

Proactive Best Available Control Technology Analysis

District BACT Guideline 4.4.2

Wood Products Coating Operation – Continuously-fed Booth \leq 5000 square feet
material coated/day

Prepared by:

Jagmeet Kahlon, Senior Air Quality Engineer

Reviewed by:

Nick Peirce, Permit Services Manager

I. Introduction

The objective of this project is to proactively update the Best Available Control Technology (BACT) guideline 4.4.2, which covers wood products coating operations with a continuously-fed booth with greater than or equal to 5,000 square feet of material coated per day. This guideline was last updated on May 12, 2000.

This proactive update is necessary to incorporate the most stringent emission control standards that have been achieved in practice. Furthermore, the proactive update to this BACT guideline will bring consistency in implementing the BACT standard throughout the regional offices of the District for new and modified wood products coating operations for a continuously-fed booth with greater than or equal to 5,000 square feet of material coated per day triggering BACT. The discussion in this document will be limited to the following items:

- Source of emissions
- Top-Down BACT Analysis for each pollutant
- Recommendation

II. Source of emissions

Surface coatings are applied to a variety of wood products to provide protection and aesthetically pleasing finishes. Volatile Organic Compounds (VOC) and Particulate Matter (PM) are the pollutants of concern emitted during the coating process. VOC emissions release during curing/drying process, whereas, PM₁₀ emissions occur during coating application.

VOC emissions can be reduced by limiting the VOC content in the coating formulation, by increasing coating transfer efficiency such that a lesser amount of coating covers more surface area, or by capturing and reducing the emissions using properly engineered capture and control system such as routing exhaust stream from spray booths to thermal/catalytic incinerator or a carbon adsorber system.

PM₁₀ emissions can be reduced by applying the coatings inside a spray booth, reducing the overspray by utilizing High Volume Low Pressure (HVLP) or equivalent spray equipment, and by routing the exhaust from spray booth through a filter system.

This BACT analysis applies to wood products coating operations with a continuously-fed booth with greater than or equal to 5,000 square feet of material coated per day, which emit VOCs and PM₁₀ emissions. Other criteria pollutants

including NO_x, SO_x, and CO may be emitted from the combustion of natural gas or LPG, if a thermal/catalytic incinerator is used to abate the VOC emissions, or a process heater is used to dry coated materials. The collateral emissions that are generated by the VOC emissions control technology itself and not by wood products coating operations, so they will not be addressed under this BACT analysis.

This proactive BACT analysis will focus exclusively on VOC and PM₁₀ emissions from the wood products coating operations with a continuously-fed booth with greater than or equal to 5,000 square feet of material coated per day.

III. Top-Down BACT Analysis

BACT analysis for VOC Emissions

As explained earlier, VOC is emitted as the water and solvents evaporate to cure/dry the coating.

Step 1 - Identify All Possible Control Technologies

The following BACT clearinghouse references were reviewed to determine whether any continuously-fed wood coating operations with greater than or equal to 5,000 square feet of material coated per day have been required to employ VOC controls:

- EPA RACT/BACT/LAER clearinghouse
- CARB BACT clearinghouse
- South Coast AQMD (SCAQMD) BACT clearinghouse
- Bay Area AQMD (BAAQMD) BACT clearinghouse
- Sacramento Metro AQMD (SMAQMD) BACT clearinghouse
- San Diego County APCD (SDCAPCD) BACT clearinghouse
- San Joaquin Valley APCD (SJVAPCD) BACT clearinghouse

Also, the following Rules and Regulations were reviewed to determine what VOC emission limits are currently imposed on wood coating operations:

- South Coast AQMD Rule 481
- Bay Area AQMD Regulation 8, Rule 32
- Sacramento Metro AQMD Rule 463
- San Diego County APCD Rule 67.11
- SJVAPCD Rule 4606

Finally, the District also conducted a survey of permit limits for wood coating operations located in the SJVAPCD. The purpose of the survey was to

determine what VOC emission control standards are currently being achieved in practice.

A. Survey of BACT Guidelines:

EPA RACT/BACT/LAER clearinghouse does not include general guidelines, only determinations made by individual agencies. The relevant data are shown in the table below:

RBLC ID	Control Method & Control Efficiency (CE)
AL-0314 (Legacy Cabinets, Inc.)	HVLP spray equipment for stains Air Assist for sealers/topcoats 0.3 pounds VHAP/lb solids 1.58 pounds VOC/gallon coating for sealers Max monthly limit 2.3 pounds VOC/gallon coating for topcoats max monthly limit 1.55 pounds VOC/Gallon for catalysts Max Monthly limit CE – Not specified
IL-0122 (MasterBrand Cabinets, Inc.)	HVLP and air assisted airless spray equipment or equipment with equivalent or better transfer efficiency; work practices: oxidizer with 98% destruction efficiency CE – 98%. This process addresses the following controlled operations: Main 1 (West): Stain, Toner & Glaze Main 2 (East): Stain, Toner & Glaze Limits: i. Stains, toners and glazes (less water and exempt compounds): Opaque Stain-4.7 lb/gal Non-topcoat pigmented coat-5.0 lb/gal Repair coat-5.6 lb/gal Semi-transparent stain-6.6 lb/gal Washcoat-6.1 lb/gal ii. Sealers (including pre-seals): Acid-cured alkyd amino vinyl sealer-2.3 lb VOM/lb solids All other sealers-1.9 lb VOM/lb solids iii. Topcoats: Acid-cured alkyd amino conversion varnish topcoats-2.0 lb VOM/lb solids All other topcoats-1.8 lb VOM/lb solids

The District notes that materials used by Masterbrand Cabinets, Inc. (RBLC ID IL-0122) have VOC contents that are significantly higher than what is allowed by SJVAPCD Rule 4606. Rule 4606 would require the use of VOC control system if a facility proposed to use such coatings in the District. In order to verify the installation, operation and the current status, District staff left a voice message to Illinois Environmental Protection Agency, <https://www2.illinois.gov/epa/topics/forms/air-permits/streamlining/Pages/statistics.aspx>, (217) 785-1705 on June 6, 2022. Mr. Andrew Washburn returned the phone call but he suggested to contact Clean Air Act Permitting Program, which deals for permitting of Major Source facilities and Title V permit. The District reached out to the Clean Air Permitting Program, but received no information regarding the status of the control system installation at MasterBrand Cabinets. Therefore, at this time, the SJVAPCD is unable to verify whether the VOC control system at MasterBrand Cabinets, Inc. can actually be considered to be an achieved-in-practice control for wood coating operations.

Furthermore, the major source threshold for area where MasterBrand Cabinets is located is 100 tons/yr for VOC emissions. The permitted potential emissions for the MasterBrand Cabinets, Inc. is unknown but based on the discussion with Mr. Washburn, it is assumed this facility's potential VOC emissions are greater than 100 tons/yr. Since this potential VOC emission rate is so much greater than any operation permitted in CA, the level of control employed at MasterBrand Cabinets would be considered to be a different category of source.

CARB BACT clearinghouse does not include general guidelines, only individual determinations made by individual air districts. No applicable BACT determinations were found.

SCAQMD BACT clearinghouse includes various sections for major-source polluting facilities:

Section I – SCAQMD LAER/BACT determinations

This section does not contain any relevant guideline related to wood coating operations;

Section II – Other LAER/BACT determinations

This section does not contain any relevant guideline related to wood coating operations;

Section II – Other Technologies

This section does not contain any relevant guideline related to wood coating operations.

SCAQMD BACT clearinghouse for non-major polluting facilities has requirements based on the subcategory of product being coated and the amount of VOC emissions. The applicable requirements are shown in the table below:

*Process: Subcategory/Rating/Size	Requirements & VOC Limit
Fully-enclosed, down-draft type, <667 lb/month of VOC emissions Other types <1170 lb/month VOC emissions	Compliance with Applicable SCAQMD Regulation XI Rules
Fully-enclosed, down-draft type, >22 lb/day of VOC emissions Other types, \geq 1170 lb/month of VOC emissions	Compliance with Applicable SCAQMD Regulation XI Rules, and VOC control system with \geq 90% collection Efficiency and \geq 95 Destruction Efficiency, Or Use of Super Compliant Materials (< 50 grams of VOC per liter of material) Or

	Use of Low-VOC Materials resulting in an equivalent Emission Reduction
Enclosed with automated spray nozzles for wood cabinets, <1,170 lb/month of VOC emissions	Compliance with Rule 1136 or use of Rule 1136 compliant UV/EB or water-based coatings

*The sum of all VOC emissions from all spray booths within the same subcategory applied for in the previous two years at the same facility are considered toward the emission threshold.

The District contacted SCAQMD to get information on the criteria that was used to establish an emission threshold of equal to or greater than 1,170 lb-VOC/month at which a facility is required to install controls or is subject to more stringent requirements, and to determine whether or not SCAQMD has a wood coating facility that emits over 1,170 lb-VOC/month and uses VOC control system.

According to SCAQMD, the monthly threshold was established sometime in the 1990s. At that time, SCAQMD staff performed a calculation that determined it was cost-effective to install controls if facility's VOC emissions equals or exceeds 39 lb/day, which was then used to establish the emissions threshold of 1,170 lb-VOC/month (39 lb-VOC/day x 30 days/month). The detailed analysis upon which this cost effectiveness determination was based is not available from SCAQMD; therefore, it is unknown what metrics (e.g., equipment cost, interest rate, equipment life, etc.) were used, and even if the cost analysis was done correctly. Furthermore, SCAQMD could provide no information on any wood coating facilities subject to this BACT guideline that use any VOC control system (such as thermal or catalytic oxidizer or carbon adsorber systems).

Therefore, at this time, the SJVAPCD is unable to confirm whether the use of a VOC control system listed in the SCAQMD BACT guideline is actually an achieved-in-practice control for wood coating operations.

BAAQMD BACT/TBACT workbook section 5 (coating sources) was reviewed. The guidelines identified in section are summarized below:

BACT Guideline	Category & Class	Achieved in Practice	Technologically feasible
161.7.1 (9/6/91)	Spray booth – Coating of flatwood paneling & wood flat stock (<50 lb/day emissions - uncontrolled)	Compliance with Reg 8, Rule 23	Coating with VOC content and transfer efficiency complying with Reg 8, Rule 23, and emissions controlled to overall capture/destruction efficiency ≥90%

161.7.2 (9/6/91)	Spray booth – coating of flat wood paneling & wood flat stock (≥50 lb/day emissions – uncontrolled)	Coating with VOC content and transfer efficiency complying with Reg 8, Rule 23, and emissions controlled to overall capture/destruction efficiency ≥90%	Coating with VOC content and transfer efficiency complying with Reg 8, Rule 23, and emissions controlled to overall capture/destruction efficiency ≥90%
161.8.1 (9/13/00)	Spray-booth – coating of wood products	Coatings with VOC content less than that required by Reg 8, Rule 32	Coatings w/ VOC content less than that required by Reg. 8, Rule 32, and emissions controlled to overall capture/ destruction efficiency > 90% by weight

The District contacted BAAQMD to obtain information on the criteria that was used to establish the emission threshold of equal to or greater than 50 lb-VOC/day (uncontrolled emissions) at which a facility is required to install controls or is subject to more stringent requirements, and to determine whether or not BAAQMD has a wood coating facility that uses VOC control system.

BAAQMD staff stated the achieved-in-practice control related to BACT 161.7.2 (9/6/91) was a part of the original BACT workbook which was created based on the BACT guidelines adopted at other Districts. Furthermore, BAAQMD could provide no information on any wood coating facilities subject to this BACT guideline that use any VOC control system (such as thermal or catalytic oxidizer or carbon adsorber systems).

Therefore, at this time, the SJVAPCD is unable to confirm whether the use of a VOC control system listed in SCAQMD BACT guideline 161.7.2 is actually an achieved-in-practice control for wood coating operations.

SMAQMD BACT clearinghouse has BACT guidelines for VOC emissions from wood coating operations. The requirements in these guidelines are summarized in the following table:

BACT Guideline	Equipment	Achieved in Practice	Technologically feasible
BACT determination #277 (11/19/20)	Paint Spray Booth, Wood Coating, ≤7,404 lb-VOC/year and facility emissions ≤40,000 lb/yr	- HVLP spray or equivalent application equipment - Compliance with SMAQMD Rule 463 (A) and SMAQMD BACT coating, solvent cleaning and stripping VOC limits (Tables 1-3 in BACT document)	None

<p>BACT determination #278 (11/19/21)</p>	<p>Paint Spray Booth, Wood Coating, >7,404 lb-VOC/year and facility emissions ≤40,000 lb/yr</p>	<ul style="list-style-type: none"> - Compliance with SMAQMD Rule 463 (A) and SMAQMD BACT coating, solvent cleaning and stripping VOC limits (Tables 1-3 in BACT document) and VOC control system with ≥ 90% collection efficiency and ≥ 95% destruction efficiency; OR - Use of super clean materials (<5% VOC by wt.); OR - Use of low-VOC materials resulting in an equivalent emission reduction 	<p>None</p>
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SMAQMD BACT guidelines are similar to that of the SCAQMD but with different emission thresholds. Similar to SCAQMD, the SMAQMD arrived at these thresholds by conducting a cost effectiveness analysis on two VOC control technologies - carbon adsorber and thermal oxidizer, and then back-calculating the 7,404 lb/yr threshold. The BACT analysis does not mention any facility/installation with over 7,404 lb/yr that uses emission control system listed as achieved-in-practice standard. Therefore, it is presumed, no such source exists in the SMAQMD.

Furthermore, a close review of the analysis indicate that parameters used in conducting theses analysis are quite different than SJVAPCD BACT policy. For instance, the SMAQMD BACT cost-effectiveness analysis uses 15 year equipment life for carbon adsorber system and 20 year equipment life for thermal oxidizer system. The equipment life of each would have been 10 years under SJVAPCD BACT policy. Further, SMAQMD analysis uses 2,080 hours/year of operation of each control technology, which is only 24% of the full time 8,760 hours/yr of operation. Under, SJVAPCD BACT policy, these two parameters (i.e., equipment life, and operational hours) would have led to a conclusion where controls may not have been cost effective.

In the absence of actual installation of the control equipment, the SJVAPCD is unable to confirm whether the use of a VOC control system listed in the SMAQMD BACT guidelines has actually been achieved-in-practice for wood coating operations.

SDCAPCD BACT clearinghouse has one BACT guideline for wood coating operations. The requirements are shown in the table below:

BACT Guideline	Equipment	Achieved in Practice	Technologically feasible
BACT Guidance Document (June 2011)	Wood coating operation (<10 gal/day), refer to page 46/52	Use of water based coatings when compatible with the operation and compliance with all other provisions of Rule 67.11, Wood Products Coating Operation for the rest of the operation.	None

SJVAPCD BACT clearinghouse has one BACT guideline for wood coating operations (continuously-fed booth with greater than or equal to 5,000 square feet of material coated per day). The requirements are shown in the table below:

BACT Guideline	Equipment	Achieved in Practice	Technologically feasible
BACT Guideline 4.4.2	Wood Coating Operation	Not specified	<ul style="list-style-type: none"> – 65% capture efficiency (open-face booth) with thermal/catalytic incineration, and using coatings with a VOC content (less water and exempt compounds) of 4.6 lb/gal for clear topcoats, 3.2 lb/gal for high-solids coatings, 4.6 lb/gal for sanding sealers – 65% capture efficiency (open-face booth) with carbon adsorption, and using coatings with a VOC content (less water and exempt compounds) of 4.6 lb/gal for clear topcoats, 3.2 lb/gal for high-solids coatings, 4.6 lb/gal for sanding sealers – 65% capture efficiency (open-face booth) with thermal/catalytic incineration, and the use of typical coatings for this source and category of operation – 65% capture efficiency (open-face booth) with carbon adsorption, and the use of typical coatings for this source and category of operation – Utilizing HVLP or equivalent application equipment and using coatings with a VOC content (less water and exempt compounds) of 4.6 lb/gal for clear topcoats, 3.2 lb/gal for high-solids coatings, 4.6 lb/gal for sanding sealers

Summary of BACT Guidelines:

Based on the above information, the current most stringent achieved-in-practice BACT standard for wood coating operations would be:

- Use of compliant coatings, or methods listed in applicable SIP approved rules.
- HVLP gun or equivalent transfer efficiency for coating application

B. Survey of Applicable Rules and Regulations:

The requirements for these applicable rules and regulations are summarized in the table below:

Agency Rule/Regulation	Requirements
<p>SCAQMD Rule 1136 (6/14/96)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.3 lb/gal for clear sealers, and 2.3 lb/gal for pigmented primers, sealers, undercoats and topcoats.</p> <p>Allowed Application Methods:</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand Roller - Flow Coat - Roll Coater - Dip Coat - Paint brush - Other coating methods capable of achieving at least 65% transfer efficiency
<p>BAAQMD Reg. 8, Rule 32 (8/5/2009)</p>	<p>Coatings using coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.9 lb/gal for high-solids stain, 2.3 lb/gal for sanding sealers, 2.3 lb/gal for pigmented primers, sealer and undercoater and 2.3 lb/gal for pigmented topcoats.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - Airless Spray - Air assisted Airless - High Volume Low-Pressure (HVLP) - Detailing or touch guns - Other coating methods capable of achieving at least 65% transfer efficiency

Agency Rule/Regulation	Requirements
<p>SMAQMD Rule 463 (9/25/08)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.9 lb/gal for high-solids stain, 2.3 lb/gal for sealers, 2.3 lb/gal pigmented coating.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand application such as brush or roller - Flowcoat - Roll Coater - Dip Coat - Low Volume Low Pressure - Air assisted airless for touch up and repair only - Other equivalent methods approved in writing
<p>SDCAPCD Reg IV Rule 67.11 (6/27/17)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.9 lb/gal for high-solids coatings, 2.3 lb/gal for sealers, and 2.3 lb/gal for pigmented coatings.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand Application - Flow Coat - Roll Coater - Dip Coat
<p>SJVAPCD Rule 4606 (11/16/08)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.0 lb/gal for high-solids coatings, 2.3 lb/gal for sanding sealers, 0.68 lb/gal for water based pigmented primers, and 1.62 lb/gal for water based pigmented topcoats.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand Roller - Flow Coat - Roll Coater - Dip Coat - Paint brush - Detailing or touch guns - Other coating methods capable of achieving at least 65% transfer efficiency

Summary of Applicable Rules and Regulations:

As shown in the above table, the current most stringent rule requirements for wood coating operation would be:

- Use of compliant coatings, or methods listed in applicable SIP approved rules.
- HVLP gun or equivalent transfer efficiency for coating application

C. Survey of Permit Requirements:

In order to evaluate what VOC emission rates are currently being achieved by wood coating operations permitted in the SJVAPCD, permit requirements of several permitted units were reviewed. The permit limits are summarized in the table below:

Permit #	Control Equipment	Industry
C-1686-1-3	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-68-8-1	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-831-1-0	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-3038-4-4 and N-3038-8-2	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-3500-3-0	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-3999-3-1	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-4065-12-1	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-7393-1-1	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
S-8721-1-0	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating

Summary of Permit Requirements:

Based on the above information, the current most stringent achieved in practice BACT emissions limitation for wood coating operations would be:

- VOC limits listed in District Rule 4606 (less water and exempt compounds) and
- HVLP gun or equivalent transfer efficiency for coating application

Based on the review of summaries of BACT guidelines, applicable rules and regulations, and permit requirements, the following is considered BACT:

Achieved-in-practice:

- Use HVLP or equivalent transfer efficiency application equipment and use coatings compliant with District Rule 4606

Technologically Feasible:

- 90% capture and 98%¹ control using engineered capture system and thermal/catalytic incineration control system; OR
- 90% capture and 95% control using engineered capture system and carbon adsorption control system; OR
- Use of Ultra Low VOC Materials² (< 50 grams of VOC per liter of material); OR

Alternate Basic Equipment:

None

Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options listed in Step 1. All of the emission control options under consideration are based on either current BACT requirements, or current rule requirements. Therefore, no further discussion is required.

Step 3 - Rank Remaining Control Technologies by Control effectiveness

This analysis is a proactive determination that is not part of a permitting action. Therefore, ranking is not necessary.

¹ The District typically assumes a 98% VOC control efficiency for thermal/catalytic incineration technologies.

² The technologically feasible options for “Super Compliant Materials (SCAQMD)” and “Super Clean Materials (SMAQMD)” will be hereinafter referred to as “Ultra Low VOC Materials” in guideline 4.4.2.

Step 4 - Cost Effectiveness Analysis

This analysis is a proactive determination that is not part of a permitting action. Therefore, a cost effectiveness analysis is not required.

Step 5 - Select BACT

This is a proactive determination that is not part of a specific permitting action. Therefore, selecting BACT is not necessary.

BACT analysis for PM₁₀ Emissions

As explained earlier, PM₁₀ is produced due to an overspray that pass through the filtration system.

Step 1 - Identify All Possible Control Technologies

The following BACT clearinghouse references were reviewed to determine whether any wood coating operations have been required to employ PM₁₀ controls:

- EPA RACT/BACT/LAER clearinghouse
- CARB BACT clearinghouse
- South Coast AQMD (SCAQMD) BACT clearinghouse
- Bay Area AQMD (BAAQMD) BACT clearinghouse
- Sacramento Metro AQMD (SMAQMD) BACT clearinghouse
- San Diego County APCD (SDCAPCD) BACT clearinghouse
- San Joaquin Valley APCD (SJVAPCD) BACT clearinghouse

Also, the following Rules and Regulations were reviewed to determine what PM₁₀ emission control equipment is currently imposed on wood coating operations:

- South Coast AQMD Rule 481
- Bay Area AQMD Regulation 8, Rule 32
- Sacramento Metro AQMD Rule 463
- San Diego County APCD Rule 67.11
- SJVAPCD Rule 4606

Finally, the District also conducted a survey of permitted control devices for wood coating operations located in the SJVAPCD. The purpose of the survey was to determine what PM₁₀ emission control standards are currently being achieved in practice.

A. Survey of BACT Guidelines:

EPA RACT/BACT/LAER clearinghouse does not include general guidelines, only determinations made by individual agencies. No requirements specifically for PM₁₀ emissions was found.

CARB BACT clearinghouse does not include general guidelines, only individual determinations made by individual air districts. No relevant BACT determinations were found.

SCAQMD BACT clearinghouse includes various sections for major-source polluting facilities:

Section I – SCAQMD LAER/BACT determinations

This section does not contain any relevant guideline related to wood coating operations;

Section II – Other LAER/BACT determinations

This section does not contain any relevant guideline related to wood coating operations;

Section II – Other Technologies

This section does not contain any relevant guideline related to wood coating operations.

SCAQMD BACT clearinghouse for non-major polluting facilities has requirements based on the subcategory of product being coated and the amount of VOC emissions. The applicable requirements are shown in the table below:

*Process: Subcategory/Rating/Size	Requirements
Fully-enclosed, down-draft type, <667 lb/month of VOC emissions	Dry filters or Waterwash
Other types <1170 lb/month VOC emissions	
Fully-enclosed, down-draft type, >22 lb/day of VOC emissions	
Other types, ≥1170 lb/month of VOC emissions	
Enclosed with automated spray nozzles for wood cabinets, <1,170 lb/month of VOC emissions	

*The sum of all VOC emissions from all spray booths within the same subcategory applied for in the previous two years at the same facility are considered toward the emission threshold.

BAAQMD BACT clearinghouse has one BACT guideline for wood coating. The requirements are shown in the table below:

BACT Guideline	Category & Class	Achieved in Practice	Technologically feasible
161.7.1 (9/6/91)	Spray booth – Coating of flatwood paneling & wood flat stock (<50 lb/day emissions - uncontrolled)	Dry filters or waterwash	None
161.7.2 (9/6/91)	Spray booth – coating of flat wood paneling & wood flat stock (≥50 lb/day emissions – uncontrolled)	Dry filters or waterwash	None
161.8.1 (9/13/00)	Spray-booth – coating of wood products	Dry filters or waterwash	None

SMAQMD BACT clearinghouse has BACT guidelines for wood coating operations. The requirements in these guidelines are summarized in the following table:

BACT Guideline	Equipment	Achieved in Practice	Technologically feasible
BACT determination #277 (11/19/20)	Paint Spray Booth, Wood Coating, ≤7,404 lb-VOC/year and facility emissions ≤40,000 lb/yr	- Enclosed spray booth with properly maintained dry filters or waterwash. - HVLP spray or equivalent application equipment	None
BACT determination #278 (11/19/21)	Paint Spray Booth, Wood Coating, >7,404 lb-VOC/year and facility emissions ≤40,000 lb/yr	- Enclosed spray booth with properly maintained dry filters or waterwash. - HVLP spray or equivalent application equipment	None

SDCAPCD BACT clearinghouse has one BACT guideline for wood coating operations. The requirements are shown in the table below:

BACT Guideline	Equipment	Achieved in Practice	Technologically feasible
BACT Guidance Document (June 2011)	Wood coating operation (<10 gal/day), refer to page 46/52	Spray booth equipped with overspray filters	None

The SJVAPCD clearinghouse has one BACT guideline for wood coating operations (continuously-fed booth with greater than or equal to 5,000 square feet of material coated per day) lists the following requirements:

BACT Guideline	Equipment	Achieved in Practice	Technologically feasible
BACT Guideline 4.4.2	Wood Coating Operation	HVLP spray equipment or equivalent	– Spray Booth exhausted to a particulate filter with a minimum cross-section face velocity of 100 ft/min and use of HVLP application equipment

Summary of BACT Guidelines:

Based on the above information, the current most stringent achieved-in-practice BACT emissions limitation for wood coating operations would be:

- Use spray booth equipped with filters for particulate matter control, and apply coatings using HVLP or equivalent application methods

B. Survey of Applicable Rules and Regulations:

The requirements for these applicable rules and regulations are summarized in the table below:

Agency Rule/Regulation	Requirements
<p>SCAQMD Rule 1136 (6/14/96)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.3 lb/gal for clear sealers, and 2.3 lb/gal for pigmented primers, sealers, undercoats and topcoats.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand Roller - Flow Coat - Roll Coater - Dip Coat - Paint brush - Other coating methods capable of achieving at least 65% transfer efficiency
<p>BAAQMD Reg. 8, Rule 32 (8/5/2009)</p>	<p>Coatings using coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.9 lb/gal for high-solids stain, 2.3 lb/gal for sanding sealers, 2.3 lb/gal for pigmented primers, sealer and undercoater and 2.3 lb/gal for pigmented topcoats.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - Airless Spray - Air assisted Airless - High Volume Low-Pressure (HVLP) - Detailing or touch guns - Other coating methods capable of achieving at least 65% transfer efficiency
<p>SMAQMD Rule 463 (9/25/08)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.9 lb/gal for high-solids stain, 2.3 lb/gal for sealers, 2.3 lb/gal pigmented coating.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand application such as brush or roller - Flowcoat - Roll Coater - Dip Coat - Low Volume Low Pressure - Air assisted airless for touch up and repair only - Other equivalent methods approved in writing

Agency Rule/Regulation	Requirements
<p>SDCAPCD Reg IV Rule 67.11 (6/27/17)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.9 lb/gal for high-solids coatings, 2.3 lb/gal for sealers, and 2.3 lb/gal for pigmented coatings.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand Application - Flow Coat - Roll Coater - Dip Coat
<p>SJVAPCD Rule 4606 (11/16/08)</p>	<p>Coatings with a VOC content (less water and exempt compounds) of 2.3 lb/gal for clear topcoats, 2.0 lb/gal for high-solids coatings, 2.3 lb/gal for sanding sealers, 0.68 lb/gal for water based pigmented primers, and 1.62 lb/gal for water based pigmented topcoats.</p> <p>Allowed Application Methods</p> <ul style="list-style-type: none"> - Electrostatic - High Volume Low-Pressure (HVLP) - Hand Roller - Flow Coat - Roll Coater - Dip Coat - Paint brush - Detailing or touch guns - Other coating methods capable of achieving at least 65% transfer efficiency

Summary of Applicable Rules and Regulations:

As shown in the above table, the current most stringent Rule requirements for wood coating operation would be:

- Apply coatings using HVLP or equivalent application methods

C. Survey of Permit Requirements:

In order to evaluate what PM₁₀ control equipment is currently being utilized by wood coating operations permitted in the SJVAPCD, several permitted units were reviewed. The results are summarized in the table below:

Permit #	Control Equipment	Industry
C-1686-1-3	Open Faced spray booth, coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-68-8-1	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-831-1-0	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-3038-4-4 and N-3038-8-2	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-3500-3-0	Spray Booth, coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-3999-3-1	Spray Booth, coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-4065-12-1	Spray Booth, coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
N-7393-1-1	Coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating
S-8721-1-0	Spray Booth, coatings compliant with VOC content limits and application methods compliant with Rule 4606	Conveyorized Wood Coating

Summary of Permitted Control Devices:

As seen in above table, the permitted PM₁₀ control devices are the use of a spray booth, coatings compliant with VOC content limits and application methods compliant with Rule 4606.

Based on the review of summaries of BACT guidelines, applicable rules and regulations, and permit requirements, the following is considered BACT:

Achieved-in-practice:

- Use spray booth equipped with exhaust filters and HVLP or equivalent transfer efficiency application methods compliant with District Rule 4606

Technologically Feasible:

None

Alternate Basic Equipment:

None

Step 2 - Eliminate Technologically Infeasible Options

There are no technologically infeasible options listed in Step 1. All of the emission control options under consideration are based on either current BACT requirements, or current rule requirements. Therefore, no further discussion is required.

Step 3 - Rank Remaining Control Technologies by Control effectiveness

The most stringent PM₁₀ emission control technology option under consideration is considered to be achieved in practice. No other control options were considered. Therefore, ranking is not necessary.

Step 4 - Cost Effectiveness Analysis

The most stringent PM₁₀ emission control technology option under consideration is considered to be achieved in practice. Therefore, a cost effective analysis is not necessary.

Step 5 - Select BACT

This is a proactive determination that is not part of a specific permitting action. Therefore, selecting BACT is not necessary.

IV. Recommendation

Adopt the recommended draft BACT guideline.

Appendix

Appendix A: Draft BACT Guideline

Appendix B: Current BACT Guideline 4.4.2

Appendix A
Draft BACT Guideline

**San Joaquin Valley
Unified Air Pollution Control District**

Best Available Control Technology (BACT) Guideline 4.4.2*

Emissions Unit: Wood Products Coating Operation -
Continuously-fed Booth ≤ 5000 square
feet material coated/day

Industry Type: Wood Products
Coating Operation

Equipment Rating: All

Last Update: June 30, 2022

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Use HVLP or equivalent transfer efficiency application methods and coatings compliant with District Rule 4606	<ul style="list-style-type: none"> - 90% capture and 98% control using engineered capture system and thermal/catalytic incineration control system; OR - 90% capture and 95% control using engineered capture system and carbon adsorption control system; OR - Use of Ultra Low VOC Materials (< 50 grams of VOC per liter of material); OR 	
PM10	Use spray booth with exhaust filters, and HVLP or equivalent transfer efficiency application methods compliant with District Rule 4606		

*BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

Appendix B
Current BACT Guideline 4.4.2

**San Joaquin Valley
Unified Air Pollution Control District**

Best Available Control Technology (BACT) Guideline 4.4.2

Emissions Unit: Wood Products Coating Operation - Continuously-fed Booth ≤ 5000 square feet material coated/day
Industry Type: Wood Products Coating Operation

Equipment Rating: All

Last Update: May 12, 2000

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC		<ul style="list-style-type: none"> - 65% capture efficiency (open-face booth) with thermal/catalytic incineration, and using coatings with a VOC content (less water and exempt compounds) of 4.6 lb/gal for clear topcoats, 3.2 lb/gal for high-solids coatings, 4.6 lb/gal for sanding sealers - 65% capture efficiency (open-face booth) with carbon adsorption, and using coatings with a VOC content (less water and exempt compounds) of 4.6 lb/gal for clear topcoats, 3.2 lb/gal for high-solids coatings, 4.6 lb/gal for sanding sealers - 65% capture efficiency (open-face booth) with thermal/catalytic incineration, and the use of typical coatings for this source and category of operation - 65% capture efficiency (open-face booth) with carbon adsorption, and the use of typical coatings for this source and category of operation - Utilizing HVLP or equivalent application equipment and using coatings with a VOC content (less water and exempt compounds) of 4.6 lb/gal for clear topcoats, 3.2 lb/gal for high-solids coatings, 4.6 lb/gal for sanding sealers 	
PM10	HVLP spray equipment or equivalent	Spray Booth exhausted to a particulate filter with a minimum cross-section face velocity of 100 ft/min and use of HVLP application equipment	

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.