

217/782-2113

CONSTRUCTION PERMIT - PSD

PERMITTEE

Owens Corning
Attn: Joe Hanna
2710 Laude Drive
Rockford, Illinois 61109-1497

Application No.: 01030029
Applicant's Designation: FOAM
Subject: Foam Insulation
Date Issued: December 12, 2001
Location: 2710 Laude Drive, Rockford

I.D. No.: 201030AXM
Date Received: March 9, 2001

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of the modification of two polystyrene foam board extrusion lines and associated finishing, grinding and polystyrene reclaiming equipment and warehouse space as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

In conjunction with this permit, approval is given with respect to the Prevention of Significant Deterioration of Air Quality Regulations (PSD) to construct the above referenced project, in that the Illinois Environmental Protection Agency (Illinois EPA) finds that the application fulfills all applicable requirements of 40 CFR 52.21. This approval is issued pursuant to the Clean Air Act, as amended, 42 U.S.C. 7401 et. seq., the Federal regulations promulgated thereunder at 40 CFR 52.21 for Prevention of Significant Deterioration of Air Quality (PSD), and a Delegation of Authority agreement between the United States Environmental Protection Agency and the Illinois EPA for the administration of the PSD Program. This approval becomes effective in accordance with the provisions of 40 CFR 124.15 and may be appealed in accordance with the provisions of 40 CFR 124.19. This approval is also based upon and subject to the following findings and conditions which follow:

Findings

1. Owens Corning Formular (Owens Corning) has requested a PSD permit for the modification of its polystyrene foam board extrusion lines and associated equipment. The feedscrews on each line will be upgraded; and warehouse storage capacity increased to facilitate a nominal increase in manufacturing throughput of about 20 percent. The existing fabrication, reclaim and packaging equipment are not being altered as they have the capacity to handle this additional throughput.
2. The plant is located in Rockford Township in Winnebago County. The area is currently designated attainment for all criteria pollutants.
3. The proposed project has the potential to emit major amounts of hydro chlorofluorocarbons (HCFC) as shown in Table I. HCFC are regulated as ozone depleting substances pursuant to Title VI of the Clean Air Act. The project, i.e., the modification of the plant, is therefore subject to PSD review for HCFC.

4. After reviewing the materials submitted by Owens Corning, the Illinois EPA has determined that the project will (i) comply with applicable Board emission standards (ii) comply with applicable federal emission standards and (iii) utilize Best Available Control Technology (BACT) on emissions of HCFC from two extrusion lines and the staging area and warehouse, which are being physically altered.
5. The air quality analysis submitted by Owens Corning and reviewed by the Illinois EPA shows that HCFC emissions from the proposed modifications will not threaten ambient air quality.
6. The Illinois EPA has determined that the proposed project complies with all applicable Illinois Air Pollution Control Board Regulations and the federal Prevention of Significant Deterioration of Air Quality Regulations (PSD), 40 CFR 52.21.
7. A copy of the application, the project summary and a draft of this permit were placed in a location in the vicinity of the project, and the public was given notice and an opportunity to examine this material and to submit comments and to request a public hearing on this matter.

The Illinois EPA is issuing approval to construct the proposed project subject to the following special conditions and consistent with the specifications and data included in the application. Any departure from the conditions of this approval or terms expressed in the application would need to receive prior written authorization by Illinois EPA.

Conditions

1.0 Unit Specific Conditions

- 1.1 Unit: Foam Board Insulation Manufacturing Processes
Control: Baghouse and Cyclone

1.1.1 Description

The facility currently operates two polystyrene foam board extrusion lines and associated finishing, grinding and reclaiming equipment. The process operations at this facility include extruding molten polystyrene plastic which has been injected with a liquid blowing agent and other additives; allowing the extruded material to expand as the blowing agent vaporizes, under a partial vacuum in a barometric leg to produce a basic board stock with a closed cell structure; cooling the stock to a level suitable for further fabrication; trimming, cutting, and shaping the product; and reclaiming and recycling the scrap and waste polystyrene material.

The HCFC emissions from the facility occur at five points: barometric legs; in-line finishing sections; the off-line sander and grinder; reclamation units; and a staging area

and warehouse. HCFC emissions occur gradually as HCFC diffuses out of the surface of the board or the board is cut or scrap is ground creating new surface area.

This project involves installing upgraded feedscrews which are used to melt and forward polystyrene in the extruding operations which in turn feed the barometric legs.

Thus, the project will involve physical changes to the extrusion equipment on each line (which includes the barometric legs), but no physical changes to remaining process equipment at the facility. The changes in potential emissions for equipment, which is physically modified, as well as existing equipment that is debottlenecked are summarized in Attachment I.

The facility is also a source of particulate matter (PM) due to the finishing of board and handling of scrap. Emissions are controlled by baghouses and cyclones.

1.1.2 List of Significant Emission Units and Pollution Control Equipment

	Emission Unit	Description	Emission Control Equipment
01	Lines 1 & 2 Barometric Legs	Extrusion Chamber Under Partial Vacuum	None
02	Lines 1 & 2 Finishing Equipment	Extruded Foam is Trimmed, Cut, and Shaped into Final Product	Baghouse and Cyclone
03	Grinder	Grinding of Recycled Foam	Baghouse
04	Reclaim Extruder	Melting by Extrusion of Ground Scrap Foam for Later Reuse	None
05	Sander	Smoothing of Product	Baghouse and Cyclone
06	Staging and Warehouse Storage	Storage of Final Foam Product	None

1.1.3 Applicability Provisions and Applicable Regulations

- a. i. An "affected foam board extrusion line" for the purpose of these unit specific conditions, is a typical process as described in Emission Unit 01 in Condition 1.1.2.
- ii. An "affected reclaim process" for the purpose of these unit-specific conditions is a process

that chops, grinds or granulates product unfit for sale or trim waste and then extrudes the recovered polystyrene for reuse. The various pieces of equipment are described in Emission Units 03 and 04 in Condition 1.1.2.

- iii. An "affected other HCFC emitting process" for the purpose of these unit-specific conditions is a process as described in Emission Units 02, 05 and 06 in Condition 1.1.2.
- b. Each affected foam board extrusion line process, each affected reclaim process and each affected other HCFC emitting process is subject to 35 IAC 212.321 which states that, "No person shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from any new process emission unit which, either alone or in combination with the emission of particulate matter from all other similar process emission units for which construction or modification commenced on or after April 14, 1972, at a source or premises, exceed the allowable emission rates specified by using the equation:

$$E = A(P)^B$$

Where:

P = Process weight rate; and
 E = Allowable emission rate; and

- 1. Up to process weight rates of 408 Mg/hr (450 T/hr):

	<u>Metric</u>	<u>English</u>
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	1.214	2.54
B	0.534	0.534

1.1.4 Non-Applicability of Regulations of Concern

- a. This permit is issued based on the affected units not being subject to the control requirements of 35 IAC 215.301 because the organic material used in the process (i.e., the blowing agent) is not photochemically reactive organic material as defined in 35 IAC 211.4690.
- b. This permit is issued based on the finishing, grinding, sanding and reclaiming equipment not being

subject to BACT because they already have the capacity to operate at the new level of facility throughput and are not being physically changed. In this regard, this permit does not authorize modification to this equipment or installation of additional grinding, sanding, and reclaiming equipment.

1.1.5 Operational and Production Limits and Work Practices

- a. The affected foam board extrusion line shall be operated with good air pollution control work practice to minimize emissions of HCFC, including the following:
 - i. Performance of "rate checks" on each extrusion line on a regular schedule, which shall be at least twice per week of operation, with prompt correction action as required. For this purpose, rate check is an evaluation of the precision with which blowing agent is added to other raw materials in the extrusion line to make the polystyrene foam. Rate checks may be conducted by weighing the amount of blowing agent introduced into the extrusion line during a given period of time, by supplying blowing agent from a container, which is weighed at the beginning and end of the evaluation, or by other procedures approved by the Illinois EPA.
 - ii. Performance of "trim loss check" on each extrusion line on a regular schedule, which shall be once during every product run or at least once per day, with prompt correction action as required. For this purpose, a trim loss check is an evaluation of the scrap foam that is generated by trimming the edges of the product to its final desired shape. Trim loss checks may be conducted by one of the following methods:
 - A. Calculating the percentage of trim loss by using the weights of untrimmed and trimmed product; or
 - B. Calculating the percentage trim loss using untrimmed and trimmed product widths; or
 - C. By other procedures approved by the Illinois EPA.

The above requirements represent Best Available Control Technology (BACT) for emissions of HCFC, as required by the PSD rules.

- b. i. The materials used as blowing agents shall not be HAP.
- ii. Usage of HCFC for Non-VOM blowing agent by the facility shall not exceed:

<u>Maximum Blowing Agent (Lb/Mo)</u>	<u>HCFC Usage (Ton/Yr)</u>
484,000	2,899

- c. The Permittee shall follow good operating practices for the reclaim process and other HCFC emitting processes, along with associated baghouses and cyclones, including periodic inspection, routine maintenance and prompt repair of defects, to minimize emissions of HCFC and PM.

1.1.6 Emission Limitations

- a. The ratio of the plant's HCFC emissions to extruded product throughput shall not exceed 86 lbs/ton, on a monthly average.

The above requirement represents Best Available Control Technology (BACT) for emissions of HCFC, as required by the PSD rules.

- b. i. The emissions of HCFC from staging/warehousing shall not exceed 39.5 lb/hour.
- ii. Emissions of HCFC from all other operations shall not exceed 187.2 lb/hour.
- c. i. Emissions of blowing agent from operations at the facility other than staging and warehousing (non-fugitive emissions) shall not exceed 82.0 tons per month and 819.8 tons per year.
- ii. Emissions of blowing agents from staging (i.e., temporary storage from production to warehouse) and warehousing (i.e., temporary storage from production to warehouse until shipped out) shall not exceed 19 tons per month and 174.5 tons per year. This limit is

based on an average monthly 35.7 mm board feet of inventory.

- d. Annual emissions shall be based on the emissions from the current month and the previous 11 months of data.

1.1.7 Testing Requirements

- a. Residual amounts of HCFC or Non-VOM blowing agent in the product shall be demonstrated by employing standard or approved testing methods.

The approved test methods are air sampling taken in Tedlar bags and charcoal tubes and actual foam samples collected from operations, each being analyzed by the gas chromatography method. Actual determination of HCFC emissions shall be by mass balance utilizing the data obtained through the gas chromatography method. Deviation from these methods will require notification to the Illinois EPA.

- b. When in the opinion of the Illinois EPA it is necessary to conduct testing to demonstrate compliance with Condition 1.1.6, the Permittee shall, at its expense, conduct such tests in accordance with the applicable test methods and procedures in 35 IC 215.105 or other test methods approved by the Illinois EPA.

1.1.8 Monitoring Requirements

None

1.1.9 Recordkeeping Requirements

- a. The Permittee shall maintain records of the following items related to good air pollution control work practices:
 - i. The performance of rate checks on each extrusion line, including date and time; results, i.e., whether the blowing agent rate was within, above or below specification; whether corrective actions were initiated; and whether such actions were effective, as shown by the next rate check.
 - ii. The performance of trim loss checks on each extrusion line, including date and time; results, i.e., whether the trim was within, above or below specification; whether corrective actions were initiated; and whether

such actions were effective, as shown by the next trim loss check.

- b. The Permittee shall maintain records of the following items for purposes of determining HCFC emissions

Note: Although there are specific emission points within the process, Condition 1.1.6 limits HCFC emissions of the entire process and records to verify compliance with this limitation are kept for the entire process based primarily on a material balance.

- i. Primary input information or measured values for each month.

- A. Blowing agent (lb/month).
- B. HCFC/Non-VOM blowing agents used.
- C. Virgin polystyrene (lb/month).
- D. Reclaimed polystyrene foam (lb/month).
- E. Other ingredients, i.e., talc, flame retardant, color concentrate, etc. (lb/month).
- F. Operating hours for extruders and barometric legs (hours/month).
- G. Foam Board Density (lb/ft³).
- H. Trim losses (%).
- I. Finished product (board-feet).
- J. Beginning inventory (board-feet).
- K. Ending inventory (board-feet).
- L. Total raw materials (lb/month).
- M. Blowing agent in product (%).
- N. Yield (%).
- O. Scrap product (%).
- P. Raw material consumption rate (lb/hr).
- Q. Finished product shipped (board-feet).

ii. Established Factors

Values to be used in making emission calculation for loss of blowing agent in product over time, during on-site staging warehousing that have been determined by representative testing, which shall be updated as needed to be kept current.

The average HCFC emission rate during the emission testing, with supporting documentation.

Note: The value may vary depending upon the specific product and time in storage.

iii. Calculated data for each month

A. HCFC blowing agent usage.

B. HCFC retained in finished goods as shipped.

C. HCFC emissions. (A - B = C)

iv. Annual HCFC emissions determined on a rolling 12-month average basis.

v. Ratio of HCFC emissions to product, (lb/ton).

1.1.10 Reporting Requirements

The Permittee shall promptly notify the Illinois EPA, Compliance Section of non-compliance of an affected unit with the permit requirements. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken.

1.1.11 Operational Flexibility/Anticipated Operating Scenarios

The Permittee is authorized to make the following physical or operational changes with respect to the process without prior notification to the Illinois EPA or revision of this permit:

Use of alternate HCFC blowing agents provided that the emission limits in Condition 1.1.6 will be met and the new agent is not a VOM or HAP.

This condition does not affect the Permittee's obligation to properly obtain a construction permit

in a timely manner for any activity constituting construction or modification of the source, as defined in 35 IAC 201.102.

1.1.12 Compliance Procedures

Compliance with the emission limits shall be based on the recordkeeping requirements in Condition 1.1.9(b) and the use of material balance as described in the application and the following formulae. Notwithstanding the procedures specifying compliance to applicable requirements, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements.

Total Raw Material Consumption =

Virgin, lb + Reclaim, lb + Other, lb + Blowing Agent, lb

Blowing Agent % =

$$\frac{\text{Blowing Agent, lb}}{\text{Virgin, lb + Reclaim, lb + Other, lb + Blowing Agent, lb}}$$

Buoyancy Factor =

$$((100 + 0.075157 * (100/\text{Density} = 100/524))/100)^1$$

Yield =

$$\frac{((\text{Finished Product, bf} / 12 \text{ bf} / \text{ft}^3) * \text{Density, lb} / \text{ft}^3) * \text{Buoyancy Factor}}{\text{Total Raw Material Consumption, lb}}$$

Yield Loss =

1 - Yield

Manufacturing Emissions =

Blowing Agent, lb * Yield Loss

Average Residence Time of Finished Product in Inventory
(Residence Time, Days) =

$$\frac{\text{Finished Product, bf}}{((\text{Beginning Inventory, bf} + \text{Finished Product, bf}) - \text{Ending Inventory, bf})} * \frac{365 \text{ Days per year}}{12 \text{ Months per year}}$$

Blowing Agent Loss (BA Loss), % =

$$(0.0848 + 0.1458 * \text{Log (Residence Time)})/100$$

Fugitive Emissions (from staging and warehousing) =

$$\frac{((\text{Finished Product, bf}/12 \text{ bf}/\text{ft}^3) * \text{Buoyancy Factor}) * \text{BA Loss, \%}}{\text{Residence Time, Days}} * \text{Days per Period}$$

Blowing Agent Emissions (lb) = Manufacturing Emissions +
Fugitive Emissions

If you have any questions on this permit, please call Bob Smet at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:RPS:jar

cc: Region 2

ATTACHMENT I

TABLE I

Applicable HCFC Emission Limits for Foam Manufacturing

<u>Emission Unit Description</u>	<u>(Lb/Hr)</u>	<u>HCFC</u>	
		<u>(Ton/Mo)</u>	<u>(Ton/Yr)</u>
Staging/Warehousing	39.5	19.0	174.5
All Other	187.2	82.0	<u>819.8</u>
			994.3

TABLE II

Permitted Net Increase in HCFC Emissions

Permitted Emissions after Modification	994.3
Actual Emissions Prior to Modification	<u>358.3</u>
Net Increase	636.0

Note: This evaluation shows an increase that is greater than the expected increase because the new allowable reflects the facility's potential emissions. It is based on the facility storing the maximum amount of finished goods and operating both extrusion lines at the maximum rate for the product with the maximum blowing agent content and trim losses.