

5 March 2012

Mr. Kevin Schmidt
Vice-President, Manufacturing
Aspen Aerogels, Inc.
30 Forbes Road, Bldg A
Northborough, MA 01532

Dear Mr. Schmidt:

The Department of Environmental Management, Office of Air Resources has reviewed and approved your application for the installation of process and air pollution control equipment at your facility located at 3 Dexter Road in East Providence, RI.

Enclosed is a minor source permit issued pursuant to our review of your application (Approval Nos. 2147-2149).

This letter also serves as acknowledgement of your registration of air pollution control equipment consisting of an APC Technologies, Inc., 619TL pulse-jet baghouse which will be used to treat emissions of particulate matter generated from the coating oven of the aerogel insulation blanket coating lines.

The registration does not relieve Aspen Aerogels, Inc. from compliance with applicable state and federal air pollution control rules and regulations. In particular, this registration does not relieve Aspen Aerogels, Inc. from compliance with Air Pollution Control Regulation No. 16, entitled "Operation of Air Pollution Control Systems". This regulation requires, in part, that "...any air pollution control system shall be operated according to its design specifications whenever the source on which it is installed is in operation or is emitting air contaminants...".

Should you have any questions concerning this permit, I can be reached at 401-222-2808, extension 7028.

Sincerely,

Aleida M. Whitney
Senior Air Quality Specialist
Office of Air Resources

cc: Mike Feinblatt – ESS
Jeffrey Silva – Aspen Aerogels, Inc.
Marco Barrueta – Aspen Aerogels, Inc.
East Providence Building Official

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES

MINOR SOURCE PERMIT

ASPEN AEROGELS, INC..

APPROVAL NOs. 2147-2149

Pursuant to the provisions of Air Pollution Control Regulation No. 9, this minor source permit is issued to:

Aspen Aerogels, Inc.

For the following:

Installation of two (2) aerogel insulating blanket coating lines (Approval Nos. 2147-2148)

and a MEGTEC Systems, Inc. Cleanswitch CS-250-95 regenerative thermal oxidizer (RTO)

(Approval No. 2149). The RTO will treat VOC emissions from the aerogel insulating

blanket coating lines.

Located At: *3 Dexter Road, East Providence, RI*

This permit shall be effective from the date of its issuance and shall remain in effect until revoked by or surrendered to the Department. This permit does not relieve *Aspen Aerogels, Inc.* from compliance with applicable state and federal air pollution control rules and regulations. The design, construction and operation of this equipment shall be subject to the attached permit conditions and emission limitations.

Douglas L. McVay, Acting Chief
Office of Air Resources

Date of issuance

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

Permit Conditions and Emission Limitations

ASPEN AEROGELS, INC.

Approval Nos. 2147-2149

A. Emission Limitations:

1. Volatile Organic Compounds (VOC)

- a. The total quantity of VOC discharged to the atmosphere from all surface coating operations shall not exceed 1,666 pounds in any one calendar month.
- b. If the emission limitation in A.1.a is exceeded, the emission limitations specified in Air Pollution Control Regulation 19, Subsection 19.3.1 shall immediately apply.
- c. All VOC emissions generated from the aerogel insulation blanket coating lines shall be captured, contained and routed to the regenerative thermal oxidizer for treatment prior to discharge to the atmosphere.
- d. All VOC emissions generated from the aerogel insulation blanket coating lines, shall be reduced by 98% or greater. This is to be achieved through a combination of 100% capture of the VOC generated by the aerogel insulation blanket coating lines and a 98% destruction of this VOC.
- e. The destruction efficiency of the regenerative thermal oxidizer for VOC shall be at least 98%.
- f. The total quantity of coatings applied on the aerogel insulating blanket coating lines shall not exceed 18,000 gallons per month and 200,000 gallons per year (12-month rolling average).
- g. The total quantity of VOC emissions discharged to the atmosphere from the entire facility shall not exceed 8167 pounds of VOC per calendar month based upon a 12 month rolling average.

2. Odors

Any air contaminant or combination of air contaminants discharged to the atmosphere from the facility shall not create an objectionable odor beyond the property line of this facility. Odor evaluations shall be conducted according to the provisions of Air Pollution Control Regulation No. 17.

3. Opacity

Visible emissions discharged into the atmosphere from the aerogel insulation blanket coating lines shall not exceed 10% opacity (six-minute average).

B. Operating Requirements

1. The operating temperature of the regenerative thermal oxidizer shall be maintained at or above 1500°F whenever VOC is being discharged to the oxidizer, or at a lower temperature that has been demonstrated in the most recent compliance test to achieve the required destruction efficiency.
2. The aerogel insulation blanket coating lines shall each be equipped with an interlock to prevent operation of the coating equipment if the operating temperature of the regenerative thermal oxidizer is less than the temperature specified in Condition B.1.
3. Aerogel Insulation Blanket Coating Line Enclosure
 - a. To ensure 100 percent capture of the VOC generated, the aerogel insulation blanket coating lines must be located within a total enclosure. This total enclosure must meet criteria for a permanent total enclosure in 40 CFR 51, Appendix M, Method 204 – “Criteria For and Verification of a Permanent or Temporary Total Enclosure”.
 - b. All access doors and windows in the total enclosure for the aerogel insulation blanket coating lines shall be closed during routine operation of the coating equipment. Brief, occasional openings of doors to allow for access and inspection are acceptable.
 - c. Air passing through any natural draft opening in the total enclosure for the aerogel insulation blanket coating lines shall flow into the enclosure continuously.
4. The total volume of air discharged to the regenerative thermal oxidizer from the aerogel insulation blanket coating lines shall not exceed 26,850 scfm, the design capacity of the thermal oxidizer.

5. The regenerative thermal oxidizer shall be operated according to its design specifications whenever the aerogel insulation blanket coating lines are in operation or are emitting VOC.
6. All cleaning of the aerogel insulation blanket coating lines with VOC containing material shall be conducted with the regenerative thermal oxidizer operating. VOC emissions generated during cleaning shall be captured and contained and discharged through the regenerative thermal oxidizer for destruction.

C. Continuous Monitoring

1. The operating temperature of the regenerative thermal oxidizer shall be continuously monitored and recorded. The equipment to continuously monitor the operating temperature of the oxidizer must have an accuracy of +/-1 percent of the temperature being monitored in degrees Celsius or +/-1 degree Celsius, whichever is greater.

The equipment to continuously monitor the operating temperature of the oxidizer must be calibrated and maintained according to the manufacturer's specifications. The calibration of the chart recorder, data logger or temperature indicator must be verified once per year or the chart recorder, data logger or temperature indicator must be replaced.

2. The static pressure within the permanent total enclosures for the aerogel insulation blanket coating lines shall be continuously monitored and indicated.
3. Each permanent total enclosure shall be inspected semi-annually and should include all the items required to demonstrate that the permanent total enclosure criteria as established in 40 CFR 51, Appendix M, and Method 204 "Criteria for Verification of a Permanent or Temporary Total Enclosure" are maintained.

D. Emissions Testing

1. Within 180 days of the issuance of this minor source permit, performance testing shall be conducted to demonstrate compliance with all applicable emission limitations.
2. An emissions testing protocol shall be submitted to the Office of Air Resources at least 60 days prior to the performance of any emissions test. The owner/operator shall provide the Office of Air Resources at least 60 days prior notice of any emissions test.

3. All test procedures used for emissions testing shall be conducted in accordance with Appendix A of 40 CFR 60 or another method approved by the Office of Air Resources and U.S. Environmental Protection Agency (EPA) prior to the performance of any emissions tests.
4. The owner/operator shall install any and all test ports or platforms necessary to conduct the required emissions testing, provide safe access to any platforms and provide the necessary utilities for sampling and testing equipment.
5. All testing shall be conducted under operating conditions deemed acceptable and representative for the purpose of assessing compliance with the applicable emission limitations or air quality standards.
6. A final report of the results of emission testing shall be submitted to the Office of Air Resources no later than 60 days following completion of the testing.
7. All emissions testing must be observed by the Office of Resources or its authorized representatives to be considered acceptable, unless the Office of Air Resources provides authorization to the owner/operator to conduct the testing without an observer present.

E. Record Keeping and Reporting

1. The owner/operator shall collect, record and maintain all of the following information each month for the aerogel insulation blanket coating lines, as well as for the regenerative thermal oxidizer:
 - a. The name, identification number and amount of the coating used, as applied, on the aerogel insulation blanket coating lines;
 - b. The mass of VOC per volume of coating, as applied, of each coating used;
 - c. The type and amount of solvent used for diluents and clean up operations;
 - d. A log of operating time for the capture system, regenerative thermal oxidizer, monitoring equipment, and the coating lines;
 - e. A maintenance log for the capture system, regenerative thermal oxidizer, and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages; and
 - f. The operating temperature of the regenerative thermal oxidizer.

2. The owner/operator shall record the static pressure within each permanent total enclosure once per day and the date, time and measurement shall be recorded unless the process is shut down.
3. The owner/operator shall, on a monthly basis, no later than 10 business days after the first of the month, determine the total quantity of VOC discharged to the atmosphere from the aerogel insulation blanket coating lines. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
4. The owner/operator shall notify the Office of Air Resources in writing within 15 days of determining that the total quantity of VOC discharged to the atmosphere from the aerogel insulation blanket coating lines exceeds 1,666 pounds in any one calendar month.
5. The owner/operator shall, on a monthly basis, no later than 10 business days after the first of the month, determine the total quantity of VOC discharged to the atmosphere from the entire facility. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
6. The owner/operator shall notify the Office of Air Resources in writing within 15 days of determining that the total quantity of VOC discharged to the atmosphere from the entire facility exceeds 8,167 pounds per calendar month based upon a 12 month rolling average.
7. The owner/operator shall notify the Office of Air Resources of any record showing noncompliance with the terms of this permit or any other air pollution control rule or regulation applicable to the aerogel insulation blanket coating lines by sending a copy of the record to the Office of Air Resources within 30 days following the occurrence.
8. The owner/operator shall notify the Office of Air Resources of any anticipated noncompliance with the terms of this permit or any other applicable air pollution control rules and regulations.
9. The owner/operator shall notify the Office of Air Resources in writing of the date of actual start-up of the aerogel insulation blanket coating lines and the MEGTEC Systems, Inc., Cleanswitch regenerative thermal oxidizer, no later than 15 days after such date.
10. The owner/operator shall maintain a record of all measurements, performance evaluations, calibration checks and maintenance or adjustments for each continuous monitor.

11. The owner/operator shall notify the Office of Air Resources in writing, of any planned physical or operational change to any equipment that would:
 - a. Change the representation of the facility in the permit application
 - b. Alter the applicability of any state or federal air pollution rules or regulations
 - c. Result in the violation of any terms or conditions of the permit
 - d. Qualify as a modification under APC Regulation No. 9.

Such notification shall include:

- Information describing the nature of the change.
- Information describing the effect of the change on the emission of any air contaminant.
- The scheduled completion date of the planned change.

Any change that may result in an increased emission rate of any air contaminant shall have the prior approval of the Director.

12. The owner/operator shall record the date of the inspection of each permanent total enclosure and maintain the check list that is used to verify PTE configuration and maintenance status and exhaust system conditions.
13. The owner/operator shall notify the Office of Air Resources, in writing, of any noncompliance with the terms of this permit within 30 calendar days of becoming aware of such occurrence and supply the Director with the following information:
 - a. The name and location of the facility;
 - b. The subject source(s) that caused the noncompliance with the permit term;
 - c. The time and date of first observation of the incident of noncompliance;
 - d. The cause and expected duration of the incident of noncompliance;
 - e. The estimated rate of emissions (expressed in lbs/hr or lbs/day) during the incident and the operating data and calculations used in estimating the emission rate;
 - f. The proposed corrective actions and schedule to correct the conditions causing the incidence of noncompliance.

14. All records required in this permit shall be maintained for a minimum of 5 years after the date of each record and shall be available to representatives of the Office of Air Resources upon request.

F. Other Permit Conditions

1. To the extent consistent with the requirements of this permit and applicable federal and state laws, the equipment shall be designed, constructed and operated in accordance with the representation of the facility in the permit application.
2. The owner/operator shall shut down the aerogel insulation blanket coating lines in the event of a malfunction of the emission capture system and/or regenerative thermal oxidizer that results in or that could result in, emissions in excess of the permit limits. The coating equipment shall remain shut down until the malfunction has been identified and corrected.
3. There shall be no by passing of the regenerative thermal oxidizer during times when VOC is being discharged to the control device.
4. Employees of the Office of Air Resources and its authorized representatives shall be allowed to enter the facility at all times for the purpose of inspecting any air pollution source, investigating any condition it believes may be causing air pollution or examining any records required to be maintained by the Office of Air Resources.
5. At all times, including periods of startup, shutdown and malfunction, the owner/operator shall, to the extent practicable, maintain and operate the facility in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Office of Air Resources which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures and inspection of the source.
6. If the emission limitation in condition A.1.a is exceeded, the owner/operator shall submit a complete application for an operating permit in accordance with the requirements of Air Pollution Control Regulation No. 29 within twelve months.

G. Malfunctions

1. Malfunction means a sudden and unavoidable breakdown of process or control equipment. In the case of a malfunction of any air pollution control system, all reasonable measures shall be taken to assure resumption of the designed control efficiency as soon as possible. In the event that the malfunction of an air pollution control system is expected or may reasonably be expected to continue for longer

than 24 hours and if the owner or operator wishes to operate the source on which it is installed at any time beyond that period, the Director shall be petitioned for a variance under Section 23-23-15 of the General Laws of Rhode Island, as amended. Such petition shall include, but is not limited to, the following:

- a. Identification of the specific air pollution control system and source on which it is installed;
 - b. The expected period of time that the air pollution control system will be malfunctioning or out of service;
 - c. The nature and quantity of air contaminants likely to be emitted during said period;
 - d. Measures that will be taken to minimize the length of said period;
 - e. The reasons that it would be impossible or impractical to cease the source operation during said period.
2. The owner/operator may seek to establish that a malfunction of any air pollution control system that would result in noncompliance with any of the terms of this permit or any other applicable air pollution control rules and regulations was due to unavoidable increases in emissions attributable to the malfunction. To do so, the owner/operator must demonstrate to the Office of Air Resources that:
- a. The malfunction was not attributable to improperly designed air pollution control equipment, lack of preventative maintenance, careless or improper operation, or operator error;
 - b. The malfunction was not part of a recurring pattern indicative of inadequate design, operation, or maintenance;
 - c. Repairs necessary to bring the air pollution control system back to operating at its design control efficiency were performed in an expeditious fashion. Off-shift labor and overtime should be utilized, to the extent practicable, to ensure that such repairs were completed as expeditiously as practicable. Any parts or material needed should be shipped overnight where possible or practical.
 - d. All possible steps were taken to minimize emissions during the period of time that the repairs were performed.
 - e. Emissions during the period of time that the repairs were performed will not:

- (1) Cause an increase in the ground level ambient concentration at or beyond the property line in excess of that allowed by Air Pollution Control Regulation No. 22 and any Calculated Acceptable Ambient Levels; and
 - (2) Cause or contribute to air pollution in violation of any applicable state or national ambient air quality standard.
- f. The reasons that it would be impossible or impractical to cease the source operation during said period.
- g. The owner/operator's action in response to the excess emissions were documented by properly signed, contemporaneous operating logs or other relevant evidence.

This demonstration must be provided to the Office of Air Resources, in writing, within two working days of the time when the malfunction occurred and contain a description of the malfunction, any steps taken to minimize emissions and corrective actions taken.

The owner/operator shall have the burden of proof in seeking to establish that noncompliance was due to unavoidable increases in emissions attributable to the malfunction.