Facility Name: **Carpenter Company**
City: Conyers
County: Rockdale
AIRS #: 04-13-247-00028

Application #: TV-15731
Date Application Received: October 27, 2004
Date Application Deemed Administratively Complete: December 27, 2004
Date of Draft Permit:
Permit No: 3079-247-0028-V-02-0

Program	Review Engineers	Review Managers
SSPP	Laura Warner	Eric Cornwell
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Toxics	N/A	N/A

Introduction

This narrative is being provided to assist the reader in understanding the content of the attached draft Part 70 operating permit. Complex issues and unusual items are explained in simpler terms and/or greater detail than is sometimes possible in the actual permit. This permit is being issued pursuant to: (1) Georgia Air Quality Act, O.C.G.A § 12-9-1, et seq. and (2) Georgia Rules for Air Quality Control, Chapter 391-3-1, and (3) Title V of the Clean Air Act Amendments of 1990. Section 391-3-1-.03(10) of the Georgia Rules for Air Quality Control incorporates requirements of Part 70 of Chapter I of Title 40 of the Code of Federal Regulations promulgated pursuant to the Federal Clean Air Act. The primary purpose of this permit is to consolidate and identify existing state and federal air requirements applicable to Carpenter Company and to provide practical methods for determining compliance with these requirements. The following narrative is designed to accompany the draft permit and is presented in the same general order as the permit. It initially describes the facility receiving the permit, the applicable requirements and their significance, and the methods for determining compliance with those applicable requirements. This narrative is intended as an adjunct for the reviewer and to provide information only. It has no legal standing. Any revisions made to the permit in response to comments received during the public participation and EPA review process will be described in an addendum to this narrative.

I. Facility Description

A. Facility Identification

1. Facility Name:

Carpenter Company

2. Parent/Holding Company Name

Carpenter Company

3. Previous and/or Other Name(s)

E. R. Carpenter Company, Inc.
Carpenter Insulation Company
Carpenter Company, Insulation Division

4. Facility Location

1820 Conyers Station Road
Conyers, GA 30013 (Rockdale County)

5. Attainment or Non-attainment Area Location

The facility is located in the Atlanta Non-Attainment Area.

6. Class I Area Impacts

The facility is not located within 100 km of any Class I areas.

B. Site Determination

There are no other facilities which could possibly be contiguous or adjacent and under common control.

C. Existing Permits

Table 1 below lists all current permits, as amended, issued to the facility, based on a comparative review of Section A6 of the Title V application and the "Permit" file(s) on the facility found in the Air Branch office.

Table 1: List of Current Permits as Amended

Permit Number and/or Purpose of Issuance	Date of Issuance and Date of Amendments (if any)	Comments	
		Yes	No
3079-247-0028-S-01-0	**October 27, 1997**		✓

D. Process Description

1. SIC Codes(s)

3086 - Plastics Foam Products

The SIC Code(s) identified above were assigned by EPD's Air Protection Branch for purposes pursuant to the Georgia Air Quality Act and related administrative purposes only and are not intended to be used for any other purpose. Assignment of SIC Codes by EPD's Air Protection Branch for these purposes does not prohibit the facility from using these or different SIC Codes for other regulatory and non-regulatory purposes.

Should the reference(s) to SIC Code(s) in any narratives or narrative addendum previously issued for the Title V permit for this facility conflict with the revised language herein, the language herein shall control; provided, however, language in previously issued narratives that does not expressly reference SIC Code(s) shall not be affected.

2. Description of Product(s)

The facility manufactures expanded polystyrene foam products including insulation products and architectural shapes.

3. Overall Facility Process Description

Polystyrene beads are expanded in either a one or two-stage process. In the first stage, polystyrene beads are steamed in the AMD Batch Pre-Expander (E2), causing the beads to expand and release pentane, a VOC. Some polystyrene beads are then further expanded in the TRI Continuous Expander (E1), where again the beads are expanded with steam and pentane is released. The expanded beads are then dried in a fluidized bed dryer, where air is blown through the bed of beads. After drying, the beads (now called prepuff) are blown into storage bags where the prepuff is aged in order to stabilize it. After aging, the prepuff is transferred to the Mold (M1) where steam expands the beads further and fuses them together into blocks. After aging to stabilize the block, the block is cut and fabricated for insulation products or architectural shapes. Scrap expandable polystyrene (EPS) board from fabrication is ground for reuse and returned to the Mold (M1). A Laminator (L1) is used to laminate a backing material to sheets of EPS board.

The Epsilon Pentane Control System (C1) collects pentane emissions from the Expanders (E1, E2) and the Mold (M1) and takes the pentane to the boiler to be burned as fuel. The collection efficiency varies but tends to be below 50% based on emissions data. Stack testing has shown a destruction efficiency of >95% for pentane collected by the Epsilon Pentane Control System (C1) and burned in the boiler. The boiler has a capacity of 6.3 MMBtu/hr and provides steam to the Expanders (E1, E2). The boiler is fired by natural gas and pentane, with pentane making up a very small percentage of the fuel. The boiler emits through stack B001. Fugitive pentane emissions are emitted from the storage of EPS beads in process in the expanded bead storage bags, from the warehouse storage of finished EPS blocks, and from the laminating process.

4. Overall Process Flow Diagram

The facility provided a process flow diagram in their Title V permit application.

E. Regulatory Status

1. PSD/NSR

The facility is now a major source with respect to the PSD/NSR rules. The major source threshold in the Atlanta Non-Attainment Area for VOC is now 25 tons per year and the facility is going to continue operating under its existing 50 ton per year VOC emission limit.

2. Title V Major Source Status by Pollutant

Table 2: Title V Major Source Status

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Yes			✓
PM_{10}	Yes			✓
SO_2	Yes			✓
VOC	Yes	✓		
NO_x	Yes			✓
CO	Yes			✓
TRS	No			✓
H_2S	No			✓
Individual HAP	No			✓
Total HAPs	No			✓

3. MACT Standards

The facility is a true minor source of HAPs, therefore, there are no applicable MACT standards for the source. The facility is not subject to any promulgated or proposed MACT standards.

4. Program Applicability

Program Code	Applicable (y/n)
Program Code 6 - PSD	No
Program Code 8 – Part 61 NESHAP	No
Program Code 9 - NSPS	No
Program Code M – Part 63 NESHAP	No
Program Code V – Title V	Yes

Regulatory Analysis

II. Facility Wide Requirements

A. Emission and Operating Caps:

The facility has a VOC emission limit of 50 tons per year, as it did under permit number 3079-247-0028-S-01-0. The facility's emissions have not changed but the facility has become a major source as a result of the Atlanta ozone nonattainment area changing from a classification of "serious" to "severe". This new classification changed the major source threshold for VOC and NO_x from 50 tons per year to 25 tons per year, resulting in the facility becoming a major source for VOC.

B. Applicable Rules and Regulations

None.

C. Compliance Status

The facility is operating in compliance with all applicable rules and regulations.

D. Operational Flexibility

The facility has not requested any operational flexibility in their Title V application.

E. Permit Conditions

Permit Condition No. 2.1.1 limits VOC emissions from the entire facility to less than 50 tons per year.

III. Regulated Equipment Requirements

A. Brief Process Description

Bead Expansion:
Polystyrene beads are expanded in the AMD Batch Pre-Expander (E2), after which some beads are further expanded in the TRI Continuous Expander (E1). Each expander causes the release of pentane emissions from the beads, some of which are captured by the Epsilon Pentane Control System (C1) and burned as fuel in the boiler, which has a destruction efficiency of >95%.

Bead Drying:
Expanded polystyrene (EPS) beads are dried in a fluidized bed dryer, where air is blown through a bed of expanded beads.

Bead Storage and Stabilization:
Expanded and dried polystyrene beads (prepuff) are blown into the Bead Storage Bags (S1) where the beads are aged and emit pentane fugitively until emissions stabilize.

Block Molding:
Aged prepuff (dried and expanded polystyrene beads) is transferred from the Bead Storage Bags (S1) to the block Mold (M1) where steam expands the beads further and fuses them together into blocks. Pentane emissions are released from the beads in the mold and some of the emissions are captured by the Epsilon Pentane Control System (C1) and burned as fuel in the boiler, which has a destruction efficiency of >95%.

Block Storage and Stabilization:
EPS blocks formed in the block Mold (M1) are stored in a warehouse where the blocks are aged and emit pentane fugitively until emissions stabilize.

Fabrication:
Aged EPS blocks are cut and fabricated into insulation products and architectural shapes. Scrap EPS board from fabrication is ground for reuse and returned to the block Mold (M1).

Lamination:
A backing material is laminated to sheets of EPS board with the Hot Melt Laminator (L1). Pentane emissions are fugitively released from the laminating process.

B. Equipment List for the Process

Table 3: Equipment List for Carpenter Company

Emission Units		Specific Limitations/Requirements	Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**ID No.**	**Description**
E1	TRI Continuous Expander	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(eee)	C1	Epsilon Pentane Control System; Boiler
E2	AMD Batch Pre-Expander	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(eee)	C1	Epsilon Pentane Control System; Boiler
M1	EPS Block Mold	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(eee)	C1	Epsilon Pentane Control System; Boiler
L1	Hot Melt Laminator	391-3-1-.02(2)(b) 391-3-1-.02(2)(e) 391-3-1-.02(2)(eee)	None	None
S1	Bead Storage Bags	391-3-1-.02(2)(b) 391-3-1-.02(2)(eee)	None	None
BS	Block Storage	391-3-1-.02(2)(b) 391-3-1-.02(2)(eee)	None	None

C. Equipment & Rule Applicability

Emission and Operating Caps:

An emission limit of 0.0175 pound VOC per pound of bead utilized per month will apply to the facility in order for it to comply with the requirements of Georgia Air Quality Rule 391-3-1-.02-(2)(eee), "VOC emissions from Expanded Polystyrene Products Manufacturing".

Applicable Rules and Regulations:

Georgia Air Quality Rule 391-3-1-.02(2)(b), *Visible Emissions*, applies to a facility that is subject to any other Rule under Chapter 391-3-1-.02. Rule (b) limits the opacity of any visible emissions from a facility to less than forty (40) percent.

Georgia Air Quality Rule 391-3-1-.02(2)(e), *Particulate Emission from Manufacturing Processes*, applies to any facility engaged in a manufacturing process. Rule (e) limits the amount of particulate matter that may be emitted from a facility with an equation based on process input weight rate.

Georgia Air Quality Rule 391-3-1-.02-(2)(eee), *VOC Emissions from Expanded Polystyrene Products Manufacturing,* applies to expandable polystyrene product manufacturing facilities with potential VOC emissions exceeding 25 tons per year and located in the 13-county Atlanta nonattainment area. The facility's annual VOC emissions are estimated to be a maximum of 29.5 tons, with a facility-wide emission limit of 50 tons of VOC per year. The facility produces expandable polystyrene insulation products and architectural shapes, so Rule 391-3-1-.02-(2)(eee)(3), for expandable polystyrene board insulation manufacturing, will apply since this rule is more stringent than the rule for expandable polystyrene custom shape manufacturing, 391-3-1-.02-(2)(eee)(4). Rule (eee)(3) includes 2 methods of complying with the rule, one of which is

establishing a facility-wide emission limit of 0.0175 lb VOC/lb bead utilized. The other method to comply with Rule (eee)(3) requires the installation and operation of VOC emission reduction equipment on the pre-expanders that achieve at least a 90.0% reduction efficiency and a capture system approved by the Director. The facility currently runs a system (Epsilon Pentane Control System) that collects pentane emissions from the expanders and the block mold and directs them to the boiler where the pentane emissions are burned as fuel with a destruction efficiency of >95% for pentane, but the collection efficiency of the system varies greatly and, based on the most recent data submitted by the facility for the period of October 2001 through December 2002, the collection efficiency is below 50% most of the time. Because the collection efficiency of the pentane control system is low, the capture system is not adequate for compliance with Rule (eee)(3) and the facility will not be allowed to comply with the rule by only using the pentane control system. Use of the pentane control system does, however, allow the facility to comply with the facility-wide emission limit of 0.0175 lb VOC/lb bead utilized, and this emission limit will be in place to keep the facility in compliance with Rule (eee)(3).

D. Compliance Status

The facility received a letter of noncompliance, dated February 23, 2005, for not having daily pentane usage records and monthly VOC usage records available during an unannounced inspection on December 9, 2004, and for not subsequently submitting copies of the records to the Division. The facility has since submitted the required records and was found to be in compliance at the time of the last inspection.

E. Operational Flexibility

The facility has not requested any operational flexibility in the Title V application.

F. Permit Conditions

Permit Condition 3.4.1 limits VOC emissions from EPS manufacturing to no greater than 0.0175 lb VOC/lb bead utilized during any calendar month in order to comply with Georgia Air Quality Rule 391-3-1-.02-(2)(eee)(3). The facility will not have the option to comply with Rule (eee)(3) by utilizing VOC emission reduction equipment described in Rule (eee)(3) and Section C above due to the low collection efficiency of the Epsilon Pentane Control System. Condition No. 6 in the existing permit only requires the facility to be in compliance with the facility-wide limit of 0.0175 lb VOC/lb bead utilized, so this requirement will remain unchanged in the new permit.

Condition No. 3.4.2 establishes Rule (b) as applicable to the EPS manufacturing equipment.

Condition No. 3.4.3 establishes Rule (e) as applicable to the EPS manufacturing equipment.

IV. Testing Requirements (with Associated Record Keeping and Reporting)

A. General Testing Requirements

The permit includes a requirement that the Permittee conduct performance testing on any specified emission unit when directed by the Division. Additionally, a written notification of any performance test(s) is required 30 days prior to the date of the test(s) and a test plan is required to be submitted with the test notification. Test methods and procedures for determining compliance with applicable emission limitations are listed and test results are required to be submitted to the Division within 60 days of completion of the testing.

B. Specific Testing Requirements

Condition No. 4.2.1 requires the facility to conduct a performance test on the boiler to determine the VOC destruction efficiency within 180 days after the date of permit issuance. A condition similar to this one does not exist in the facility's existing SM permit. The most recent performance test on the boiler, according to the Division's files, was conducted on December 1, 1995, and resulted in an average destruction efficiency of 99.34%. Due to the extended period of time since the last test, the Division determined that a new test should be conducted.

1. Individual Equipment

None applicable.

2. Equipment Groups (all subject to the same test requirements):

None applicable.

V. Monitoring Requirements (with Associated Record Keeping and Reporting)

A. General Monitoring Requirements

Condition 5.1.1 requires that all continuous monitoring systems required by the Division be operated continuously except during monitoring system breakdowns and repairs. Monitoring system response during quality assurance activities is required to be measured and recorded. Maintenance or repair is required to be conducted in an expeditious manner.

B. Specific Monitoring Requirements

1. Individual Equipment:

Condition No. 5.2.1 is based on Condition Nos. 12 and 13 of the facility's existing SM permit. Condition No. 5.2.1 requires that the boiler temperature and the amount of pentane (in pounds) captured from the expanders and the mold and routed to the boiler be measured and recorded as a means of complying with Condition No. 3.4.1 and as a means to calculate the amount of pentane destroyed in the boiler.

The facility is not subject to CAM because the post-control potential emissions from each emission unit (E1, E2, M1) are less than 25 tons/yr. The majority of VOC emissions from the EPS manufacturing process come from the pre-expanders. Pre-expander VOC emissions account for no more than 50 percent of the total plantwide emissions prior to the air pollution control device. Calculations performed using emission distribution data from industry and Carpenter Co. over varying collection efficiencies for the control device showed that, with plantwide VOC emissions capped at less than 50 tons/yr, post-control VOC emissions from Carpenter's two pre-expanders combined are below the major source threshold of 25 tons/yr, therefore, post-control VOC emissions from each separate pre-expander are also below the major source threshold of 25 tons/yr.

According to Condition No. 25 in the facility's existing SM permit, a standard operating temperature for the boiler should have been established by the Division based on boiler operating records that were to be submitted after the boiler temperature monitoring device had been in operation for three months. This temperature is needed to determine if an excursion has occurred as described in Condition No. 6.1.7.c.i of the Title V permit. No record of this standard operating temperature was found in the Division's files, but an inspection report for the inspection on December 12, 2002, stated that the boiler temperature at the time of the inspection was 1196°F.

Condition No. 5.2.2 is based on Condition No. 14 of the facility's existing SM permit. Condition No. 5.2.2 requires the facility to analyze a sample of the final EPS product once every twelve months, in either July or August, to determine VOC retention in pounds of VOC per pound of product produced, utilizing methods and procedures approved by the Division. The sampling is required in July or August in order to get a conservative value to be used in the facility's pentane emission calculations. More pentane is likely to be emitted from the beads in the heat of summer than in the cold of winter. The results of this sampling must be included in the semiannual report required by Condition 6.1.4. The

VOC retention in pounds is used by the facility to calculate monthly pentane emissions with the equation in Condition No. 6.2.3. The facility's most recent analysis of VOC retention in the beads, according to the inspection report for an unannounced inspection on December 12, 2002, was conducted in June of 2002, with a result of 1.093% of pentane retained per pound of product produced; however, the facility is not required by their current SM permit to submit these test results to the Division.

Due to the nature of the EPS process, the likelihood of a violation of Georgia Rules (b) and (e) is minimal. Therefore, no monitoring is required.

2. Equipment Groups (all subject to the same monitoring requirements):

None applicable.

VI. Other Record Keeping and Reporting Requirements

A. General Record Keeping and Reporting Requirements

The Permit contains general requirements for the maintenance of all records for a period of five years following the date of entry and requires the prompt reporting of all information related to deviations from the applicable requirements. Records, including identification of any excess emissions, exceedances, or excursions from the applicable monitoring triggers, the cause of such occurrence, and the corrective action taken, are required to be kept by the Permittee and reporting is required on a semiannual basis.

B. Specific Record Keeping and Reporting Requirements

Condition Nos. 6.2.1 through 6.2.7 ensure compliance with the facility's annual VOC limit of 50 tons and the EPS manufacturing VOC limits required by Georgia Air Quality Rule 391-3-1-.02(2)(eee).

Condition No. 6.2.1 requires monthly usage records to be kept for all pentane and other VOC containing materials used at the facility and gives the requirements for subtracting VOCs contained in waste materials. This condition is similar to Condition No. 16 in the facility's existing SM permit, except that the pentane records are required daily in the SM permit rather than monthly. The pentane records are being changed from daily to monthly because the permit only requires the monthly calculation of pentane and other VOC emissions, so requiring daily usage records is excessive.

Condition No. 6.2.2 requires the calculation of the amount of pentane destroyed by the boiler on a monthly basis. This condition is similar to Condition No. 17 in the facility's existing SM permit, except that the pentane records are required daily in the SM permit rather than monthly. The pentane records are being changed from daily to monthly because the permit only requires the monthly calculation of pentane and other VOC emissions, so requiring daily usage records is excessive.

Condition No. 6.2.3 requires the calculation of the total monthly pentane emissions from the facility using the equation given in the condition. This condition is similar to Condition No. 18 in the facility's existing SM permit, except that the pentane records are required daily in the SM permit rather than monthly. The pentane records are being changed from daily to monthly because the permit only requires the monthly calculation of pentane and other VOC emissions, so requiring daily usage records is excessive.

Condition No. 6.2.4 requires that the total monthly VOC emissions (other than pentane) be calculated and recorded and combined with the total monthly VOC emissions from pentane to determine total monthly VOC emissions from the entire facility. This condition also requires that notification be sent to the Division if the monthly VOC emissions exceed 4.15 tons for any calendar month. This condition is similar to Condition No. 19 in the facility's existing SM permit.

Condition 6.2.5 requires that the monthly, twelve-month rolling total VOC emissions from the entire facility be calculated and notification be sent to the Division if the monthly, twelve-month rolling total VOC emissions equal or exceed 50 tons for any consecutive twelve month period. A condition similar to this does not exist in the facility's existing SM permit.

Condition No. 6.2.6 requires that the monthly VOC emissions in pounds of VOC per pound of bead utilized be calculated for each month and notification be sent to the Division if the monthly emissions exceed 0.0175 lb VOC/lb bead processed. This condition is similar to Condition No. 20 in the facility's existing SM permit.

VII. Specific Requirements

A. Operational Flexibility

The facility has not requested any operational flexibility in the Title V application.

B. Alternative Requirements

There are no alternative requirements indicated.

C. Insignificant Activities

See Attachment B for the list of Insignificant Activities in existence at the facility at the time of permit issuance.

The facility listed a space heater under number 2 in the "Industrial Operations" section of the Insignificant Activities Checklist, but space heaters do not fit under any of those descriptions, so the space heater was accounted for as fuel burning equipment with a heat input capacity of less than 5 MM Btu/hr in the "Description of Fuel Burning Equipment" table in Attachment B of the Title V permit.

D. Temporary Sources

There are no temporary sources indicated.

E. Short-Term Activities

There are no short-term activities indicated.

F. Compliance Schedule/Progress Reports

The Division's files indicate that the facility does not currently have any compliance issues.

G. Emissions Trading

Not applicable.

H. Acid Rain Requirements

Not applicable.

I. Prevention of Accidental Releases

Not applicable.

J. Stratospheric Ozone Protection Requirements

The facility has indicated that they have air conditioners or refrigeration equipment that use CFC's, HFC's or other stratospheric ozone-depleting substances, but the equipment does not contain a refrigerant charge of greater than 50 pounds.

K. Pollution Prevention

There are no pollution prevention provisions incorporated into this Title V Permit.

L. Specific Conditions

All conditions have been covered elsewhere in the review.

VIII. General Provisions

Generic provisions have been included in this permit to address the requirements in 40 CFR Part 70 that apply to all Title V sources, and the requirements in Chapter 391-3-1 of the Georgia Rules for Air Quality Control that apply to all stationary sources of air pollution.

Addendum to Narrative

The 30-day public review started on September 22, 2005 and ended on October 22, 2005. Comments were not received by the Division.

The facility is located approximately 150 km from the Cohutta Wilderness Class I area.

The equation used to calculate pentane emissions in Condition No. 6.2.3 has been changed to account for any differences between the amount of beads processed and the amount of final product that is shipped off-site. This will account for any VOC emissions resulting from the grinding and disposal of bead waste.