



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Secretary

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Date Stamped September 29, 2011

Mr. Nathaniel Weiner
Bostik, Inc.
211 Boston Street
Middleton, MA 01949

RE: **MIDDLETON** - Metropolitan
Boston/Northeast Region
310 CMR 7.02 NON-MAJOR
COMPREHENSIVE PLAN
APPLICATION
Appl. No. MBR-11-IND-013
Transmittal No. X238052
CONDITIONAL APPROVAL

Dear Mr. Weiner:

The Metropolitan Boston/Northeast Regional Office of the Department of Environmental Protection (MassDEP), Bureau of Waste Prevention, has completed its technical review of the plan application listed above. This application concerns the proposal to control the vaporous emissions from your reactor processes via an existing, approved regenerative thermal oxidizer at your 211 Boston Street facility in Middleton, Massachusetts. The submitted application bears the seal and signature of Mr. Stephen Jelinek, Massachusetts P.E. No. 46670.

MassDEP has determined that your application is administratively and technically complete and that the subject proposal is in conformance with current air pollution control engineering practices. Therefore, MassDEP hereby grants **Conditional Approval** for the proposal, with the conditions listed below.

Please review the entire Conditional Approval carefully, as it stipulates the particular conditions with which the facility owner/operator must comply in order for the facility to be operated in compliance with the Regulations. Failure to comply with this Conditional Approval will constitute a violation of the Regulations and can result in the revocation of the Conditional Approval.

1. BACKGROUND AND DESCRIPTION OF FACILITY

Bostik, Inc. ("Bostik") manufactures polyester resins and polyurethane resins used in industrial grade adhesives, solid web and film adhesives, and solvent based liquid adhesive coatings at its existing Middleton facility. Enclosed batch reactors are employed to manufacture the polyester resins and the polyurethane resins. An enclosed mixing vessel is utilized to produce solvent based liquid adhesives.

Polyester Department

The Polyester Department is located in Building 36 and in Building 39. It produces polyester resins in the following reactors or emission units (EUs): EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, and EU-R14. The manufactured polyester resins are either shipped as pellets or granules directly to customers or are converted in-house to web or solvent based liquid adhesives.

EU-R1, EU-R3, and EU-R13 are first stage reactors. First stage reactions take place under high temperature and agitation. This stage is not conducted under vacuum. As part of the reaction, process vapors flow upwards from the reactor through a water cooled condenser where much of the process vapor is converted to a liquid called polyester distillate. Polyester distillate is a hazardous waste due to ignitability. The condensed liquid and the remaining vapor drains by gravity to receiver tanks, numbered to correspond to each specific reactor (V1, V2, V3, V4, V10, V13, and V14). Condensed liquid accumulated in the V13 receiver tank is piped to a temporary storage tank known as Day Tank 1 (EU-DT1). The condensed liquid in the remaining receiver tanks are transferred directly to one of two bulk hazardous waste storage tanks, either EU-T1 or EU-T2, before it is combusted on-site in the Struthers-Wells industrial boiler. The process vapors from EU-DT1, EU-T1, and EU-T2 contain both volatile organic compounds (VOC) and hazardous air pollutants (HAPs) that will be directed to the new process vapor header pipe. These receiver tanks are not emission units as they accumulate only condensed liquids which are hard piped to either EU-DT1, EU-T1, or EU-T2.

Once the first stage reaction is complete, nitrogen is added and the partially completed batch is transferred to a corresponding second stage reactor, either EU-R2, EU-R4, or EU-R14, where vacuum is applied to complete the reaction. Similar to the first stage reactors, any condensed liquid polyester distillate and the remaining vapor polyester distillates also flow to EU-DT1 and then the liquid polyester distillate is transferred to either EU-T1 or EU-T2. After the second stage reaction is completed, the vacuum is broken by the introduction of nitrogen to unload the product from the reactor to either the direct pelletization process or to cooling trays. EU-R10 will serve as both a first stage and a second stage reactor.

To control fugitive dust emissions during the loading of the first stage reactors, dust will be collected from three powder loading stations and from the reactors by two Airex Model No. DCCH-9 dust collectors. The dust collectors will be located and vented outside, adjacent to Building 36. The particulate matter (PM) emissions from these two (2) dust collectors plus the proposed dust collector in the Churn Room will be less than 215 pounds per year; as such, this installation is not subject to 310 CMR 7.02 – Plan Approval.

Polyurethane Department

The Polyurethane Department is located in Building 37. It consists of a 100-gallon reactor (EU-R100), a 500-gallon reactor (EU-R500), and a 1,000-gallon reactor (EU-R1000), as well as two (2) large wash tanks, EU-WT1 and EU-WT2. Polyurethane reactions take place in these three enclosed reactors. Neither vacuum nor pressure is applied to any of these reactors during the polymerization process. Once the polymerization process is complete, a small vacuum blower is utilized to remove air bubbles from the finished product before packaging. The process vapors from the polyurethane reactors will be vented through the small vacuum blower to the new process vapor header pipe through a flame arrestor and conservation vent. The polyurethane resins that are produced can be solvent borne or solvent-free adhesives and are packaged and shipped directly to customers.

V-3 Mixer Department

The V-3 Mixer Department is located in the same building as the Polyurethane Department. Solvent based liquid adhesives are manufactured in the enclosed EU-V3 mixing vessel by reacting rubber compounds with silanes and acrylates in various solvents. These solvent based liquid adhesives are shipped directly to customers.

Process vapors from EU-V3 will be vented through the same small vacuum blower utilized in the Polyurethane Department to the new process vapor header pipe through a flame arrestor and conservation vent.

Film Adhesive Coating Line

In 2008, Bostik installed a new paper adhesive coating line (EU-CL) for the production of numerous products that were previously produced at another Bostik facility. The new coating line consists of a knife over roll coating head and a five zone natural gas-fired drying oven. The VOC and HAPs generated from this coating line are controlled by the regenerative thermal oxidizer (RTO), also known as Pollution Control Device RTO (PCD-RTO), which was approved by MassDEP via Plan Approval No. MBR-07-IND-024 dated March 6, 2008.

The coating process involves silicone coated paper in rolls up to 60 inches in width which is unwound through a series of rollers to control tension and alignment. The coating head is a knife over roll configuration which relies on the coating being pre-applied to the paper. As the coating and paper pass through, the knife scrapes off the excess coating to provide the necessary coating thickness on the paper. The coating line is capable of operating at a maximum line speed of 100 feet per minute.

After the coating has been applied, the coated paper is fed into the new, five-zone, Advance Systems, Inc. drying oven via a vacuum table where the paper is suspended on a stream of heated air. The air velocity is balanced from top and bottom to ensure that the coated paper does not contact any surface. The temperature increases from zone 1 to zone 5 as the coated paper makes its way toward the oven exit. When the coated paper exits the oven, the coating will be a minimum of 99 percent (%) solids, by weight. The coated paper is then conveyed either to a lamination process with a secondary web or directly to the re-wind area. No air pollutant emissions are generated from the lamination process. Finished rolls from the re-winder are palletized for delivery.

PCD-RTO, a L & E America Model No. TR20.5-95C RTO, controls the VOC and HAPs emissions from EU-CL. PCD-RTO is equipped with a natural gas only Maxon Kinemax 4KM Maxon burner, which is rated at a maximum heat input of 4,000,000 British thermal units per hour (Btu/hr). A total of ten (10) dual element Type K thermocouples are used for temperature monitoring and control. A temperature monitoring and recording system records the average of these temperatures continuously.

On-site Industrial Boiler

Liquid hazardous waste byproducts from the Polyester Department are collected in EU-DT1 and pumped into either EU-T1 or EU-T2. These liquid hazardous waste byproducts are considered to be hazardous based on the characteristic of ignitability so they are combusted in the existing on-site Struthers Wells industrial boiler (PCD-BIF), which is currently in the final stage of RCRA Part B permitting via the U.S. EPA.

Liquid hazardous waste byproducts from the Polyurethane Department and the V-3 Mixer Department are collected in a Tote (EU-TOTE) and shipped off-site for proper disposal.

Nordemechanica Laminator

The Nordemechanica Laminator (EU-NORD) was approved by MassDEP via Plan Approval No. MBR-09-IND-010 dated August 3, 2009. This uncontrolled, research and development lamination machine is located in Building 29. It emits VOC, HAPs, and acetone.

New Process Vapor Header Pipe

Process vapors from the Polyester Department, the Polyurethane Department, and the V-3 Mixer Department, as well as the ancillary tanks listed in Table 1 below, will be vented through a new 1,400 foot process vapor header pipe to one of two air pollution control devices. Previously, these process vapors were directed to PCD-BIF for control. If PCD-BIF was not in operation, the process vapors were directed to a MassDEP approved enclosed flare for control (see Approval Nos. MBR-97-IND-055 and MBR-98-IND-008, dated March 5, 1998 and May 12, 1998, respectively).

Through Application No. MBR-11-IND-013, Bostik is proposing to direct these process vapors to PCD-RTO as the primary control device and to PCD-BIF whenever PCD-RTO is not in operation. The enclosed flare which had a control efficiency of 95% by weight for VOC and HAPs will be decommissioned. PCD-RTO will have a minimum overall control efficiency of 99% by weight for the VOC and HAPs that will be contained in the process vapors from the new process vapor header pipe and EU-CL. PCD-BIF will have a minimum control efficiency of greater than 99% by weight for the VOC and HAPs that will be contained in the process vapors from the new process vapor header pipe and the liquid hazardous waste byproducts from EU-T1 and EU-T2.

The new process vapor header pipe will be equipped with pressure transducers, flow meters, a lower flammability limit (LFL) meter, new knock-out pots, and new flame arrestors and detonation arrestors as safety precautions. Pressure transducers will be installed in three locations to monitor the pressure conditions and flow throughout the length of the header pipe. Vortex flow meters will be installed to monitor the flow conditions throughout the pipe. An LFL meter will be installed near PCD-RTO to monitor the flammability limit and ensure that explosive conditions are not occurring in the header pipe. Two knock-out pots will be installed in the header pipe to trap any liquids entrained in the process vapor stream and to prevent these liquids from reaching either PCD-RTO or PCD-BIF. Several new flame arrestors and detonation arrestors will be installed in the header pipe in multiple locations. All flame arrestor locations will be configured with an in-line back-up to allow each flame arrestor to be periodically cleaned while the system is still operating under the redundant flame arrestor.

While controlling the process vapors from the Polyester Department, the Polyurethane Department, and the V-3 Mixer Department, as well as the VOC and HAPs emissions from EU-CL, PCD-RTO will provide a minimum residence time for the process air of 0.8 second at a minimum operating temperature of 1,550°F. PCD-RTO will continue to provide a minimum VOC and HAPs destruction efficiency of 99 percent by weight and the air handling system serving EU-CL and the various reactors and tanks in Table 1 will meet the requirements of permanent total enclosures (PTEs) thereby providing a VOC and HAPs capture efficiency of 100 percent.

The new air handling system which will direct the process vapors to PCD-RTO will use a Twin City Model ES-52 blower, or equivalent. The blower will have a rated capacity of 1,100 standard cubic feet per minute of process air. The new process header pipe will be connected to PCD-RTO outside Building 23. Compliance test sample ports associated with PCD-RTO and PCD-BIF will be installed in the new process header pipe in compliance with 40 CFR Appendix A, Method 1.

The treated process air stream will exit the PCD-RTO between 300°F and 1,000°F. This air stream will be vertically exhausted to the atmosphere through an aluminum-clad stack, the opening of which is 40 feet above ground level and 16 feet above the building roof. The inside stack diameter is 47 inches and provides a maximum stack gas exit velocity of 60 feet per second. A heat recovery system has been added to the PCD-RTO exhaust to reduce energy consumption for building heat. The recovered heat will be utilized to provide space heating for some adjacent buildings. The heat recovery system is equipped with valves that will be closed during the triennial compliance testing to ensure proper exhaust stack testing.

PCD-RTO also has a purge stack that is used to exhaust any gases from the dryer oven prior to start up of the dryer burners associated with EU-CL. The opening of this carbon steel stack is located 40 feet above ground level and 15.75 feet above the building roof. The inside stack diameter is 40 inches and provides a maximum stack gas exit velocity of 40 feet per second.

Whenever PCD-RTO is not in operation, the process vapors from the Polyester Department, the Polyurethane Department, and the V-3 Mixer Department will be controlled by PCD-BIF. PCD-BIF will provide a minimum residence time for the process air of 3.4 seconds at a minimum combustion chamber temperature of 1,293°F. The new process vapor header pipe with the process vapors from these three departments will meet the requirements of a PTE thereby providing a capture efficiency of 100 percent.

The existing air handling system which will direct the process vapors to PCD-BIF uses a National Turbine Model NT03108625075GD blower. The blower has a rated capacity of 400 standard cubic feet per minute of process air.

The treated process air stream will exit the PCD-BIF between 300°F and 1,050°F. This air stream will be vertically exhausted to the atmosphere through a carbon steel stack, the opening of which is 64.5 feet above ground level and 15 feet above the building roof. The inside stack diameter is 24 inches and provides a maximum stack gas exit velocity of 45 feet per second.

Churn Room Modification

The Churn Room contains eighteen (18) existing open-top churns used to mix raw material. Bostik is proposing to install leak proof covers equipped with conservation vents on each of these churns. This modification should decrease VOC and HAP emissions since there will be no direct volatilization of material from the churns. The conservation vents from each of the 18 churns will discharge any breathing losses into one (1) common header which will be vented outside, adjacent to Building 24. The breathing losses will be passive. Since this will result in a decrease in VOC and HAP emissions, this installation is not subject to 310 CMR 7.02 – Plan Approval.

In addition, a new Airex Model No. DCCH-9 dust collector will be installed to control fugitive dust from two powder loading stations and from each churn when solids are being loaded into them. The dust collector will be located and vented outside Buildings 23/24. Since the combined potential PM emission rate of the two Polyester Department dust collectors and the Churn Room dust collector will be less than 215 pounds per year, this installation is not subject to 310 CMR 7.02 – Plan Approval.

2. EMISSION UNIT IDENTIFICATION

The following emission units listed in Table 1 below are subject to and governed by this Approval:

Table 1				
EMISSION UNIT (EU)	DESCRIPTION OF EMISSION UNITS	LOCATED IN BUILDING	EU DESIGN CAPACITY	POLLUTION CONTROL DEVICE
EU-R1	First Stage Polyester Reactor	36	1,550 gallons	Primary Pollution Control Device – RTO (PCD-RTO) or Secondary Pollution Control Device - BIF (PCD-BIF)
EU-R2	Second Stage Polyester Reactor	36	1,200 gallons	
EU-R3	First Stage Polyester Reactor	36	1,550 gallons	
EU-R4	Second Stage Polyester Reactor	36	1,200 gallons	
EU-R10	First Stage or Second Stage Polyester Reactor	39	2,000 gallons	
EU-R13	First Stage Polyester Reactor	39	2,100 gallons	
EU-R14	Second Stage Polyester Reactor	39	2,000 gallons	
EU-DT1	Liquid Polyester Distillate Day Tank	39	950 gallons	
EU-T1	Liquid Hazardous Waste Tank No. 1	Outside 39	8,000 gallons	
EU-T2	Liquid Hazardous Waste Tank No. 2	Outside 39	8,000 gallons	
EU-R100	Polyurethane Reactor	37	100 gallons	
EU-R500	Polyurethane Reactor	37	500 gallons	
EU-R1000	Polyurethane Reactor	37	1,000 gallons	
EU-WT1	Polyurethane Wash Tank No. 1	37	2,500 gallons	
EU-WT2	Polyurethane Wash Tank No. 2	37	2,500 gallons	
EU-V3	Solvent Based Liquid Adhesives Mixer	37	1,500 gallons	
EU-TOTE	Liquid Hazardous Waste Tote	Outside 37	500 gallons	
EU-CL	Film Adhesive Coating Line	1	100 feet per minute line speed	
EU-NORD	Nordemechanica Laminator	29	400 feet per minute line speed	None
	Enclosure of 18 Churns in the Churn Room	Building 24	Not subject to 310 CMR 7.02	
	Polyester Manufacturing and Churn Room Dust Collection	Building 36 and Building 23/24	Not subject to 310 CMR 7.02	Three (3) Airex Model No. DCCH-9 dust collectors

3. APPLICABLE REQUIREMENTS

A. EMISSION LIMITS AND RESTRICTIONS

1. Bostik shall comply with the emission limits/restrictions as contained in Table 2 below:

Table 2				
EU#	RESTRICTION / OPERATING PRACTICES	AIR POLLUTANTS	EMISSION LIMIT/STANDARD	APPLICABLE REGULATION AND/OR APPROVAL NUMBER
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE	Permanent Total Enclosure (PTE) PCD-RTO combustion chamber temperature \geq 1550 °F; PCD-BIF combustion chamber temperature \geq 1293 °F (or such other temperatures as may be established pursuant to satisfactory compliance testing results as determined by MassDEP)	VOC and HAPs	\leq 0.25 tpm VOC and \leq 0.10 tpm total HAPs \leq 1.8 tpy VOC and \leq 0.51 tpy total HAPs PCD-RTO minimum 99.0% control efficiency by weight & 100% capture efficiency via U.S. EPA Method 204 PCD-BIF minimum 99.99% control efficiency by weight & 100% capture efficiency via U.S. EPA Method 204	310 CMR 7.02 MBR-11-IND-013
EU-CL	PTE PCD-RTO combustion chamber temperature \geq 1550 °F; (see above)	VOC and HAPs	\leq 0.8 tpm VOC and \leq 0.5 tpm total HAPs \leq 9.3 tpy VOC and \leq 6.0 tpy total HAPs PCD-RTO or PCD-BIF minimum 99.0% control efficiency by weight & 100% capture efficiency via U.S. EPA Method 204	310 CMR 7.02 MBR-07-IND-024 superceded by MBR-11-IND-013
EU-NORD	NA	VOC and HAPs	$<$ 1.0 tpm VOC and $<$ 0.1 tpm total HAPs $<$ 4.0 tpy VOC and $<$ 0.35 tpy total HAPs $<$ 0.7 tpm and $<$ 2.7 tpy acetone	310 CMR 7.02 MBR-09-IND-010
Facility-wide	NA	VOC	\leq 3.5 tpm \leq 32.30 tpy	310 CMR 7.02
		Single HAP	\leq 1.0 tpm \leq 9.5 tpy	
		Total HAPs	\leq 1.5 tpm \leq 12.6 tpy	

Table 2 Key:

VOC = volatile organic compounds	°F = degrees Fahrenheit
HAPs = hazardous air pollutants	% = percent
NA = not applicable	\leq = less than or equal to
tpy = tons per rolling twelve month calendar period	\geq = greater than or equal to
tpm = tons per month	$<$ = less than

B. COMPLIANCE DEMONSTRATION

Bostik shall comply with the monitoring/testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

Table 3	
EU #	MONITORING/TESTING REQUIREMENTS
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-R100, EU-R500, EU-R1000, EU-V3	1) Monitor the VOC-containing and HAPs-containing materials used during each batch, the VOC and HAPs content of each material, and the actual emissions of VOC and HAPs for each batch, for the month, as well as for the prior 11 months.
EU-CL	2) Monitor the VOC-containing and HAPs-containing materials used during each production run, the VOC and HAPs content of each material, and the actual emissions of VOC and HAPs for the month as well as for the prior 11 months.
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1,EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE, EU-CL	3) Monitor operations so that a minimum PCD-RTO combustion chamber temperature of 1,550 degrees Fahrenheit is achieved prior to start-up of any associated emission unit, and this minimum temperature is maintained at all times while any associated emission unit(s) is/(are) in operation. Temperature monitoring shall include date and time and any necessary description of operational changes that may occur.
	4) Monitor operations so that in the event of PCD-RTO malfunction, an interlock system shall prevent the uncontrolled operation of these emission units. Bostik shall immediately cease operation of these emission units until PCD-RTO is operating properly. The one exception is that all of these emission units, but not including EU-CL, may be brought back to operation if their associated vapors are being controlled by PCD-BIF, once it has achieved at its minimum combustion chamber temperature of 1,293 degrees Fahrenheit and is operating properly.
	5) Compliance testing shall be completed on PCD-RTO and the associated PTEs every three years, with the first compliance test commencing within 180 days of commencement of continuous operation of any EU controlled by PCD-RTO. The compliance testing of PCD-RTO must demonstrate, at minimum, that: a) each enclosure complies with the United States Environmental Protection Agency's (USEPA) Method 204 which outlines criteria for Permanent Total Enclosures; and b) the VOC and HAPs destruction efficiency of PCD-RTO is a minimum of 99 percent by weight. The compliance testing procedures must follow USEPA and MassDEP methods and guidelines.
	6) Monitor all maintenance activities associated with PCD-RTO.
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE	7) Monitor operations so that a minimum PCD-BIF combustion chamber temperature of 1,293 degrees Fahrenheit is achieved prior to start-up of any associated emission unit, and this minimum temperature is maintained at all times while any associated emission unit(s) is/(are) in operation. Temperature monitoring shall include date and time and any necessary description of operational changes that may occur.

Table 3	
EU #	MONITORING/TESTING REQUIREMENTS
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE	8) Monitor operations so that in the event of a malfunction of PCD-BIF, an interlock system shall prevent the uncontrolled operations of these emission units. Bostik shall immediately cease operation of these associated emission units until PCD-BIF is operating properly, or if PCD-RTO is back to proper operating conditions.
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE	9) Compliance testing shall be completed on PCD-BIF and the associated PTEs every three years, with the first compliance test commencing within 180 days of commencement of continuous operation of any EU controlled by PCD-BIF. The compliance testing of PCD-BIF must demonstrate, at minimum, that: a) each enclosure complies with the United States Environmental Protection Agency's (USEPA) Method 204 which outlines criteria for Permanent Total Enclosures; and b) the VOC and HAPs destruction efficiency of PCD-BIF is a minimum of 99 percent by weight. The compliance testing procedures must follow USEPA and MassDEP methods and guidelines. 10) Monitor all maintenance activities associated with PCD-BIF.
EU-NORD	11) Monitor the materials containing VOC, HAPs, and/or acetone used during each production run, the VOC, HAPs, and acetone content of each material, and the actual emissions of VOC, HAPs, and acetone for the month as well as for the prior 11 months.
Facility-Wide	12) Investigate the feasibility of implementing alternative technologies or reformulated raw material inputs which will lead to the decrease of overall emissions from the facility to the environment. Seek assistance from outside sources such as the Office of Technical Assistance, located at the Executive Office of Environmental Affairs, 251 Causeway Street, Suite 900, Boston, Massachusetts 02114-2136, Telephone (617) 626-1060. 13) Perform Emissions Compliance Testing (Stack Testing), in accordance with 310 CMR 7.13, or any other testing if and when requested by the MassDEP or USEPA using methods under 40 CFR 60, Appendix A and/or other methods approved in a pre-test protocol by the MassDEP or USEPA. 14) Monitor to ensure that all VOC and HAPs-containing materials such as coatings, solvents, and cleanup solutions, shall be transported and stored in tightly covered containers. 15) Monitor that all cleaning rags used in conjunction with the cleaning solutions shall be placed in tightly covered containers when not in use, and shall be collected for proper recycling or disposal. 16) Monitor facility operations so that deviations from Plan Approval requirements can be reported to MassDEP. 17) Monitor raw material usage each month in order to determine the actual emissions of VOC and HAPs for the month as well as for the prior 11 months for the entire facility. 18) Monitor facility operations such that emissions may be calculated as required for compliance with 310 CMR 7.12.

Table 4	
EU #	RECORD KEEPING REQUIREMENTS
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-R100, EU-R500, EU-R1000, EU-V3	1) In order to verify that the VOC and HAPs emission rates from these emission units at the subject facility do not exceed the emission limits specified in Table 2 of this Plan Approval, maintain on-site adequate records to document compliance with said limits. These records shall include a list of the VOC-containing or HAPs-containing materials used during each batch, the VOC and HAPs content of each material, and the actual emissions of VOC and HAPs for each batch, for the month, as well as for the prior 11 months.
EU-CL	2) In order to verify that the VOC and HAPs emission rates from this emission unit at the subject facility do not exceed the emission limits specified in Table 2 of this Plan Approval, maintain on-site adequate records to document compliance with said limits. These records shall include a list of the VOC-containing or HAPs-containing materials used during each production run, the VOC and HAPs content of each material, and the actual emission rates of VOC and HAPs for the month as well as the prior 11 months.
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE, EU-CL	3) Maintain records documenting that PCD-RTO combustion chamber temperature of 1,550 degrees Fahrenheit is being achieved prior to start-up of any of these emission units, and this minimum temperature is maintained at all times while any associated emission unit(s) is/(are) in operation. Temperature monitoring shall include the date and any necessary description of operational changes that may occur. The combustion chamber temperature of the PCD-RTO shall be recorded with temperature monitoring and recording equipment using a digital readout and stored on a computerized flash card or disc. Bostik shall have on-site a temperature data back up to the flash card or disc. To demonstrate compliance with the minimum required operating temperature of 1550°F, Bostik shall calculate block averages using at least one measurement per minute (i.e., using at least 60 data points to determine the hourly block average). These records shall be maintained on-site for a minimum of five years, and shall be made available to MassDEP personnel upon request. 4) Maintain records of all malfunctions and history of the interlock system usage associated with PCD-RTO, including the cause and steps taken to prevent similar malfunctions from reoccurring in the future. 5) Maintain records of all emission testing for PCD-RTO. 6) Maintain a maintenance log for PCD-RTO which shall record all routine and emergency maintenance work and repairs performed on it. Said log shall indicate all malfunctions and down time and shall be maintained for a period of at least five years. 7) Maintain all records of utilization of the PCD-RTO emergency bypass damper and any associated uncontrolled VOC/HAPs emissions. All uses of the emergency bypass damper shall be automatically recorded with a time and date chart recorder.
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE	8) Maintain records documenting that PCD-BIF combustion chamber temperature of 1,293 degrees Fahrenheit is being achieved prior to start-up of any of these emission units, and this minimum temperature is maintained at all times while any associated emission unit(s) is/(are) in operation. Temperature monitoring shall include the date and any necessary description of operational changes that may occur. The combustion chamber temperature of the PCD-BIF shall be recorded with temperature monitoring and recording equipment using a digital readout and stored on a computerized flash card or disc. Bostik shall have on-site a temperature data back up to the flash card or disc. To demonstrate compliance with the minimum required operating temperature of 1,293°F, Bostik shall calculate block averages using at least one measurement per minute (i.e., using at least 60 data points to determine the hourly block average). These records shall be maintained on-site for a minimum of five years, and shall be made available to MassDEP personnel upon request. 9) Maintain records of all malfunctions and history of the interlock system usage associated with PCD-BIF, including the cause and steps taken to prevent similar malfunctions from reoccurring in the future.

Table 4	
EU #	RECORD KEEPING REQUIREMENTS
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE	10) Maintain records of all emission testing for PCD-BIF.
	11) Maintain a maintenance log for PCD-BIF which shall record all routine and emergency maintenance work and repairs performed on it. Said log shall indicate all malfunctions and down time and shall be maintained for a period of at least five years.
EU-NORD	12) In order to verify that the VOC, HAPs, and acetone emission rates from this emission unit at the subject facility do not exceed the emission limits specified in Table 2 of this Plan Approval, maintain on-site adequate records to document compliance with said limits. These records shall include a list of the VOC-containing, HAPs-containing, and acetone-containing materials used during each production run, the VOC, HAPs, and acetone content of each material, and the actual emission rates of VOC, HAPs, and acetone for the month as well as for the prior 11 months.
Facility-Wide	13) Maintain records of all facility operations so that deviations from Plan Approval requirements can be reported to the MassDEP. Maintain a record of all deviations from Plan Approval conditions.
	14) Bostik shall maintain adequate records on site to document compliance with the facility-wide emission restrictions contained in Table 2 above for VOC, HAPs, and acetone. Said records shall be made available to MassDEP personnel upon request, and shall be kept on site for a minimum of five (5) years.
	15) Maintain the test results of any testing or testing methodology required by the MassDEP or EPA.
	16) Maintain records of facility operations such that information may be reported as required for compliance with 310 CMR 7.12. Keep copies of all information supplied to the MassDEP pursuant to 310 CMR 7.12 on site for five (5) years after the date the report is submitted.
	17) Bostik shall maintain an Environmental Logbook, or similar record keeping system, which shall record actions associated with environmental issues and overall emissions changes at the facility. The facility shall record information such as the results of federal, state, or local environmental inspections; maintenance or corrective actions related to pollution control equipment (filter changes, etc.); and measures taken to lower overall emissions to the environment (air, solvent waste, etc.). This Logbook, or similar, shall be made available to MassDEP personnel upon request and shall also record any accidental or emergency releases to the ambient air. Separate logbooks can be maintained for Standard Operating and Maintenance actions, if necessary.

Table 5	
EU #	REPORTING REQUIREMENTS
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-R100, EU-R500, EU-R1000, EU-V3	1) A semi-annual report of the VOC and HAPs emissions data for the period of January 1 through June 30 inclusive and for the period of July 1 through December 31 inclusive must be submitted to the MassDEP, attention Permit Chief for the Bureau of Waste Prevention, by no later than the following July 30th and January 30th, respectively.

Table 5	
EU #	REPORTING REQUIREMENTS
EU-CL	2) A semi-annual report of the VOC and HAPs emissions data for the period of January 1 through June 30 inclusive and for the period of July 1 through December 31 inclusive must be submitted to the MassDEP, attention Permit Chief for the Bureau of Waste Prevention, by no later than the following July 30th and January 30th, respectively.
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE, EU-CL	3) In the event of any PCD-RTO malfunction which results in any uncontrolled emissions, and/or should the emergency bypass damper be used, for any reason, Bostik shall notify MassDEP by telephone within one business day and subsequently in writing within seven days of said occurrence. This written notification shall describe the reason(s) for and the extent of down time of the equipment and all steps that have been or will be taken to prevent similar malfunctions from occurring in the future. 4) At least 60 days prior to testing PCD-RTO, submit a pretest protocol to the MassDEP for review and approval. This protocol shall describe the test methodologies, sampling point locations, sampling equipment, and the sampling and analytical procedures to be employed during the required compliance testing. A final compliance test results report must be submitted by Bostik to this Office, attention Permit Chief for the Bureau of Waste Prevention, within sixty (60) days of completion of the above required compliance testing.
EU-R1, EU-R2, EU-R3, EU-R4, EU-R10, EU-R13, EU-R14, EU-DT1, EU-T1, EU-T2, EU-R100, EU-R500, EU-R1000, EU-WT1, EU-WT2, EU-V3, EU-TOTE	5) In the event of any PCD-BIF malfunction which results in any uncontrolled emissions, notify MassDEP by telephone within one business day and subsequently in writing within seven days of said occurrence. This written notification shall describe the reason(s) for and the extent of down time of the equipment and all steps that have been or will be taken to prevent similar malfunctions from occurring in the future. 6) At least 60 days prior to testing PCD-BIF, submit a pretest protocol to the MassDEP for review and approval. This protocol shall describe the test methodologies, sampling point locations, sampling equipment, and the sampling and analytical procedures to be employed during the required compliance testing. A final compliance test results report must be submitted by Bostik to this Office, attention Permit Chief for the Bureau of Waste Prevention, within sixty (60) days of completion of the above required compliance testing.
Facility-wide	7) Bostik shall submit a semi-annual report of the VOC and HAPs emissions rates for the period of January 1 through June 30 inclusive and for the period of July 1 through December 31 inclusive, to this Office, attention BWP Permit Chief, by no later than the following July 30th and January 30th. This report shall include documentation that the facility is complying with the restrictions in this Approval letter for VOC, acetone, single HAP, and total HAPs. (An electronic version of both the On-site Record-keeping Forms and Report Form in Microsoft Excel format can be obtained at http://www.mass.gov/dep/air/approvals/aqforms.htm). Bostik shall also attach a summary sheet outlining any progress made toward lowering overall emissions to the environment. 8) Bostik shall submit, in writing, an Exceedance Report to MassDEP should the facility exceed any limitation/restriction established within this Conditional Approval. Said Exceedance Report shall be submitted to this Office within seven (7) days of determination of the exceedance of the limitation. The Exceedance Report shall include identification, duration, reason for the exceedance, and remedial action plan to prevent future exceedances. 9) Bostik shall accurately report the facility's air emissions on Source Registration/Emission Statement Forms as required by Regulation 310 CMR 7.12.

4. SPECIAL TERMS AND CONDITIONS

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

1. Within thirty (30) days of receipt of this Approval, Bostik shall provide permanent, visible signage on each emission unit (EU) identifying its designated EU name as listed in Table 1 of this Approval.
2. Sound impacts from the subject facility shall not exceed 10 dB (A) above background at the property line and shall not cause a puretone condition as defined in the Division of Air Quality Control Noise Policy No. 90-001 (copy attached).
3. This Plan Approval supercedes the following Plan Approval letters issued to Bostik by MassDEP in their entirety: Approval Nos. MBR-97-IND-055, MBR-98-IND-008, and MBR-07-IND-024.
4. Bostik shall notify this Regional Office, in writing, attention Permit Chief, Bureau of Waste Prevention, when the connection of the new process vapor header pipe to PCD-RTO is complete and deemed ready for continuous operation, within fourteen (14) days thereof.
5. That for compliance testing purposes, the compliance test sampling ports for PCD-RTO and PCD-BIF must be located in accordance with 40 CFR 60, Appendix A, Method 1.
6. The facility shall use an exhaust stack on each of the emission units listed in Table 6 below 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 “shanty caps” and “egg beaters”. Any emission impacts of exhaust stacks upon sensitive receptors including, but not limited to, people, windows and doors that open, and building fresh air intakes shall be minimized by employing good air pollution control engineering practices. Such practices include without limitation: a) avoiding stack locations that may be subject to downwash of the exhaust; and, b) installing stacks of sufficient height in locations that will prevent and minimize exhaust gas impacts upon sensitive receptors. The facility shall install and utilize exhaust stacks with the following parameters (Table 6) for its subject emission units that are regulated by this Approval:

Table 6				
PCD Stack	Stack Height Above Ground, feet	Stack Exit Diameter, inches	Maximum Exhaust Gas Exit Velocity, feet per second	Outside Stack Shell Material
PCD-RTO	40	47	60	Aluminum Clad
PCD-RTO Bypass	40	40	40	Carbon Steel
PCD-BIF	64.5	24	45	Carbon Steel

7. Bostik shall maintain documentation and adhere to the criteria for VOC capture efficiency - U.S. EPA Method 204 for permanent total enclosures (PTEs) for EU-CL and the new process header pipe. The criteria for a PTE are the following:
 - a) All access doors and windows are closed during normal operation.
 - b) The interior of the PTE is under negative pressure to the outside environment.
 - c) The average velocity through the natural draft openings (NDOs) must be greater than 200 feet per minute.
 - d) Sources of VOC in the PTE must be at least four (4) equivalent diameters from each NDO.
 - e) The total area of all NDOs must be less than five (5) percent of the total area of the enclosure.

The above procedures shall be incorporated into Bostik's Standard Operating and Maintenance Procedure (SOMP) for EU-CL and the new process header pipe.

8. Bostik shall maintain a copy of the full PTE site-specific test plan on-site. The test plan should contain the following:
 - a) A description of how Bostik will demonstrate that, within the PTE, the VOC and HAPs concentrations shall be maintained and not rise or exceed safe Occupational Safety & Health Administration (OSHA) levels. Method 204 lists the requirements for such levels;
 - b) A full explanation of any possible natural draft openings (NDOs) and how they might affect the overall certification of the PTE;
 - c) A description of how Bostik will monitor to verify that the PTE will meet either inward flow to the PTE or negative pressure in the PTE; and
 - d) A calculation of the PTE area ratios as required in Method 204.

This plan shall be made available to MassDEP personnel upon request.

9. PCD- RTO serving EU-CL shall provide an overall, minimum control efficiency of 99 weight percent (destruction efficiency of 99 percent times a capture efficiency of 100 percent) for VOC and HAPs. The associated permanent total enclosures (PTEs) serving EU-CL shall provide 100 percent capture efficiency.

10. Bostik shall not exceed the emission limitations and emission standards contained in Table 2 above.
11. PCD-RTO and the drying oven for EU-CL shall utilize natural gas as their only fuel of use.
12. An electronic interlock system shall prevent the operation of EU-CL or any other emission unit requiring control by PCD-RTO until the PCD-RTO achieves and maintains the minimum operating temperature of 1,550°F (or such other temperature as may be established pursuant to satisfactory compliance testing results as determined by MassDEP). The electronic interlock system shall also prevent the operation of EU-CL or any other emission unit if PCD-RTO's operating temperature falls below the minimum required operating temperature for more than five (5) minutes.
13. If PCD-RTO experiences an upset condition that lasts for more than five (5) minutes which prevents it from operating properly, then Bostik shall discontinue operation of the associated emission units until PCD-RTO is repaired and operating properly.
14. There are two upset conditions for which the associated EU-CL and other emission units being controlled by PCD-RTO shall immediately be shut down. The two conditions are as follows:
 - a) if the PCD-RTO combustion chamber temperature exceeds 1,800°F; and/or
 - b) if the PCD-RTO exhaust fan fails.
15. All bypass stack usage associated with PCD-RTO shall be monitored and recorded with the date, time, and duration of each bypass stack usage. Bostik shall notify the MassDEP by telephone within one business day of a bypass stack usage indicating the reason for usage and approximate duration of usage. Within seven days of each emergency bypass stack usage, Bostik shall provide this office with a written report of the date and time of bypass usage, amount of uncontrolled emissions, extent of usage, reason for usage, steps taken to remediate the situation, and SOP modifications taken to eliminate the cause of the bypass stack usage in the future.
16. Whenever PCD-RTO is not in operation, the process vapors from the Polyester Department, the Polyurethane Department, and the V-3 Mixer Department shall be controlled by PCD-BIF. An electronic interlock system shall prevent the operation of any emission unit until PCD-BIF achieves and maintains the minimum combustion chamber temperature of 1,300°F (or such other temperature as may be established pursuant to satisfactory compliance testing results as determined by MassDEP). The electronic interlock system shall also prevent the operation of any emission unit if PCD-BIF's operating temperature falls below the minimum required operating temperature for more than five (5) minutes.

17. PCD-BIF shall provide an overall, minimum control efficiency of 99.99 weight percent (destruction efficiency of 99.99 percent times a capture efficiency of 100 percent) for VOC and HAPs. The associated permanent total enclosures (PTEs) serving the coating line shall provide 100 percent capture efficiency.
18. If PCD-BIF experiences an upset condition that lasts for more than five (5) minutes which prevents it from operating properly, then Bostik shall discontinue operation of the associated emission units until PCD-BIF is repaired and operating properly.
19. Bostik shall comply with all applicable requirements of the Federal National Emission Standards for Hazardous Air Pollutants (NESHAPs) from Hazardous Waste Combustors (40 CFR Part 63 Subpart EEE). This regulation covers affected facilities which generate HAPs from a hazardous waste combustor. Since the MassDEP has not accepted delegation for Subpart EEE, you are advised to consult with USEPA, Region I, One Congress Street, Suite 100 (CAP), Boston, MA 02109-3912. The applicable requirements may include notification, record keeping, and reporting requirements.
20. A copy of the Standard Operating and Maintenance Procedure (SOMP) for PCD-RTO and PCD-BIF shall be located at or nearby the associated system's control panel.
21. The start-up specifications and maintenance procedures for PCD-RTO shall be incorporated into its SOMP. The SOMP shall address the spare parts inventory and back-up equipment systems for the associated film line dryer and PCD-RTO to prevent or reduce any downtime of the dryer or PCD-RTO. In addition, a copy of any subsequent revisions made to the SOMP must be submitted to this office within seven (7) days of the modification(s).
22. The start-up specifications and maintenance procedures for PCD-BIF shall be incorporated into its SOMP. The SOMP shall address the spare parts inventory for PCD-BIF to prevent or reduce any downtime PCD-BIF. In addition, a copy of any subsequent revisions made to the SOMP must be submitted to this office within seven (7) days of the modification(s).
23. Should PCD-RTO become inoperable, for any reason, Bostik's Environmental Health and Safety personnel or designee must be notified within 15 minutes of Bostik operators receiving the alarm. If PCD-RTO becomes inoperable for more than 1 hour, Bostik shall notify MassDEP within one business day by fax, attention Bureau of Waste Prevention Compliance & Enforcement Chief, at (978) 694-3499, and subsequently in writing within seven (7) days of occurrence, describing the reason(s) for and the extent of down time of the equipment and all steps that have been or will be taken to prevent said occurrence from recurring. Bostik shall take immediate action to minimize emissions and diagnose and repair the problem.

24. Bostik shall ensure that any modification or new equipment installation which increases emissions by one (1) ton or more per year shall comply with the requirements of Regulation 310 CMR 7.02. Any other modifications (such as moving equipment for increased efficiency, changing solvents, or changing exhaust configurations) shall be noted on the Source Registration/Emission Statement Forms as required by Regulation 310 CMR 7.12. These modifications cannot violate the conditions of this facility wide approval, including the emission restrictions.

5. GENERAL CONDITIONS

1. 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).
2. A copy of this Approval letter shall be posted at or near the subject equipment.
3. If asbestos remediation/removal should be required as a result of the approved construction, reconstruction, or alteration of this facility, removal/remediation of asbestos shall be done in accordance with Regulation 310 CMR 7.15 in its entirety and 310 CMR 4.00.
4. The Permittee shall allow MassDEP and/or EPA personnel access to the facility, buildings, and all pertinent records at all times for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.
5. Be advised that this Plan Approval does not negate the responsibility of the Permittee to comply with other applicable Federal, State, or local regulations now or in the future. Nor does this Approval imply compliance with this or any other applicable federal, state, or local regulations now or in the future.
6. This Plan Approval may be suspended, modified, or revoked by MassDEP if, at any time, MassDEP determines that the Permittee is violating any condition or part of this Plan Approval.
7. This Approval consists of all Application materials and this Approval letter. If conflicting information is found between these two documents, then the requirements of the Approval letter shall take precedence over the documentation in all Application materials.

8. Failure to comply with any of the above stated conditions will constitute a violation of the "Regulations", and can result in the revocation of the Approval granted herein and/or other appropriate enforcement action as provided by law. MassDEP may also revoke this Approval if the construction work is not begun within two years from the date of issuance of this Approval, or if the construction work is suspended for one year or more.
9. 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 Regulation 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 at a later time.

This Plan Approval is an action of the 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 you received 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

The 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.

Should you have any questions concerning this matter, please do not hesitate to contact Mr. Mun Wong by telephone at (978) 694-3200 or at the Metropolitan Boston/Northeast Region, 205B Lowell Street, Wilmington, Massachusetts 01887.

Very truly yours,

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.

Mun S. Wong
Environmental Engineer
Bureau of Waste Prevention

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.

James E. Belsky
Permit Chief
Bureau of Waste Prevention

JEB/EMW/mw

cc: Board of Health, Memorial Hall, Middleton, MA 01949
Fire Headquarters, 4 Lake Street, Middleton, MA 01949
DEP, Boston, Yi Tian (e-copy)
DEP/NERO, Attn: M. Wong, M. Altobelli, M. Persky, M. Bolis