



Joseph E. Kernan
Governor

Lori F. Kaplan
Commissioner

April 12, 2004

100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015
(317) 232-8603
(800) 451-6027
www.in.gov/idem

TO: Interested Parties / Applicant
RE: Carpenter Company / SPM 039-17958-00086
FROM: Paul Dubenetzky
Chief, Permits Branch
Office of Air Quality

Notice of Decision: Approval – Effective Immediately

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 13-17-3-4 and 326 IAC 2, this permit modification is effective immediately, unless a petition for stay of effectiveness is filed and granted, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3-7 and IC 13-15-7-3 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office Environmental Adjudication, 100 North Senate Avenue, Government Center North, Room 1049, Indianapolis, IN 46204, **within eighteen (18) days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

- (1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
- (2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
- (3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

- (1) the name and address of the person making the request;
- (2) the interest of the person making the request;
- (3) identification of any persons represented by the person making the request;
- (4) the reasons, with particularity, for the request;
- (5) the issues, with particularity, proposed for considerations at any hearing; and
- (6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

Pursuant to 326 IAC 2-7-18(d), any person may petition the U.S. EPA to object to the issuance of a Title V operating permit or modification within sixty (60) days of the end of the forty-five (45) day EPA review period. Such an objection must be based only on issues that were raised with reasonable specificity during the public comment period, unless the petitioner demonstrates that it was impracticable to raise such issues, or if the grounds for such objection arose after the comment period.

To petition the U.S. EPA to object to the issuance of a Title V operating permit, contact:

U.S. Environmental Protection Agency
401 M Street
Washington, D.C. 20406

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live.

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Governor

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April 12, 2004

Mr. Tom Stinson
Carpenter Co.
P.O. Box 2386
Elkhart, IN 46515

Re: **039-17958-00086**
Second Significant Permit Modification to
Part 70 No.: T 039-6059-00086

Dear Mr. Stinson:

Carpenter Co. was issued a permit (T 039-6059-00086) on June 11, 1999 for a stationary source that produces soft block foam, chemical blending for customers and cushion blocks. A letter requesting changes to this permit was received on September 11, 2003. Pursuant to the provisions of 326 IAC 2-7-12 a significant permit modification to this permit is hereby approved as described in the attached Technical Support Document.

The modification consists of the incorporation of a Best Available Control Technology (BACT) pursuant to 326 IAC 8-1-6 to control volatile organic compound (VOC) emissions from the one (1) foam pouring line, identified as EU01A/B. Additional emission factors were discovered through an internal investigation by Carpenter Company. The additional emission factors causes an increase in potential VOC emissions, which results in the applicability of 326 IAC 8-1-6.

The changes in the Part 70 Operating Permit are documented in the Technical Support Document. All other conditions of the permit shall remain unchanged and in effect. Please attach a copy of this modification and the following revised permit pages to the front of the original permit.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter, please contact Stephanie A. Ryan, c/o OAQ, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana, 46206-6015, at 631-691-3395 or in Indiana at 1-800-451-6027 (ext 631-691-3395).

Sincerely,

Original signed by Paul Dubenetzky
Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

Attachments
SAR/MES

cc: File - Elkhart County
U.S. EPA, Region V
Elkhart County Health Department
Air Compliance Section Inspector - Paul Karkiewicz
Compliance Branch - Karen Ampil
Administrative and Development
Technical Support and Modeling - Michelle Boner



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PART 70 OPERATING PERMIT OFFICE OF AIR QUALITY

**Carpenter Co.
195 County Road 15 South
Elkhart, Indiana 46515**

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 and 326 IAC 2-1-3.2 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Operation Permit No.: T 039-6059-00086	
Issued by: Janet G. McCabe, Assistant Commissioner Office of Air Quality	Issuance Date: June 11, 1999 Expiration Date: June 11, 2004

First Minor Source Modification 039-12641-00086, issued on October 16, 2000
 Second Minor Source Modification 039-13216-00086, issued on November 26, 2001
 First Significant Permit Modification 039-14225-00086, issued on August 14, 2001
 First Reopening R039-13216-00086, issued on November 26, 2001
 First Administrative Amendment 039-15274-00086, issued on March 5, 2002
 Second Administrative Amendment 039-17257-00086, issued on April 23, 2003
 Third Administrative Amendment 039-17761-00086, issued on June 16, 2003

Second Significant Permit Modification 039-17958-00086	Pages Affected: 30a, 30b and 49
Issued by: Original signed by Paul Dubenetzky Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: April 12, 2004

SECTION D.1 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] Foam Pouring Line EU-01A/B

- (a) One (1) foam pouring line, identified as EU-01A/B, consisting of a mixer, tunnel, foam block cut, and slab room, maximum production is 60,000 lbs of foam per hour exhausting through vents 14, 15, 16 and vents b through k.

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.1 Volatile Organic Compounds (VOC) [326 IAC 8-1-6]

Pursuant to 326 IAC 8-1-6 (New facilities; General reduction requirements), BACT for the one (1) foam pouring line, identified as EU-01A/B, has been determined to be as follows:

- (a) The total VOC emissions from the one (1) foam pouring line shall be limited to no more than 38.6 tons per twelve (12) consecutive month period, with compliance determined at the end of each month. This limitation is based on the following equation:

$$\text{VOC Emissions (tons/year)} = (\text{Catalyst Usage (tons/year)} \times \text{Flash Off (\%)}) + (\text{TDI Usage (tons/year)} \times \text{Flash Off (\%)})$$

- (b) The continued development of non-emitting amine catalysts for replacement of existing emitting catalysts where feasible.
- (c) The listed work practice as follows:

Storage containers used to store VOC and/or HAP containing materials shall be kept covered when not in use.

D.1.2 Volatile Organic Compounds (VOC) [326 IAC 8-1-2] [326 IAC 8-1-4]

Compliance with the VOC content and usage limitations contained in Condition D.1.1 shall be determined pursuant to 326 IAC 8-1-4(a)(3) and 326 IAC 8-1-2(a) using formulation data supplied by the material manufacturer. IDEM, OAQ, reserves the authority to determine compliance using Method 24 in conjunction with the analytical procedures specified in 326 IAC 8-1-4.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

No monitoring requirements are applicable to the foam pouring line.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.1.3 Record Keeping Requirements

- (a) To document compliance with Condition D.1.1(a), the Permittee shall maintain records in accordance with (1) through (3) below. Records maintained for (1) through (3) shall be taken monthly and shall be complete and sufficient to establish compliance with the VOC usage limit established in Condition D.1.1(a).

- (1) The amount of raw material used on a monthly basis.

Records shall include inline flow meter readings of raw material usages and material

safety data sheets (MSDS) necessary to verify the type and amount used.

- (2) The total VOC usage for each month; and
 - (3) The weight of VOC emitted for each compliance period.
- (b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.1.4 Reporting Requirements

A quarterly summary of the information to document compliance with Condition D.1.1(a) shall be submitted to the address listed in Section C - General Reporting Requirements, of the permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF AIR QUALITY
 COMPLIANCE DATA SECTION**

Part 70 Quarterly Report

Source Name: Carpenter Co.
 Source Address: 195 County Road 15 South, Elkhart, Indiana 46516
 Mailing Address: P.O. Box 2386, Elkhart, Indiana 46515
 Part 70 Permit No.: T 039-6059-00086
 Facility: Foam Pouring Line (EU-01A/B)
 Parameter: VOC Emission Rate
 Limit: 38.6 tons per twelve (12) consecutive month period, with compliance determined at the end of each month based on the following equation:

$$\text{VOC Emissions (tons/year)} = (\text{Catalyst Usage (tons/year)} \times \text{Flash Off (\%)}) + (\text{TDI Usage (tons/year)} \times \text{Flash Off (\%)})$$

YEAR: _____

Month	VOC Emissions (tons)	VOC Emissions (tons)	VOC Emissions (tons)
	This Month	Previous 11 Months	12 Month Total

- 9 No deviation occurred in this quarter.
- 9 Deviation/s occurred in this quarter.
 Deviation has been reported on: _____

Submitted by: _____

Title / Position: _____

Signature: _____

Date: _____

Phone: _____

Attach a signed certification to complete this report.

Indiana Department of Environmental Management Office of Air Quality

Addendum to the Technical Support Document for a Significant Permit Modification to a Part 70 Operating Permit

Source Name: Carpenter Co.
Source Location: 195 County Road 15 South, Elkhart, Indiana 46516
County: Elkhart
Operation Permit No.: T 039-6059-00086
Significant Permit Modification No.: 039-17958-00086
SIC Code: 3086
Permit Reviewer: Stephanie A. Ryan

On January 23, 2004, the Office of Air Quality (OAQ) had a notice published in the Elkhart Truth, Elkhart, Indiana, stating that Carpenter Co. had applied for a Significant Permit Modification to a Part 70 Operating Permit for the incorporation of a best available control technology (BACT) pursuant to 326 IAC 8-1-6 to control volatile organic compound (VOC) emissions from the one (1) foam pouring line. The notice also stated that OAQ proposed to issue a Significant Permit Modification and provided information on how the public could review the proposed Significant Permit Modification and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this Significant Permit Modification to a Part 70 Operating Permit should be issued as proposed.

On February 17, 2004, Robert Waugaman of Bruce Carter Associates submitted comments on the proposed Significant Permit Modification to a Part 70 Operating Permit. The comments are as follows: The permit language, if changed, has deleted language as ~~strikeouts~~ and new language **bolded**.

Comment 1:

The correct company name is Carpenter Co. and not Carpenter Company. Please make this change on the permit cover page and elsewhere throughout the permit and TSD as needed.

Response 1:

The change in the name from Carpenter Company to Carpenter Co. has been made on all appropriate pages as follows:

PART 70 OPERATING PERMIT OFFICE OF AIR QUALITY

~~Carpenter Company Co.~~
195 County Road 15 South
Elkhart, Indiana 46515

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION

Part 70 Quarterly Report

Source Name: Carpenter ~~Company~~ Co.
Source Address: 195 County Road 15 South, Elkhart, Indiana 46516
Mailing Address: P.O. Box 2386, Elkhart, Indiana 46515
Part 70 Permit No.: T 039-6059-00086
Facility: Foam Pouring Line (EU-01A/B)
Parameter: VOC Emission Rate
Limit: 38.6 tons per twelve (12) consecutive month period, with compliance determined at the end of each month based on the following equation:

Comment 2:

The paragraph on Emission Calculations in the TSD on page 2 of 9 refers to the pouring line PTE as 133 TPY instead of the revised PTE of 38.6 TPY.

Response 2:

The IDEM, OAQ agrees. The paragraph on Emissions Calculations in the TSD should read 38.6 TPY.

However, IDEM, OAQ prefers that the Technical Support Document reflect the permit that was on public notice. Changes to the permit or technical support material that occur after the public notice are documented in this Addendum to the Technical Support Document. This accomplishes the desired result of ensuring that these types of concerns are documented and part of the record regarding this permit decision.

Comment 3:

Condition D.1.3(a)(1) is written as if the foam pouring line is a surface coating process with an applicable pounds VOC per gallon of coating limit. This condition refers to "coating material" and "solvent less water" plus requires that "solvent usage records shall differentiate between those added to coatings and those used as cleanup solvents." Since this is not a surface coating process, Carpenter Co. requests that this condition be changed to better reflect the process being monitored. In addition, most purchasing is done at the corporate level at another location. Purchase order records are not maintained on site. Carpenter Co. has a more accurate method of tracking usages in place than through the use of purchase orders and invoice records. Currently, the amounts of the raw materials used on the pour line are electronically recorded through the use of inline flow meters. This information is then used not only to track the amount of materials used for production and quality control purposes, but also for emission calculations. Carpenter Co. requests that this method of record keeping replace the requirement of maintaining purchase orders and invoices on site. Following are requested changes to this condition. Text added is in **bold** and text to remove is in ~~strikeout~~.

- (a) To document compliance with Condition D.1.1, the Permittee shall maintain records in accordance with (1) through (3) below. Records maintained for (1) through (3) shall be taken monthly and shall be complete and sufficient to establish compliance with the VOC content and usage limits established in Conditions D.1.1(a) and (b).
 - (1) The amount of ~~coating raw material and solvent less water~~ used on a ~~daily~~ **monthly** basis.
 - (A) Records shall include ~~purchase orders, invoices,~~ **inline flow meter readings of raw material usages** and material safety data sheets (MSDS) necessary to verify the type and amount used.
 - (B) ~~Solvent usage records shall differentiate between those added to coatings and those used as cleanup solvents.~~

Response 3:

Condition D.1.3(a)(1) has been amended as follows:

D.1.3 Record Keeping Requirements

- (a) To document compliance with Condition D.1.1(a), the Permittee shall maintain records in accordance with (1) through (3) below. Records maintained for (1) through (3) shall be taken monthly and shall be complete and sufficient to establish compliance with the VOC usage limit established in Condition D.1.1(a).
 - (1) The amount of ~~coating raw material and solvent less water~~ used on a ~~daily~~ **monthly** basis.
 - (A) Records shall include ~~purchase orders, invoices,~~ **inline flow meter readings of raw material usages** and material safety data sheets (MSDS) necessary to verify the type and amount used.
 - (B) ~~Solvent usage records shall differentiate between those added to coatings and those used as cleanup solvents.~~
 - (2) The total VOC usage for each month; and
 - (3) The weight of VOC emitted for each compliance period.
- (b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

Comment 4:

The TSD in paragraph (b) under the section on Enforcement Issue, page 2 of 9, states

- (b) IDEM is reviewing this matter and has taken appropriate action. The compliance schedule in this proposed permit will satisfy the requirements of the above stated requirement.

Since the development of new emission factors for the amine catalysts is similar to the changes

made in the fiberglass reinforced plastics (FRP) industry with the development of revised emission factors for styrene emissions, it is the position of Carpenter Co. that these new emission factors only allow for better estimates of emissions from an existing process and not an increase in emissions. Since IDEM did not view the changes in emission factors for the FRP industry as an enforcement issue, Carpenter Co. requests that the above paragraph be changed as follows to reflect this approach.

- (b) IDEM ~~is reviewing~~ **has reviewed** this matter and has taken appropriate action. The compliance schedule in this proposed permit will satisfy the requirements of the above stated requirement.

Response 4:

IDEM, OAQ has duly noted this comment from Carpenter Co., however, the Office of Enforcement has not yet had the opportunity to fully review this matter. Therefore at this time, no further determination can be made with regard to the referral issue.

Indiana Department of Environmental Management Office of Air Quality

Technical Support Document (TSD) for a Part 70 Significant Permit Modification

Source Background and Description

Source Name:	Carpenter Company
Source Location:	195 County Road 15 South, Elkhart, Indiana 46516
County:	Elkhart
SIC Code:	3086
Operation Permit No.:	T 039-6059-00086
Operation Permit Issuance Date:	June 11, 1999
Significant Permit Modification No.:	039-17958-00086
Permit Reviewer:	Stephanie A. Ryan

The Office of Air Quality (OAQ) has reviewed a modification application from Carpenter Company relating to the incorporation of a Best Available Control Technology (BACT) pursuant to 326 IAC 8-1-6 to control volatile organic compound (VOC) emissions from the one (1) previously permitted foam pouring line, identified as EU01A/B.

As a result of an internal investigation by Carpenter Company of the process feed materials for the prime foam line, some amine catalysts were found to be a source of VOC emissions. The potential to emit VOC from the one (1) foam pouring line including emissions from the amine catalysts is greater than twenty-five (25) tons per year. Since there are no other 326 IAC 8 rules applicable to foam pouring, the requirements of 326 IAC 8-1-6 are applicable.

History

Carpenter Company was issued a Part 70 permit (T 039-6059-00086) on June 11, 1999, a First Minor Source Modification (MSM 039-12641-00086) on October 16, 2000, a First Significant Permit Modification (SPM 039-14225-00086) on August 14, 2001, a First Reopening (R 039-13216-00086) on November 26, 2001, a Second Minor Source Modification (MSM 039-13216-00086) on November 26, 2001, a First Administrative Amendment (AA 039-15274-00086) on March 5, 2002, a Second Administrative Amendment (AA 039-17257-00086) on April 23, 2003 and a Third Administrative Amendment (AA 039-17761-00086) on June 16, 2003.

On September 11, 2003, Carpenter Company submitted an application to the OAQ requesting a Second Significant Permit Modification to incorporate a BACT to control VOC emissions from the one (1) foam pouring line.

Enforcement Issue

- (a) IDEM is aware that the one (1) foam pouring line is not in compliance with the following emission limitation:

326 IAC 8-1-6 (New Facilities; General Reduction Requirements)

Pursuant to 326 IAC 8-1-6 (New Facilities; General Reduction Requirements), New facilities as of January 1, 1980, which have potential emissions of twenty-five (25) tons per year or more shall reduce VOC emissions by using best available control technology (BACT). The one (1) existing foam pouring line, identified as EU-01A/B, has the potential to emit VOC

greater than twenty-five (25) tons per year and is therefore not in compliance with 326 IAC 8-1-6 (New Facilities; General Reduction Requirements).

- (b) IDEM is reviewing this matter and has taken appropriate action. The compliance schedule in this proposed permit will satisfy the requirements of the above stated requirement.

Recommendation

The staff recommends to the Commissioner that the Part 70 Significant Permit Modification be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on September 11, 2003. Additional information was received on October 30, 2003.

Emission Calculations

Emissions calculations are based on confidential trade secret information. The one (1) foam pouring line is a batch operation. Total foam production is based on a twenty-four (24) hour production cycle with actual foam pouring operating up to nine (9) hours per day (3,285 hours per year). Potential to emit calculations for the one (1) foam pouring line are therefore based on 3,285 hours of pouring and 8,760 hours of operation.

The potential to emit VOC for the one (1) foam pouring line is 133 tons per year with no particulate matter emissions. HAP emissions are less than ten (10) tons per year for a single HAP and less than twenty-five (25) tons per year for a combination of HAPs.

Potential To Emit of the Previously Permitted Foam Pouring Line Including Amine Catalysts

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U.S. EPA."

This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Pollutant	Potential To Emit (tons/year)
PM	0.00
PM ₁₀	0.00
SO ₂	0.00
VOC	38.6
CO	0.00
NO _x	0.00

HAPs	Potential To Emit (tons/year)
Individual HAP	less than 10
TOTAL	less than 25

BACT Analysis

326 IAC 8-1-6 (New Facilities; General Reduction Requirements)

The potential VOC emissions from the one (1) foam pouring line are greater than twenty-five (25) tons per year. Since there are no other 326 IAC 8 rules applicable to foam pouring, the requirements of 326 IAC 8-1-6 are applicable, and the source must comply with the requirements of the best available control technology (BACT) determination.

The following control options were evaluated in a BACT analysis:

- (a) Solvent/Material Substitution - The type of amine catalyst that is used is based on the properties of the foam that is being produced. Some amine catalysts are reactive, bond into the product and are not emitted while others are non-reactive and emitted. The emissions for the one (1) foam pouring line and slab room identified as EU-01A/B are based on the worst case emission coming from non-reactive amines that are emitted. Because the amine is selected based on foam properties it is not possible to substitute water or non photochemically reactive solvents for the amine. These alternatives would not allow the necessary chemical reaction to occur and therefore the foam would not be properly formed. Therefore, solvent/material substitution would not be technically feasible.
- (b) High Solids Application - Using a foam pouring mixture with a higher solids content results in a decrease in the amount of volatiles released during the foam curing process and a direct reduction in facility emissions. Likewise with the solvent/material substitution method, the type of amine catalyst that is used is based on the properties of the foam that is being produced. Similarly, high solids application is not technically feasible because the chemical make-up of the foam cannot be altered and still produce the same end product.
- (c) Transfer Efficiency of Application Equipment - The one (1) foam pouring line has a transfer efficiency of one hundred (100) percent, in that all of the material used is transferred to the pouring tunnel to become foam. Increasing the transfer efficiency is not possible and is therefore not technically feasible.
- (d) Add-On Controls
 - (1) Condensation - Condensation systems are only effective for gas streams containing high concentrations of high molecular weight VOCs. The exhaust streams at this source contain low concentrations of relatively low molecular weight VOCs. In addition, the condensate would contain several chemicals and would not be suitable for reuse on site. Therefore, condensation is not technically feasible.
 - (2) Chemical Scrubbers - A chemical scrubber is an absorption system in which the waste stream is dissolved in a solvent. In order for liquid absorption to be effective, the VOCs of the waste stream must be soluble in the same liquid. At this source, the waste streams from the foam pouring line contain amines and a small percentage of TDI which would react with a sulfuric acid and water scrubber solution. Therefore, chemical scrubbers are technically feasible.

Carpenter Co. has performed testing on VOC emissions from their foams and developed new emission factors for the amine emissions. In addition, the cost of the duct work and actual placement of the control devices has been incorporated into the original BACT analysis.

Based on Carpenter's internal analysis, emission factors for the foam and amine catalysts used at the Elkhart facility will range from 0% to 67.3% depending upon the amine being used and foam type being produced. The preliminary emission factor of 95% cited in the original BACT was not reproducible and therefore discarded. Since all foam types are not made at the same pour rate, Carpenter Co. cannot immediately assume that the catalyst with the 67.3% emission factor will have the highest VOC emissions. Based on the worst case scenario, VOC emissions using the latest emission factors would be 38.6 tons per year. This is considerably less than the original estimate of 134.76 tons per year cited in the original BACT.

Upon further review of the site layout by Carpenter Co., it was discovered that due to the adjacent railroad spur located next to the north side of the building, any control device proposed could not be located next to the existing exhaust fans which are also on the north side of the building. The closest available space is at the northwest corner of the site adjacent to the proposed expanded slab room. Because of the air flow limits of the scrubbers, Carpenter Co. determined that only three (3) of the exhaust fans could be combined into one (1) duct system and piped to a single scrubber. All other fans will need to be controlled by individual dedicated scrubbers. This would require that a total of nine (9) scrubbers and related duct work be installed to service the exhaust system. Due to the distance from the exhaust fans to the closest available space for the scrubbers, Carpenter Co. would need to install approximately 5,321 feet of duct work.

Based on U.S. EPA's Total Annual Cost Spreadsheet Program for ductwork, the diameter of the ducts would range from 56.6 inches to 70.3 inches with seven (7) systems requiring a 64.9 inch diameter. Without allowing for any possible additional supporting structure that may be needed to reinforce the roof, based on EPA's spreadsheet, the purchased equipment cost for the ductwork alone, not including installation, shipping, etc., would be \$804,419. The Total Capital Investment (TCI) for the ductwork together with the scrubbers now becomes \$2,771,181.

Although Carpenter Co. has listed the scrubbers as a possible control for the VOC emissions from this process, there still remains the question of whether they are actually technically feasible for controlling this process. This is of concern since Carpenter Co. did not find any other company using scrubbers to control a similar process. Notwithstanding this, if Carpenter Co. is to consider scrubbers, the cost effectiveness per ton of VOC removed in the above scenario would be \$35,296 per ton assuming 100% capture efficiency of the VOC emissions. The slab room is not effectively cut off from the rest of the plant due to the large openings used to transport slabs between the slabroom and the rest of the building for further processing. In addition, there are 33 dock doors on the south and east side of the building plus several personnel doors that would preclude 100% capture efficiency. The true capture efficiency would be less than 100% due to all of these openings. Therefore, the true cost per ton would be higher than \$35,296 depending on the actual capture efficiency.

- (3) Adsorption - The two (2) types of adsorption systems are carbon and zeolite. Carbon adsorption would not be feasible because of fire hazards related to carbon

bed systems. Carbon systems require the addition of a fire suppression system to extinguish possible fires. The addition of the fire suppression system would make the cost about the same as that of the safer zeolite system and would require more clean-up time, resulting in lost production. Zeolite adsorption is technically feasible for this source and would not require a fire suppression system. Zeolite adsorption will be evaluated further as a concentrator treatment system.

- (4) Incineration:
- (A) Catalytic Incineration - Catalytic incineration is similar to thermal incineration, but uses a catalyst to lower the oxidation temperature, thus decreasing the fuel requirements. Catalytic incineration is technically feasible at this source. Thermal incineration was not included in the cost analysis because the annual natural gas costs are far greater than those for catalytic incineration, which would make the cost of control higher for thermal incineration than for catalytic incineration.
 - (B) Concentrator Treatment Systems - Concentrator systems combine the features of adsorption and incineration. This involves adsorbing the VOCs from a large volume air stream onto a bed of activated carbon, then desorbing the VOCs from the bed with a small volume of hot air. The smaller concentrated air stream is then incinerated. Zeolite concentrator treatment systems are technically feasible at this source.
 - (C) Thermal Oxidation - Regenerative thermal oxidizer systems recover up to ninety-five percent (95%) of the heat generated during the oxidation process. An electric heating element, used for start-up heating, is surrounded by a bed of high temperature silica gravel. This gravel, once heated, will maintain combustion temperatures with little additional fuel, thereby reducing the system fuel requirements. A regenerative thermal oxidizer is a technically feasible control option for this source.
- (5) Biofiltration - Biofiltration is a land-intensive system in which contaminated air is fed under an active bed of soil containing microorganisms. As air rises through the soil, the microorganisms consume and convert the chemicals into carbon dioxide and water. This source does not have sufficient available land to use for the filter bed. Therefore, biofiltration is not technically feasible.

The add-on control options evaluated in a cost analysis are catalytic incineration, chemical scrubbers, concentrator treatment systems (zeolite concentrator with oxidizer) and regenerative thermal oxidation. The cost of add-on control methods, as determined by the cost analysis, ranged between \$35,296 per ton of VOC removed and \$325,586 per ton of VOC removed. The least expensive option was adding chemical scrubbers (\$35,296 per ton). The applicant has indicated that this add-on control method is not economically feasible for this source.

No similar sources with any add-on controls, as a BACT, were found in Indiana.

In addition, Carpenter Co. is currently working with its suppliers to develop an amine catalyst that is non-emitting which will become a replacement for the catalyst currently used in the above scenario for the worst case foam. It is anticipated that this replacement will come on line during 2004. Once this change is approved for production, VOC emissions will be further reduced making all add-on control devices even less cost effective.

Therefore, BACT for the one (1) foam pouring line identified as EU-01A/B has been determined to

be as follows:

- (a) The total VOC emissions from the one (1) foam pouring line shall be limited to no more than 38.6 tons per twelve (12) consecutive month period, with compliance determined at the end of each month. This limitation is based on the following equation:

$$\text{VOC Emissions (tons/year)} = (\text{Catalyst Usage (tons/year)} \times \text{Flash Off (\%)}) + (\text{TDI Usage (tons/year)} \times \text{Flash Off (\%)})$$

- (b) The continued development of non-emitting amine catalysts for replacement of existing emitting catalysts where feasible.
- (c) The listed work practice as follows:

Storage containers used to store VOC and/or HAP containing materials shall be kept covered when not in use.

Proposed Changes

Pursuant to AA 039-15274-00086, issued on March 5, 2002, Section D.1 for the one (1) foam pouring line, identified as EU-01A/B, was removed because the blowing agent for the foam pouring line was converted from methylene chloride to carbon dioxide. The requirements associated with the use of methylene chloride were removed and therefore the entire section was removed. Due to the increase in potential to emit of VOCs from the one (1) foam pouring line, this facility is now subject to the requirements of 326 IAC 8-1-6 (New Facilities; General Reduction Requirements). Therefore, a new Section D.1 for the one (1) foam pouring line, identified as EU-01A/B, shall be incorporated and all subsequent sections shall be renumbered.

The following permit conditions and quarterly report shall be included in T 039-6059-00086, issued June 11, 1999. The permit language is changed to read as follows (deleted language appears as ~~strikeouts~~, new language appears in **bold**):

SECTION D.1 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)] Foam Pouring Line EU-01A/B

- (a) **One (1) foam pouring line, identified as EU-01A/B, consisting of a mixer, tunnel, foam block cut, and slab room, maximum production is 60,000 lbs of foam per hour exhausting through vents 14, 15, 16 and vents b through k.**

(The information describing the process contained in this facility description box is descriptive information and does not constitute enforceable conditions.)

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.1.1 Volatile Organic Compounds (VOC) [326 IAC 8-1-6]

Pursuant to 326 IAC 8-1-6 (New facilities; General reduction requirements), BACT for the one (1) foam pouring line, identified as EU-01A/B, has been determined to be as follows:

- (a) **The total VOC emissions from the one (1) foam pouring line shall be limited to no more than 38.6 tons per twelve (12) consecutive month period, with compliance determined at the end of each month. This limitation is based on the following equation:**

VOC Emissions (tons/year) = (Catalyst Usage (tons/year) x Flash Off (%)) + (TDI Usage (tons/year) x Flash Off (%))

- (b) The continued development of non-emitting amine catalysts for replacement of existing emitting catalysts where feasible.**
- (c) The listed work practice as follows:**

Storage containers used to store VOC and/or HAP containing materials shall be kept covered when not in use.

D.1.2 Volatile Organic Compounds (VOC) [326 IAC 8-1-2] [326 IAC 8-1-4]

Compliance with the VOC content and usage limitations contained in Condition D.1.1 shall be determined pursuant to 326 IAC 8-1-4(a)(3) and 326 IAC 8-1-2(a) using formulation data supplied by the material manufacturer. IDEM, OAQ, reserves the authority to determine compliance using Method 24 in conjunction with the analytical procedures specified in 326 IAC 8-1-4.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

No monitoring requirements are applicable to the foam pouring line.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.1.3 Record Keeping Requirements

(a) To document compliance with Condition D.1.1(a), the Permittee shall maintain records in accordance with (1) through (3) below. Records maintained for (1) through (3) shall be taken monthly and shall be complete and sufficient to establish compliance with the VOC usage limit established in Condition D.1.1(a).

(1) The amount of coating material and solvent less water used on a daily basis.

(A) Records shall include purchase orders, invoices, and material safety data sheets (MSDS) necessary to verify the type and amount used.

(B) Solvent usage records shall differentiate between those added to coating and those used as cleanup solvents.

(2) The total VOC usage for each month; and

(3) The weight of VOC emitted for each compliance period.

(b) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.1.4 Reporting Requirements

A quarterly summary of the information to document compliance with Condition D.1.1(a) shall be submitted to the address listed in Section C - General Reporting Requirements, of the permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported.

All subsequent sections are renumbered.

Carpenter Company
Elkhart, Indiana
Permit Reviewer: SAR/MES

Page 8 of 10
Significant Permit Modification: 039-17958-00086

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF AIR QUALITY
 COMPLIANCE DATA SECTION**

Part 70 Quarterly Report

Source Name: Carpenter Company
Source Address: 195 County Road 15 South, Elkhart, Indiana 46516
Mailing Address: P.O. Box 2386, Elkhart, Indiana 46515
Part 70 Permit No.: T 039-6059-00086
Facility: Foam Pouring Line (EU-01A/B)
Parameter: VOC Emission Rate
Limit: 38.6 tons per twelve (12) consecutive month period, with compliance determined at the end of each month based on the following equation:

$$\text{VOC Emissions (tons/year)} = (\text{Catalyst Usage (tons/year)} \times \text{Flash Off (\%)}) + (\text{TDI Usage (tons/year)} \times \text{Flash Off (\%)})$$

YEAR: _____

Month	VOC Emissions (tons)	VOC Emissions (tons)	VOC Emissions (tons)
	This Month	Previous 11 Months	12 Month Total

- 9 No deviation occurred in this quarter.
- 9 Deviation/s occurred in this quarter.
 Deviation has been reported on: _____

Submitted by: _____

Title / Position: _____

Signature: _____

Date: _____

Phone: _____

Attach a signed certification to complete this report.

Conclusion

The source shall be subject to the conditions of the attached proposed Part 70 Significant Permit Modification No. 039-17958-00086.

BACT Cost Analysis

Facility Name: Carpenter Company
 Location: Elkhart, Indiana
 Permit No.: SPM 039-17958-00086
 Permit Reviewer: SAR/MES

Capital Cost (\$)

Option	Base Price	Direct Cost	Indirect Cost	Total
Catalytic Incinerator	5,118,073	1,555,894	1,586,603	8,260,570
Chemical Scrubbers	2,270,845	247,724	252,613	2,771,182
RTO Incineration	2,112,616	672,235	654,911	3,409,762
Zeolite Concentrator with Oxidizer	6,171,000	1,875,984	1,913,010	9,959,994

Annual Operating, Maintenance & Recovery Cost (\$)

Option	Direct Cost	Indirect Cost	Capital Recovery Cost	Total
Catalytic Incinerator	9,065,436	360,978	1,252,794	10,679,208
Chemical Scrubbers	834,943	-	389,825	1,224,768
RTO Incineration	3,742,244	17,430	20,492	3,780,167
Zeolite Concentrator with Oxidizer	913,926	-	1,620,943	2,534,869

Evaluation

Option	Potential Emissions (tons/yr)	Emissions Removed (tons/yr)	Control Efficiency (%)	\$/ton removed
Catalytic Incinerator	38.6	32.8	85.0	325,586
Chemical Scrubbers	38.6	34.7	90.0	35,296
RTO Incineration	38.6	36.7	95.0	103,002
Zeolite Concentrator with Oxidizer	38.6	34.7	90.0	73,051

Methodology:

Emissions removed = (potential emissions)*(control efficiency)
\$/ton removed = total annual cost/emissions removed

The cost breakdown is as follows:

1. Capital Cost

- a) Base price: purchase price, auxiliary equipment, instruments, controls, taxes and freight.
- b) Direct installation cost: foundations/supports, erection/handling, electrical, piping, insulation, painting, site preparation and building/facility.
- c) Indirect installation cost: engineering, supervision, construction/filed expenses, construction fee, start up, performance test, model study and contingencies.

2. Annual Cost

- a) Direct operating cost: operating labor (operator, supervisor), labor and material maintenance, operating materials, utilities (electricity, gas).
- b) Indirect operating cost: overhead, property tax, insurance, administration and capital recovery cost (for 10 yrs life of the system at 10% interest rate).