

**CONSTRUCTION PERMIT  
OFFICE OF AIR MANAGEMENT**

**Carpenter Company  
195 County Road 15 South  
Elkhart, Indiana 46515**

is hereby authorized to construct a polyurethane foam production operation, consisting of the following equipment:

- (a) Two (2) closed mold polyurethane foam turnstile production operation identified as EU-5.1 and EU-5.2, with total of two (2) robotic high volume low pressure (HVLV) spray application, with maximum capacity of 37.0 lbs. release agent per hour, 808.30 pounds of Isocyanates and 1,550 pounds of polyols per hour, exhausting at vents identified as V-34 and V-35.
- (b) One(1) fixed roof above ground storage tank identified as MLD-1, for storage of Isocyanates, has the diameter, height and annual throughput as: 10 feet, 14 feet and 131,549 gallons per year respectively.
- (c) One (1) fixed roof above ground storage tank identified as MLD-2, for storage of Polyols-soft, has the diameter, height and annual throughput as: 10 feet, 14 feet, and 323,546 gallons per year respectively.
- (d) One (1) fixed roof above ground storage tank identified as MLD-3, for storage of Polyols-hard, has the diameter, height and annual throughput as: 10 feet, 14 feet, and 310,408 gallons per year respectively.

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-1 and 40 CFR 52.780, with conditions listed on the attached pages.

Construction Permit No.: CP-039-9044-00086	
Issued by:  Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date:

## Construction Conditions

### General Construction Conditions

1. That the data and information supplied with the application shall be considered part of this permit. Prior to any proposed change in construction which may affect allowable emissions, the change must be approved by the Office of Air Management (OAM).
2. That this permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

### Effective Date of the Permit

3. That pursuant to IC 13-15-5-3, this permit becomes effective upon its issuance.
4. That pursuant to 326 IAC 2-1-9(b)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.
5. That notwithstanding Construction Condition No. 6, all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).

### First Time Operation Permit

6. That this document shall also become a first-time operation permit pursuant to 326 IAC 2-1-4 (Operating Permits) when, prior to start of operation, the following requirements are met:
  - (a) The attached affidavit of construction shall be submitted to the Office of Air Management (OAM), Permit Administration & Development Section, verifying that the facilities were constructed as proposed in the application. The facilities covered in the Construction Permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM.
  - (b) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.
  - (c) Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.
  - (d) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-7-19 (Fees).
  - (e) The Permittee has submitted their Part 70 permit (T039-6059-00086) on June 4, 1996, for the existing source. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 application.

### Phase Construction Time Frame

6a. That pursuant to 326 IAC 2-1-9(b)(Revocation of Permits), the IDEM may revoke this permit to construct if the:

- (a) Construction of polyurethane foam turnstile production has not begun within eighteen (18) months from the effective date of this permit or if during the construction of polyurethane foam turnstile production, work is suspended for a continuous period of one (1) year or more.

The OAM may extend such time upon satisfactory showing that an extension, formally requested by the Permittee is justified.

7. That when the facility is constructed and placed into operation the following operation conditions shall be met:

### **Operation Conditions**

#### General Operation Conditions

1. That the data and information supplied in the application shall be considered part of this permit. Prior to any change in the operation which may result in an increase in allowable emissions exceeding those specified in 326 IAC 2-1-1 (Construction and Operating Permit Requirements), the change must be approved by the Office of Air Management (OAM).
2. That the Permittee shall comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder.

#### Preventive Maintenance Plan

3. That pursuant to 326 IAC 1-6-3 (Preventive Maintenance Plans), the Permittee shall prepare and maintain a preventive maintenance plan, including the following information:
  - (a) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices.
  - (b) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions.
  - (c) Identification of the replacement parts which will be maintained in inventory for quick replacement.

The preventive maintenance plan shall be submitted to IDEM, OAM upon request and shall be subject to review and approval.

#### Transfer of Permit

4. That pursuant to 326 IAC 2-1-6 (Transfer of Permits):
  - (a) In the event that ownership of this polyurethane foam production operation is changed, the Permittee shall notify OAM, Permit Branch, within thirty (30) days of the change. Notification shall include the date or proposed date of said change.

- (b) The written notification shall be sufficient to transfer the permit from the current owner to the new owner.
- (c) The OAM shall reserve the right to issue a new permit.

Permit Revocation

5. That pursuant to 326 IAC 2-1-9(a)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this permit.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.
- (d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.
- (e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of 326 IAC 2-1 (Permit Review Rules).

Availability of Permit

6. That pursuant to 326 IAC 2-1-3(l), the Permittee shall maintain the applicable permit on the premises of this source and shall make this permit available for inspection by the IDEM or other public official having jurisdiction.

Malfunction Condition

7. That pursuant to 326 IAC 1-6-2 (Records; Notice of Malfunction):

- (a) A record of all malfunctions, including startups or shutdowns of any facility or emission control equipment, which result in violations of applicable air pollution control regulations or applicable emission limitations shall be kept and retained for a period of three (3) years and shall be made available to the Indiana Department of Environmental Management (IDEM), Office of Air Management (OAM) or appointed representative upon request.
- (b) When a malfunction of any facility or emission control equipment occurs which lasts more than one (1) hour, said condition shall be reported to OAM, using the Malfunction Report Forms (2 pages). Notification shall be made by telephone or facsimile, as soon as practicable, but in no event later than four (4) daytime business hours after the beginning of said occurrence.
- (c) Failure to report a malfunction of any emission control equipment shall constitute a violation of 326 IAC 1-6, and any other applicable rules. Information of the scope and expected duration of the malfunction shall be provided, including the items specified in 326 IAC 1-6-2(a)(1) through (6).

- (d) Malfunction is defined as any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. [326 IAC 1-2-39]

Annual Emission Reporting

8. That pursuant to 326 IAC 2-6 (Emission Reporting), the Permittee must annually submit an emission statement for the source. This statement must be received by April 15 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. The annual statement must be submitted to:

Indiana Department of Environmental Management  
Technical Support & Modeling Section, Office of Air Management  
100 North Senate Avenue, P. O. Box 6015  
Indianapolis, Indiana 46206-6015

The annual emission statement covers the twelve (12) consecutive month time period starting December 1 and ending November 30.

Opacity Limitations

9. That pursuant to 326 IAC 5-1-2 (Visible Emission Limitations) except as provided in 326 IAC 5-1-3 (Temporary Exemptions), the visible emissions shall meet the following:
- (a) visible emissions shall not exceed an average of 40% opacity in 24 consecutive readings.
- (b) visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

Fugitive Dust Emissions

10. That pursuant to 326 IAC 6-4 (Fugitive Dust Emissions), the Permittee shall be in violation of 326 IAC 6-4 (Fugitive Dust Emissions) if any of the criteria specified in 326 IAC 6-4-2(1) through (4) are violated. Observations of visible emissions crossing the property line of the source at or near ground level must be made by a qualified representative of IDEM. [326 IAC 6-4-5(c)].

Process Operations

11. That pursuant to 326 IAC 6-3-2 (Process Operations):  
Two (2) closed mold polyurethane foam turnstile production operations identified as EU-5.1 and EU-5.2 shall comply with 326 IAC 6-3-2(c) using the following equation:

$$E = 4.10P^{0.67} \quad \text{where: } E = \text{rate of emission in pounds per hour,}$$

P = process weight in tons per hour, if  
P is equal to or less than 60,000 lbs./hr (30 tons/hr)

BACT Condition

12. That pursuant to 326 IAC 8-1-6 (New Facilities, General Reduction Requirements),
- (a) The high volume low pressure (HVLP) spray application shall be used all the time when two (2) closed mold polyurethane turnstile production units identified as EU-5.1 and EU -5.2 are in operation.

High volume low pressure (HVLP) spray means technology used to apply coating to a substrate by means of coating application equipment which operates between one-tenth (0.1) and ten (10) pounds per square inch gauge (psig) air pressure measured dynamically at the center of the air cap and at the air horns of the spray system.

- (b) The volatile organic compounds (VOC) delivered to the mold release compound shall not exceed 2.71 tons per month from each of the two (2) closed mold polyurethane turnstile production units identified as EU-5.1 and EU-5.2 . This is equivalent to 7% solid content by weight in the mold release compound, based on the 0.003 gallon of the mold release use per unit.

Any change or modification in which may increase the potential VOC emissions from the two (2) closed mold polyurethane turnstile production operation identified as EU-5.1 and EU-5.2 in this BACT analysis shall be approved by the Office of Air Management (OAM).

Reporting Requirements

13. That a log of information necessary to document compliance with operation permit condition no. 12(b) shall be maintained. These records shall be kept for at least the past 36 month period and made available upon request to the Office of Air Management (OAM).

Open Burning

14. That the Permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6. The previous sentence notwithstanding, Permittee may open burn in accordance with an open burning approval issued by the Commissioner under 326 IAC 4-1-4.1.

**MALFUNCTION REPORT**

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF AIR MANAGEMENT  
FAX NUMBER - 317 233-5967**

**This form should only be used to report malfunctions applicable to Rule 326 IAC 1-6  
and to qualify for the exemption under 326 IAC 1-6-4.**

THIS FACILITY MEETS THE APPLICABILITY REQUIREMENTS BECAUSE: IT HAS POTENTIAL TO EMIT 25 LBS/HR PARTICULATES ?\_\_\_\_, 100 LBS/HR VOC ?\_\_\_\_, 100 LBS/HR SULFUR DIOXIDE ?\_\_\_\_ OR 2000 LBS/HR OF ANY OTHER POLLUTANT ?\_\_\_\_ EMISSIONS FROM MALFUNCTIONING CONTROL EQUIPMENT OR PROCESS EQUIPMENT CAUSED EMISSIONS IN EXCESS OF APPLICABLE LIMITATION \_\_\_\_\_.

THIS MALFUNCTION RESULTED IN A VIOLATION OF: 326 IAC \_\_\_\_\_ OR, PERMIT CONDITION # \_\_\_\_\_ AND/OR PERMIT LIMIT OF \_\_\_\_\_

THIS INCIDENT MEETS THE DEFINITION OF 'MALFUNCTION' AS LISTED ON REVERSE SIDE ?    Y        N

THIS MALFUNCTION IS OR WILL BE LONGER THAN THE ONE (1) HOUR REPORTING REQUIREMENT ?    Y        N

COMPANY:Carpenter Company PHONE NO. ( 219 ) 522 - 2800

LOCATION: (CITY AND COUNTY) Elkhart, County

PERMIT NO. 039-9044AFS PLANT ID:039-00086AFS POINT ID: \_\_\_\_\_ INSP: Greg Wingstrom  
CONTROL/PROCESS DEVICE WHICH MALFUNCTIONED AND REASON: \_\_\_\_\_

DATE/TIME MALFUNCTION STARTED: \_\_\_\_/\_\_\_\_/ 19\_\_\_\_    AM / PM

ESTIMATED HOURS OF OPERATION WITH MALFUNCTION CONDITION: \_\_\_\_\_

DATE/TIME CONTROL EQUIPMENT BACK-IN SERVICE \_\_\_\_/\_\_\_\_/ 19\_\_\_\_    \_\_\_\_\_ AM/PM

TYPE OF POLLUTANTS EMITTED: TSP, PM-10, SO2, VOC, OTHER: \_\_\_\_\_

ESTIMATED AMOUNT OF POLLUTANT EMITTED DURING MALFUNCTION: \_\_\_\_\_

MEASURES TAKEN TO MINIMIZE EMISSIONS: \_\_\_\_\_

REASONS WHY FACILITY CANNOT BE SHUTDOWN DURING REPAIRS:

CONTINUED OPERATION REQUIRED TO PROVIDE ESSENTIAL\* SERVICES: \_\_\_\_\_

CONTINUED OPERATION NECESSARY TO PREVENT INJURY TO PERSONS: \_\_\_\_\_

CONTINUED OPERATION NECESSARY TO PREVENT SEVERE DAMAGE TO EQUIPMENT: \_\_\_\_\_

INTERIM CONTROL MEASURES: (IF APPLICABLE) \_\_\_\_\_

MALFUNCTION REPORTED BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

(SIGNATURE IF FAXED)

MALFUNCTION RECORDED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

REV 3/96FAX NUMBER - 317 233-5967\*SEE REVERSE

PAGE 1 OF 2

**Please note - This form should only be used to report malfunctions  
applicable to Rule 326 IAC 1-6 and to qualify for  
the exemption under 326 IAC 1-6-4.**

**326 IAC 1-6-1                    Applicability of rule**

Sec. 1. The requirements of this rule (326 IAC 1-6) shall apply to the owner or operator of any facility which has the potential to emit twenty-five (25) pounds per hour of particulates, one hundred (100) pounds per hour of volatile organic compounds or SO<sub>2</sub>, or two thousand (2,000) pounds per hour of any other pollutant; or to the owner or operator of any facility with emission control equipment which suffers a malfunction that causes emissions in excess of the applicable limitation.

**326 IAC 1-2-39                    “Malfunction” definition**

Sec. 39.                    Any sudden, unavoidable failure of any air pollution control equipment, process, or combustion or process equipment to operate in a normal and usual manner. (Air Pollution Control Board; 326 IAC 1-2-39; filed Mar 10, 1988, 1:20 p.m. : 11 IR 2373)

**\*Essential services** are interpreted to mean those operations, such as, the providing of electricity by power plants. Continued operation solely for the economic benefit of the owner or operator shall not be sufficient reason why a facility cannot be shutdown during a control equipment shutdown.

If this item is checked on the front, please explain rationale:

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## Indiana Department of Environmental Management Office of Air Management

### Technical Support Document (TSD) for New Construction and Operation

#### Source Background and Description

Source Name: Carpenter Company  
 Source Location: 195 County Road 15 South, Elkhart, Indiana 46515  
 County: Elkhart  
 Construction Permit No.: CP-039-9044-00086  
 SIC Code: 3086  
 Permit Reviewer: Manoj P. Patel

The Office of Air Management (OAM) has reviewed an application from Carpenter Company relating to the construction and operation of polyurethane foam production, consisting of the following equipment:

- (a) Two (2) closed mold polyurethane foam turnstile production operation identified as EU-5.1 and EU-5.2, with total of two (2) robotic high volume low pressure (HVLP) spray application, with maximum capacity of 37.0 lbs release agent per hour, 808.30 pounds of Isocyanates and 1,550 pounds of polyols per hour, exhausting at vents identified as V-34 and V-35.
- (b) One(1) fixed roof above ground storage tank identified as MLD-1, for storage of Isocyanates, has the diameter, height and annual throughput as: 10 feet, 14 feet and 131,549 gallons per year respectively.
- (c) One (1) fixed roof above ground storage tank identified as MLD-2, for storage of Polyols-soft, has the diameter, height and annual throughput as: 10 feet, 14 feet, and 323,546 gallons per year respectively.
- (d) One (1) fixed roof above ground storage tank identified as MLD-3, for storage of Polyols-hard, has the diameter, height and annual throughput as: 10 feet, 14 feet, and 310,408 gallons per year respectively.

#### Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
Vent 34	EU-5.1	26	3.17	25,000	ambient
Vent 35	EU-5.2	26	3.17	25,000	ambient

#### Enforcement Issue

There is no enforcement issue pending with the source.

#### Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Information, unless otherwise stated, 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 October 8, 1997, with additional information received on December 18, 1997.

### Emissions Calculations

(B) Closed Mold Polyurethane Process: (EU-5.1 and EU-5.2)

See Appendix A of TSD for detailed VOC emissions calculations from EU- 5.1 and EU-5.2.

This process emits small amounts of toluene diisocyanate (TDI), 4-4, Methylenediphenyl Diisocyanate (MDI) and Diethanolamine (DEOA), which are hazardous air pollutants (HAPs). Similar rates for MDI, TDI and DEOA are calculated using the "MDI / Polymeric MDI Reporting Guidelines For the Polyurethane Industry: for Section 313 of EPCRA and State Reporting (Completing EPA's From R)."

Toluene Diisocyanate (TDI):

Polyurethane foam industry TDI emission factor at 50 lb. TDI / 1,000,000 lbs.

$$\begin{aligned} \text{Potential Emissions} &= \text{wt. \% HAP} \times \text{gal /unit} \times \text{unit/ hr} \times \text{e.f.} \times 8760 \text{ hrs./year} \times \text{ton/2000} \\ \text{in tons per year} &= 0.81 \times 10.16 \times 0.121 \times 480 \times 5.0 \times 10^{-5} \times 8760 \times 1/2000 \\ &= 0.010 \text{ ton / year} \end{aligned}$$

4-4 Methylenediphenyl Diisocyanate (MDI):

MDI emissions are calculated as follows:

$$\begin{aligned} \text{Saturated Vapor Pressure (SVC)}_{\text{ppm}} &= \frac{(\text{MDI VP (MM Hg. )} \times 10^6)}{\text{Barometric Pressure (mm Hg. )}} \\ &= \frac{1.4 \times 10^{-3} \times 10^6 \text{ mm Hg.}}{760 \text{ mm Hg.}} \\ &= 1.84 \text{ ppm} \\ \text{Saturated Vapor Pressure (SVC)}_{\text{lbs/ft}^3} &= 1.84 \text{ ppm} \times (10.2 \text{ mg/M}^3 \text{ MDI/1 ppm}) \times \\ &= (2.2 \text{ lb./1} \times 10^6 \text{ mg}) \times (1 \text{ M}^3 / 35.31 \text{ ft}^3) \\ &= 1.2 \times 10^{-6} \text{ lbs/ft}^3 \\ \text{Total Volume of mold in ft}^3 &= \text{no.of mold} \times \text{mold volume} \\ &= 2 \times (2 \text{ ft}^3) \\ &= 4 \text{ ft}^3 / \text{mold} \\ \text{Total MDI released per mold frequency} &= (1.2 \times 10^{-6} \text{ lbs/ft}^3) \times (4 \text{ ft}^3) \end{aligned}$$

$$\begin{aligned}
 &= 4.80 \times 10^{-6} \text{ lbs. / mold} \\
 \text{Total MDI released per year} &= 4.80 \times 10^{-6} \text{ lbs. / mold} \times \text{mold} / 8.13 \text{ min} \times \\
 &60 \text{ min/hr} \times 24 \text{ hr/ day} \times 365 \text{ days/year} \times \\
 &1 \text{ ton/2000 lbs.} \\
 &= 1 \times 10^{-3} \text{ Tons per year}
 \end{aligned}$$

Diethanolamine (DEOA):

$$\begin{aligned}
 \text{DEOA potential emissions} &= 0.87 \times 9.0 \times 0.006 \times 480 \times 1.0 \text{ E}^{-5} \times 4.38 \\
 &= 9.9 \text{ E}^{-4} \text{ ton/year}
 \end{aligned}$$

(b) Storage Tank Emissions:

Storage tanks emissions were calculated using the TANKS 3.0 programs. This calculation was based on the worst case assumption. The emissions are summarized as follows:

Tank Identification	Total Loses in lb.
MLD-1	13.40
MLD-2	157.00
MLD-3	157.00
Total Emissions in tons per year	0.160

**Total Potential and Allowable Emissions**

Indiana Permit Allowable Emissions Definition (after compliance with applicable rules, based on 8,760 hours of operation per year at rated capacity):

Pollutant	Allowable Emissions (tons/year)	Potential Emissions (tons/year)
Particulate Matter (PM)	20.30	0.32
Particulate Matter (PM10)	20.30	0.32
Sulfur Dioxide (SO <sub>2</sub> )	0.0	0.0
Volatile Organic Compounds (VOC)	161**	161
Carbon Monoxide (CO)	0.0	0.0
Nitrogen Oxides (NO <sub>x</sub> )	0.0	0.0
Single Hazardous Air Pollutant (HAP)	0.01	0.01
Combination of HAPs	0.011	0.011

(a) Allowable emissions of PM are determined from the applicability of rule 326 IAC 6-3.

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour; and} \\
 P = \text{process weight rate in tons per hour}$$

Closed Mold Polyurethane Process:(P = 1.20 ton/hr)

$$\begin{aligned} E &= 4.10 P^{0.67} \\ &= 4.10 (1.2)^{0.67} \\ &= 4.63 \text{ lb/hr} \\ &= 20.30 \text{ tons/year} \end{aligned}$$

- (b) The potential VOC emissions before control are less than the allowable emissions, therefore, the potential VOC emissions before control are used for the permitting determination.
- (c) Allowable emissions (as defined in the Indiana Rule) of volatile organic compounds (VOC) are greater than 25 tons per year\*\* prior to consideration of the case-by-case control technology requirements of 326 IAC 8-1-6. Therefore, pursuant to 326 IAC 2-1, Sections 1 and 3, a construction permit is required.

### County Attainment Status

- (a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Elkhart County has been designated as attainment or unclassifiable for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Elkhart County has been classified as attainment or unclassifiable for other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

### Source Status

Existing Source PSD, Part 70 or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (ton/yr)
PM	0.22
PM10	0.22
SO <sub>2</sub>	0.04
VOC	18.40
CO	2.15
NO <sub>x</sub>	9.20

- (a) This existing source is **not** a major stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or more, and it is not in one of the 28 listed source categories.

### Proposed Modification

PTE from the proposed modification (based on 8,760 hours of operation per year at rated capacity

including enforceable emission control and enforceable permit condition, where applicable):

Pollutant	PM (ton/yr)	PM10 (ton/yr)	SO <sub>2</sub> (ton/yr)	VOC (ton/yr)	CO (ton/yr)	NO <sub>x</sub> (ton/yr)
Proposed Modification	0.32	0.32	0.0	8.0	0.0	0.0
PSD Threshold Level	250	250	250	250	250	250

This modification to an existing minor stationary source is not major because the emission increase is less than the PSD significant levels. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

### Part 70 Permit Determination

#### 326 IAC 2-7 (Part 70 Permit Program)

This existing source has submitted their Part 70 (T-039-6059-00086) application on June 4, 1996. The equipment being reviewed under this permit shall be incorporated in the submitted Part 70 application.

### Federal Rule Applicability

There are no National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 63 applicable to this facility.

40 CFR Part 60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels The volatile organic liquid storage tanks identified as MLD-1, MLD-2 and MLD-3 are not applicable to the New Source Performance Standard, 326 IAC 12, (40 CFR Part 60.110, Subpart Kb), because each tank has the volume of 31.20 cubic meters which is less than the applicability level of 40 cubic meters.

### State Rule Applicability

#### 326 IAC 2-1-3.4 (New Source Toxics Control)

This rule does not apply to two(2) closed mold polyurethane foam production facilities, because it does not have potential to emit ten (10) tons per year or more of any hazardous air pollutant or twenty-five (25) tons of any combination of hazardous air pollutants which are listed in Section 112(b) of the Clean Air Act.

#### 326 IAC 2-6 (Emission Reporting)

This facility is subject to 326 IAC 2-6 (Emission Reporting), because the source has potential to emit volatile organic compounds (VOC) into ambient air at levels equals to or greater than ten (10) tons/yr in Elkhart county. Pursuant to this rule, the owner/operator of this facility must annually submit an emission statement of the facility. The annual statement must be received by April 15 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

#### 326 IAC 6-3 Particulate Emissions Limitation

This source is subject to this rule which mandates an allowable particulate matter (PM) emissions using the following equation:

$$E = 4.10 P^{0.67}$$

Where: E = PM allowable emissions in pound per hour  
P = Process weight rate in ton / hr

Closed Mold Polyurethane Process:(P = 1.20 ton/hr)

$$\begin{aligned} E &= 4.10 P^{0.67} \\ &= 4.10 (1.2)^{0.67} \\ &= 4.63 \text{ lb./hr} \\ &= 20.30 \text{ tons/year} \end{aligned}$$

Based on this calculation, the potential emissions are less than the allowable emissions, therefore, this closed mold polyurethane processes complies with the rule.

### 326 IAC 5-1-2 Opacity Limitation

That pursuant to 326 IAC 5-1-2 (Visible Emission Limitations) except as provided in 326 IAC 5-1-3 (Temporary Exemptions), the visible emissions shall meet the following:

- (a) visible emissions shall not exceed an average of 40% opacity in 24 consecutive readings.
- (b) visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

### 326 IAC 8-4-3 Petroleum Sources: petroleum liquid storage facilities

The storage tanks identified as MLD-1, MLD-2 and MLD-3 are not subject to this rule, because the storage tanks does not store any petroleum liquid and have capacities less than 39,000 gallons and true vapor pressure less than 10.5 kPa.

### 326 IAC 8-6-1 Organic Solvent Emission Limitations

This rule does not apply to this source, because this source commenced operation after the applicability of this rule.

### 326 IAC 8-1-6 General Reduction Requirements for New Facilities

The closed mold polyurethane processes identified as EU-5.1 and EU-5.2 are subject to this rule, because new facilities (as of January 1, 1980), which have potential emissions of 25 tons or more per year, located anywhere in the state, which are not otherwise regulated by other provisions of 326 IAC 8, shall reduce VOC emissions using the best available control technology (BACT).

#### Best Available Control Technology (BACT) for VOC:

Best Available Control Technology (BACT) analysis for the carousel style polyurethane foam reaction injection mold (RIM) process identified as EU-5.1 and EU-5.2, submitted by Bruce Carter Associates, L.L.C., a consultant for Carpenter Company, was conducted in accordance with the "Top Down BACT Guidance from U.S. EPA".

This analysis evaluated the feasibility of using the following: solvent / material substitution, nonphotochemically reactive solvents, transfer efficiency of spray equipment and add-on controls.

### **Solvent / Material Substitution:**

- (1) Waterborne Coatings - These are sometimes used to reduce the VOC emissions from open mold surface coating operations. Release agents are formulated with water replacing some of the volatile organic compounds. The parting agents are reformulated to allow the water to become a carrier in the process, and is evaporated during the application and foam expansion process. Water born carries increase the dry time in a RIM process due to slower evaporation rate. Unsuccessful mold release cause defective foam products. The replacement of hydrocarbon naphtha with water is not technologically feasible in a RIM carousel and, is **not** an options at this time.
- (2) Nonphotochemically Reactive Solvents - The use of nonphotochemically reactive solvents as a replacement of release agents in the RIM process, is **not** feasible because they are not commercially available.
- (3) Transfer Efficiency - The company will use robotic high velocity low pressure (HVLP) spray equipment for the mold release application. The transfer efficiency of HVLP spray equipment is estimated to be 80%. The transfer efficiency of the part A and part B components in the closed mold process estimated to be at 100%.

### **Add-On Controls:**

- (1) Adsorption

Adsorption systems operate by providing a large surface area on which the air pollutant can adhere. Carbon is commonly used as the adsorptive solid. Due to its internal pore structure, activated carbon has a significant surface area, giving it a large adsorption capacity. In most cases, it's more economical to regenerate the carbon at the source by stripping to an afterburner. This concentration/incineration method is the most economical approach. **Carbon adsorption system is technically feasible**, therefore further analysis of carbon adsorption with an onsite incineration will be performed.

- (2) Recuperative Thermal Oxidizer

This technology recovers up to 70% of the heat of combustion using a gas-to-gas heat exchanger, and is recommended for emission streams contains a minimum of 20 ppm of combustible VOC but less than 25% of the lower explosive limit (LEL) of the pollutant. **This option is technically feasible**, therefore, further analysis will be made on this control option.

- (3) Regenerative Thermal Oxidizer

This system recovers up to 95 percent of the heat generated during the oxidation process. This technology is similar in concept to the recuperative thermal Incineration, where both use high temperatures to destroy VOC. It is suitable for the same inlet streams as the recuperative thermal incinerator. The difference is the method of preheating the pollutant stream before the combustion chamber. Instead of the air-to-air heat exchanger used in the recuperative system, regenerative installations have two or more heat recovery chambers. **This option is technically feasible**.

- (4) Regenerative Catalytic Incinerator

This technology uses the same method of heat recovery as the regenerative thermal incinerator. The pollutant stream passes through a heat exchanger chamber for preheating by the silica gravel. The pollutant stream passes through a heat recovery chamber for preheating by the silica gravel and into the combustion chamber. After destruction, the high temperature exhaust from the combustion chamber flows through a second heat recovery chamber, heating the silica there. Then the flow reverse and the second chamber becomes the preheater while the first reheats. This option is **not** feasible at this point.

(5) Concentrator Treatment Systems

This system concentrates the VOC in an emission stream and then uses a lower volume of hot air to desorb the pollutant from the bed with a small volume of hot air. This small concentrated air stream is then incinerated. The carbon concentrator treatment systems have been effective on other broad range of the hydrocarbons. Zeolite, an inorganic compound consisting mainly of hydrated aluminosilicates, has a large internal pore structure giving it the large surface area necessary for adsorption systems. The concentrator works similarly to a carbon concentrator and withstands temperatures up to 1,800 degrees Fahrenheit, which is hot enough to burn off any hydrocarbon. **Zeolite and carbon concentrator treatment systems are technically feasible, and therefore, will be further evaluated.**

Environmental Impacts:

The following table summarized the environmental impacts of the options that were determined to be technically feasible.

Control	Energy Impacts		NOx Emission rate (#/hr)	Total Operation (hrs./year)	NOx Emission Rate (Tons/year)
	Electricity (KWH/hr)	Natural Gas (MMBtu/hr)			
Regenerative Thermal Oxidization	201.42	5.0	0.48	8,760	2.10
Recuperative Thermal Oxidization	201.42	6.80	0.64	8,760	2.83
Zeolite Concentrator with Oxidizer	46.25	0.98	0.10	8,760	0.405
Carbon Concentrator with Oxidizer	81.0	0.54	.052	8,760	0.23

**BACT Cost Analysis**

The following tables summarized the options that were determined to be technically feasible.

Capital Cost

Option	Base Price	Direct Cost	Indirect Cost	Total
Regenerative Thermal Oxidizer	\$700,000	\$350,500	\$0	\$1,050,500
Recuperative Thermal Oxidizer	\$700,000	\$350,500	\$0	\$1,050,000
Carbon Concentrator w/ Oxidizer	\$724,000	\$136,500	\$15,000	\$876,000
Zeolite Concentrator w/ Oxidizer	\$724,500	\$136,500	\$ 15,000	\$1,100,000

Annual Operating, Maintenance & Recovery Cost

Option	Direct Cost	Indirect Cost	Capital Recovery Cost	Total
Regenerative Thermal Oxidizer	\$295,020	\$ 0	\$170,964	\$ 465,984
Recuperative Thermal Oxidizer	\$ 348,519	\$ 0	\$ 170,964	\$ 519,483
Carbon Concentrator w/ Oxidizer	\$ 75,404	\$ 0	\$ 146,565	\$ 221,969
Zeolite Concentrator w/ Oxidizer	\$ 63,382	\$ 0	\$ 179,101	\$ 242, 483

Evaluation

Option	Potential Emissions (tons/yr)	Emissions Removed (tons/yr)	Control Efficiency (%)	\$/ton removed
Regenerative Thermal Oxidizer	161.0	157.40	98%	\$ 2961
Recuperative Thermal Oxidizer	161.0	157.40	98%	\$ 3300
Carbon Concentrator w/ Oxidizer	161.0	153.0	95%	\$ 1450
Zeolite Concentrator w/ Oxidizer	161.0	155.50	96.4%	\$ 1562

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.

### VOC BACT Conclusion:

OAM has reviewed the confidential profit margins analysis, cost of the project along with the cost of the control equipment and OAM believes that the cost effectiveness provided by the applicant is reasonable. OAM has also considered that the source is in Elkhart county, which is an ozone maintenance area. **OAM has determined that the carbon, zeolite, or other concentrator with the oxidizer shall be Best Available Control Technology from the two (2) closed mold polyurethane foam turnstile production operations identified as EU-5.1 and EU-5.2.**

### Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 187 hazardous air pollutants set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Construction Permit Application Form Y.

- (a) This polyurethane closed mold foam production units will emit levels of air toxics less than those which constitute a major source according to Section 112 of the 1990 Amendments to Clean Air Act.
- (b) See attached table for detailed air toxic calculations as follows:

HAP Component	Emissions in tons per year
Toluene Diisocyanate (TDI)	0.010
4-4 Methylenediphenyl Diisocyanate (MDI)	$1 \times 10^{-3}$
Diethanolamine (DEOA)	$9.9 \times 10^{-4}$

### Conclusion

The construction of this polyurethane foam production will be subject to the conditions of the attached proposed **Construction Permit No. CP-039-9044-00086.**

Appendix C: Emissions Calculations (BACT)

VOC and Particulate

From Polyurethane Foam Operations

(double % solid content, reducing half in release agent usage)

Company Name: Carpenter Company  
 Address City IN Zip: 195 County Road 15 South, Elkhart, Indiana 46515  
 CP: 039-9044  
 PIt ID: 039-00086  
 Reviewer: Manoj P. Patel  
 Date: December 4, 1997

Material	Density (Lb/Gal)	Weight % Volatile (H2O& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Flash OFF %	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	Ib VOC /gal solids	Transfer Efficiency
Release Agent RCT - B1208	6.4	96.50%	0.0%	96.5%	0.0%	7.00%	0.00600	400.000	6.20	6.20	100.000%	14.87	356.85	65.12	0.47	88.50	80%
<b>PART A BLEND</b>																	
ISOCYANATE NPU 586203	10.0	0.00%	0.0%	0.0%	0.0%	0.00%	0.03100	400.000	0.00	0.00	0.00002%	0.00	0.00	0.00	0.00	0.00	100%
ISOCYANATE	10.16	0.00%	0.0%	0.0%	0.0%	0.00%	0.12100	400.000	0.00	0.00	0.0005%	0.00	0.00	0.00	0.00	0.00	100%
FIRE RETARDANT	12.7	0.01%	0.0%	0.0%	0.0%	0.00%	0.01100	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%
<b>PART B BLEND</b>																	
CARPOL GP 5015	8.50	0.05%	0.05%	0.0%	0.0%	0.00%	0.24900	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%
ARCOL E-519	8.83	0.04%	0.04%	0.0%	0.04%	28.00%	0.11300	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%
SURFACTANT	8.39	0.30%	0.0%	0.3%	2.7%	0.00%	0.00400	400.000	0.03	0.03	0%	0.00	0.00	0.00	0.00	0.00	100%
CROSS-LINKER	9.0	100.00%	15.5%	84.5%	16.7%	0.00%	0.00600	400.000	9.13	7.61	0.001%	0.00	0.00	0.001	0.00	0.00	100%
CATALYST	8.66	100.00%	0.0%	100.0%	0.0%	0.00%	0.00100	400.000	8.66	8.66	0%	0.00	0.00	0.00	0.00	0.00	100%
CATALYST	8.66	100.00%	2.7%	97.3%	2.8%	0.00%	0.00200	400.000	8.67	8.43	0%	0.00	0.00	0.00	0.00	0.00	100%
CATALYST	9.50	0.20%	0.2%	0.0%	0.2%	0.00%	0.00004	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%

State Potential Emissions

14.87 356.85 65.13 0.47

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) \* Weight % Organics) / (1-Volume % water)  
 Pounds of VOC per Gallon Coating = (Density (lb/gal) \* Weight % Organics)  
 Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr)  
 Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr) \* (24 hr/day)  
 Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr) \* (8760 hr/yr) \* (1 ton/2000 lbs)  
 Particulate Potential Tons per Year = (units/hour) \* (gal/unit) \* (lbs/gal) \* (1-Weight % Volatiles) \* (1-Transfer efficiency) \* (8760 hrs/yr) \* (1 ton/2000 lbs)  
 Pounds VOC per Gallon of Solids = (Density (lbs/gal) \* Weight % organics) / (Volume % solids)  
 Total = Worst Coating + Sum of all solvents used

**Appendix B: Emissions Calculations  
VOC and Particulate  
From Polyurethane Foam Operations  
(HVLP SPRAY GUN & CLOSED MOLD PROCESS)**  
**Company Name:** Carpenter Company  
**Address City IN Zip:** 195 County Road 15 South, Elkhart, Indiana 46515  
**CP:** 039-9044  
**Plt ID:** 039-00086  
**Reviewer:** Manoj P. Patel  
**Date:** December 4, 1997

Material	Density (Lb/Gal)	Weight % Volatile (H2O& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Flash OFF %	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	Ib VOC /gal solids	Transfer Efficiency
Release Agent RCT - B1208	6.4	96.50%	0.0%	96.5%	0.0%	5.00%	0.01200	400.000	6.20	6.20	100.000%	29.74	713.70	130.25	0.94	123.91	80%
<b>PART A BLEND</b>																	
ISOCYANATE NPU 586203	10.0	0.00%	0.0%	0.0%	0.0%	0.00%	0.03100	400.000	0.00	0.00	0.00002%	0.00	0.00	0.00	0.00	0.00	100%
ISOCYANATE	10.16	0.00%	0.0%	0.0%	0.0%	0.00%	0.12100	400.000	0.00	0.00	0.0005%	0.00	0.00	0.00	0.00	0.00	100%
FIRE RETARDANT	12.7	0.01%	0.0%	0.0%	0.0%	0.00%	0.01100	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%
<b>PART B BLEND</b>																	
CARPOL GP 5015	8.50	0.05%	0.05%	0.0%	0.0%	0.00%	0.24900	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%
ARCOL E-519	8.83	0.04%	0.04%	0.0%	0.04%	28.00%	0.11300	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%
SURFACTANT	8.39	0.30%	0.0%	0.3%	2.7%	0.00%	0.00400	400.000	0.03	0.03	0%	0.00	0.00	0.00	0.00	0.00	100%
CROSS-LINKER	9.0	100.00%	15.5%	84.5%	16.7%	0.00%	0.00600	400.000	9.13	7.61	0.001%	0.00	0.00	0.001	0.00	0.00	100%
CATALYST	8.66	100.00%	0.0%	100.0%	0.0%	0.00%	0.00100	400.000	8.66	8.66	0%	0.00	0.00	0.00	0.00	0.00	100%
CATALYST	8.66	100.00%	2.7%	97.3%	2.8%	0.00%	0.00200	400.000	8.67	8.43	0%	0.00	0.00	0.00	0.00	0.00	100%
CATALYST	9.50	0.20%	0.2%	0.0%	0.2%	0.00%	0.00004	400.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%

State Potential Emissions

**29.74      713.70      130.25      0.94**

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) \* Weight % Organics) / (1-Volume % water)  
Pounds of VOC per Gallon Coating = (Density (lb/gal) \* Weight % Organics)  
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr)  
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr) \* (24 hr/day)  
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr) \* (8760 hr/yr) \* (1 ton/2000 lbs)  
Particulate Potential Tons per Year = (units/hour) \* (gal/unit) \* (lbs/gal) \* (1-Weight % Volatiles) \* (1-Transfer efficiency) \* (8760 hrs/yr) \* (1 ton/2000 lbs)  
Pounds VOC per Gallon of Solids = (Density (lbs/gal) \* Weight % organics) / (Volume % solids)  
Total = Worst Coating + Sum of all solvents used

**Appendix A: Emissions Calculations  
VOC and Particulate  
From Polyurethane Foam Operations  
(HVLP SPRAY GUN & CLOSED MOLD PROCESS)**  
**Company Name:** Carpenter Company  
**Address City IN Zip:** 195 County Road 15 South, Elkhart, Indiana 46515  
**CP:** 039-9044  
**Plt ID:** 039-00086  
**Reviewer:** Manoj P. Patel  
**Date:** December 4, 1997

Material	Density (Lb/Gal)	Weight % Volatile (H2O& Organics)	Weight % Water	Weight % Organics	Volume % Water	Volume % Non-Vol (solids)	Gal of Mat (gal/unit)	Maximum (unit/hour)	Pounds VOC per gallon of coating less water	Pounds VOC per gallon of coating	Flash OFF %	Potential VOC pounds per hour	Potential VOC pounds per day	Potential VOC tons per year	Particulate Potential ton/yr	Ib VOC /gal solids	Transfer Efficiency	
Release Agent RCT - B1208	6.4	99.00%	0.0%	99.0%	0.0%	5.00%	0.01200	480.000	6.36	6.36	100.000%	36.61	878.63	160.35	0.32	127.12	80%	
<b>PART A BLEND</b>																		
ISOCYANATE NPU 586203	10.0	0.00%	0.0%	0.0%	0.0%	0.00%	0.03100	480.000	0.00	0.00	0.00002%	0.00	0.00	0.00	0.00	0.00	100%	
ISOCYANATE	10.16	0.00%	0.0%	0.0%	0.0%	0.00%	0.12100	480.000	0.00	0.00	0.0005%	0.00	0.00	0.00	0.00	0.00	100%	
FIRE RETARDANT	12.7	0.01%	0.0%	0.0%	0.0%	0.00%	0.01100	480.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%	
<b>PART B BLEND</b>																		
CARPOL GP 5015	8.50	0.05%	0.05%	0.0%	0.0%	0.00%	0.24900	480.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%	
ARCOL E-519	8.83	0.04%	0.04%	0.0%	0.04%	28.00%	0.11300	480.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%	
SURFACTANT	8.39	0.30%	0.0%	0.3%	2.7%	0.00%	0.00400	480.000	0.03	0.03	0%	0.00	0.00	0.00	0.00	0.00	100%	
CROSS-LINKER	9.0	100.00%	15.5%	84.5%	16.7%	0.00%	0.00600	480.000	9.13	7.61	0.001%	0.00	0.01	0.001	0.00	0.00	100%	
CATALYST	8.66	100.00%	0.0%	100.0%	0.0%	0.00%	0.00100	480.000	8.66	8.66	0%	0.00	0.00	0.00	0.00	0.00	100%	
CATALYST	8.66	100.00%	2.7%	97.3%	2.8%	0.00%	0.00200	480.000	8.67	8.43	0%	0.00	0.00	0.00	0.00	0.00	100%	
CATALYST	9.50	0.20%	0.2%	0.0%	0.2%	0.00%	0.00004	480.000	0.00	0.00	0%	0.00	0.00	0.00	0.00	0.00	100%	
<b>State Potential Emissions</b>												<b>36.61</b>	<b>878.63</b>	<b>160.35</b>	<b>0.32</b>			

METHODOLOGY

Pounds of VOC per Gallon Coating less Water = (Density (lb/gal) \* Weight % Organics) / (1-Volume % water)  
Pounds of VOC per Gallon Coating = (Density (lb/gal) \* Weight % Organics)  
Potential VOC Pounds per Hour = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr)  
Potential VOC Pounds per Day = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr) \* (24 hr/day)  
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) \* Gal of Material (gal/unit) \* Maximum (units/hr) \* (8760 hr/yr) \* (1 ton/2000 lbs)  
Particulate Potential Tons per Year = (units/hour) \* (gal/unit) \* (lbs/gal) \* (1-Weight % Volatiles) \* (1-Transfer efficiency) \* (8760 hrs/yr) \* (1 ton/2000 lbs)  
Pounds VOC per Gallon of Solids = (Density (lbs/gal) \* Weight % organics) / (Volume % solids)  
Total = Worst Coating + Sum of all solvents used

## Indiana Department of Environmental Management Office of Air Management

### Addendum to the Technical Support Document for New Construction and Operation

Source Name: Carpenter Company  
 Source Location: 195 County Road 15 South, Elkhart, Indiana 46515  
 County: Elkhart  
 Construction Permit No.: CP-039-9044-00086  
 SIC Code: 3086  
 Permit Reviewer: Manoj P. Patel

On January 2, 1998, the Office of Air Management (OAM) had a notice published in the Elkhart Truth, Elkhart, Indiana, stating that Carpenter Company had applied for a construction permit to construct and operate two (2) closed mold polyurethane foam turnstile production (ID#. EU-5.1 and 5.2) and three (3) fixed roof above ground storage tanks (ID#. MLD-1, 2 and 3). The notice also stated that OAM proposed to issue a permit for this installation and provided information on how the public could review the proposed permit 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 permit should be issued as proposed.

On January 2, 1998, Bruce Carter Associates, L.L.C., a consultant for Carpenter Company submitted comments on the proposed construction permit. The summary of the comments and corresponding responses is as follows:

#### **Comment 1:**

The company has revised the product cycle time from 5 minutes to 6 minutes to allow for better curing of the parts prior to removal from the molds. Due to the revised cycle time, the maximum capacity of each turntable foam production unit identified as EU-5.1 and EU-5.2 will be 200 parts per hour. The company proposes to reformulate the mold release RCT-B1208 solid content from 3.5% to 7% by weight. This will result in a decrease in potential VOC emissions from 181 tons per year to 65 tons per year. The ventilation system efficiency was re-estimated to be 65% for the capture of the fumes emitted when applying the mold release compounds. The revised cost effectiveness for add-on control ranges from a low of \$6,182 for a zeolite concentrator with oxidizer to a high of \$12,502 for a recuperative thermal oxidizer. Therefore, add-on controls are not economically feasible.

#### **Response to Comment 1:**

OAM will make the necessary change in the emission calculation. An appendix C is attached with the addendum to reflect these changes in the VOC emissions calculation. The OAM agrees that due to the changes in the material input and reduction in VOC emissions, the previously add-on controls as Best Available Control Technology (BACT) are not economically feasible. Therefore, the original proposed BACT as follows:

- ~~\_\_\_\_\_ BACT Condition~~
- ~~14. That pursuant to 326 IAC 8-1-6, carbon concentrator with thermal oxidizer shall be used at all times that the two (2) closed mold polyurethane foam turnstile production units identified as EU-5.1 and EU-5.2 are operated. When operating, the thermal oxidizer shall maintain at a minimum burner operating temperature and fan amperages as determined from the compliance test described in operation condition 7 to achieve~~
- ~~\_\_\_\_\_ a. capture efficiency of 100%~~

~~b. destruction efficiency of 95%~~

~~Any change or modification which may increase the potential VOC emissions to 250 tons per year or more from the equipments covered in this BACT analysis shall be approved by the Office of Air Management (OAM).~~

has been changed to the following:

**BACT Condition**

**12. That pursuant to 326 IAC 8-1-6 (New Facilities, General Reduction Requirements),**

- (a) The high volume low pressure (HVLP) spray application shall be used all the time when two (2) closed mold polyurethane turnstile production units identified as EU-5.1 and EU-5.2 are in operation.

High volume low pressure (HVLP) spray means technology used to apply coating to a substrate by means of coating application equipment which operates between one-tenth (0.1) and ten (10) pounds per square inch gauge (psig) air pressure measured dynamically at the center of the air cap and at the air horns of the spray system.

- (b) The volatile organic compounds (VOC) delivered to the mold release compound shall not exceed 2.71 tons per month from each of the two (2) closed mold polyurethane turnstile production units identified as EU-5.1 and EU-5.2 . This is equivalent to 7% solid content by weight in the mold release compound, based on the 0.003 gallon of the mold release use per unit.