCBtF-based formulations; however, alternative options are included in PAR 1124. The reformulation process will require resource allocation towards research and development. Personnel time will need to be shifted to reformulation efforts, which will incur some associated costs. In addition, research time also includes specification and product requirements for the material and application. Reformulation also requires the necessary raw materials such as solvents, resins, and additives to support the development efforts. Based on manufacturer feedback, the cost for specialty solvents, such as pCBtF and t-BAc, exceed conventional solvent cost; therefore, the manufacturers may recover some cost based on the raw materials. In the case of adhesion promoters and maskants, pCBtF comprises around 70 percent of those coatings, so the cost savings could be considerable.

Overall Emissions Impact

The anticipated emissions increase from the increasing the VOC content limit for adhesion promoters to 750 g/L is approximately 0.004 ton per day. The alternative PW-MIR VOC limit for maskants is designed to be equivalent to the 160 g/L VOC limit for Type II etchants; therefore, there will not be a VOC emission increase. Other subcategories of maskants have higher mass-based VOC limits, if those products reformulated to meet the PW-MIR VOC limit, that would result in lower ozone forming potential from those maskants. Staff did not quantify emission reductions because it cannot be foreseen how many maskant might be reformulated to the alterative PW-MIR VOC limit. The baseline emissions from the 17 Title V facilities is approximately 0.0122 tons per day, but assuming all 17 Title V facilities install a carbon adsorption system, which can achieve 95% percent reduction, the VOC emission reduction will be approximately 0.012 ton per day from all 17 Title V facilities. Thus, the estimated overall net VOC emission impact in PAR 1124 will result in a VOC reduction of 0.008 ton per day. It is important to note that each Title V facility is unique in its operation, such as the number of existing spray booths, type of aerospace part being coated, and type of aerospace manufacturing contract, so the actual number of Title V facilities electing to install carbon adsorption control system will vary.

Socioeconomic Impact Assessment

On March 17, 1989, the South Coast Air Quality Management District (South Coast AQMD) Governing Board adopted a resolution which requires an analysis of the socioeconomic impacts associated with adopting and amending rules and regulations. In addition, Health and Safety Code Sections 40440.8 and 40728.5 require a socioeconomic impact assessment for proposed and amended rules resulting in significant impacts to air quality or emission limitations. Thus, this Socioeconomic Impact Assessment has been prepared in accordance with Health and Safety Code and South Coast AQMD Governing Board requirements. Lastly, Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes Best Available Retrofit Control Technology (BARCT) or "all feasible measures" requirements relating to emissions of ozone, carbon monoxide (CO), sulfur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOC), and their precursors. PAR 1124 is designed to partially implement the 2022 AQMP control measure CTS-01 to phase out pCBtf and t-BAc from aerospace materials. Since PAR 1124 is not focused on reducing emissions of criteria pollutants or their precursors, a cost-effectiveness analysis is not required and has not been prepared.

Introduction

Rule 1124 limits VOC emissions from coatings, adhesives, sealants, lubricants, maskants, and cleaning solvents ("aerospace materials") used in aerospace manufacturing and maintenance. South Coast AQMD relies on exempt solvents to comply with these limits. However, some exempt solvents have been shown to have carcinogenic properties. In 2017, the Stationary Source Committee directed South Coast AQMD staff to prioritize toxicity over emissions in such cases. In 2018 and 2020, pCBtF and t-BAc were determined by OEHHA to have toxic endpoints which have equal or higher cancer potency than other compounds prohibited by South Coast AQMD. As such, PAR 1124 limits the use of pCBtF and t-BAc in aerospace materials based on whether they are classified as Level I or Level II. Specifically, PAR 1124 proposes to fully phase out pCBtF and t-BAc in Level I materials which do not rely on these solvents in their formulations. For Level II materials that rely on pCBtF or t-BAc, PAR 1124 allows for three compliance options: 1) air pollution control systems; 2) low-use provisions; or 3) facility-level phase out.

Legislative Mandates

The legal mandates directly related to the Socioeconomic Impact Assessment of PAR 1124 include a South Coast AQMD Governing Board resolution and various sections of the Health and Safety Code, which are described in the following sections.

South Coast AQMD Governing Board Resolution

On March 17, 1989, the South Coast AQMD Governing Board adopted a resolution that requires an analysis of the economic impacts associated with adopting and amending rules and regulations which consider all of the following elements:

- Affected industries;
- Range of probable costs;
- Cost-effectiveness of control alternatives; and
- Public health benefits.

Health and Safety Code Requirements

The state legislature adopted legislation which reinforces and expands the aforementioned South Coast AQMD Governing Board resolution requiring socioeconomic impact assessments for rule development projects. Health and Safety Code Section 40440.8 requires a socioeconomic impact assessment for any proposed rule, rule amendment, or rule repeal which "will significantly affect air quality or emissions limitations."

To satisfy the requirements in Health and Safety Code Section 40440.8, the scope of the analysis should include all of the following information:

- Type of affected industries;
- Impact on employment and the regional economy;
- Range of probable costs, including those to industry;
- Availability and cost-effectiveness of alternatives to the rule;
- Emission reduction potential; and
- Necessity of adopting, amending, or repealing the rule in order to attain state and federal ambient air quality standards.

The compliance cost of PAR 1124 is estimated to be minimal (e.g., less than one million U.S. dollars per year), which is less than the minimum threshold necessary for conducting macroeconomic modeling that would produce reliable employment impact estimates. Therefore, a job impact analysis was not conducted for PAR 1124.

Health and Safety Code Section 40728.5 requires the South Coast AQMD Governing Board to: 1) actively consider the socioeconomic impacts of regulations; 2) make a good faith effort to minimize adverse socioeconomic impacts; and 3) include small business impacts. To satisfy the requirements in Health and Safety Code Section 40728.5, the socioeconomic impact assessment should include the following information:

- Type of industries or business affected, including small businesses; and

- Range of probable costs, including costs to industry or business, including small business.

  In addition, to satisfy the requirements in Health and Safety Code Section 40920.6, the scope of the analysis should include an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes BARCT or "all feasible measures" requirements relating to emissions of ozone, CO, SOx, NOx, VOC, and their precursors. Since PAR 1124 aims to reduce toxics from aerospace materials, rather than focusing on achieving emission reductions of criteria pollutants or their precursors, a cost-effectiveness analysis pursuant to Health and Safety Code Section 40440.8 and an incremental cost-effectiveness analysis pursuant to Health and Safety Code Section 40920.6 are not required and have not been prepared.

Affected Facilities and Industries

Implementation of PAR 1124 would affect approximately 393 facilities in the South Coast AQMD jurisdiction with 259 facilities in Los Angeles County, 92 facilities in Orange County, 24 facilities in San Bernardino County, and 18 facilities in Riverside County. Among the 393 affected facilities, 376 are classified as Non-Title V, while 17 are classified as Title V. Table 1 presents the distribution of affected facilities across various North American Industrial Classification System (NAICS) sectors. The majority of affected facilities are from the sectors of the Fabricated Metal Product Manufacturing (NAICS 332), Other Transportation Equipment Manufacturing (NAICS 3364-3369) and Computer and Electronic Product Manufacturing (NAICS 334), which account for 31.6 percent, 23.7 percent and 9.2 percent of all the affected facilities, respectively.

Table 4-2: Affected Industries

NAICS	Industry Name	Number of Facilities	Percentage of Facilities
332	Fabricated metal product manufacturing	124	31.6%
3364-3369	Other transportation equipment manufacturing	93	23.7%
334	Computer and electronic product manufacturing	36	9.2%
42	Wholesale trade	20	5.1%
326	Plastics and rubber product manufacturing	19	4.8%
811	Repair and maintenance	15	3.8%
487-488	Scenic and sightseeing transportation; Support activities for transportation	11	2.8%
335	Electrical equipment and appliance manufacturing	9	2.3%
92	State and Local Government	8	2.0%
325	Chemical manufacturing	8	2.0%
54	Professional, scientific, and technical services	7	1.8%

Table 4-3: Affected Industries (Concluded)

NAICS	Industry Name	Number of Facilities	Percentage of Facilities
481	Air transportation	6	1.5%
3361-3363	Motor vehicles, bodies and trailers, and parts manufacturing	5	1.3%
333	Machinery manufacturing	5	1.3%
331	Primary metal manufacturing	3	0.8%
322	Paper manufacturing	3	0.8%
44-45	Retail trade	3	0.8%
324	Petroleum and coal products manufacturing	2	0.5%
712	Museums, historical sites, zoos, and parks	2	0.5%
313-314	Textile mills; Textile product mills	2	0.5%
493	Warehousing and storage	2	0.5%
23	Construction	2	0.5%
323	Printing and related support activities	2	0.5%
337	Furniture and related product manufacturing	2	0.5%
321	Wood product manufacturing	1	0.3%
61	Educational services	1	0.3%
339	Miscellaneous manufacturing	1	0.3%
813	Membership associations and organizations	1	0.3%
Total		**393**	**100%**

Small Business Analysis

The South Coast AQMD defines a "small business" in Rule 102 for purposes of fees as one which employs 10 or fewer persons and which earns less than $500,000 in gross annual receipts. The South Coast AQMD also defines "small business" for the purpose of qualifying for access to services from the South Coast AQMD's Small Business Assistance Office as a business with an annual receipt of $5 million or less, or with 100 or fewer employees. In addition to the South Coast AQMD's definition of a small business, the United States (U.S.) Small Business Administration and the federal 1990 Clean Air Act Amendments (1990 CAAA) each have their own definition of a small business.

The 1990 CAAA classifies a business as a "small business stationary source" if it: 1) employs 100 or fewer employees; 2) does not emit more than 10 tons per year of either VOC or NOx; and 3) is a small business as defined by the U.S. Small Business Administration. Based on firm revenue and employee count, the U.S. Small Business Administration definition of a small business varies by

six-digit NAICS codes.[2] The majority of facilities affected by PAR 1124 are within the Electroplating, Plating, Polishing, Anodizing and Coloring industry (NAICS 332813). According to the U.S. Small Business Administration, businesses in this industry with fewer than 500 employees are classified as small businesses.

South Coast AQMD mostly relies on Dun and Bradstreet data to conduct small business analyses for private companies. In cases where the Dun and Bradstreet data are unavailable or unreliable, other external data sources such as Manta, Hoover, LinkedIn, and company website data will be used. The determination of data reliability is based on data quality confidence codes in the Dun and Bradstreet data as well as staff's discretion. Revenue and employee data for publicly owned companies are gathered from Securities and Exchange Commission (SEC) filings. Since subsidiaries under the same parent company are interest-dependent, the revenue and employee data of a facility's parent company will be used for the determination of its small business status.

Employment and revenue estimates from 2025 Dun and Bradstreet data as well as other external sources are available for 366 of the 393 affected facilities. Although the employment and revenue data for some facilities are unknown or missing, the current data used for this small business analysis represents the most thorough and accurate information obtainable as of the date of this Staff Report. Table 2 presents the number of affected facilities that qualify as small businesses, based on each of the four small business definitions. For the 366 facilities with available employment and revenue data, up to 257 may qualify as small businesses. Note that only 67 of the 366 facilities have reported their annual VOC or NOx emissions to South Coast AQMD, of which 18 facilities qualify as small businesses, based on the 1990 CAAA definition.

Table 4-4: Number of Small Businesses Based on Various Definitions

Small Business Definition	Number of Facilities
South Coast AQMD Rule 102	34
South Coast AQMD Small Business Assistance Office	198
U.S. Small Business Administration	257
1990 CAAA	18

Compliance Costs

PAR 1124 classifies aerospace materials into two categories: Level I and Level II. Level I materials do not rely on pCBtF and/or t-BAc in their formulations and are therefore required to be completely phased out. Suitable substitute materials are readily available at comparable or lower cost, allowing Level I materials to be easily replaced. As a result, phasing out pCBtF and t-BAc is expected to result in minimal to no compliance costs for facilities using Level I materials in their operations.

[2] U.S. Small Business Administration, 2023 Small Business Size Standards, https://www.sba.gov/document/support-table-sizestandards, accessed March 7, 2025.

Level II materials contain and rely on pCBtF and/or t-BAc in their formulations. Under PAR 1124, facilities using Level II materials must select one of the three proposed compliance options to continue using these materials in their operations.

- **Option 1 – Air Pollution Control System**
- **Option 2 – Low-Use Provision**
- **Option 3 – Phase-out of pCBtF and t-BAc**

Cost assumptions of these compliance options are described in the following sections:[3]

Option 1 – Air Pollution Control System

Under Option 1, affected facilities would elect to install and operate an approved air pollution control system and thus, incur one-time costs for: 1) the purchase and installation of an air pollution control system; and 2) a permit alteration or modification fee. In addition, affected facilities that select this compliance option would incur recurring operating and maintenance (O&M) costs for the air pollution control system.

Carbon Adsorption System – Equipment and Installation

PAR 1124 will be applicable to 17 Title V facilities, however two of these facilities have existing air pollution control systems which are not anticipated to require modifications. Therefore, 15 Title V facilities are anticipated to select Option 1 and purchase and install a carbon adsorption system as their air pollution control technology, as these facilities are generally larger and have existing coating operations which are conducted within existing total enclosures. Based on estimates from air pollution control device manufacturers, the total cost of equipment and installation for a typical carbon adsorption system ranges from $80,000 to $150,000 per system, with a useful life of approximately 25 years. So as to not underestimate the potential costs associated with carbon adsorption systems, the upper-bound cost of $150,000 per system was used in the cost estimation resulting in a total cost of approximately $2.3 million if all 15 Title V facilities elect to install a carbon adsorption system.

Title V Permit Revision Fees

In order for the 15 Title V facilities to be able to install carbon adsorption systems, one-time costs associated with application fees seeking to revise each facility's Title V permits to incorporate the new or modified equipment will be required. The Title V permit revision fees are established in South Coast AQMD Rule 301 – Permitting and Associated Fees.[4] Specifically, the fee rates are outlined in Table Fee Rate-A for fiscal year (FY) 2025-26, which details the permit fees for processing, changes of conditions, and alterations or modifications. The fee for altering or modifying a related permit for a Schedule C Title V facility is approximately $7,844. Based on the applicable fee rate, the total one-time Title V permit revision fees for all 15 Title V facilities are approximately $117,662.

[3] All dollar amounts in the analysis are in 2024 U.S. dollars.

[4] South Coast AQMD, 2025, Rule 301 – Permitting and Associated Fees, https://www.aqmd.gov/docs/default-source/rule-book/reg-iii/rule-301.pdf, accessed January 2026.

Carbon Replacement Costs

The recurring O&M costs of operating a carbon adsorption system include costs associated with periodically replacing the spent carbon with fresh activated carbon which typically occurs every six years, conducting source tests, and electricity costs. The cost to replace spent carbon with fresh activated carbon is approximately $200,000 per changeout per carbon adsorption system per facility, based on manufacturers' feedback. Thus, for 15 Title V facilities, the total cost of replacing spent carbon with fresh activated carbon for 15 carbon adsorption systems over the useful life of 25 years is approximately $12 million.

Costs for Conducting Source Testing & Electricity Usage

Another O&M cost is related to conducting periodic source tests and the use of electricity to operate each carbon adsorption system. Manufacturers' feedback indicates that the cost associated with conducting source tests and electricity usage is approximately five percent of the carbon replacement cost, or about $10,000 per facility per year. Over the 25-year useful life of the carbon adsorption systems, the total cost associated with conducting source tests and electricity usage for 15 Title V facilities is estimated to be approximately $3.8 million.

Option 2 – Low-Use Provision

Under Option 2, affected facilities may continue to use Level II materials containing pCBtF and/or t-BAc provided they either: a) demonstrate through recordkeeping that the total Level II usage is no more than 1.25 gallons per year; or b) apply for a permit revision seeking to add a permit condition which limits the total annual usage to less than the enforceable, health-based limits set forth in Table 2-10 of Chapter 2. While Option 2a does not involve any costs involving permit revisions, so as to not underestimate the maximum potential costs associated with implementing the low-use provision under Option 2b, the analysis assumes that all 376 facilities, which are Non-Title V facilities, would submit applications seeking to revise their permits to include a permit condition limiting the total annual usage.

Administrative Permit Fees

The fee rates for an administrative change to the permit description for Non-Title V facilities are provided in Rule 301 subparagraph (c)(3)(C). The total one-time permit fee for a Schedule B Non-Title V facility is $1,293. Based on the applicable fee rate, the total permit revision costs will be approximately $486,330 for all 376 Non-Title V facilities.

Option 3 – Phase-out of pCBtF and t-BAc

Lastly, Option 3 provides a compliance pathway for facilities that can fully eliminate the use of pCBtF and t-BAc in Level II materials by transitioning to using compliant products that do not contain these compounds.

Option 3 is anticipated to be utilized for phasing out pCBtF from two categories of coatings, adhesion promoters and maskants, which can contain 70 percent or greater quantities of pCBtF in those formulations. Since replacement solvents without pCBtF have a lower cost than pCBtF, the phase out of pCBtF under Option 3 will be expected to result in a reduced cost. Thus, if facilities elect to implement Option 3 to phase out the use of pCBtF, adverse

compliance costs are not expected to be incurred. It is important to note that based on currently available information, adhesion promoters and maskants do not contain t-BAc, so facilities will not be expected to utilize Option 3 to phase out the use of t-BAc.

Total Compliance Costs of PAR 1124

The total estimated compliance costs of PAR 1124 cover a 25-year forecast period, from 2026 to 2050, based on the useful life of carbon adsorption systems. To calculate the present value of the total compliance costs, all amortized/annualized compliance costs have been discounted to year 2026. Table 3 summarizes the present value as well as annual average of the amortized costs from 2026 to 2050 if PAR 1124 is implemented. The total present value of the amortized compliance costs of PAR 1124 is estimated to be $17,483,755 and $12,462,859 at a one percent and four percent discount rate, respectively. The average annual compliance cost over the period from 2026 to 2050 is estimated to range from $755,313 to $792,647 at a one percent to four percent real interest rate, respectively. Note that for the annual average estimates, only capital cost categories are affected by the interest rate (one or four percent), as interest applies to upfront capital investments, while recurring costs are not subject to financing and therefore remain unaffected.

Table 4-5: Estimated Compliance Costs of PAR 1124

Cost Categories	Present Value (2026)		Annual Average (2026-2050)	
	1% Discount Rate	4% Discount Rate	1% Real Interest Rate	4% Real Interest Rate
Capital Costs				
Carbon Adsorption System – Equipment and Installation (Option 1)	$3,080,429	$2,250,000	$101,154	$138,487
Permit Alteration/Modification Fees (Option 1)	$117,662	$117,662	$4,706	$4,706
Administrative Permit Fees (Option 2)	$486,330	$486,330	$19,453	$19,453
Recurring Costs				
Carbon Replacement (Option 1)	$10,462,826	$7,171,823	$480,000	$480,000
Source Testing & Electricity (Option 1)	$3,336,508	$2,437,044	$150,000	$150,000
Total	**$17,483,755**	**$12,462,859**	**$755,313**	**$792,647**

Macroeconomic Impacts on the Regional Economy

Regional Economic Models, Inc. (REMI) developed the Policy Insight Plus Model (PI+ v3) is a tool that South Coast AQMD typically uses to assess the impacts of rule development projects on

the job market, prices, and other macroeconomic variables in the region when the average annual compliance cost is greater than one million current U.S. dollars ($1 MM).[5] However, when the average annual compliance cost of a project is less than $1 MM, the model cannot reliably forecast the macroeconomic impacts, because resultant impacts from the project would be too small relative to the baseline economic forecast.

Since the total average annual compliance cost of PAR 1124 is estimated to range from $755,313 to $792,647, at a one percent and four percent real interest rate, respectively, which is less than the $1 MM threshold, a macroeconomic impact analysis will not be conducted for PAR 1124.

California Environmental Quality Act (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Sections 15002(k) and 15061, the proposed project (PAR 1124) is exempt from CEQA pursuant to CEQA Guidelines Sections 15061(b)(3). A Notice of Exemption will be prepared pursuant to CEQA Guidelines Section 15062, and if the proposed project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino counties, and with the State Clearinghouse of the Governor's Office of Land Use and Climate Innovation.

Draft Findings Under the Health and Safety Code

Health and Safety Code Section 40727 requires that prior to adopting, amending, or repealing a rule or regulation, the South Coast AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, nonduplication, and reference, as defined in that section, based on relevant information presented at the hearing, this written analysis, and the rulemaking record. The draft findings are as follows:

Necessity – A need exists based on the Stationary Source Committee's direction to address the toxic risk of currently exempt compounds pCBtF and t-BAc in existing operations.

Authority - The South Coast AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Health and Safety Code Sections 39002, 40000, 40001, 40440, 40702 and 41508.

Clarity - Proposed Amended Rule 1124 – Aerospace Assembly and Component Manufacturing Operations, is written and displayed so that the meaning can be easily understood by persons directly affected by it.

Consistency - Proposed Amended Rule 1124 – Aerospace Assembly and Component Manufacturing Operations, is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or federal and state regulations.

Nonduplication - Proposed Amended Rule 1124 – Aerospace Assembly and Component Manufacturing Operations, does not impose the same requirement as any existing state or federal regulation, and the proposed amendments are necessary and proper to execute the powers and duties granted to, and imposed upon, the South Coast AQMD.

[5] Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Area (70-sector model). Version 3. 2023.

Reference - In amending this rule, the South Coast AQMD Governing Board references the following statutes which the South Coast AQMD hereby implements, interprets, or makes specific: Health and Safety Code Sections 40001, 40440, and 40702.

Comparative Analysis

As set forth in Health and Safety Code Section 40727.2, the South Coast AQMD is required to perform a comparative analysis when adopting, amending, or repealing a rule or regulation. The comparative analysis is relative to existing federal requirements, existing or proposed South Coast AQMD rules and air pollution control requirements and guidelines which are applicable to VOC regulations for aerospace materials. There are no other existing or proposed South Coast AQMD rules that directly apply to the same source type (aerospace assembly and component manufacturing operations). At the state level, CARB has not adopted any Suggested Control Measures (SCMs), regulations, or guidance specific to VOC emissions for aerospace materials. Staff evaluated three of the larger air districts within California, San Diego Air Pollution Control District (APCD), Bay Area AQMD, and San Joaquin Valley APCD (referred to collectively herein as California Air Districts) because they have similar aerospace material rules to PAR 1124. The comparative analysis for PAR 1124 is presented in the following table.

Table 4-6: PAR 1124 Comparative Analysis

Rule Element	PAR 1124	U.S. EPA. 40 CFR, Part 63, Subpart GG National Emission Standards for Aerospace Manufacturing and Rework Facilities	California Air Districts
Applicability	• Any operation associated with manufacturing and assembling products for Aircraft and Space-Vehicles for which an Aerospace Material is used and to any Person who supplies, sells, offers for sale, markets, manufactures, blends, packages, repackages, possesses, or distributes any Aerospace Material or associated solvent for use within the South Coast AQMD, as well as any owner or operator of a Facility who uses, applies, or solicits the use or application of any Aerospace Material, or associated solvent within the South Coast AQMD	• Applies to facilities that are engaged, either in part or in whole, in the manufacture or rework of commercial, civil, or military aerospace vehicles or components and that are major sources	• Applies to aerospace manufacturing, assembly, coating, masking, bonding, depainting, surface preparation, cleaning, stripping, maintenance, and associated cleanup operations for aerospace vehicles or components within the respective districts • Applies to facilities that manufacture, assemble, coat, repair, service, or rework aerospace components and conduct associated solvent usage, waste handling, and equipment cleanup activities
Requirements	• VOC limits for aerospace materials including topcoats, primers, adhesives sealants, maskants, lubricants, cleaning solvents and strippers; no new VOC content limits are being proposed with exception for adhesion promoters, for which a 750 g/L VOC limit is established • Classification of aerospace materials into Level I and Level II categories based on health risk considerations • Alternative PW-MIR limit for adhesion promoters • Minimum transfer efficiency requirements • Emission control system compliance options in lieu of meeting coating VOC limits • Alternative compliance pathways for Level II materials, including the use of emission control systems or low-use provisions	• Organic hazardous air pollutants and VOC content limits and work practice standards for affected aerospace manufacturing and rework operations, including coating application (e.g., topcoats and primers), adhesives and sealants, maskants, depainting, cleaning solvents, and chemical milling operations. • Establishes a VOC content limit of 890 g/L for adhesion promoters. • •Compliance options, as specified by the rule and dependent on the affected operation, which may include material limits, work practice standards, monitoring requirements, and the use of emission control systems, where applicable	• VOC content limits for aerospace coatings and related materials, including topcoats, primers, adhesives and sealants, maskants, cleaning solvents, and paint strippers • Adhesion promoters are not subject to a specific VOC content limit in two of the evaluated districts; however, San Joaquin Valley APCD Rule 4605 establishes a VOC content limit of 850 g/L • VOC limits similar to U.S EPA, 40 CFR Part 63, Subpart GG • Cleaning and stripping requirements, including VOC content limits, vapor pressure limits, closed-container practices, and evaporative loss minimization • Emission control system compliance options in lieu of meeting coating VOC limits by requiring demonstration of minimum capture and control efficiency or equivalent VOC emission reductions

Rule Element	PAR 1124	U.S. EPA. 40 CFR, Part 63, Subpart GG National Emission Standards for Aerospace Manufacturing and Rework Facilities	California Air Districts
Prohibition	• Prohibition on the manufacturing of aerospace materials containing pCBtF and t-BAc, with compliance dates based on material level classification unless an approved alternative compliance method is used • Prohibition on the sale and use of products containing pCBtF and t-BAc, based on material level classification unless an approved alternative compliance method is used	• None	• None
Recordkeeping	• Daily (as applicable per compliance pathway), including low-use daily usage records and retention requirements	• Records demonstrating compliance with material limits, work practices, and control device requirements • Usage records for aerospace materials and cleaning solvents • Control device monitoring and maintenance records (if applicable)	• Daily, weekly, or monthly records (district-specific) • Control device monitoring records, including key operating parameters, when emission controls are used • Records must generally be retained for a minimum of three to five years and made available upon request
Administrative	• Container labeling of VOC content and date of manufacture • Container labeling of PW-MIR limit for Adhesion Promoters and Maskants • Air pollution control systems for pCBtF and t-BAc must inspect, operate, and maintain control equipment in accordance with manufacturer specifications and maintain compliance records • Low-use provision for Level II materials must maintain purchase records, safety data sheets, daily usage records, application method information, and required records for a minimum of five years	• Initial notification, compliance status reports, and semiannual compliance reports • Performance test reports and monitoring data, where applicable • Startup, shutdown, and malfunction (SSM) records (as applicable)	• Operation and maintenance requirements and monitoring plans when emission control systems are used • Notification or approval requirements for alternative compliance approaches (e.g., control devices or equivalent compliance demonstrations)

Rule Element	PAR 1124	U.S. EPA. 40 CFR, Part 63, Subpart GG National Emission Standards for Aerospace Manufacturing and Rework Facilities	California Air Districts
Exemptions	• Aerospace materials meant as test specimens in facility laboratories for purposes of research, development, quality control, and testing for production-related operations • Exemption for possession of aerospace materials that are not meant for use within South Coast AQMD jurisdiction.	• Research and laboratory activities, subject to specific conditions	• Research, development, testing, prototype, and laboratory activities.

APPENDIX A: RESPONSE TO COMMENTS

Public Workshop Comments

Staff held a Public Workshop on January 7, 2026, to provide a summary of PAR 1124. The following is a summary of the verbal comments provided on PAR 1124 and staff's responses.

Commentator #1 Peter Weissman – AC Products

Peter Weissman expressed interest in meeting with staff to discuss challenges associated with reformulating maskants, noting that AC products is exploring alternative solvents to replace pCBtF and are in communication with their customers regarding these efforts. Commentator also suggested that maskants be reclassified from Level I to Level II materials under the proposed amendments.

Staff Response to Commentator #1:

Staff acknowledged the challenges associated with reformulation and agreed to meet with the commentator to further discuss these challenges.

Commentator #2 Bill Pearce – The Boeing Company

Bill Pearce requested clarification on the proposed rule language in subparagraph (e)(2)(B), specifically regarding whether an "or" should be included after each of the options listed in that subparagraph. Commentator also requested clarification on the reasoning behind the proposed three-year source testing frequency compared to a five-year interval. Lastly, commentator expressed appreciation for staff's collaboration.

Staff Response to Commentator #2:

Staff indicated that they will further evaluate the requested clarification regarding subparagraph (e)(2)(B). Upon review, staff determined that the inclusion of the word "or" after each listed provision is not necessary. The use of clauses designated as (i), (ii), and (iii) clearly indicates that compliance with any one of the listed options is sufficient, and additional wording is not needed to provide further clarity.

In addition, staff explained that the proposed source testing frequency is more frequent due to toxicity concerns associated with pCBtF and t-BAc.

Commentator #3 Rita Loof – RadTech International

Rita Loof expressed concerns regarding the proposed test method language, noting that U.S. EPA Method 24 is not suitable for thin-film, UV, EB, or LED-curable materials. She stated that ASTM D7767 is the industry-accepted method for determining VOC content for these materials and requested that clarification be provided regarding VOC content determination and labeling requirements for energy-curable thin-film coatings, similar to clarifications recently made during the rule development of Rule 1107.

Staff Response to Commentator #3:

Staff noted that guidance addressing VOC determination for thin-film energy-curing materials had been made available on the South Coast AQMD website[6] based on comments during the

[6] https://www.aqmd.gov/home/rules-compliance/compliance/vocs/calculations

amendments to Rule 1107. The guidance was intentionally drafted to be more generic and applicable across different coating applications and not limited to Rule 1107. Staff also offered to provide the guidance link to the commentator.

Commentator #4 Jake Newkirk – Boeing Encore Interiors

Jake Newkirk requested clarification regarding the proposed use-through provision for Level II materials and sought confirmation that existing inventories of these materials could continue to be used for up to 36 months following the date of rule adoption without the use of an air pollution control device or an alternative compliance pathway. He explained that the facility intends to ultimately phase out these materials and requested clarification on the timeframe allowed to deplete existing inventory prior to transitioning to compliant alternatives. Commentator also requested information regarding the anticipated timeframe for rule adoption.

Staff Response to Commentator #4:

Staff confirmed commentator's understanding that the use-through period for Level II materials is 36 months after date of rule adoption. Staff also confirmed that the intended Public Hearing date for PAR 1124 is March 6, 2026.

Comment Letter #1

California Council for Environmental and Economic Balance
369 Pine Street, Suite 720, San Francisco, CA 94104
1201 J Street, Suite 222-223, Sacramento, CA 95814
(415) 512-7890 | cceeb.org

January 16, 2026

Sergio Torres Callejas
Planning, Rule Development, and Implementation South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765

Subject: Comments on Proposed Amended Rule 1124 – Aerospace Assembly and Component Manufacturing Operations

Dear Mr. Callejas,

The California Council for Environmental and Economic Balance (CCEEB) is a coalition of business, labor, and public policy leaders who work together to pursue balanced and effective policy solutions. CCEEB member organizations operate facilities within the South Coast Air Quality Management District (SCAQMD or "District"), including facilities classified as Aerospace Assembly and Component Manufacturing Operations. As such, we are closely following the development of Proposed Amended Rule 1124 (PAR 1124).

CCEEB understands the need to move away from the use of pCBtF/t-BAc, and we respectfully request that the adopting resolution direct staff to complete a technology assessment a year before the start of the compliance timeline for Level II materials. Such a technology assessment would provide facilities a clear understanding of the state of available technology before they must, under the rule, select a compliance pathway that will work best for their operations.

CCEEB recognizes the importance of this proposed rule and, along with our members, is committed to working with you throughout its development. Please let me know if you would like to meet to discuss our comments in greater detail.

Sincerely,

William J. Quinn
CCEEB Consultant

cc: Sarady Ka
Heather Farr
Michael Krause
Tim Carmichael
Peter Okurowski
Kirstin Kolpitcke
Members, CCEEB SCAP Project

Response to Comment Letter 1

Staff acknowledges the importance of technology check-in to ensure future effective requirements are feasible and effective. Staff will include a provision in the resolution presented for Governing Board's approval that directs staff to conduct a technology check-in approximately 1.5 years after rule adoption. This check-in will focus on the progress of reformulation efforts to transition away from pCBtF in: 1) maskants; 2) adhesion promoters; and 3) Level II materials.

Comment Letter #2

January 21, 2026

Sergio Torres-Callejas
Air Quality Specialist
South Coast Air Quality Management District
21865 Copley Dr, Diamond Bar, CA 91765
scallejas@aqmd.gov

Re: Public comments on Proposed Amended Rule 1124 (Aerospace Assembly and Component Manufacturing Operations)

Dear Mr. Torres-Callejas:

RadTech International is pleased to comment on the proposed amendments to Rule 1124. UV/EB/LED technology plays a role in the aerospace coatings market as detailed in the attached article. RadTech supports the district's efforts to improve air quality in the Basin without sacrificing a healthy business climate and believes that the implementation of UV/EB/LED technology can accomplish both goals.

The stated goal of the rule amendments is to transition away from Products Containing pCBtf or t-BAc—UV/EB/LED formulations do not contain these materials and thus compliment the goal. One of the potential compliance options presented by staff is reformulation to products that are toxic free without requiring an air pollution control system. According to staff, thermal oxidizers generate corrosive byproducts such as hydrochloric acid for chlorinated solvents and hydrofluoric acid for fluorinated solvents. Because of their low levels of volatile organic compounds (VOC), thermal oxidizers are not required for UV/EB/ LED processes. The District has long recognized the benefits of our technology. The 2001 Rule 1124 Staff Report stated:

"We recognize that many UV and EB adhesives and coatings exhibit low-VOC content and as a result offer reductions in VOCs that usually meet or exceed rule limits. "

As stated during the public working group meetings, our Association believes that the district can achieve voluntary emission reductions from companies who convert their processes to UV/EB/LED technology. There have been many advances in UV/EB/LED technology for aerospace operations. As an example, "Sharkskin" coatings are engineered to mimic the microscopic texture of real shark skin, which helps reduce drag and inhibit bacterial growth. Originally developed by the military to improve aerodynamic and antimicrobial properties, these coatings are now being adapted for commercial applications in industries such as commercial aviation.

Comment 2-1

Exemption Request

According to staff, Proposed Amended Rule 1124 seeks to phase out two toxic compounds (t-BAc and p-CBtF). RadTech urges the district to provide regulatory flexibility to UV/EB/LED processes. Our materials are typically well below 50 grams/liter in VOC content which is minimal compared to the current limits, some as high as 1,000 grams per liter. We respectfully request that UV/EB/LED materials be exempted from the rule requirements. An exemption would be an incentive for businesses to voluntarily choose UV/EB/LED technology resulting in additional emission reductions for the District. Additionally, we urge the district to add a definition for energy curable materials which the current rule lacks.

Inclusion of Test Method

Comment 2-2

In order to avoid confusion, we urge the district to include ASTM D7767-11 in the rule. Currently Section (f)(5) "Multiple Test Methods" does not specify a method for energy curable materials applied as thin films. Some aerospace operations require that coatings be applied as thin films. Research projects (please see attached article titled "Aerospace UV Cured Coatings: Yesterday, Today and Tomorrow") by the Small Business Innovative Research (SBIR) and Strategic Environmental Research and Development (SERDP) showed that a 3 mils wet film thickness (WFT) did not cure properly. Researchers found that thinner layers resulted in the proper cure. These particular UV cure coatings were one component (1K), which is the traditional concept for a UV cure aerospace coating. Thicker film samples (tested above the accepted wet film thickness), resulted in poor through-cure leading to the coating peeling off the substrate.

The Environmental Protection Agency has recognized that due to the very low VOC content of our materials, the traditional EPA Method 24 is not suitable. Neither the EPA or the district have been able to develop a method that would accurately measure the very low levels of volatiles in our products. This leaves our companies in test method limbo. The current language that allows "multiple" test methods is vague and could result in enforcement problems for our members and their customers. Section c(74) of the proposed rule language leaves out ASTM D7767-11 which is the industry's accepted method to test energy curable thin films. We urge district staff to provide clarification regarding the procedures for reporting VOC content for energy curable thin films,

Comment 2-2 cont.

specifically by including guidance similar to what was established in the rulemaking process for Rule 1107.

Although the staff presentation did not mention additional recordkeeping and reporting requirements, we are concerned with a potential rule expansion into that arena. We are hopeful that the district will not add additional administrative requirements as part of the rule amendment.

We appreciate your attention to this matter and look forward to a productive rulemaking process.

Sincerely,

Rita Loof

Rita M. Loof
Director, Environmental Affairs

Cc: Heather Farr, Michael Krause, Mike Morris, Wayne Nastri

Attachments: Article-- -"Aerospace UV Cured Coatings: Yesterday, Today and Tomorrow"

Response to Comment 2-1

Staff acknowledges the interest in promoting lower-emission technologies and recognizes that UV/EB/LED materials generally contain low VOC content and do not rely on pCBtF or t-BAc.

However, staff is not proposing an exemption for UV/EB/LED materials under PAR 1124 at this time. These materials are already able to comply with the proposed rule requirements due to their low VOC content and the absence of the targeted solvents. As such, an exemption is not necessary to facilitate their use.

South Coast AQMD maintains a technology-neutral regulatory framework. The intent of PAR 1124 is to address health concerns associated with specific solvents by establishing consistent, health-protective requirements, while allowing manufacturers and facilities the flexibility to determine which compliant technologies best meet their operational needs. Materials that inherently meet or exceed the proposed limits remain fully compliant without the need for additional exemptions.

In addition, the rule does not include any requirements or provisions for energy curable materials so adding a definition as the only mention in the rule could cause confusion. During this rule amendment, staff deleted eight definitions because the terms were not used in the rule language. It is South Coast AQMD policy not to define terms that are not used in the rule because it could cause confusion; therefore, staff does not agree with the recommendation to include a definition at this time.

Response to Comment 2-2

Staff notes that this comment was addressed during the Public Workshop, further information can be found in the Staff Response to Commentator #3. The following description is now included on the South Coast AQMD website[7] to provide further clarification:

> Coatings products sold or used within South Coast AQMD's jurisdiction may be required to include VOC content on product labels pursuant to Rule 443.1 – *Labeling of Materials Containing Organic Solvents*. VOC content for labeling purposes may be determined by calculation from formulation data and/or by test results. The approved VOC test methods appropriate for determining product VOC content, whether for labeling or compliance purposes, vary by coating application. Please refer to the specific VOC rule applicable to the coating product to identify the required test methods and VOC calculation procedures. Further information on VOC test methods is available at: https://www.aqmd.gov/home/rules-compliance/compliance/vocs/architectural-coatings/current-and-past-activities/working-group.
>
> For energy-curable coatings, VOC content may be determined using ASTM D5403 – *Standard Test Methods for Volatile Content of Radiation Curable Materials*, which is an approved method for establishing VOC content for both labeling and compliance purposes. However, thin-film energy-curable coatings (including UV/EB/LED-cured materials applied with very low film thickness) currently do not have an approved compliance test method for determining VOC content under South Coast AQMD rules. When VOC content must be included on product labels

[7] https://www.aqmd.gov/home/rules-compliance/compliance/vocs/calculations

pursuant to Rule 443.1, manufacturers may use formulation data or estimate the VOC emissions of the reactive components of the thin film energy curable coatings using ASTM D7767 ─ *Standard Test Method to Measure Volatiles from Radiation Curable Acrylate Monomers, Oligomers, and Blends and Thin Coatings Made from Them*. ASTM D7767 is not a U.S. EPA approved test method and as such is not an appropriate compliance test method that a third-party laboratory, or the South Coast AQMD Laboratory, could rely on to verify the VOC content of a thin-film energy curable coating. For determining compliance with VOC limits for thin-film energy-curable coatings, manufacturers may rely on formulation data and ASTM D7767 to determine product VOC content for labeling purposes.