



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Western Regional Office • 436 Dwight Street, Springfield MA 01103 • 413-784-1100

DEVAL L. PATRICK
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Secretary

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Commissioner

Date **May 13, 2014**

Ms. Theresa R. Thibault
Saint-Gobain Ceramic Materials
Coating Solutions
175 Industrial Drive
Northampton, MA 01060

RE: Northampton
Transmittal No.: X257361
Application No.: WE-13-029
Class: SM-25
FMF No.: 329609

AIR QUALITY PLAN APPROVAL

Administrative Amendment

Dear Ms. Thibault:

The Massachusetts Department of Environmental Protection (“MassDEP”), Bureau of Waste Prevention, has reviewed your Limited Plan Application (“Application”) listed above. This Application concerns the construction and operation of an existing spray dryer, cyclone, and associated dust collector at your thermal ceramic powder manufacturing facility located at 175 Industrial Drive in Northampton, Massachusetts (“Facility”).

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 “Air Pollution Control,” regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP’s review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

The March 10, 2014 version of this Plan Approval has been amended to specify a higher temperature limit upstream of the Donaldson Torit Downflo II DFT 2-4 dust collector. In a letter received April 17, 2014, the facility notified MassDEP of their plan to change to a filter cartridge with an increased temperature rating of 350°F (originally 275°F). The following changes have been made to the Plan Approval:

- Section 1, Description of Facility and Application;
- Section 3, Table 2, Provision 2;
- Section 3, Table 3, Provision 2;
- Section 3, Table 4, Provision 1.b.; and
- The name of the filter cartridge has been changed throughout the document from “Thermo-Web” to “Donaldson Torit High Temperature.”

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator (“Permittee”) must comply in order for the Facility to be operated in compliance with this Plan Approval.

This amended Plan Approval is intended to supersede Plan Approval # WE-13-029 issued March 10, 2014 in its entirety.

DESCRIPTION OF FACILITY AND APPLICATION

Saint-Gobain Ceramic Materials Coating Solutions (Saint-Gobain) is located at 175 Industrial Drive in Northampton, MA. The referenced Limited Plan Application is for construction and operation of an existing spray dryer, cyclone, and associated dust collector. The system converts ceramic slurry into an agglomerated ceramic powder. The thermal spray powders are later, in a separate process, sintered onto a part/substrate with a plasma gun. This gives the part a heat and wear resistant coating.

The facility has previously received the following Plan Approvals:

Plan Approval :	Issue Date:	Description:
1-P-00-002	4/ 21/2000 7/14/2000	Non-major Comprehensive Plan Approval to install a zirconium oxide sintering process, including scrubbers, and four plasma torches The original Plan Approval was amended by adding two additional plasma torches (six total)
1-P-01-069	2/5/2002	Limited Plan Approval of an N ₂ shroud to inhibit NO _x formation at the torches
1-P-02-013	6/24/2002	Conditional Limited Plan Approval to increase the number of torches in use at any one time to five (5)
1-P-08-040	2/20/2009	Limited Plan Approval for start-up and operation of the two backup plasma torches, a cyclone, and a dust collector
1-P-10-040	12/23/2010	Limited Plan Approval to relocate an electric drying oven, two kilns, a thermal oxidizer, and a spray booth to the Northampton facility

General operations take place at the facility during three (3) shifts, five (5) days per week. It is estimated that the Niro spray dryer operates 2,550 hours per year. The pollutant of concern related to this spray dryer process is total particulate matter (PM), including both PM_{2.5} and PM₁₀.

Estimates from Saint-Gobain predict a 75% removal of material by the spray dryer and a 97.7% removal by the cyclone. Based on this information and a slurry feed rate supplied by Saint-Gobain, running 8,760 hours per year, potential emissions of total PM from the spray dryer and cyclone unit, before controls, are estimated to be 5.45 tons per year. With a dust collector minimum total PM control efficiency of 99.9% and a worse case operating schedule of 8760 hours per year, the total PM emissions from the exhaust of the dust collector associated with the spray dryer process will not exceed 0.0055 tons per year. Therefore, a total PM emission limit of 0.006 tons per year has been determined.

Prior to entering the spray dryer, the wet slurry passes through a rotating wheel which contains holes to clump the material together (centrifugal atomization). The clumped (or agglomerated) material enters a pretreated natural gas fired dryer. Coarse particles drop out within the dryer chamber and are captured. To prevent damage to the dust collector, the temperature will be monitored upstream to ensure that it is no more than 350°F.

Finer particles move to a Niro cyclone separator and are further collected. The exhaust gas from the cyclone is sent to a cartridge-type particulate filter dust collector with a minimum total PM removal efficiency of 99.9%. Dust collected on the filter is sent offsite to a landfill. Exhaust from the dust collector is vented to ambient air through a vertical stack with specifications summarized in Table 7.

The dust collector utilized by Saint-Gobain is a Donaldson Torit Downflo II DFT 2-4 with four cylindrical cartridges. The maximum air flow through the system is 3,150 scfm. Saint-Gobain will use a Donaldson Torit High Temperature Cartridge (or equivalent) which is rated for up to 350°F. The four cartridges have a total filtering surface area of 1016 ft², resulting in a gas to cloth ratio of 3.1 ft³/min·ft².

Differential pressure across the filters is continuously monitored with a magnehelic pressure gauge. Cleaning of the unit is automatically triggered by pressure drop. The filters are cleaned by reverse-pulse of air causing the dust from the surface of the filter to fall into a collection hopper which is disposed of by Saint-Gobain offsite. When the pressure drop reaches the manufacturer recommended limit, the operator replaces the cartridges.

Regulatory Applicability

The spray dryer, cyclone, and associated dust collector constructed by Saint-Gobain is subject to the Best Available Control Technology standards of 310 CMR 7.02(8)(a)2. To achieve this standard, Saint-Gobain will use a dust collector equipped with Donaldson Torit High Temperature Cartridges, or an equivalent filter cartridge, to remove 99.9% of total PM from the exiting gas stream. They will monitor pressure drop across the dust collector, temperature within the spray dryer, and will ensure that a sufficient number of filter cartridges are kept on-hand for replacement. The resultant total PM emission limit will be 0.006 tons per year

The natural gas burner on the dryer is rated at approximately 500,000 Btu/hr of heat input and is not subject to 310 CMR 7.02, Plan Approval and Emission Limitations.

Saint-Gobain is subject to the visible emission requirements of 310 CMR 7.06, the dust, odor, construction and demolition requirements of 310 CMR 7.09 and the noise reduction requirements of 310 CMR 7.10.

EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1			
EU#	Description	Design Capacity	Pollution Control Device (PCD)
11	Niro spray dryer and cyclone	Per manufacturers specifications	Donaldson Torit Downflo II DFT 2-4 dust collector with four (4) Donaldson Torit High Temperature Cartridge filters

Table 1 Key:

EU# = Emission Unit Number
PCD = Pollution Control Device
kg = kilogram
hr = hour

1. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2 below:

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
11	1. In accordance with the best available control technology provision of 310 CMR 7.02 (8)(a)2, EU 11 shall be controlled by a Donaldson Torit Downflo II DFT 2-4 dust collector with four (4) Donaldson Torit High Temperature Cartridge filters, or equivalent, which shall have a particulate matter removal efficiency of $\geq 99.9\%$.	PM/PM ₁₀ /PM _{2.5}	0.0012 TPM 0.006 TPY 0% Opacity
	2. In accordance with the best available control technology provision of 310 CMR 7.02 (8)(a)2, the dust collector associated with EU 11 shall be equipped with filter cartridges with a temperature rating of 350° F or greater.		
	3. In accordance with the best available control technology provision of 310 CMR 7.02 (8)(a)2, the inlet temperature to the Donaldson Torit Downflo II DFT 2-4 dust collector shall not exceed the manufacturer recommended temperature limit.		

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
	4. In accordance with the best available control technology provision of 310 CMR 7.02 (8)(a)2, the Permittee shall replace the dust collector filters according to manufacturer recommendations, based on pressure drop across the dust collector.		

Table 2 Key:

EU# = Emission Unit Number

PM = Total Particulate Matter

PM10 = Particulate Matter less than or equal to 10 microns in diameter

PM2.5 = Particulate Matter less than or equal to 2.5 microns in diameter

TPM = tons per calendar month

TPY = tons per consecutive 12-month period

COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

Table 3	
EU#	Monitoring and Testing Requirements
11	<ol style="list-style-type: none"> 1. In accordance with 310 CMR 7.02(8)(a)2, the Donaldson Torit Downflo II DFT 2-4 dust collector shall be equipped with instrumentation to continuously monitor the differential pressure across the dust collector. 2. In accordance with 310 CMR 7.02(8)(a)2, the Donaldson Torit Downflo II DFT 2-4 dust collector shall be equipped with instrumentation to continuously monitor temperature of the gas upstream of the dust collector to ensure it does not exceed 350°F. 3. In accordance with 310 CMR 7.02(3)(d), the Permittee shall monitor the amount of slurry/solid material inputted to the Niro spray dryer on a per month (ton per month) and per year (ton per consecutive 12 month) basis. 4. In accordance with 310 CMR 7.02(3)(d), Monitoring and Testing, the Permittee shall monitor the removal of solid material from the Niro spray dryer and cyclone separator on a per month (ton per month) and per year (ton per consecutive 12 months) basis.
Facility-wide	<ol style="list-style-type: none"> 5. In accordance with 310 CMR 7.12, the Permittee shall monitor all operations to ensure sufficient information is available to comply with Source Registration. 6. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13

Table 3 Key:

EU# = Emission Unit Number

Table 4	
EU#	Record Keeping Requirements
11	<p>1. The Permittee shall maintain comprehensive and accurate records of:</p> <ul style="list-style-type: none"> a. daily records, at a minimum, of the pressure drop across the Donaldson Torit Downflo II DFT 2-4 dust collector, including the time of day and date of each reading. b. daily records, at a minimum, of the inlet (or upstream) temperature to the Donaldson Torit Downflo II DFT 2-4 dust collector, including the time of day and date of each reading. c. the amount of slurry processed by the spray dryer during each calendar month and during the previous 12-month period (the current month and previous 11 months). d. the amount of material removed by the Niro spray dryer and cyclone during each month and during the previous 12-month period (the current month and previous 11 months). e. records of any maintenance or repairs performed on the Donaldson Torit Downflo II DFT 2-4 dust collector, including, but not limited to, the number and locations of any damaged filters discovered and replaced.
Facility-wide	<p>2. The Permittee shall maintain adequate records on-site to demonstrate compliance with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve month period (current month plus prior eleven months). These records shall be compiled no later than the 15th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/dep/air/approvals/aqforms.htm#report.</p> <p>3. The Permittee shall maintain records of monitoring and testing as required by Table 3.</p> <p>4. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU(s) and PCD approved herein on-site.</p> <p>5. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates on the approved EU(s), PCD, and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.</p> <p>6. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.</p> <p>7. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.</p> <p>8. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.</p>

Table 4 Key:

EU# = Emission Unit Number
 PCD = Pollution Control Device
 SOMP = Standard Operating and Maintenance Procedure
 USEPA = United States Environmental Protection Agency

Table 5	
EU#	Reporting Requirements
11	1. The Permittee shall provide records from Table 4 of this Plan Approval to the MassDEP upon request.
Facility-wide	2. The Permittee shall submit to MassDEP any information requested pursuant to this Plan Approval over the signature of a “Responsible Official” as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	3. The Permittee shall notify the Western Regional Office of MassDEP, BWP Permit Chief by telephone 413-755-2115, email, Marc.Simpson.State.MA.US or fax 413-784-1149, as soon as possible, but no later than one (1) business day after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to BWP Permit Chief at MassDEP within three (3) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	4. The Permittee shall report every three years to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require Plan Approval.
	5. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within 30-days from MassDEP’s request.
	6. The Permittee shall submit to MassDEP for approval a stack emission pretest protocol, at least 30 days prior to emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.
	7. The Permittee shall submit to MassDEP a final stack emission test results report, within 45 days after emission testing, for emission testing as defined in Table 3 Monitoring and Testing Requirements.

Table 5 Key:

EU# = Emission Unit Number

SPECIAL TERMS AND CONDITIONS

The Permittee is subject to, and shall comply with, the following special terms and conditions:

A. The Permittee shall comply with the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU#	Special Terms and Conditions
11	1. In accordance with the best available control technology provision of 310 CMR 7.02(8)(a)2, the Permittee shall shut down the spray dryer if the inlet temperature of the Donaldson Torit Downflo II DFT 2-4 dust collector exceeds the manufacturer recommended temperature limit of the filter cartridges. 2. In accordance with the best available control technology provision of 310 CMR 7.02(8)(a)2, the Permittee shall not operate the Niro spray dryer and cyclone without the simultaneous operation of the Donaldson Torit Downflo II DFT 2-4 dust collector. 3. In accordance with the best available control technology provision of 310 CMR 7.02(8)(a)2, the Permittee shall keep on hand a sufficient quantity of spare cartridge filters for the Donaldson Torit Downflo II DFT 2-4 dust collector to facilitate immediate replacement of any damaged or spent cartridges. The Permittee shall track and record the number of extra filters on hand.
Facility-wide	4. Any prior Plan Approvals issued under 310 CMR 7.02 shall remain in effect unless specifically changed or superseded by this Plan Approval. The Facility shall not exceed the emission limits and shall comply with approved conditions specified in the prior Plan Approval(s) unless specifically altered by this Plan Approval.

Table 6 Key:

EU# = Emission Unit Number

B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not limited to rain protection devices known as “shanty caps” and “egg beaters.” The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7 below, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU#	Stack Height Above Ground (feet)	Stack Inside Exit Dimensions <i>(Choose units of measure)</i>	Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (°F)
11	37	6 inch	60 - 67	166 - 168

Table 7 Key:

EU# = Emission Unit Number
 °F = Degree Fahrenheit

4. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.

- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.
- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. The Permittee shall conduct emission testing, if requested by MassDEP, in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13. If required, a pretest protocol report shall be submitted to MassDEP at least 30 days prior to emission testing and the final test results report shall be submitted within 45 days after emission testing.
- K. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

5. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain "Fail-Safe Provisions," which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact Amy Stratford by telephone at 413-755-2144, or in writing at the letterhead address.

*This final document copy is being provided to you electronically by the
Department of Environmental Protection. A signed copy of this document
is on file at the DEP office listed on the letterhead.*

Marc Simpson
Permit Chief
Bureau of Waste Prevention

Enclosure

ecc: MassDEP/Boston - Yi Tian