

217/782-2113

CONSTRUCTION PERMIT - PSD

PERMITTEE

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

Application No.: 01030029

I.D. No.: 201030AXM

Applicant's Designation: FOAM

Date Received: March 9, 2001

Subject: Foam Insulation

Date Issued:

Location: 2710 Laude Drive, Rockford

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; the fabrication, reclaim and packaging equipment adjusted; and warehouse storage capacity increased to facilitate an increase in manufacturing throughput of about 20 percent.
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. 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 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 excess polystyrene material. 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.

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.

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 plant. The changes in potential emissions for equipment, which is physically modified, as well as equipment which is simply debottlenecked are summarized in Section 1.1.2.

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 are not being physically changed.

1.1.5 Operational and Production Limits and Work Practices

- a. Every affected foam board extrusion line, reclaim process and other HCFC emitting process shall be operated with good air pollution work practice to minimize emissions of HCFC 142b.

- b. i. The emissions of HCFC 142b from staging/warehousing shall not exceed 41.6 lb/hour.
- ii. Emissions from all other operations shall not exceed 187.2 lb/hour.

The above requirements represent Best Available Control Technology (BACT) for emissions of HCFC 142b, as required by the PSD rules.

- c. 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</u> <u>(Lb/Mo)</u>	<u>HCPC Usage</u> <u>(Ton/Yr)</u>
484,000	2,899

- d. The Permittee shall follow good operating practices for the baghouses and cyclones, including periodic inspection, routine maintenance and prompt repair of defects.

1.1.6 Emission Limitations

- a. Emissions of blowing agent from operations at the plant other than staging and warehousing (non-fugitive emissions) shall not exceed 82.0 tons per month and 819.8 tons per year.
- b. 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 182.4 tons per year. This limit is based on an average monthly 35.7 mm board feet of inventory.
- c. 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 owner or operator of an affected polystyrene foam board extrusion line shall, at their expense, conduct such tests in accordance with the applicable test methods and procedures in 35 IC 215.105.

1.1.8 Monitoring Requirements

None

1.1.9 Recordkeeping Requirements

The Permittee shall maintain records of the following items:

a. Records for HCFC Emissions

Specific records to determine 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. The levels of residual amounts of blowing agent in intermediate or final product have previously been determined. The value may vary depending upon the specific product and time in storage.

- i. Primary input information or measure values for each month.
 - A. HCFC/Non-VOM blowing agents used.
 - B. Virgin polystyrene (lb/month).
 - C. Reclaimed polystyrene foam (lb/month).
 - D. Talc (lb/month).
 - E. Flame retardant (lb/month).
 - F. Color concentrate (lb/month).

- G. Blowing agent (lb/month).
- H. Operating hours (hour/month).
- I. Foam Board Density (lb/ft³).
- J. Trim losses (%).
- K. Finished product (board-feet).
- L. Beginning inventory (board-feet).
- M. Ending inventory (board-feet).
- N. Total raw materials (lb/month).
- O. Blowing agent in product (%).
- P. Yield (%).
- Q. Scrap product (%).
- R. Raw material consumption rate (lb/hr).
- S. Finished product shipped (board-feet).

ii. Predetermined Values

Values to be used in making emission calculation that have been determined by previous testing, unless later testing establishes new values. These values are required by Condition 1.1.5(a) and (b).

- A. The average HCFC-142b emission rate during the emission testing.

iii. Calculated data for each time period.

- 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.

1.1.10 Reporting Requirements

The Permittee shall promptly notify the Illinois EPA, Compliance Section of non-compliance of an affected

polystyrene foam board extrusion line 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.

- a. Use of any Non-VOM blowing agent that is not a HAP.
- b. Use of alternate HCFC blowing agents provided that the emission limits in Condition 1.1.6 are met and the new agent is not a 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 and the use of a material balance as described in the application and the following formulae:

Total Raw Material Consumption =

Virgin, lb + Reclaim, lb + Talc, lb + Flame Retardant, lb + Color Concentrate, lb + Blowing Agent, lb

Blowing Agent % =

$$\frac{\text{Blowing Agent, lb}}{\text{Virgin, lb + Reclaim, lb + Talc, lb + Flame Retardant, lb + Color Concentrate, lb + Blowing Agent, lb}}$$

Buoyancy Factor =

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

Yield =

$$\frac{((\text{FinishedProduct, bf} / 12 \text{ bf} / \text{ft}^3) * \text{Density, lb} / \text{ft}^3) * \text{BuoyancyFactor}}{\text{Total Raw Material Consumption, lb}}$$

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) =

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

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

TABLE I

Applicable Limitations for Foam Manufacturing

<u>Pollutant</u>	<u>Emission Limits Control Equipment</u>	<u>Basis/ Pct. Eff.</u>
HCFC	Staging/Warehousing: 41.6 lb/hour	BACT
	All Other Operations: 187.2 lb/hour	BACT

TABLE II

Emission Limits for Foam Manufacturing

<u>Emission Unit Description</u>	<u>HCFC 142b</u>	
	<u>(Ton/Mo)</u>	<u>(Ton/Yr)</u>
Staging/Warehousing	19.0	182.4
All Other	82.0	819.8

TABLE III

Net Increase in HCFC Emissions

Proposed Permitted Emissions after Modification	1,002.2
Actual Emissions Prior to Modification	<u>278.2</u>
Net Increase	724.0

**OWENS CORNING
ROCKFORD, ILLINOIS
PROJECT SUMMARY**

I. INTRODUCTION

Owens Corning has proposed to modify its polystyrene foam insulation board plant in Rockford. The project involves the upgrading of the feedscrews in the extruder, which makes the foam board, adjusting the fabricating, reclaiming and packaging equipment, and increasing the warehouse capacity. The result will be to increase overall production at the plant. The proposed project requires a permit because of the associated emissions of the organic blowing agent used to create the foam board.

II. PROJECT DESCRIPTION

Significant emission units at this source are as follows:

	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

The polystyrene foam insulation board is made by injecting a blowing agent under pressure in molten polystyrene plastic. When the pressure is released, the blowing agent vaporizes, while the plastic solidifies forming the characteristic structure of foam insulation board. This process occurs in a continuous manner using an extrusion machine.

The foam is extruded under a partial vacuum into an enclosure called a barometric leg. Processing the material from the extruder in this way aids in expansion of the blowing agent that is contained within the closed cells of the product. Thus, less blowing agent is required to achieve the desired insulating properties of the product. In addition, the process used at this facility does not use the blowing agent blends containing low boiling hydrocarbons (VOM), commonly used by other installations, which manufacture low density foam.

After the solid foam exits the barometric leg, it may be stored for sale or further processed on one of two finishing lines. The Finishing Lines trim, cut, and shape the edges of the basic extruded foam board stock into final finished foam products. Equipment which machines the edges and surfaces of the board stock or grinds scrap material for polymer reclamation generates particulate matter (PM) emission which are controlled by cyclonic separators followed by baghouse dust collectors. Equipment such as hot wire cutters and knife blade saws do not create PM; therefore, they are not vented to these control devices.

Ground and trim "scrap" materials are conveyed into reclaim units that carefully melt the foam, to allow it to be returned to the board manufacturing process as basic feedstock.

Additional units at the Rockford facility include a stand-alone sander that is used for only a small portion of the facility's product mix for customers with special applications requiring close thickness tolerances or unusual surface finish requirements and a grinder which shreds scrap material for processing in the reclaim units.

III. PROJECT EMISSIONS

When the foam board is initially produced and as if subsequently handled and stored, some of the blowing agent in the material is lost to the atmosphere as emissions.

Emissions of organic blowing agent result from the polystyrene foam insulation manufacturing operations. The potential emissions from the proposed plant, following modification are provided below, based on 8760 hours of operation (i.e., year round). Currently emissions are 278.2 tons/year.

Potential Project Emissions (Ton/Year)	
Unit	HCFC-142b (Tons/Year)
Line 1 and 2 Barometric Legs and Finishing; Grinder/Reclaim and Sander	819.8
Staging and Warehouse Storage	182.4

IV. APPLICABLE REGULATIONS

A. General

The proposed project will comply with applicable state and federal emission standards, including the Illinois Air Pollution Control Board emission standards and regulations (35 Ill. Adm. Code: Subtitle B) and applicable federal emission standards.

B. Additional Requirements for Major Stationary Source Construction and Modification

The project is in an area classified as attainment for all criteria pollutants. The facility is considered a major source subject to Prevention of Significant Deterioration (PSD) regulations, 40 CFR 52.21 because HCFC-142b is regulated under Title VI of the Clean Air Act.

The increase in HCFC emissions resulting from this modification is 724.0 tons per year. The project is therefore subject to the additional requirements imposed by the federal rules for PSD for HCFC, namely, that Best Available Control Technology (BACT), be implemented for the affected units.

V. PREVENTION OF SIGNIFICANT DETERIORATION

A major project in an attainment area is subject to the federal PSD rules. The PSD rules were established to ensure that new and modified sources will not adversely impact "clean air" areas and will comply with applicable standards.

A PSD review requires: 1) a case-by-case Best Available Control Technology (BACT) determination, taking into account energy, environmental and economic impacts, as well as technical feasibility; 2) an ambient air quality impact analysis, including a baseline determination and dispersion modeling, to determine whether the allowable emissions from the source, in conjunction with the proposed net emissions increase, would cause or contribute to a violation of the applicable PSD increment or National Ambient Air Quality Standard (NAAQS); 3) an assessment of the impact on soils, vegetation and visibility; and 4) public notice and comment, including an opportunity for public hearing. The Illinois EPA has been delegated authority by the USEPA to administer the federal PSD program.

A. Best Available Control Technology

BACT is defined as an emission limitation based on the maximum degree of pollution reduction determined on a case-by-case basis considering technical, economic energy and environmental considerations.

Owens Corning conducted a BACT analysis for HCFC-142b in order to determine the most appropriate level of control required at the facility for this pollutant.

Owens Corning has proposed good operating practices to minimize the emissions of HCFC. Use of add-on control or material substitution were deemed to be economically infeasible. The Illinois EPA concurred that the project will utilize BACT for HCFC.

B. Air Quality Analysis and Assessment of Environmental Impacts

There are no air quality standards. HCFCs have been shown to deplete the ozone layer in the stratosphere.

VI. PROPOSED PERMIT

The conditions of the proposed permit contain limitations and requirements for the complete polystyrene foam insulation manufacturing process, including measures to minimize HCFC emissions. The permit also establishes appropriate compliance procedures, including inspection practices, recordkeeping requirements and reporting requirements.

VII. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the proposed permit meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue a permit for construction of the proposed project.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit. If substantial public interest is shown in this matter, the Illinois EPA will consider holding a public hearing in accordance with 35 Ill. Adm. Code Part 164.