

12 June 2014

Mr. Gerald Fargo, Jr.
General Manager
Umicore Thin Film Products
50 Sims Avenue
Providence, RI 02909

Dear Mr. Fargo:

The Department of Environmental Management, Office of Air Resources has reviewed and approved your request for the installation of process equipment (for a new indium Process R) and air pollution control equipment at your facility located at 50 Sims Avenue, Providence, RI.

Enclosed are two minor source permits issued pursuant to our review of your application (Approval Nos. 2252 and 2253).

If there are any questions concerning this permit, please contact me at 401-222-2808, extension 7415 or at stephen.stamand@dem.ri.gov.

Sincerely,

Stephen G. St. Amand
Air Quality Specialist
Office of Air Resources

cc: Eric A. Pearson, P.E. - ESS
Providence Building Official

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

MINOR SOURCE PERMIT

UMICORE THIN FILM PRODUCTS

APPROVAL NOs. 2252 and 2253

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

UMICORE THIN FILM PRODUCTS

For the following:

Installation of a new indium Process R (Approval No. 2252) and a Vanair Model VT-550-12 wet scrubber (Approval No. 2253) to control ammonia emissions from indium Process P and indium Process R.

Located at: *50 Sims Avenue, 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 *Umicore Thin Film Products* 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, 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

UMICORE THIN FILM PRODUCTS

APPROVAL NOs. 2252 and 2253

A. Emission Limitations

1. Ammonia
 - a. Ammonia emissions generated from the indium Process P and indium Process R shall be reduced by 99.5% or greater before discharge to the atmosphere.
 - b. The total combined quantity of ammonia emissions discharged to the atmosphere from the facility shall not exceed 300 pounds in any consecutive 12-month period.
2. Opacity
 - a. Visible emissions from the wet scrubber exhaust shall not exceed 10% opacity (six-minute average). Where the presence of uncombined water is the only reason for failure to meet the requirements of this condition, such failure shall not be a violation of this permit.
3. 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.

B. Operating Requirements

1. Ammonia emissions generated from the indium Process P and indium Process R shall be captured, contained and routed to the wet scrubber for treatment prior to discharge to the atmosphere.
2. The maximum number of batches produced for Process P and Process R shall be limited as follows:
 - a. Process P – 600 batches in any consecutive 12-month period
 - b. Process R – 100 batches in any consecutive 12-month period

3. The pressure drop across the wet scrubber shall not exceed 3 inches water.
4. The pH of the wet scrubber water shall be maintained at 5 or lower.
5. The owner/operator shall maintain and operate the wet scrubber in accordance with the manufacturer's operating procedures and good air pollution control practice.

C. Monitoring

1. The pH of the scrubbing liquid shall be monitored continuously and checked a minimum of once per day and the date, time, and measurement shall be recorded.
2. The pressure drop across the wet scrubber shall be monitored continuously and checked a minimum of once per day and the date, time, and measurement shall be recorded.
3. The scrubbing liquid flow rate shall be monitored continuously and checked a minimum of once per day and the date, time, and measurement shall be recorded.
4. The monitoring devices used for the measurement of pH, pressure drop and flow rate shall be calibrated periodically consistent with the manufacturer's recommendations.

D. Stack Testing

1. Within 180 days of startup of the scrubber, performance testing shall be conducted emissions testing shall be conducted to demonstrate compliance with condition A.1 of this permit.
2. A stack testing protocol shall be submitted to the Office of Air Resources for review at least 60 days prior to the performance of any stack tests. The owner/operator shall provide the Office of Air Resources at least 60 days prior notice of any stack test.
3. All test procedures used for stack testing shall be approved by the Office of Air Resources prior to the performance of any stack tests.
4. The owner/operator shall install any and all test ports or platforms necessary to conduct the required stack 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 emissions limitations.

6. A final report of the results of stack testing shall be submitted to the Office of Air Resources no later than 60 days following completion of testing.
7. All stack 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 stack testing without an observer present.

E. Recordkeeping and Reporting

1. The owner/operator shall maintain the following records:
 - a. The owner/operator shall maintain all records of the pH, pressure drop and scrubbing liquid flow rate measurements for the wet scrubber.
 - b. Records of all maintenance performed on the wet scrubber and monitoring equipment.
 - c. Records of the occurrence, duration and cause (if known) of each malfunction of process equipment, control equipment and monitoring equipment that could result in ammonia emissions in excess of permit limits.
2. The owner/operator shall, on a monthly basis, no later than 15 days after the first of the month, determine the total quantity of Process P batches and Process R batches for the previous 12-month period. The owner/operator shall keep records of this determination and provide such records to the Office of Air Resources upon request.
3. The owner/operator shall notify the Office of Air Resources, in writing, within 15 days of the determination, whenever the total quantity of Process P batches exceeds 600 for the previous twelve months.
4. The owner/operator shall notify the Office of Air Resources, in writing, within 15 days of the determination, whenever the total quantity of Process R batches exceeds 100 for the previous twelve months.
5. The owner/operator shall, on a monthly basis, no later than 15 days after the first of the month, determine the total quantity of ammonia discharged to the atmosphere from the facility for the previous 12-month period. 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 the determination, whenever the total combined quantity of ammonia discharged to the atmosphere from the facility during the previous 12-month period exceeds 300 pounds.

7. The owner/operator shall notify the Office of Air Resources, in writing, of the date of initial startup of the wet scrubber no later than 15 days after startup.
8. The owner/operator shall notify the Office of Air Resources, in writing, of the date of initial startup of the indium Process R no later than 15 days after startup.
9. 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.
10. 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 the 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.
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 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 this 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 such change shall be consistent with the appropriate regulation and have the prior approval of the Director.

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

F. Malfunctions

1. 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 rule 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 equipment, lack of preventative maintenance, careless or improper operation or operator error;
 - b. The malfunction is not part of a recurring pattern indicative of inadequate design, operation or maintenance;
 - c. Repairs 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.
 - d. All possible steps were taken to minimize emissions during the period of time that repairs were performed.
 - e. Emissions during the period of time that the repairs were performed will not:
 - (1) Cause and 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 reason that it would be impossible or impractical to cease the source operation during said period.

- g. The owner/operator's actions 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 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.

G. Other Permit Conditions

1. To the extent consistent with the requirements of this permit and applicable federal and state laws, the facility shall be designed, constructed and operated and in accordance with the representation of the facility in the permit application.
2. There shall be no by-passing of the scrubber during times when the indium Process P and indium Process R are operating.
3. Employees of the Office of Air Resources and its authorized representative 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.
4. The owner/operator shall shut down the indium Process P and indium Process R in the event of a malfunction of the scrubber that results in, or that could result in, emissions in excess of the permit limits. The processes shall remain shut down until the malfunction has been identified and corrected.
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.