

SMAQMD BACT CLEARINGHOUSE

ACTIVE

CATEGORY Type: **DRYER**

BACT Category: SMALL EMITTER

BACT Determination Number:	381	BACT Determination Date:	07/22/2025
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Equipment Information

Permit Number: N/A - Generic BACT Determination
Equipment Description: DRYER LINEN (NON-PROCESS HEATER) - NATURAL GAS FIRED
Unit Size/Rating/Capacity: < 5 MMBTU/HOUR
Equipment Location: N/A - Generic BACT Determination

BACT Determination Information

District Contact: Vy Doan **Phone No.:** (279) 207 - 1177 **Email:** vdoan@airquality.org

ROCs	Standard:	Natural gas fired
	Technology Description:	Natural gas fuel
	Basis:	Achieved in Practice
NOx	Standard:	20 ppmvd @ 3% oxygen
	Technology Description:	Low NOx burner
	Basis:	Achieved in Practice
SOx	Standard:	Natural gas fired
	Technology Description:	Natural gas fuel
	Basis:	Achieved in Practice
PM10	Standard:	75% control
	Technology Description:	Lint collector and natural gas fuel, or equal
	Basis:	Achieved in Practice
PM2.5	Standard:	75% control
	Technology Description:	Lint collector and natural gas fuel, or equal
	Basis:	Achieved in Practice
CO	Standard:	114 ppmvd @ 3% oxygen
	Technology Description:	Natural gas fuel

	Basis:	Achieved in Practice
LEAD	Standard:	
	Technology Description:	
	Basis:	
Comments:	This is a generic BACT determination based on BACT determinations made, and published, by other air agencies in California and/or other States.	

Printed:

07/22/2025



BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NOS.: 381
DATE: January 14, 2025
ENGINEER: Vy Doan

Category/General Equip Description: Dryer
Equipment Specific Description: Dryer Linen (Non-Process Heater) - Natural Gas Fired
Equipment Size/Rating: < 5 MMBtu/hr, Small Emitter BACT (PTE < 10 lb/day)
Previous BACT Det. No.: 249

This Best Available Control Technology (BACT) determination will update Determination #249, which was made on March 19, 2020. BACT #249 was made to update the previous BACT #115, which was made on January 17, 2017.

Commercial laundry dryers, which are part of an automated washroom process, use the combustion of fuel to dry products in the chamber. This BACT determination is for commercial laundry dryers that use burners with a low turndown ratio (< 30:1). Turndown ratio refers to the width of the operational range of a device and is defined as the ratio of the maximum capacity to minimum capacity.

This BACT determination will be for Small Emitter source category based on the District's "Otherwise-Exempt Equipment" BACT Determinations policy (dated 5/16/2019). The policy states that units which are classified as small emitters (less than 10 lbs/day of VOC, NOx, SOx, PM10, or PM2.5 and less than 550 lbs/day of CO) and are located at nonmajor stationary sources are only required to meet BACT standards that have been achieved in practice. Therefore, this BACT determination will only be based on what is achieved in practice and will only be applied to small emitters at non-major sources. BACT will be evaluated on a case-by-case basis for units that do not fit these criteria.

BACT/T-BACT ANALYSIS

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

The following control technologies are currently employed as BACT/T-BACT for commercial laundry dryers, natural gas fired and rated < 5 MMBtu/hr by the following agencies and air pollution control districts:

US EPA

BACT

Source: [EPA RACT/BACT/LAER Clearinghouse](#)

For Natural Gas Fired Commercial Laundry Dryer < 5 MMBtu/hr	
VOC	N/A – No BACT determinations found
NOx	N/A – No BACT determinations found
SOx	N/A – No BACT determinations found
PM10	N/A – No BACT determinations found
PM2.5	N/A – No BACT determinations found
CO	N/A – No BACT determinations found

Note: The following process codes were reviewed:
 (A) 19.600 – Misc. Boilers, Furnaces, Heaters
 (B) 19.900 – Other Misc. Combustion

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

No applicable rule requirements were found.

California Air Resource Board (CARB)

BACT

Source: [CARB BACT Clearinghouse](#) (See Attachment A)

ARB BACT Clearinghouse	
VOC	Natural gas fueled [SMAQMD ^(A)]
NOx	30 ppm @ 3% O ₂ [SMAQMD ^(A) , SCAQMD ^(B)]
SOx	Natural Gas [SMAQMD ^(A)]
PM10	75% control [SMAQMD ^(A)]
PM2.5	75% control [SMAQMD ^(A)]
CO	N/A – No BACT determinations found

(A) SMAQMD BACT Determination No. 249

(B) SCAQMD BACT Determination (application # 391633); based on Part D of BACT Guidelines.

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[CARB Airborne Toxic Control Measures \(ATCM\):](#)

There are currently no ATCMs that apply to this source category.

Sacramento Metropolitan AQMD

BACT

Source: [SMAQMD BACT Clearinghouse](#)

BACT #249: Commercial Laundry Dryer, Natural Gas Fired, < 5 MMBtu/hr (3/19/2020)	
VOC	Natural gas fueled
NOx	30ppmvd @ 3% O ₂ , Low NOx burner
SOx	Natural gas fueled
PM10	75% control ^(A)
PM2.5	75% control ^(A)
CO	No standard

(A) Lint collector and natural gas fuel, or equal

T-BACT

No T-BACT Determination.

RULE REQUIREMENTS:

[Rule 419 – NOx From Miscellaneous Combustion Units \(Adopted 07/26/2018, amended 10/25/2018\)](#)

This rule applies to any miscellaneous combustion unit or cooking unit with a total rated heat input capacity of 2 million Btu per hour or greater that is located at a major stationary source of NOx (> 25 TPY of NOx) and to any miscellaneous combustion unit or cooking unit with a total rated heat input capacity of 5 million Btu per hour or greater that is not located at a major stationary source of NOx. For miscellaneous combustion units rated < 5 MMBtu per hour located at area sources, this rule does not apply.

[Rule 404 – Particulate Matter \(11/20/1984\)](#)

This rule limits particulate matter emissions to less than 0.23 grams per dry standard cubic meter (0.1 grains per dry standard cubic foot).

[Rule 406 – Specific Contaminants \(12/06/1978\)](#)

This rule limits sulfur emissions to less than 0.2% by volume, except as otherwise provided in Rule 420, calculated as sulfur dioxide (SO₂). This rule also limits combustion contaminants to less than 0.23 grams per dry standard cubic meter (0.1 grains per dry standard cubic foot) of gas calculated to 12% of carbon dioxide (CO₂).

[Rule 420 – Sulfur Content of Fuels \(8/13/81\)](#)

No person shall burn any gaseous fuels containing sulfur compounds in excess of 50

grains per 100 cubic feet, calculated as hydrogen sulfide at standard conditions, or any liquid fuel or solid fuel having a sulfur content in excess of 0.5% by weight.

South Coast AQMD

BACT

Source: SCAQMD BACT Guidelines for Non-Major Polluting Facilities, page 43 (2/1/2019)

Tenter Frame Fabric Dryer	
VOC	No standard
NOx	30 ppmvd corrected to 3% O ₂ or Compliance with Rule 1147 (2-1-2019)
SOx	Natural Gas (10-20-2000)
PM10	Natural Gas (10-20-2000)
PM2.5	No standard
CO	No standard

Other Dryers and Ovens – Direct and Indirect Fired^{(A)(B)}	
VOC	No standard
NOx	30 ppmvd corrected to 3% O ₂ (04-10-98)
SOx	Natural Gas (10-20-2000)
PM10	Natural Gas (10-20-2000)
PM2.5	No standard
CO	No standard

(A) Does not include food or bakery ovens. Does not include digester gas or landfill gas units.

Source: SCAQMD LAER/BACT Determinations

Dryer or Oven – Dryer, Laundry A/N 391633 (12/6/02)	
VOC	No standard
NOx	30 ppmvd @ 3% O ₂ , Low-NOx burner
SOx	No standard
PM10	No standard
PM2.5	No standard
CO	No standard

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Reg II, Rule 219 – Equipment Not Requiring A Written Permit Pursuant to Regulation II \(4/7/2023\) \(05/06/2022\)](#)

Permits are not required for boilers, process heaters, or any combustion equipment that has a rated maximum heat input capacity of 2,000,000 Btu per hour or less and are equipped to be heated exclusively with natural gas, methanol, liquefied petroleum gas, or any combination thereof.

[Reg XI, Rule 1147 – NOx Reductions From Miscellaneous Sources \(05/06/2022\)](#)

The purpose of this rule is to reduce nitrogen oxide (NOx) emissions while limiting carbon monoxide (CO) emissions from gaseous and liquid fuel fired combustion equipment as defined in this rule. New dryers are required to meet the emission limits listed in Rule 1147, Table 2. This rule applies to units rated at 325,000 Btu/hr or greater with nitrogen oxide emissions that require a SCAQMD permit and are not specifically required to comply with a nitrogen oxide emission limit by other SCAQMD Regulation XI rules.

In practice, the below standards only apply to commercial laundry dryers with a heat input greater than 2,000,000 Btu/hr because SCAQMD's Reg II, Rule 219 exempts combustion equipment firing on natural gas with a heat input of 2,000,000 Btu/hr or less from District permit requirement.

Equipment Categories	Process Temperature (A)	Emission Limits (ppmv corrected to 3% O ₂ , dry unless otherwise specified)	
		NOx Limit	CO Limit
Gaseous Fuel -Fired Equipment^(B)			
Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank	< 1,200°F	20 ppmv or 0.024 lb/MMBtu	1,000 ppmv
	≥ 1,200°F	30 ppmv or 0.036 lb/MMBtu	
Tenter Frame or Fabric or Carpet Dryer	All	20 ppmv or 0.024 lb/MMBtu	1,000 ppmv
Other Unit or Process Temperature	< 1,200°F	30 ppmv or 0.036 lb/MMBtu	1,000 ppmv
	≥ 1,200°F	60 ppmv or 0.073 lb/MMBtu	

(A) Linen dryers are normally fired at a process temperature of < 1,200°F.

(B) Emission limit applies to burners in Units fueled by 100% natural gas that are used to incinerate air toxics, VOCs, or other vapors; or to heat a Unit. The emission-limit applies solely when burning 100% gaseous fuel and not when the burner is incinerating air toxics, VOCs, or other vapors. The Unit shall be tested or certified to meet the emission limit while fueled with natural gas.

San Joaquin Valley Unified APCD

BACT

Source: [SJVUAPCD Best Available Control Technology \(BACT\) Guideline 1.9.11 \(7/1/2020\)](#)

Commercial Laundry Dryer, Natural Gas-Fired - < 5.0 MMBtu/hr		
Pollutant	Achieved in Practice or in the SIP	Technologically Feasible
VOC	Use of PUC quality natural gas fuel	
NOx	Use of 30 ppmvd NOx @ 3% O ₂ (equivalent to 0.0365 lb-NOx/MMBtu) low NOx burner (or equivalent) fired on PUC quality natural gas fuel	Use of 9.2 ppmvd @ 3% O ₂ (equivalent to 0.0111 lb-NOx/MMBtu) ultra-low NOx burner (or equivalent) fired on PUC quality natural gas fuel
SOx	Use of PUC quality natural gas fuel	
PM10	Use of a lint collector with a control efficiency of ≥ 75% or equivalent and PUC quality natural gas fuel	<ol style="list-style-type: none"> 1. Use of a baghouse with a control efficiency of ≥ 99% or equivalent and PUC quality natural gas fuel 2. Use of a venturi scrubber with a control efficiency of ≥ 90% or equivalent and PUC quality natural gas fuel
PM2.5	No standard	
CO	Use of 114 ppmvd CO @ 3% O ₂ (equivalent to 0.084 lb-CO/MMBtu) burner (or lower) fired on PUC quality natural gas fuel	Use of 4.6 ppmvd CO @ 3% O ₂ (equivalent to 0.0034 lb-CO/MMBtu) burner fired on PUC quality natural gas fuel

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Rule 4309 – Dryers, Dehydrators, and Ovens \(12/15/2005\)](#)

This rule applies to any dryer, dehydrator, or oven that is fired on gaseous fuel, liquid fuel, or is fired on gaseous and liquid fuel sequentially, and the total rated heat input for the unit is 5.0 million British thermal units per hour (5.0 MMBtu/hr) or greater. Therefore, Rule 4309 does not apply.

San Diego County APCD

BACT

Source: [New Source Review Requirements for Best Available Control Technology \(Bact\) - Guidance Document \(November 2023\)](#) and <https://www.sdapcd.org/content/sdapcd/permits/BACT.html>

Natural Gas-Fired Commercial Laundry Dryer	
VOC	N/A – No BACT determinations found
NOx	N/A – No BACT determinations found
SOx	N/A – No BACT determinations found
PM10	N/A – No BACT determinations found
PM2.5	N/A – No BACT determinations found
CO	N/A – No BACT determinations found

Note: Pursuant to [Rule 11 \(10/13/2022\)](#), Section (d)(18)(iv), laundry dryers, extractors, or tumblers used for fabrics cleaned only with solutions of bleach or detergents, provided that the VOC content of detergents and additives used does not exceed 50 grams per liter (this exemption does not apply to equipment used for previously VOC-laden materials such as rags, cloths, etc.) are not required to obtain a permit and are therefore not subject to New Source Review (BACT).

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Rule 68 - Fuel-Burning Equipment - Oxides Of Nitrogen \(09/20/1994\)](#)

This rule limits NOx emissions to 125 ppmvd at 3% O₂ and 240 mg/m³ at 20°C for gaseous fuels. This rule applies to any non-vehicular, fuel-burning equipment that has a maximum heat input rating greater than or equal to 50 MMBtu/hr. Therefore, this rule does not apply.

Bay Area AQMD

BACT

Source: [BAAQMD BACT Guideline](#)

Natural Gas-Fired Commercial Laundry Dryer	
VOC	N/A – No BACT determinations found
NOx	N/A – No BACT determinations found
SOx	N/A – No BACT determinations found
PM10	N/A – No BACT determinations found
PM2.5	N/A – No BACT determinations found
CO	N/A – No BACT determinations found

T-BACT

There are no T-BACT standards published in the clearinghouse for this category.

RULE REQUIREMENTS:

[Reg 8 Organic Compound, Rule 2 – Miscellaneous Operations \(05/04/2022\)](#)

This rule limits precursor organic compounds (POC) emissions from miscellaneous operations to 6.8 kg/day (15 lb/day) and 300 ppm total carbon on a dry basis. This rule exempts any operation consisting entirely of natural gas, and therefore does not apply.

[Reg 9 Inorganic Gaseous Pollutants, Rule 3 – Nitrogen Oxides from Heat Transfer Operations \(3/17/1982\)](#)

This rule does not apply to any new or modified heat transfer operation designed for a maximum heat input of less than 264 GJ (250 MMBtu).

Summary of Achieved in Practice Control Technologies

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

Summary Table

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
VOC	1. Natural gas fueled [SMAQMD, SJVUAPCD]
NOx	1. 20 ppmvd @ 3% O ₂ ^(A) [SCAQMD Rule 1147] 2. 30 ppmvd @ 3% O ₂ [CARB, SMAQMD, SCAQMD, SJVUAPCD]
SOx	1. Natural Gas [SMAQMD, SCAQMD, SJVUAPCD]
PM10	1. 75% control (lint collector and natural gas fuel, or equal) [SMAQMD, SJVUAPCD] 2. Natural Gas [SCAQMD]

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
PM2.5	1. 75% control (lint collector and natural gas fuel, or equal) [SMAQMD, SJVUAPCD] 2. Natural Gas [SCAQMD]
CO	1. 114 ppmvd @ 3% O ₂ [SJVUAPCD] 2. 1,000 ppmvd @ 3% O ₂ [SCAQMD]

(A) Linen dryers are normally fired at a process temperature of < 1,200°F.

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

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	Standard	Source
VOC	Natural gas fueled	SMAQMD, SJVUAPCD
NOx	20 ppmvd @ 3% O ₂	SCAQMD Rule 1147
SOx	Natural gas fueled	SMAQMD, SCAQMD, SJVUAPCD
PM10	75% control (lint collector and natural gas fuel, or equal)	SMAQMD, SJVUAPCD
PM2.5	75% control (lint collector and natural gas fuel, or equal)	SMAQMD, SJVUAPCD
CO	114 ppmvd @ 3% O ₂	SJVUAPCD

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

Technologically Feasible Alternatives:

The District’s Small Emitter and “Otherwise-Exempt Equipment” BACT Determinations policy (dated 5/16/2019) states that units which are classified as small emitters (less than 10 lbs/day of VOC, NOx, SOx, PM10, or PM2.5 and less than 550 lbs/day of CO) and are located at nonmajor stationary sources are only required to meet BACT standards that have been achieved in practice. Therefore, this BACT determination will only be based on what is achieved in practice and will only be applied to small emitters at non-major sources. BACT will be evaluated on a case-by-case basis for units that do not fit these criteria.

Cost Effectiveness Determination:

Cost effectiveness determination is not applicable for this BACT determination category (Small Emitter).

C. SELECTION OF BACT:

Based on the above analysis, BACT for VOC, NOx, SOx, PM10, and CO will be the most stringent standards of what is currently achieved in practice.

BACT 381 FOR DRYER LINEN (NON-PROCESS HEATER), NATURAL GAS FIRED, < 5 MMBTU/HR		
Pollutant	Standard	Source
VOC	Natural gas fueled	SMAQMD, SJVUAPCD
NOx	20 ppmvd @ 3% O ₂	SCAQMD Rule 1147
SOx	Natural gas fueled	SMAQMD, SCAQMD, SJVUAPCD
PM10	75% control (lint collector and natural gas fuel, or equal)	SMAQMD, SJVUAPCD
PM2.5	75% control (lint collector and natural gas fuel, or equal)	SMAQMD, SJVUAPCD
CO	114 ppmvd @ 3% O ₂	SJVUAPCD

D. SELECTION OF T-BACT:

There are no Federal NSPSs, NESHAPs nor State ATCMs for this source category. None of the sources surveyed have any toxic T-BACT determinations published. Therefore, T-BACT standards will be considered as meeting the BACT standards identified above for VOCs.

Toxics are in the form of VOCs and particulate matter. Since toxic emissions from natural gas fired units in the less than or equal to 10 MMBtu/hr size range are so small and the cancer risk is expected to be well below 1 in a million, T-BACT was not evaluated for this determination.

APPROVED BY: *Brian F Krebs*

DATE: 07-22-2025

Attachment A

Review of BACT Determinations published by ARB

List of BACT determinations published in ARB's BACT Clearinghouse for Dryer or Oven, Direct or Indirect:

Capacity	Source	Date	NOx	VOC	CO	PM10
3.5 MMBtu/hr, Average load equals 1.5 MMBtu/hr ^(A)	SCAQMD	9/6/2002	30 ppmvd @ 15% O ₂	NA	NA	NA

(A) Tumbler dryer used for drying clothes (commercial laundry); SCAQMD determined on 10/27/2001 that BACT for NOx for a commercial laundry dryer was 30 ppmv @ 3% O₂. The MAXON Cyclomax burner used in this application has a maximum turndown ratio of 15:1. Source: SCAQMD Permit No. F45784 and MAXON Packaged & EBMRV CYCLOMAX® Burners (09/03).

Attachment B

District BACT Determinations

CATEGORY Type:

DRYER (NON PROCESS HTR)

BACT Category: SMALL EMITTER (PTE < 10 LBS/DAY)

BACT Determination Number: 249	BACT Determination Date: 3/19/2020
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Equipment Information

Permit Number: N/A -- Generic BACT Determination
Equipment Description: DRYER
Unit Size/Rating/Capacity: Commercial Laundry Dryer, Natural Gas < 5 MMBtu/hr
Equipment Location:

BACT Determination Information

District Contact: Michelle Joe Phone No.: (916) 874 - 4853 email: mjoe@airquality.org

ROCs	Standard:	Natural gas fueled
	Technology Description:	
	Basis:	Achieved in Practice
NOx	Standard:	30ppmvd @ 3% O2
	Technology Description:	Low-NOx burner
	Basis:	Achieved in Practice
SOx	Standard:	Natural gas fueled
	Technology Description:	
	Basis:	Achieved in Practice
PM10	Standard:	75% control
	Technology Description:	Lint collector and natural gas fuel, or equal
	Basis:	Achieved in Practice
PM2.5	Standard:	75% control
	Technology Description:	Lint collector and natural gas fuel, or equal
	Basis:	Achieved in Practice
CO	Standard:	No standard
	Technology Description:	
	Basis:	
LEAD	Standard:	No standard
	Technology Description:	
	Basis:	

Comments: This is a generic BACT determination based on BACT determinations made, and published, by other air agencies in California and/or other States.

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities***

10-20-2000 Rev. 0
2-2-2018 Rev. 1
2-1-2019 Rev 2

Equipment or Process: Dryer or Oven

Subcategory/ Rating/Size	Criteria Pollutants						
	VOC	NOx	SOx	CO	PM ₁₀	Inorganic	
Carpet Oven		30 ppm Compliance with Rule 1147 (2-1-2019)	Natural Gas (1990)		Natural Gas (1990)		
Rotary, Spray and Flash Dryers ¹⁾		Compliance with Rule 1147 (2-1-2019)	Natural Gas (1990)		Natural Gas with Baghouse (1990)		
Tray, Agitated Pan, and Rotary Vacuum Dryers		Compliance with Rule 1147 (2-1-2019)	Natural Gas (1990)		Natural Gas (1990)		
Tenter Frame Fabric Dryer		30 ppm Compliance with Rule 1147 (2-1-2019)	Natural Gas (10-20-2000)		Natural Gas (10-20-2000)		
Other Dryers and Ovens – Direct and Indirect		30 ppmvd corrected to 3% O ₂ (04-10-98)	Natural Gas (10-20-2000)		Natural Gas (10-20-2000)		

* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions