SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report

Proposed Amended Rule 1171 – Solvent Cleaning Operations

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Rule 1171 – Solvent Cleaning Operations (Rule 1171) was adopted in August 1991 to limit Volatile Organic Compound (VOC) emissions, toxic air contaminants, stratospheric ozone-depleting compounds, and global-warming compound emissions from solvent cleaning materials used in cleaning operations during the production, repair, maintenance, or servicing of products, tools, machinery, and general work areas. Subsequent rule amendments expanded the scope of the rule to apply to all solvent cleaning activities at all facilities.

Rule 1171 includes five primary categories of solvent cleaning activities with VOC limits and applies to any person who uses solvent cleaning materials in solvent cleaning operations during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas within South Coast Air Quality Management District (South Coast AQMD). The rule also applies to all persons who store and dispose of solvent cleaning materials used in solvent cleaning operations, and all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations within the South Coast AQMD.

The current proposed rule amendments partially implement the 2022 Air Quality Management Plan (AQMP) control measure CTS-01 to address two exempt compounds that were determined to have toxic end points, including potential carcinogenicity, by the Office of Environmental Health Hazard Assessment (OEHHA): *tert*-Butyl Acetate (t-BAc), which is exempt from the definition of a VOC for certain categories of products in a few source specific rules, and para-chlorobenzotrifluoride (pCBtF), which is considered exempt from the definition of a VOC for all uses within the South Coast AQMD. These exempt compounds can be utilized by manufacturers of solvent cleaning materials to formulate cleaning solvents that comply with Rule 1171 VOC content limits. The Stationary Source Committee directive on April 21, 2017, was to prioritize lowering the toxicity of coatings and solvents, even if it means increasing VOC levels. Additionally, in 2017, Assembly Bill 617 (AB 617) was signed into state law and required strategy development to reduce toxic air contaminants and criteria pollutants in overburdened communities.

Staff's proposed changes have two primary goals: 1) a prohibition and a phase-out timeline for pCBtF and t-BAc, and 2) to address specific industry concerns regarding ability to comply with specific rule requirements. The proposed amendments to the rule include:

- Prohibiting the use of pCBtF and t-BAc solvent cleaning materials effective:
    - January 1, 2026
    - Sell-through allowed until January 1, 2027
    - Use-through allowed until January 1, 2028
- Prohibiting the possession of non-compliant solvent cleaning materials
- Alternative usage and MIR limits for electricity and water distribution facilities
- Alternative usage limits for aerosol cleaning activities and electric and water utilities
- Alternative MIR limits of 0.38 g O_3/g VOC for any solvent cleaning activity
- Updating rule structure, adding new definitions, and removing outdated rule provisions

Staff does not anticipate any VOC emission increases or costs due to the phase out of pCBtF and t-BAc as most solvent cleaning materials and not formulated with pCBtF or t-BAc.

CHAPTER 1: BACKGROUND

INTRODUCTION

REGULATORY HISTORY

AFFECTED INDUSTRIES

PUBLIC PROCESS

Introduction

Rule 1171 – Solvent Cleaning Operations is a source-specific rule adopted on August 2, 1991, to reduce Volatile Organic Compound (VOC) emissions, toxic air contaminants, stratospheric ozone-depleting compounds, and global-warming compound emissions from the use of solvents for the removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants from parts, products, tools, machinery, equipment and general work areas. Later rule amendments expanded the scope of the rule to apply to all solvent cleaning activities at all facilities. Rule 1171 includes five categories of solvent cleaning activities with VOC limits and applies to any person who uses solvent materials in solvent cleaning operations during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas within South Coast AQMD. The rule also applies to all persons who store and dispose of solvent cleaning materials used in solvent cleaning operations, and all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations within the South Coast AQMD.

To reduce the VOC emissions from solvent cleaning materials and activities, many cleaning solvent manufacturers have relied on the use of aqueous or water-based options or through the use of solvents that are exempt from the definition of a VOC due to their low photochemical reactivity. In April 2017, the South Coast AQMD Stationary Source Committee recommended a precautionary approach when considering exempt compounds with a potential toxic endpoint and removing the exempt status for any compound that has an established toxic endpoint. The California Office of Environmental Health Hazard Assessment (OEHHA) has determined that two exempt compounds para-chlorobenzotrifluoride (pCBtF) and tert-butyl acetate (t-BAc), have toxic endpoints. Therefore, the current rule development has two primary goals: 1) to propose a phase-out of pCBtF and t-BAc, and 2) to address various industry-specific concerns regarding their ability to continue operations and comply with the rule.

Regulatory History

Rule 1171 was adopted on August 2, 1991, and has since been amended ten times. The most recent amendment was on May 1, 2009, which sought to further extend the compliance date for the 100 grams per liter VOC content limit for solvents used for the cleaning of ultraviolet/electron beam (UV/EB) inks in lithographic printing, and on-press screens and automatic screen reclamation in screen printing operations from January 1, 2009, to January 1, 2010. The amendment also sought to make administrative changes to the rule to enhance the understanding of current applicable rule requirements by removing obsolete rule language and making minor revisions and editorial corrections.

Prior to the 2009 amendment, Rule 1171 was amended in February 2008 to extend the compliance date to January 1, 2009, for the 100 grams per liter VOC content limit for solvents used for the cleaning of ultraviolet/electron beam (UV/EB) inks in lithographic printing, and on-press screens and automatic screen reclamation in screen printing operations. The delay was necessary to allow additional time for the printing industry to test new formulations and transition to the new cleaning materials. Facilities that engage in lithographic and screen printing were directly impacted by the lower VOC limit of 100 grams per liter requirement; the 2006 rule amendment delayed the implementation of the 100 grams per liter due to infeasibility for 18 months; low VOC solvent cleaning material were not available at the time and the technology assessment encountered unforeseen delays. In May 2006, the technology assessment to support the target VOC limit of 100

grams per liter for lithographic ink application was completed and the results indicated that low VOC alternative material such as water-based cleaners, blends of VOC exempt solvents, and methyl esters can be used to clean press rollers and blankets. Additional time that was provided allowed the printing industry and solvent formulators to evaluate the results of the technology assessment, develop and test new formulations, and transition to the new cleaning materials. The printing industry tested compliant products in actual production environments at various printing facilities. The test results indicated significant success in the performance of low VOC cleaning materials for removing conventional inks from rollers and blankets in lithographic in application equipment; the success was achieved for both hand wipe (manual) and automatic cleaning of rollers and blanket.

Background on t-BAc and pCBtF

In 1994, the U.S. EPA exempted pCBtF from the definition of a VOC, and in 2004, South Coast AQMD added pCBtF as an exempt VOC compound in Rule 102. A Rule 102 VOC exemption means pCBtF is not considered a VOC for any application in the South Coast AQMD.

In 2004, the U.S. EPA exempted t-BAc from the definition of a VOC, but due to toxicity concerns, the South Coast AQMD did not allow for an unlimited Rule 102 exemption but did allow for several limited exemptions in source specific rules, e.g., Rules 1113 and 1151. In 2013, the Rule 1113 amendment included a resolution that directed staff to review the exemption for t-BAc due to renewed toxicity concerns. OEHHA finalized their t-BAc assessment in 2017, concluding that it had a higher cancer potency than previously estimated. In 2018, staff presented the preliminary t-BAc assessment and expressed concerns regarding pCBtF because OEHHA had not assessed its toxicity. Based on staff recommendations, the Stationary Source Committee directed staff to: remove existing t-BAc exemption in Rules 1113 and 1151 when rules are amended and request OEHHA to review the potential toxicity of pCBtF and remove the exemption, as resources allow, if pCBtF is deemed a potential carcinogen. In 2020, the pCBtF Hot Spots cancer inhalation unit risk factor document was adopted by OEHHA, which indicated pCBtF is a potential carcinogen.

The Stationary Source Committee recommended a precautionary approach to prioritize reducing the use of compounds with a known or suspected toxic endpoint over reducing VOC emissions. Based on that recommendation, staff is working to amend each VOC rule, considering category by category, the best approach to reduce the toxicity of coatings and solvents used within the South Coast AQMD.

2022 Air Quality Management Plan

The 2022 AQMP adopted on December 2, 2022, set forth a path for improving air quality and meeting federal air pollution standards by striving for zero-NOx emission technologies across all sectors and lower VOC emissions where feasible. The 2022 AQMP includes Control Measure CTS-01 Further Emission Reductions From Coatings, Solvents, Adhesives, and Lubricants, which seeks to reduce the toxic impact of pCBtF and t-BAc emissions. PAR 1171 partially implements the 2022 AQMP Control Measure CTS-01 by prohibiting the use of solvent cleaning materials that contain pCBtF and t-BAc.

Assembly Bill 617

AB 617 was signed into state law in 2017 and requires strategy development to reduce toxic air contaminants and criteria pollutants in overburdened communities. During the development of the

AB 617 CERP for the South Los Angeles (SLA) community, community members expressed concern about the impacts from autobody shops, many of which are located close to residents and can be clustered within the community. The rule development for Rule 1151 confirmed that automotive coatings used at autobody shops contain large amounts of pCBtF or t-BAc. Autobody shops also conduct solvent cleaning activities that are subject to PAR 1171. PAR 1171 addresses the air quality commitment objectives related to the solvent cleaning operation of autobody refinishing coating application equipment by reducing toxic air emissions with the phase out of pCBtF and t-BAc.

Affected Industries

Rule 1171 is applicable to any person who uses solvent materials in solvent cleaning operations during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas as part of a business or public service; any person who stores and disposes of solvents used in solvent cleaning operations as part of a business or public service; and all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations within the South Coast AQMD.

Many industries are affected by Rule 1171 and includes but are not limited to automotive refinishing, automotive repair, various types of printing, medical, pharmaceutical, electricity generation and distribution, water distribution, electronics and miscellaneous manufacturing industries.

Process Description

Solvent cleaning materials are used for many purposes including but not limited to product cleaning during manufacturing processes, surface preparation for coating, adhesive or ink application, repair and maintenance cleaning, cleaning of coatings, adhesives, resin or ink application equipment, cleaning of medical tools or devices, and general cleaning of tools, equipment or machinery. Solvent cleaning activities subject to Rule 1171 are those performed during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas as part of a business or public service within the South Coast AQMD.

Public Process

The current rule amendment process began in December 2023. Staff conducted three working group meetings and multiple individual meetings with industry stakeholders and representatives. Table 1-1 summarizes the key topics discussed at each of the Working Group Meetings, which ranged from one to three hours and included presentations that are posted on the South Coast AQMD's website.[1]

[1] https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1171

Table 1-1: Summary of Working Group Meetings

Meeting title	Date	Highlights
Working Group Meeting #1	January 16, 2024	• Rule background • Key amendment objectives • Exempt solvent background • Preliminary technology assessments
Working Group Meeting #2	May 29, 2024	• Summary of WGM #1 • Amendment progress update • Industry uses of t-BAc and pCBtF • Industry compliance concerns • Initial rule concepts
Working Group Meeting #3	February 26, 2025	• Rule amendment resumption update • Rule background refresher • Key amendment objectives refresher • WGM #2 summary • t-BAc and pCBtF Regulatory Background • Initial rule concepts

CHAPTER 2: SOLVENT CLEANING ASSESSMENT

SOLVENT CLEANING AND EXEMPT COMPOUNDS

pCBtF and t-BAc BACKGROUND AND TOXICITY

SOLVENT CLEANING MATERIAL ASSESSMENT

AEROSOL USAGE AND LIQUID ALCOHOLS

PRODUCT WEIGHTED MAXIMUM INCREMENTAL REACTIVITY

Solvent Cleaners and VOC Control

Solvent cleaning materials are used in a variety of solvent cleaning activities by a wide range of industries and their associated equipment and workspaces. Solvent cleaning materials consist of a variety of different products with varying VOC contents, and can be used at industrial, commercial, and residential facilities. However, solvent cleaning activities that occur at residences are not regulated by PAR 1171 because the solvent cleaning materials used at residence are considered consumer products and regulated by the California Air Resources Board (CARB). Solvent cleaning materials subject to PAR 1171 are used during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas as part of a business or public service within the South Coast AQMD.

VOC emissions resulting from the use of solvent cleaning materials are controlled primarily by two methods. The first approach can be taken at the end-user level through improvement of work practices, including but not limited to keeping solvent containers tightly sealed or properly disposing of used solvents. The second approach includes modifying the chemistry of the solvent cleaning materials to reduce the VOC content. This approach is generally taken at the manufacturer or supplier level. Reducing the VOC content of solvent cleaning materials via reformulation can be achieved by transitioning to a water-based formulation, manufacturing with low-VOC solvent mixtures, or utilizing exempt solvents. The most widely used method for controlling VOC emissions from solvent cleaning materials is to transition to water-based systems since water has excellent cleaning properties and can be enhanced with surfactants, rust inhibitors, and rinsing agents. In these cases, the VOC limit can readily comply with the applicable 25 grams per liter VOC limit. However, for other specific solvent cleaning activities or applications it may be challenging to find suitable effective low-VOC cleaning solvents, these applications are afforded a higher limit in Rule 1171. Another option that manufacturers of solvent cleaning materials can utilize to reduce VOC content is to formulate with exempt compounds or solvents, such as acetone or para-chlorobenzotrifluoride since they do not count towards the VOC content the solvent cleaning material.

The following table shows the categories and VOC limits in Rule 1171, staff is not proposing to change any of the VOC limits.

Table 2-1: Rule 1171 VOC Limits

Solvent Cleaning Activity	VOC Content Limit (g/L)
(A) Product Cleaning During Manufacturing Process or Surface Preparation For Coating, Adhesives, or Ink Applications	
(i) General	25
(ii) Electrical Apparatus Components & Electrical Components	100
(iii) Medical Devices & Pharmaceuticals	800
(B) Repair and Maintenance Cleaning	
(i) General	25
(ii) Electrical Apparatus Components & Electrical Components	100
(iii) Medical Devices & Pharmaceuticals	
(A) Tool, Equipment, & Machinery	800
(B) General Work Surfaces	600
(C) Cleaning of Coatings or Adhesives Application Equipment	25
(D) Cleaning of Ink Application Equipment	
(i) General	25
(ii) Flexographic Printing	25
(iii) Gravure	
(A) Publications	100
(B) Packaging	25
(iv) Lithographic (offset) or Letter Press Printing	
(A) Roller Wash, Blanket Wash, & On-Press	100
(B) Removable Press Components	25
(v) Screen Printing	100
(vi) Ultraviolet Ink/Electron Beam Ink Application Equipment (except screen printing)	100
(vii) Specialty Flexographic Printing	100
(E) Cleaning of Polyester Resin Application Equipment	25

Comparing pCBtF and t-BAc toxicity to Other Compounds

Staff considered several approaches to address the toxicity concerns for pCBtF and t-BAc from removing the exempt status to a complete prohibition of use. To inform that decision, staff considered how other compounds with potential toxic endpoints have historically been addressed. Rule 102 defines exempt compounds as being Group I or Group II compounds; Group II compounds are prohibited from use in some rules. Cancer Potency Factor is a measure used to estimate the risk of cancer associated with exposure to a carcinogenic substance and represents the increased cancer risk per unit of exposure over a lifetime. Reference Exposure Level (REL) is the

maximum concentration level of a substance in the air that is not expected to have adverse health effects in humans over a specified exposure duration; RELs can be acute (short-term), 8-hour, or chronic (long-term). Four compounds and their Cancer Potency Factors and RELs are listed in Table 2-2 and 2-3 for comparison.

Table 2-2 Cancer Potency Factor Comparison

Compound	Cancer Potency Factor (Slope Factor)
perchloroethylene (perc)	0.021
Dimethyl Carbonate (DMC)	0.0035
t-BAc	0.0047
pCBtF	0.03

For the four compounds shown in the Table 2-2, pCBtF has the highest Cancer Potency Factor. The Cancer Potency Factor of pCBtF is almost 50 percent higher than perchloroethylene's, a prohibited Group II Exempt Compound.

Table 2-3 shows the available Acute RELs for the same four compounds. t-BAc has the lowest REL, meaning the highest risk among the compounds. While the Cancer Potency Factor for pCBtF is much higher than t-BAc, perc, and DMC, but it has no established Acute REL.

Table 2-3 Acute REL Comparison

Compound	Acute REL
perc	20,000
DMC	14,000
t-BAc	10,000
pCBtF	N/A

Volatile Methylated Siloxanes (VMS)

In 1994, the U.S. EPA revised the regulatory definition of VOC to exempt volatile methylated siloxanes (VMS) due to negligible contribution to the formation of tropospheric ozone.

VMS compounds are defined Group II Exempt compounds in South Coast AQMD Rule 102 – Definition of Terms. Group II exempt compounds are defined as compounds that may be restricted in the future due to toxicity or other environmental impacts. South Coast AQMD prohibits the use of materials containing VMS compounds in other rules, such as Rule 1151 – Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations. OEHHA has not evaluated and

developed any cancer inhalation unit risk factors, acute reference exposure levels, or chronic reference exposure levels for any VMS compounds. Staff is aware that the use of three VMS compounds have been restricted in the European Union due to concerns over potential toxicity and environmental impacts. The South Coast AQMD Stationary Source Committee directed staff to adopt a precautionary approach to exempt VOC compounds.

VMS solvent cleaners were only found to be used for limited solvent cleaning activities where alternatives exist and are widely used. Staff is proposing to revise the current exemption for Group II exempt solvents which excludes VMS compounds to include a prohibition date and future effective phase out date for VMS cleaning solvents.

Staff Recommendations on pCBtF, t-BAc, and VMS

The preceding comparison of pCBtF and t-BAc to other toxic compounds that are prohibited from use in VOC rules, including Rule 1171, supports a future prohibition of pCBtF and t-BAc. OEHHA's assessment of pCBtF and t-BAc shows these compounds to be as toxic as many chemicals currently prohibited; therefore, staff recommends prohibiting the use of pCBtF, t-BAc, and VMS.

pCBtF and t-BAc Use in Solvent Cleaning

The main objective of PAR 1171 is to prohibit the use of the two exempt compounds or partially exempt compounds that have been determined to have toxic endpoints: pCBtF and t-BAc. PAR 1171 regulates five main categories of solvent cleaning activities in which each of the main category can further be subcategorized into general and more specific solvent cleaning activities. Staff assessed solvent cleaning materials used in each of the main solvent cleaning activity categories and concluded that majority of the solvent cleaning materials used do not contain pCBtF or t-BAc, therefore a prohibition can take effect relatively quickly.

Automotive Coating Manufacturer pCBtF and t-BAc Survey

During the rulemaking for Rule 1151, staff conducted a survey of automotive coating manufacturers to further understand the extent to which pCBtF and t-BAc is used to comply with the VOC limits in Rule 1151 and for solvent cleaning activities. The survey was conducted in December 2023, of manufacturers who sell automotive coatings and products subject to Rule 1151. The main exempt compounds of interest of the survey were pCBtF and t-BAc. As part of the survey, staff requested additional information regarding solvent cleaning products used for the cleaning of automotive coating spray guns and body panels. Based on the survey data that was submitted by the manufacturers, the use of pCBtF or t-BAc was only identified in solvent cleaning materials used for automotive coating spray gun cleaning activities. However, the primary solvent used for solvent cleaning of associated spray gun equipment is acetone.

Solvent Cleaning Material Assessment and pCBtF Usage

The use of t-BAc is not common since it is not a fully exempted solvent in many South Coast AQMD regulations; it is only partially exempt in a few regulations. Since t-BAc is not considered exempted in Rule 1171, its use is still counted towards the overall VOC content. As a result, most solvent cleaning materials subject to Rule 1171 are not formulated with t-BAc. However, pCBtF is a fully exempted solvent and is used in many industries to comply with low VOC limits in many South Coast AQMD regulations. The use of pCBtF in solvent cleaning material subject to Rule 1171 is limited, staff identified three solvent cleaning operations that use solvent cleaning

materials that contain pCBtF in its formulation. The three operations are automotive repair and maintenance (parts washing), offset printing (blanket and roller), and autobody repair (spray gun cleaning). Due to its exempt status, pCBtF is not considered a VOC when used in solvent cleaning material; however, it does have potential health impacts due to its toxic end point.

Rule 1171 establishes VOC limits for all solvent cleaning activities identified in the rule. As previously mentioned, achievement of the target VOC limits is expected through greater use of aqueous or water-based cleaning technologies and VOC exempt solvents, through development of new cleaning materials. All of the VOC limits established in the 1999 amendment for Rule 1171 have now been implemented, including ink application equipment which initially encountered challenges in meeting the lower limit. The printing industry has been largely successful in its efforts for finding suitable low VOC solvent cleaning materials and is a prime example of what research and development can achieve. Most recently members of the printing industry have requested an alternative reactivity-based limit to provide additional compliance flexibility in developing solvent cleaning material formulations; giving the industry ability to provide and use more effective solvent cleaning material and provide additional options.

As mentioned previously, the printing industry was given additional time to test many compliant products in actual production environments which showed that water-based cleaners, blend of other exempt solvents, and methyl esters can be successfully used to clean press rollers and blankets. Staff also conducted several visits to autobody facilities which showed the most common lower cost and pCBtF free options used to clean spray guns is acetone; this was also confirmed in the survey that was conducted for Rule 1151 in December 2023. Automotive repair and maintenance facilities use a pCBtF containing solvent to washing parts or components during transmission or engine repairs; the solvent cleaning material contains 95 percent pCBtF by volume and the intended use of the product is for cleaning and degreasing metal parts for the removal of adhesives, carbon deposits, greases, mold release, oils, and waxes. The manufacturer indicated they primarily rely on pCBtF to comply with the current Rule 1171 VOC limits of 25 grams per liter and that the customer base for the pCBtF containing cleaning material is relatively small and limited to parts washing for transmission and engine repair. The manufacturer indicated that existing customers using the pCBtF containing solvent can be transitioned to a replacement solvent cleaner that is free of pCBtF but would require time to completely transition and replace the existing product.

Staff will be proposing a prohibition of pCBtF,t-BAc, and VMS that includes sell-through and use-through periods for solvent cleaning materials already in the supply chain in order to prevent stranded assets associated with existing inventory. The sell-through and use-through is for any solvent cleaning material that is manufactured prior to the proposed prohibition date of January 1, 2026. The following table provides a summary of the proposal.

Table 2-4 Proposed Prohibition, sell-through, use-through

Category	Prohibition Effective Date	Sell-through End Date	Use-through End Date
All Solvent Cleaning Activities listed in Table 1	January 1, 2026	January 1, 2027	January 1,2028

Aerosol Usage Exemption

Rule 1171 provides an exemption for the use of 160 ounces or less of aerosol solvent cleaning products that contain VOC in excess of the limits listed in Table 1 – Table of Standards in the Rule. Aerosol solvent cleaning materials are regulated by the California Air Resources Board and are not required to comply with the VOC limits of Rule 1171; however, Rule 1171 can limit the amount of aerosol solvent that can be used at permitted facilities. Several industries and business have indicated that they rely on the aerosol exemption for cleaning of specific equipment, while others have indicated that the exemption does not reflect the current operation of their business. Electricity distribution, water distribution, water treatment facilities, battery manufacturing facilities, and automotive repair industry have expressed concerns regarding the current exemption.

Aerospace Facilities, Electricity Distribution, Water Treatment, and Water Distribution
Electricity distribution, water distribution, and water treatment facilities that operate similar equipment currently rely on the aerosol exemption and use aerosolized, alcohol-based solvent cleaning products to clean specific equipment. Many electricity distribution facilities use aerosolized denatured alcohols to clean circuit breaker components such as driving mechanisms and interrupters, as specified by equipment manufacturers. Staff has identified other solvent cleaning materials that can potentially be used to clean the equipment such as dry ice or acetone; however, the equipment manufacturer will not approve the use cleaners that have not been tested; use of untested cleaners can potentially cause safety issues. Furthermore, industry stakeholders expressed concern regarding the availability of denatured alcohol in aerosol spray form since there have been times when it was unavailable. Due to the uncertainty of availability, stakeholders requested the ability to use liquid denatured alcohol or liquid isopropyl alcohol instead of aerosol denatured alcohol. The rule currently allows approximately 456 gallons of denatured alcohol per year in aerosol form, but based on feedback from industry stakeholders, the estimated use of denatured alcohol in liquid form is approximately 70 gallons per year for all large utilities under common ownership. Staff is recommending to allow up to 70 gallons of liquid alcohol use for cleaning and including a maximum incremental reactivity (MIR) limit to reduce the ozone forming potential of the cleaning solvent to the alcohols currently being used. A discission of MIR based-VOC limits is included later in this chapter. Table 2-5 shows the proposed volume and product weighted-MIR limits (PW-MIR).

Similarly, water distribution and water treatment facilities also requested the use of non-compliant liquid denatured alcohols to clean specific equipment such as ozone generators, UV sterilization systems, chlorine systems, and electrical components. Based on the information provided to staff by the facilities, the equipment manufacturers specify using only denatured alcohol for cleaning

the specific equipment. The manufacturers have indicated that they have not identified compliant, non-aerosol VOC alternatives for chlorine system cleaning operations. Based on facility feedback, the estimated alcohol usage amounts at each facility are:

- Ozone generators at approximately 15 gallons per generator every 10 years
- UV sterilization at approximately five ounces per reactor with a total of 29 reactors every month
- Chlorine system at approximately five gallons per facility per year and can be up to 6 facilities
- Electrical components at approximately five gallons per year per facility

Staff is recommending to allow up to 70 gallons of liquid alcohol use for cleaning of specific equipment located at electricity and water distribution utility operations and will also include a PW-MIR limit to reduce the ozone forming potential of the cleaning solvent to the alcohols currently being used; the two types of alcohol that are currently being used are isopropyl alcohol and denatured alcohol. Isopropyl alcohol has a MIR value of 0.61 whereas the MIR value of denatured alcohol can vary based on composition. The composition of denatured alcohol can also vary by manufacturer, so staff evaluated the composition of several commercial denatured alcohol products to estimate a range of potential PW-MIR values; the PW-MIR values ranged from 0.94 to 1.7. As a result, staff is proposing a PW-MIR limit at the upper limit of 1.7 which will provide flexibility to the facility. Using the upper limit will allow the facility to use denatured alcohol from several manufacturers. Table 2-5 shows the proposed usage volume and PW-MIR limits.

Table 2-5 Proposed Alternative Usage and MIR Limits

Solvent Cleaning Activity	Usage Limits (gallons per year)	PW-MIR
(A) Electricity Generating or Distribution Equipment	70	0.61
(B) Water Distribution Equipment		
(i) Chlorination Systems	5	1.7
(ii) Ozone Generators	30	0.61
(iii) Ultraviolet Light Treatment Systems	16	1.7

Aerospace facilities also expressed concerns for cleaning similar equipment as the electricity and water distribution utilities and staff's initial proposal to reduce the aerosol exemption allowance from 160 ounce per day to 160 fluid ounces per year. They indicated that they intend to continue to use the aerosol exemption for their cleaning needs, instead of transitioning to liquid cleaners,

but need at least 160 ounces per month of aerosols to clean their electrical equipment, a cleaning activity that only occurs every few years. To address this concern, staff is proposing to revise the aerosol exemption to allow for 160 ounces per month.

Metric used to qualify for aerosol exemption (fluid ounces versus ounces)

In regard to the aerosol exemption, staff is also proposing to change the metric used to qualify for the exemption from fluid ounces to ounces. Fluid ounces are not a unit of weight and is used to measure volume of a liquid and does not align with the California Air Resources Board (CARB) definition for VOC content of an aerosol product. CARB defines the VOC content of an aerosol product as the total weight of VOC in a product expressed as a percentage of the product weight. Since aerosol products sold for use must comply with CARB's consumer product regulation, most aerosol cans sold in California will have labels that display weight in ounces and/or grams.

Automotive Repair Facilities and Battery Manufacturing Facilities

Most of the solvents used for automotive parts washing are aqueous products or are compliant with the 25 grams per liter VOC limit; however, automotive repair facilities also rely on the aerosol exemption for small solvent cleaning activities, such as adhesive removal, and for the cleaning of intake throttle body automotive components. Battery manufacturers also rely on the aerosol exemption to clean grease or other contaminants from battery terminals. Industry stakeholders indicated that they have tested compliant alternative cleaning products but have not found a suitable replacement that meets the operational and performance requirements. The aerosol cleaning solvent products used for these cleaning operations have a VOC content greater than 25 grams per liter limit of the rule and usage will vary depending on the volume of cars serviced or amount of batteries manufactured. A high-volume car service dealership typically needs approximately 4,500 ounces per month of non-complaint aerosol for intake/throttle body cleaning whereas aerosol cleaning solvent used for adhesive removal require a much smaller amount of approximately 75 ounces per year. Battery manufacturers use approximately 2,400 ounces per month to clean the terminals during the battery manufacturing process. The rule currently provides a daily aerosol limit that equates to a 4,800 ounces per month allowance; however, stakeholders expressed concern that the daily allowance does not reflect current operational needs. Stakeholders requested that the allowance for non-complaint aerosols be changed to a monthly limit rather than a daily limit to provide additional flexibility to the facilities. This change would not increase or change the overall usage volume and merely provide flexibility to the facility. Staff's assessment did not identify any low VOC alternatives for these specific cleaning operations. As a result, staff is proposing to revise the current aerosol allowances to reflect the operational needs for auto repair facilities and battery manufacturers, as shown in Table 2-6.

Table 2-6 Proposed Usage Limits for Aerosol Solvent Cleaners

Solvent Cleaning Activity	Usage Limits
(A) Cleaning of Automotive Parts	
(i) Throttle Body and Intake Systems	4,800 ounces per month
(ii) All Other Automotive Part Cleaning	32 ounces per month
(B) Battery Terminal Cleaning at Battery Manufacturing Facilities	2,400 ounces per month
(C) All Others Solvent Cleaning Activities	160 ounces per month

Product-Weighted Maximum Incremental Reactivity

Many stakeholders have requested that PAR 1171 also includes a general alternative PW-MIR VOC limit of 0.38 g O_3/g VOC for all solvent cleaning activities. Alternative PW-MIR limits were introduced in Rule 1151- Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations for a few categories to provide manufacturers additional flexibility to develop alternative compliant formulations with less impact on ozone formation. Traditional mass-based VOC limits treat all VOCs equal, other than water and exempt compounds which are excluded. However, research[2] 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 these limits[3].

As an example, a PW-MIR analysis was conducted in Rule 1151 for the adhesion promoter coating category. Adhesion promoters are typically used to facilitate bonding of paint to plastic automotive parts; adhesion promoters usually consist of a low-solids formulation composed primarily of solvents. One of the primary solvents used is t-BAc but with the prohibition of pCBtF and t-BAc, manufacturers were limited in solvent options to comply with the traditional mass-based limits. For the analysis, staff 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

[2] Carter, William P.L., College of Engineering, Center for Environmental Research and Technology, The SAPRC-99 Chemical Mechanism and Updated VOC Reactivity Scales, February 2023

[3] California Air Resources Board (CARB), "Tables of Maximum Incremental Reactivity (MIR) Values", available at https://ww2.arb.ca.gov/sites/default/files/2020-12/cp_reg_mir-tables.pdf

compounds were reported as a range, staff calculated an average PW-MIR based on the mid-point of the reported range, as well as a maximum PW-MIR using the highest reported value for each VOC compound. After calculating the average and maximum PW-MIR values for all the products, staff performed a statistical analysis to propose an appropriate PW-MIR limit for adhesion promoters. Table 2-7 lists the products staff considered; included are the weight percentages (wt%) for pCBtF and t-BAc in those products, as those solvents have very low MIR values. Staff put more emphasis on adhesion promoters without pCBtF and t-BAc to more accurately reflect the potential PW-MIR of these products once those exempt solvents are prohibited.

Table 2-7 PW-MIR Values for Adhesion Promoters in Rule 1151

PRODUCT	Regulatory VOC As Applied (g/L)	pCBtF (wt %)	t-BAc (wt %)	PW-MIR with Average VOC Content (g O_3/g VOC)	PW-MIR with Max VOC Content (g O_3/g VOC)
Product 1	540	87.8	0	0.26	0.36
Product 2	526	0	58.1	1.22	1.75
Product 3	540	0	0	1.35	1.68
Product 4	537	3.1	22	2.72	3.21
Product 5	508	86.9	0	0.35	0.51
Product 6	540	82.8	0	0.4	0.56
Product 7	537	55.8	0	0.49	0.62
Product 8	520	54.8	0	1.42	1.81
Product 9	516	49.4	0	0.16	0.2
Product 10	517	49.3	0	0.37	0.56
Product 11	511	33.9	0	0.47	0.74
Product 12	533	3.5	20.2	2.69	3.17
Product 13	526	0	58.1	1.22	1.75
Product 14	529	0	20	2.68	3.16
Product 15	540	0	0	1.35	1.68

In addition to this assessment, a manufacturer of an adhesion promoter 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 VOC, which supports staff's assessment and proposed limit for adhesion promoters in Rule 1151.

The proposed PW-MIR limits for alcohol related solvent cleaning activity in PAR 1171 are in Table 2-5. The PW-MIR limits are designed to achieve equal or greater reductions in ground-level ozone compared to traditional mass-based VOC limits because VOCs with the greatest ozone forming potential will be limited rather than treating each VOC equally; this offers more flexibility in product reformulation. The use of PW-MIR is presented as an option rather than a requirement; the PW-MIR approach provides manufacturers with greater flexibility in reformulating their products. It is also important to note that a product complying with the proposed MIR limit can potentially have a higher mass-based VOC content (g/L) than the limits in the Table of Standards in the rule.

As the South Coast AQMD phases out of exempt solvents such as pCBtF and t-BAc, a mechanism to reduce the air quality impact of solvent cleaning operations is to develop PW-MIR limits. The solvent cleaning materials will continue to have a mass-based VOC limit; however, the new PW-MIR limit may potentially result in less ground-level ozone formation. In essence, reactivity-based limits would require manufacturers to choose solvents with lower MIR value. One of the solvent cleaning materials evaluated by staff was an automotive spray gun cleaner used at autobody repair facilities; a facility can either choose to use a specialty spray gun cleaner that is comprised of a mixture of solvents or acetone. Acetone has a MIR value of 0.36 and a lower potential for ozone formation whereas the specialty spray gun cleaner is only slightly higher. To gather detailed VOC information for the product, staff conducted online searches and also reviewed the technical and safety data sheets for the specialty spray gun cleaner. Using the CARB MIR values, staff calculated the PW-MIR for the product. In cases where VOC compounds were reported as a range, staff determined the PW-MIR based on the upper end of the reported range. Table 2-8 shows staff's assessment of the PW-MIR of a spray gun cleaner that would not meet the mass-based limit of 25 g/L but will comply with the proposed PW-MIR limit of 0.38. The spray gun cleaner is a mixture of acetone and alkanes and has a VOC content of 36 g/L which is higher than the VOC limit of 25 g/L allowed in the rule. The evaluation showed that despite having a higher VOC content limit allowed in the rule, the PW-MIR limit of the cleaner is 0.38 which is similar to the MIR value of acetone. Providing a slightly higher alternative PW-MIR limit at 0.38 will give the manufacturer formulation flexibility to meet the performance requirements of the specific solvent cleaning activity.

Table 2-8 Values of Solvents used in Spray Gun Cleaner

Solvent	Weight Percent	MIR	PW-MIR
Alkanes	3%	0.52	0.03
Acetone	97%	0.36	0.35
Total	**100%**		**0.38**

Potential Ozone Reduction Benefit

By adopting a PW-MIR approach instead of relying solely on mass-based VOC limits measured in grams per liter, the regulatory framework can be better aligned with air quality goals while providing manufacturers with increased flexibility. The PW-MIR approach offers flexibility, allowing manufacturers to explore various formulations without being restricted by a single mass-based VOC limit. This encourages innovation and the development of products that meet regulatory requirements while enhancing performance and reducing environmental impact. Stakeholders that are developing solvent cleaning material also requested that an alternative PW-MIR limit also be incorporated since some formulations may not comply the mass-based limit but would comply with a PW-MIR limit. The stakeholder indicated that their formulation is comprised primarily acetone with a small mixture of other solvents with an approximate PW-MIR of 0.38. Since acetone is an exempt compound and has a MIR value of approximately 0.4, staff's is proposing an alternative PW-MIR limit of 0.38 g O_3/g VOC for all solvent cleaning activities to provide formulation flexibility.

Enclosed Mobile Containers Used to Transport Material

Some solvent cleaning operations utilize biodiesel as a solvent cleaning material to clean large enclosed mobile containers used to transport materials. These containers include, but are not limited to, rail tank cars and tanker truck containers. Biodiesel is used as the cleaning agent to remove any residual commodity (known as "heel") remaining in an empty container. This cleaning system works for various commodities requiring cleaning from enclosed containers, such as asphalt, crude oil, and fertilizers.

These solvent cleaning systems are generally closed loop systems, where a nozzle is attached to the top hatch of an enclosed container, forming a sealed high-pressure wash and rinse system that dissolves and dislodges the heel, then removes the residual wash solution through successive high-pressure rinses. The solvent cleaning wash solutions sprayed inside the railcar are pumped from the enclosed container to a holding tank in a closed loop recirculating system. Spent wash solutions are typically pumped from the storage tank into a tank truck for transport to a commercial waste management facility.

Because there is no established VOC content for biodiesel and because the VOC content of biodiesel can vary, staff is proposing an alternate compliance option for solvent cleaning activities that utilize biodiesel as a solvent cleaning material and that are performed on enclosed mobile containers used to transport material. The proposed alternate compliance option includes requiring the container to be completely airtight and leak free during the solvent cleaning activity and ensure that all vapor leaks from fugitive components do not exceed a concentration of 50 parts per million calculated as carbon and testing requirements to ensure compliance.

CHAPTER 3: SUMMARY OF PROPOSALS

Introduction

The main objective of the proposed amendments to Rule 1171 is to phase out the use of pCBtF and t-BAc as solvents in solvent cleaning materials, as directed by the South Coast AQMD's Stationary Source Committee, due to toxicity concerns.

Staff is proposing the following amendments to Rule 1171. The proposed amendments primarily pertain to the prohibition of pCBtF and t-BAc use in the regulated products and the introduction of various types of alternative compliance options, including reactivity based limits and volumetric usage limits. 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) General Prohibitions
(g) Recordkeeping Requirements
(h) Test Methods
(i) Rule 442 Applicability
(j) Exemptions

Proposed Amended Rule 1171

Purpose [Subdivision (a)]

The purpose of this rule is to reduce emissions of VOCs, toxic air contaminants, stratospheric ozone-depleting compounds, and global-warming compounds from the use, storage and disposal of solvent cleaning materials used in solvent cleaning activities performed in South Coast AQMD.

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)]

PAR 1171 applies to any person who uses solvent cleaning materials in solvent cleaning operations during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas within South Coast AQMD at public service facilities or facilities that are a part of a business or businesses. The rule also applies to all persons who store and dispose of solvent cleaning materials used in solvent cleaning operations, and all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations within the South Coast AQMD.

No significant revisions were made to this subdivision. Staff 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 1171 for a complete list of definitions.

The following are new and modified definitions for PAR 1171, including some that distinguish the new solvent cleaning activities and associated equipment and facility types. For all definitions, refer to the preliminary draft of PAR 1171 released with the Staff Report. Accordingly, the following definitions will be added:

AUTOMOTIVE PART in paragraph (c)(4), which means:

> *"any individual mechanical component that that is part of a vehicle that allows the vehicle to operate, including but not limited to, engine components, transmission components, suspension components, brake components, and intake system components."*

BATTERY TERMINAL in paragraph (c)(5), which means:

> *"the electrical contact or component of a battery that connects the battery to a charger, device, other battery, or external electrical circuit and transfers energy."*

CHLORINATION SYSTEM in paragraph (c)(8), which means:

> *"a chlorine feed system used for the oxidation of microbiological material, organic compounds or inorganic compounds during the water or wastewater treatment process. Chlorine can be in the form of gaseous chlorine, sodium hypochlorite, or calcium hypochlorite."*

CURED COATING, CURED INK, OR CURED ADHESIVE in paragraph (c)(9), which means:

> *"a coating, ink, or adhesive, that is dry to the touch, and that has undergone a chemical or physical process to achieve its final state, where it is no longer tacky and does not release volatile components under normal use conditions."*

ELECTRICITY DISTRIBUTION UTILITY in paragraph (c)(11), which means:

> *"one of several organizations that control energy transmission and distribution in California, including, but not limited to, the Pacific Gas and Electric Company, the San Diego Gas and Electric Company, Southern California Edison, Los Angeles Department of Water and Power, the Imperial Irrigation District, and the Sacramento Municipal Utility District."*

ELECTRICITY GENERATING FACILITY in paragraph (c)(12), which means:

> *"(A) A facility that is owned or operated by an investor-owned electric utility or a public-owned electric utility and has one or more electric generating units; or*
>
> *(B) A facility that has electric generating units for onsite use or distribution in the state or local electrical grid system.*

Electricity Generating Facility does not include facilities subject to Rule 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations."

EMISSION CONTROL SYSTEM in paragraph (c)(14), which means:

"any combination of capture systems and control devices used to reduce VOC emissions."

ENERGY CURABLE INK in paragraph (c)(15), which means:

"an ink that dries upon exposure to visible-light, ultra-violet light, or an electron beam."

INK APPLICATION EQUIPMENT in paragraph (c)(26), which means:

"any tool, machine, system, or component of any tool, machine, or system used to apply ink to a substrate."

MAXIMUM INCREMENTAL REACTIVITY (MIR) in paragraph (c)(35), 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 O_3/g VOC). MIR values for individual VOCs are specified in sections 94700 and 94701, Title 17, California Code of Regulations."

OZONE GENERATOR in paragraph (c)(42), which means:

"a mechanical system that produces ozone used for water or wastewater treatment. Ozone is produced by applying an electric potential to oxygen that can be either in the form of dry air or pure oxygen"

PRESS in paragraph (c)(47), which means:

"a mechanical device used to apply pressure to an inked surface resting on a substrate to transfer color, design, alphabetical text, or numerals to the substrate."

PUBLIC WATER DISTRIBUTION SYSTEM in paragraph (c)(49), which means:

"a system that provides water for human consumption through pipes or other constructed conveyances that has fifteen or more connections or regularly serves at least twenty-five individuals daily at least sixty days out of the year."

PRODUCT-WEIGHTED MIR (PW-MIR) in paragraph (c)(50), which means:

"the sum of all weighted-MIR for all ingredients in a Regulated Product. 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; and
1,2,3,...,n	=	each ingredient in the product up to the total n ingredients in the product.*"*

SOLVENT CLEANER OR SOLVENT CLEANING MATERIAL in paragraph (c)(60), which means:

"a liquid substance used to perform Solvent Cleaning."

SOLVENT CLEANER SUPPLIER in paragraph (c)(61), which means:

"any person who sells and delivers or arranges to deliver Solvent Cleaning Materials to a facility subject to this rule."

SOLVENT CLEANING in paragraph (c)(62), which means:

"the use of a Solvent Cleaner or Solvent Cleaning Material for the removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants that include, but are not limited to, dirt, soil, and grease from parts, products, tools, machinery, equipment, and general work areas. Each distinct method of Solvent Cleaning shall constitute a Solvent Cleaning Activity."

SOLVENT CLEANING ACTIVITY in paragraph (c)(63), which means:

"a distinct method of cleaning in a Solvent Cleaning process or single event."

SOLVENT CLEANING OPERATION in paragraph (c)(64), which means:

"a Solvent Cleaning Activity or Solvent Cleaning Activities conducted as part of a business or a public service."

SOUTH COAST AQMD TEST METHOD in paragraph (c)(66), 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)."

THROTTLE BODY in paragraph (c)(72), which means:

"a component of a vehicle air intake system, and is located between the air intake filter and intake manifold of the vehicle air intake system, and controls the amount of air that flows into the vehicle engine."

ULTRAVIOLET LIGHT TREATMENT in paragraph (c)(73), which means:

> *"the process of using ultraviolet light to inactivate microorganisms (i.e., disinfection) or using ultraviolet light either with or without the addition of peroxide to oxidize contaminants (i.e., oxidation). Ultraviolet light treatment is used for both potable water and wastewater, including indirect and direct potable water reuse projects."*

WATER TREATMENT FACILITY in paragraph (c)(75), which means:

> *"a public entity that is responsible for water delivery operations, sewage pumping plants, sewage treatment, or water reclamation."*

Requirements [Subdivision (d)]

This subdivision contains the provisions for any person who uses solvent cleaning materials in solvent cleaning operations or solvent cleaning activities, and for any person who supplies solvent cleaning materials.

Paragraph (d)(1) - PAR 1171 VOC Content Limits

PAR 1171 establishes VOC content limits and for solvent cleaning activities by category, as summarized in PAR 1171 Table 1 – Table of Standards. The following table provides a summary of the current VOC content limits, staff is not proposing to change any of the current limits. Based on the future effective phase out dates, solvent cleaning materials complying with VOC limits will be prohibited from containing pCBtF or t-BAc.

Table 3-1: Summary of the VOC Content Limits

SOLVENT CLEANING ACTIVITY	VOC Limits	
	g/L	lbs/gal
(A) Product Cleaning During Manufacturing Process, or Surface Preparation for Coating, Adhesive, or Ink Application		
(i) General	25	0.21
(ii) Electrical Apparatus Components & Electronic Components	100	0.83
(A) Printed Circuit Boards	800	6.7
(iii) Medical Devices & Pharmaceuticals	800	6.7
(B) Repair and Maintenance Cleaning		
(i) General	25	0.21
(ii) Electrical Apparatus Components & Electronic Components	100	0.83
(A) Electronic or Electrical Cables	400	3.4
(iii) Medical Devices & Pharmaceuticals		
(A) Tools, Equipment, & Machinery	800	6.7
(B) General Work Surfaces	600	5.0
(C) Cleaning of Coatings or Adhesives Application Equipment		
(i) General	25	0.21

(ii) Thin or Sheet Metal Laminating Equipment	950	8.0
(D) Cleaning of Ink Application Equipment		
(i) General	25	0.21
(ii) Flexographic Printing	25	0.21
(iii) Gravure Printing		
(A) Publication	100	0.83
(B) Packaging	25	0.21
(iv) Lithographic (Offset) or Letter Press Printing		
(A) Roller Wash, Blanket Wash, & On-Press Components	100	0.83
(B) Removable Press Components	25	0.21
(v) Screen Printing	100	0.83
(vi) Energy Curable Ink Application Equipment (except screen printing)	100	0.83
(vii) Specialty Flexographic Printing	100	0.83
(E) Cleaning of Polyester Resin Application Equipment	25	0.21

Paragraph (d)(2) – Cleaning Devices and Methods Requirements

Staff removed language referencing an Office of Operations' manual listing approved devices for solvent cleaning activities that was to be periodically updated by the Executive Officer previously in subparagraph (d)(2)(D). Staff confirmed that this manual no longer exists. Staff added language to clarify acceptable wipe cleaning solvent cleaning methods.

Paragraph (d)(3) – Remote Reservoir Cleaners

Staff added recordkeeping requirements for repairs of any liquid leak, visible tear, or crack detected in a remote reservoir cleaner solvent cleaner container.

Paragraph (d)(5) – Solvent Cleaning Material Labeling Requirements

In paragraph (d)(5), staff moved solvent cleaning material labeling requirements from the General Prohibitions subdivision to the Requirements subdivision.

Alternative Compliance Options [Subdivision (e)]

This subdivision contains the provisions for any person that chooses to comply with the provisions of paragraph (d)(1) by using an approved emission control system or complying with the applicable proposed volumetric usage limits or alternative PW-MIR limit.

Subdivision (e) was previously a paragraph in the preceding subdivision and is now its own stand-alone subdivision. Staff moved this language for better readability and consistency.

Subparagraph (e)(1)(D) – Cleaning of Enclosed Mobile Containers

Subparagraph (e)(1)(D) outlines the requirements for an alternative compliance option for the cleaning of the internal surfaces of enclosed mobile containers used to transport materials. These enclosed containers include but are not limited to rail tank cars and tanker truck containers.

In lieu of complying with the requirements in paragraph (d)(1), subparagraph (e)(1)(D) allows a person to comply with a measuring requirement and output limit of no more than 50 parts per million of VOC calculated as carbon on a South Coast AQMD organic vapor analyzer at all fugitive components, provided that the enclosed container and system is air-tight and leak-free during solvent cleaning activities. For the purpose of this cleaning activity, the air-tight and leak-free enclosed container shall be considered emission control equipment.

Paragraph (e)(2) – Alternative Limits for Electricity and Water Utilities

Paragraph (e)(2) outlines alternative options for the cleaning of specific equipment associated with electricity generation and distribution, water treatment and water distribution utilities. These options include volumetric usage limits for solvent cleaning materials that exceed VOC limits in paragraph (d)(1) in addition to a PW-MIR incremental reactivity limit.

The proposed PW-MIR limits are based on industry feedback and the solvent cleaning materials reportedly used. This alternative compliance option will require monthly recordkeeping requirements for a minimum of five years.

Paragraph (e)(3) – Alternative Limits for Aerosol Solvent Cleaning Materials

Paragraph (e)(3) outlines alternative options for the cleaning of automotive parts, battery terminals, and all other solvent cleaning activities. These options include usage limits for aerosol solvent cleaning products that exceed VOC limits in paragraph (d)(1).

Table 3-2 Aerosol Solvent Cleaner Usage Limits

Solvent Cleaning Activity	Usage Limits
(A) Cleaning of Automotive Parts	
(i) Throttle Body and Intake Systems	4,800 ounces per month
(ii) All Other Automotive Part Cleaning	32 ounces per month
(B) Battery Terminal Cleaning at Battery Manufacturing Facilities	2,400 ounces per month
(C) All Others Solvent Cleaning Activities	160 ounces per month

The proposed usage limits are based on industry feedback and reported usage. This alternative compliance option will require monthly recordkeeping requirements for a minimum of five years and will require that all aerosol solvent cleaning products comply with applicable CARB regulations.

Paragraph (e)(4) – Alternative MIR Limit

Paragraph (e)(4) clarifies that a person can supply for use within South Coast AQMD or use any solvent cleaning materials that comply with an alternative PW-MIR limit of 0.38 g O_3/g VOC for

any solvent cleaning activity in lieu of complying with the applicable VOC limit in paragraph (d)(1).

General Prohibitions [Subdivision (f)]

This subdivision contains the provisions for any person that supplies for use within or uses solvent cleaning materials to perform solvent cleaning activities within the South Coast AQMD.

Paragraph (f)(3) – Carcinogenic Materials and Exempt Compounds

Paragraph (f)(3) was restructured to streamline the rule and group all provisions that include prohibitions together in the same subdivision.

Currently, the rule prohibits the use of any solvent cleaning materials that contain any Group II exempt compounds other than cyclic, branded, or linear, completely methylated siloxanes (VMS).

In addition, PAR 1171 proposes to prohibit the use of solvent cleaning materials that contain pCBtF, t-BAc, or Volatile Methylated Siloxanes (VMS) with an upper concentration limit of 0.01 weight percent effective January 1, 2026.

Paragraph (f)(4) – Sell-Through and Use-Through Provision

Paragraph (f)(4) clarifies the periods in which solvent cleaning materials that contain pCBtF, t-BAc, or VMS, and that were manufactured prior to January 1, 2026, can continue to be sold and used.

The sell-through and use-through periods are intended to prevent stranded assets for solvent cleaning materials that are already in the supply chain on the prohibition effective date.

Paragraph (f)(7) – Solvent Cleaning Material Documentation

Paragraph (f)(7) prohibits the use of solvent cleaning materials when documentation confirming the VOC content of the solvent cleaning materials cannot be provided.

This Documentation is required to confirm compliance with applicable VOC limits.

Paragraph (f)(8) – Prohibition of Possession of Non-Compliant Solvent Cleaning Materials

Paragraph (f)(8) prohibits the possession of solvent cleaning materials that do not comply with the requirements of PAR 1171.

Similar South Coast AQMD rules include a prohibition of the possession applicable non-compliant regulated products in addition to the prohibition of sale and use of applicable non-compliant regulated products.

Recordkeeping Requirements [Subdivision (g)]

Subdivision (g) outlines the recordkeeping requirements including maintaining records for VOC emissions pursuant to Rule 109 – Recordkeeping for Volatile Organic Compound Emissions, emission control systems, and for any person who supplies for use or uses solvent cleaning materials within South Coast AQMD.

This subdivision was previously included in the requirements subdivision; however, staff moved recordkeeping requirements to its own separate subdivision and restructured to streamline and

better organize the rule provisions in a manner consistent with the structure of similar rules. Most of the changes are minor, defined terms were capitalized.

Staff revised the lengths of time that records are required to be maintained for uniformity and consistency.

Test Methods [Subdivision (h)]

This provision specifies the approved test methods for determining the VOC content of solvent cleaning materials, to quantify amounts of exempt perfluorocarbon compounds in solvent cleaning materials, and efficiency of emission control systems.

Staff removed an outdated test method that is no longer used by the South Coast AQMD laboratory and corrected a separate referenced test method name. The structure and numbering has been amended and streamlined.

Rule 442 Applicability [Subdivision (i)]

This provision clarifies that any solvent cleaner, solvent cleaning material that is exempt pursuant to subdivision (j) 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 amend a reference that changed.

Exemptions [Subdivision (j)]

This subdivision provides conditional exemptions to various provisions of PAR 1171.

Paragraph (j)(1) – Recordkeeping Exemption

Paragraph (j)(1) outlines the conditions in which a person conducting solvent cleaning activities shall not be subject to the recordkeeping provisions in subdivision (g). Staff made no significant changes to this paragraph, but did reword the paragraph to provide greater clarity.

Paragraph (j)(2) – Exempt Solvent Cleaning Activities

Paragraph (j)(2) lists various solvent cleaning activities exempt from all provisions of this rule. Most of these exempted solvent cleaning activities are subject to separate rules. Staff made minor edits to this paragraph and moved an exemption that was previously listed in a paragraph (j)(10) to subparagraph (j)(2)(H).

Paragraph (j)(3) – Exemptions from VOC Limits

Paragraph (j)(3) lists solvent cleaning activities that are exempt from the VOC limits in paragraph (d)(1).

Staff removed conditionally exempt solvent cleaning activities, which the exemption status is contingent on the use of a solvent cleaning material that complies with a maximum VOC content

limit. Staff moved these solvent cleaning activities and the respective VOC limits to paragraph (d)(1) to be consistent with other solvent cleaning activities with an applicable VOC limit.

Paragraph (j)(4) – Aerosol Atomization Exemption

Paragraph (j)(4) maintains the exemption of aerosol solvent cleaning products from paragraph (f)(1), which prohibits solvent cleaning materials from being atomized unless they are vented to emission control equipment. Staff removed language limiting the volume of aerosol solvent cleaning product usage and added revised language to subdivision (e).

Paragraph (j)(5) – Exemptions of Various Cleaning of Coatings or Adhesives Application Equipment

Paragraph (j)(5) lists specific solvent cleaning activities for coating or adhesive application equipment that are exempted from the VOC limits in subparagraph (d)(1)(C).

Staff revised subparagraph (j)(5)(C) to remove the conditional VOC limit of 900 g/L for solvent cleaning materials used for the cleaning of solvent-based fluoropolymer coating application equipment and is proposing to replace the VOC limit with a volumetric usage limit of one gallon per day.

Paragraph (j)(7) and Paragraph (j)(8) – On-Press Screen Cleaning and UV/EB Ink Application and Curing Equipment Cleaning

Paragraph (j)(7) outlined an exemption for the use of solvent cleaning materials used for the cleaning of on-press screen printing equipment from VOC limits listed in clause (c)(1)(D)(v). Paragraph (j)(8) outlined an exemption for the use of solvent cleaning materials used for cleaning of UV/EB ink application and curing equipment from VOC limits listed in clause (c)(1)(D)(vi). Both of the exemptions were allowed until January 1, 2010. Staff has removed these two paragraphs as they are both now obsolete.

Paragraph (j)(10) – Printing and Film Operation Exemption

Paragraph (j)(10) was removed and added to paragraph (j)(2) as subparagraph (j)(2)(H) to streamline the listing of solvent cleaning activities exempt from all provisions of this rule.

CHAPTER 4: IMPACT ASSESSMENT

Emission Inventory

To estimate the VOC emissions inventory for PAR 1171, staff reviewed the rule factors associated with the 2009 rule amendment. The rule factors from the 2009 amendment impacted 3 Source Classification Codes (SCC) for point sources and 13 Category Emission Source (CES) codes for area sources. The category for area sources include chemical evaporation of organic solvents relating to cold solvent cleaning or stripping, general thinning solvents, printing and publishing, solvent degreasing, tank truck and railcar cleaning, graphic arts, and surface coating operations. Categories for point sources include industrial solvent use, cold cleaning and degreasing, and hand wiping with solvents. Staff then ran a query of Annual Emissions Reporting (AER) SIP inventory for compliance year 2023 using the SSC and CES codes. Based on the evaluation, PAR 1171 point sources account for approximately 0.003 tons per day whereas area sources accounts for approximately 3.6 tons per day; the main contributor to the VOC baseline emissions are area sources. PAR 1171 has an estimated 2023 VOC baseline emissions inventory of approximately 3.6 tons per day.

Control Technology

Compliance with PAR 1171 is expected to be met through the use of aqueous solvent cleaning material or by substituting solvent cleaning materials with other chemicals that contain less VOCs, non-toxics solvents, and no stratospheric ozone-depleting compounds. The manufacturers will have flexibility to use any compliant alternative reformulation to meet the VOC limits in PAR 1171. Some end-users may comply with the rule using alternative options such as control devices (e.g., emission collection systems or thermal oxidizer). The latter options may be cost prohibitive for most facilities, so it is anticipated that most will comply with existing VOC limits with existing products or commercially available replacement products.

Emission Reductions

Staff's proposed prohibition of pCBtF and t-BAc does not impact existing VOC emissions for the solvent cleaning activities subject to the rule since alternative pCBtF-free formulations are currently available that meet existing limits. The prohibition will not require any changes to existing VOC limits and will be maintained at current levels. In addition, staff's proposed change to the current aerosol exemption for electricity and water distribution utilities will not impact VOC emissions since the overall usage amounts will not change; the change is simply an alternative usage allowance for the use of liquid alcohol rather than aerosol alcohol. Similarly, changes to the aerosol exemption by including a usage limit for specific operations related to cleaning of automotive parts or battery terminal cleaning at battery manufacturing facilities will not impact exiting aerosol usage and will remain unchanged. Therefore, staff will not be considering any associated emission reductions with the proposed amendments to PAR 1171.

Cost-Effectiveness and Incremental Cost-Effectiveness

Cost-Effectiveness

Staff does not anticipate any cost associated with the proposed changes to PAR 1171 since only a few solvent cleaning materials use pCBtF in their formulations and most solvent cleaning materials already have direct replacements.; thus, a cost-effectiveness and incremental cost-effectiveness analysis was not conducted.

Socioeconomic Impact Assessment

A socioeconomic impact assessment will be conducted and released for public review and comment at least 30 days prior to the South Coast AQMD Governing Board Hearing for PAR 1171, which is scheduled for June 6, 2025 (subject to change).

California Environmental Quality Act (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) and South Coast AQMD's certified regulatory program (Public Resources Code Section 21080.5 and CEQA Guidelines Section 15251(l); codified in South Coast AQMD Rule 110), the South Coast AQMD, as lead agency, is reviewing the proposed project (PAR 1171) to determine if it will result in any potential adverse environmental impacts. Appropriate CEQA documentation will be prepared based on the analysis.

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 Public Hearing, this written analysis, and the rulemaking record. The draft findings are as follows:

Necessity – PAR 1171 is needed to phase out two exempt compounds, pCBtF and t-BAc, to address their toxic risk as by proposed by 2022 AQMP Control Measure CTS-01.

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 - PAR 1171 is written and displayed so that the meaning can be easily understood by persons directly affected by it.

Consistency - PAR 1171 is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or federal and state regulations.

Nonduplication - PAR 1171 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.

Reference - In amending Rule 1171, 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

Under 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 automotive coatings. A comparative analysis will be prepared and released at least 30 days prior

to the South Coast AQMD Governing Board Hearing on PAR 1171, which is scheduled for June 6, 2025 (subject to change).