



Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

8/7/2012

Michael Conny
MAC Trailer Mfg. Inc.
14599 Commerce Street
Alliance, OH 44601

RE: FINALAIR POLLUTION PERMIT-TO-INSTALL AND OPERATE
Facility ID: 1576001906
Permit Number: P0110518
Permit Type: Initial Installation
County: Stark

Certified Mail

Yes	TOXIC REVIEW
No	PSD
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
No	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MAJOR NON-ATTAINMENT
Yes	MODELING SUBMITTED
No	SYNTHETIC MINOR TO AVOID TITLE V
No	FEDERALLY ENFORCABLE PTIO (FEPTIO)
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

Dear Permit Holder:

Enclosed please find a final Air Pollution Permit-to-Install and Operate (PTIO) which will allow you to install, modify, and/or operate the described emissions unit(s) in the manner indicated in the permit. Because this permit contains conditions and restrictions, please read it very carefully. Please complete a survey at www.epa.ohio.gov/dapc/permitsurvey.aspx and give us feedback on your permitting experience. We value your opinion.

The issuance of this PTI is a final action of the Director and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00, made payable to "Ohio Treasurer Josh Mandel," which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, OH 43215

If you have any questions, please contact Canton City Health Department at (330)489-3385 or the Office of Compliance Assistance and Pollution Prevention at (614) 644-3469. This permit can be accessed electronically on the DAPCWeb page, www.epa.ohio.gov/dapc, by clicking the "Issued Air Pollution Control Permits" link.

Sincerely,

Michael W. Ahern, Manager
Permit Issuance and Data Management Section, DAPC

Cc: Canton



FINAL

**Division of Air Pollution Control
Permit-to-Install and Operate
for
MAC Trailer Mfg. Inc.**

Facility ID:	1576001906
Permit Number:	P0110518
Permit Type:	Initial Installation
Issued:	8/7/2012
Effective:	8/7/2012
Expiration:	9/5/2018



Division of Air Pollution Control
Permit-to-Install and Operate
for
MAC Trailer Mfg. Inc.

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Authorization

Facility ID: 1576001906

Application Number(s): A0041530

Permit Number: P0110518

Permit Description: Initial installation of a paint spray booth for heavy truck trailer units and miscellaneous metal components using VOC-compliant coatings. Includes a 4.4 mmBtu/hr natural gas-fired make-up air unit (28,410 cfm, 150 deg F max.) to provide heated air heater to reduce drying time. Particulate emissions are controlled by a 99% efficient passive dry filter.

Permit Type: Initial Installation

Permit Fee: \$200.00

Issue Date: 8/7/2012

Effective Date: 8/7/2012

Expiration Date: 9/5/2018

Permit Evaluation Report (PER) Annual Date: Oct 1 - Sept 30, Due Nov 15

This document constitutes issuance to:

MAC Trailer Mfg. Inc.
14599 Commerce Street
Alliance, OH 44601

of a Permit-to-Install and Operate for the emissions unit(s) identified on the following page.

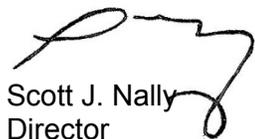
Ohio EPA District Office or local air agency responsible for processing and administering your permit:

Canton City Health Department
420 Market Avenue
Canton, OH 44702-1544
(330)489-3385

The above named entity is hereby granted this Permit-to-Install and Operate for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and federal laws and regulations.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency



Scott J. Nally
Director



Authorization (continued)

Permit Number: P0110518

Permit Description: Initial installation of a paint spray booth for heavy truck trailer units and miscellaneous metal components using VOC-compliant coatings. Includes a 4.4 mmBtu/hr natural gas-fired make-up air unit (28,410 cfm, 150 deg F max.) to provide heated air heater to reduce drying time. Particulate emissions are controlled by a 99% efficient passive dry filter.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Emissions Unit ID:	K004
Company Equipment ID:	Spray Booth 4
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable

A. Standard Terms and Conditions

1. What does this permit-to-install and operate ("PTIO") allow me to do?

This permit allows you to install and operate the emissions unit(s) identified in this PTIO. You must install and operate the unit(s) in accordance with the application you submitted and all the terms and conditions contained in this PTIO, including emission limits and those terms that ensure compliance with the emission limits (for example, operating, recordkeeping and monitoring requirements).

2. Who is responsible for complying with this permit?

The person identified on the "Authorization" page, above, is responsible for complying with this permit until the permit is revoked, terminated, or transferred. "Person" means a person, firm, corporation, association, or partnership. The words "you," "your," or "permittee" refer to the "person" identified on the "Authorization" page above.

The permit applies only to the emissions unit(s) identified in the permit. If you install or modify any other equipment that requires an air permit, you must apply for an additional PTIO(s) for these sources.

3. What records must I keep under this permit?

You must keep all records required by this permit, including monitoring data, test results, strip-chart recordings, calibration data, maintenance records, and any other record required by this permit for five years from the date the record was created. You can keep these records electronically, provided they can be made available to Ohio EPA during an inspection at the facility. Failure to make requested records available to Ohio EPA upon request is a violation of this permit requirement.

4. What are my permit fees and when do I pay them?

There are two fees associated with permitted air contaminant sources in Ohio:

PTIO fee. This one-time fee is based on a fee schedule in accordance with Ohio Revised Code (ORC) section 3745.11, or based on a time and materials charge for permit application review and permit processing if required by the Director.

You will be sent an invoice for this fee after you receive this PTIO and payment is due within 30 days of the invoice date. You are required to pay the fee for this PTIO even if you do not install or modify your operations as authorized by this permit.

Annual emissions fee. Ohio EPA will assess a separate fee based on the total annual emissions from your facility. You self-report your emissions in accordance with Ohio Administrative Code (OAC) Chapter 3745-78. This fee assessed is based on a fee schedule in ORC section 3745.11 and funds Ohio EPA's permit compliance oversight activities. Unless otherwise specified, facilities subject to one or more synthetic minor restrictions must use Ohio EPA's "Air Services" to submit annual emissions associated with this permit requirement. Ohio EPA will notify you when it is time to report your emissions and to pay your annual emission fees.

5. When does my PTIO expire, and when do I need to submit my renewal application?

This permit expires on the date identified at the beginning of this permit document (see "Authorization" page above) and you must submit a renewal application to renew the permit. Ohio EPA will send a renewal notice to you approximately six months prior to the expiration date of this permit. However, it is

very important that you submit a complete renewal permit application (postmarked prior to expiration of this permit) even if you do not receive the renewal notice.

If a complete renewal application is submitted before the expiration date, Ohio EPA considers this a timely application for purposes of ORC section 119.06, and you are authorized to continue operating the emissions unit(s) covered by this permit beyond the expiration date of this permit until final action is taken by Ohio EPA on the renewal application.

6. What happens to this permit if my project is delayed or I do not install or modify my source?

This PTIO expires 18 months after the issue date identified on the "Authorization" page above unless otherwise specified if you have not (1) started constructing the new or modified emission sources identified in this permit, or (2) entered into a binding contract to undertake such construction. This deadline can be extended by up to 12 months, provided you apply to Ohio EPA for this extension within a reasonable time before the 18-month period has ended and you can show good cause for any such extension.

7. What reports must I submit under this permit?

An annual permit evaluation report (PER) is required in addition to any malfunction reporting required by OAC rule 3745-15-06 or other specific rule-based reporting requirement identified in this permit. Your PER due date is identified in the Authorization section of this permit.

8. If I am required to obtain a Title V operating permit in the future, what happens to the operating provisions and PER obligations under this permit?

If you are required to obtain a Title V permit under OAC Chapter 3745-77 in the future, the permit-to-operate portion of this permit will be superseded by the issued Title V permit. From the effective date of the Title V permit forward, this PTIO will effectively become a PTI (permit-to-install) in accordance with OAC rule 3745-31-02(B). The following terms and conditions will no longer be applicable after issuance of the Title V permit: Section B, Term 1.b) and Section C, for each emissions unit, Term a)(2).

The PER requirements in this permit remain effective until the date the Title V permit is issued and is effective, and cease to apply after the effective date of the Title V permit. The final PER obligation will cover operations up to the effective date of the Title V permit and must be submitted on or before the submission deadline identified in this permit on the last day prior to the effective date of the Title V permit.

9. What are my obligations when I perform scheduled maintenance on air pollution control equipment?

You must perform scheduled maintenance of air pollution control equipment in accordance with OAC rule 3745-15-06(A). If scheduled maintenance requires shutting down or bypassing any air pollution control equipment, you must also shut down the emissions unit(s) served by the air pollution control equipment during maintenance, unless the conditions of OAC rule 3745-15-06(A)(3) are met. Any emissions that exceed permitted amount(s) under this permit (unless specifically exempted by rule) must be reported as deviations in the annual permit evaluation report (PER), including nonexempt excess emissions that occur during approved scheduled maintenance.

10. Do I have to report malfunctions of emissions units or air pollution control equipment? If so, how must I report?

If you have a reportable malfunction of any emissions unit(s) or any associated air pollution control system, you must report this to the Canton City Health Department in accordance with OAC rule 3745-15-06(B). Malfunctions that must be reported are those that result in emissions that exceed permitted emission levels. It is your responsibility to evaluate control equipment breakdowns and operational upsets to determine if a reportable malfunction has occurred.

If you have a malfunction, but determine that it is not a reportable malfunction under OAC rule 3745-15-06(B), it is recommended that you maintain records associated with control equipment breakdown or process upsets. Although it is not a requirement of this permit, Ohio EPA recommends that you maintain records for non-reportable malfunctions.

11. Can Ohio EPA or my local air agency inspect the facility where the emission unit(s) is/are located?

Yes. Under Ohio law, the Director or his authorized representative may inspect the facility, conduct tests, examine records or reports to determine compliance with air pollution laws and regulations and the terms and conditions of this permit. You must provide, within a reasonable time, any information Ohio EPA requests either verbally or in writing.

12. What happens if one or more emissions units operated under this permit is/are shut down permanently?

Ohio EPA can terminate the permit terms associated with any permanently shut down emissions unit. "Shut down" means the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31.

You should notify Ohio EPA of any emissions unit that is permanently shut down by submitting¹ a certification that identifies the date on which the emissions unit was permanently shut down. The certification must be submitted by an authorized official from the facility. You cannot continue to operate an emissions unit once the certification has been submitted to Ohio EPA by the authorized official.

You must comply with all recordkeeping and reporting for any permanently shut down emissions unit in accordance with the provisions of the permit, regulations or laws that were enforceable during the period of operation, such as the requirement to submit a PER, air fee emission report, or malfunction report. You must also keep all records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, for at least five years from the date the record was generated.

Again, you cannot resume operation of any emissions unit certified by the authorized official as being permanently shut down without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31.

¹Permittees that use Ohio EPA's "Air Services" can mark the affected emissions unit(s) as "permanently shutdown" in the facility profile along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update will constitute notifying of the permanent shutdown of the affected emissions unit(s).

13. Can I transfer this permit to a new owner or operator?

You can transfer this permit to a new owner or operator. If you transfer the permit, you must follow the procedures in OAC Chapter 3745-31, including notifying Ohio EPA or the local air agency of the change in ownership or operator. Any transferee of this permit must assume the responsibilities of the transferor permit holder.

14. Does compliance with this permit constitute compliance with OAC rule 3745-15-07, "air pollution nuisance"?

This permit and OAC rule 3745-15-07 prohibit operation of the air contaminant source(s) regulated under this permit in a manner that causes a nuisance. Ohio EPA can require additional controls or modification of the requirements of this permit through enforcement orders or judicial enforcement action if, upon investigation, Ohio EPA determines existing operations are causing a nuisance.

15. What happens if a portion of this permit is determined to be invalid?

If a portion of this permit is determined to be invalid, the remainder of the terms and conditions remain valid and enforceable. The exception is where the enforceability of terms and conditions are dependent on the term or condition that was declared invalid.

B. Facility-Wide Terms and Conditions

1. This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).
 - a) For the purpose of a permit-to-install document, the facility-wide terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - (1) 2. below (Definitions)
 - b) For the purpose of a permit-to-operate document, the facility-wide terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
 - (1) None.
2. Definitions as used in this permit:

As-applied: the formulation of a coating during the application on, or impregnation into a substrate, including any dilution solvents or thinners [or other components] added at the source before application of the coating. [OAC rule 3745-21-01(D)]

As-received: the formulation of a coating material or component (e.g., thinner, catalyst, or additive) as received from the supplier. As-received is equivalent to "as-purchased."

Cleaning material: a solvent used to remove contaminants and other materials such as dirt, grease, oil, and dried (e.g., depainting) or wet coating from a substrate before or after coating application; or from equipment associated with a coating operation, such as spray booths, spray guns, tanks, and hangers. Thus, it includes any cleaning material used on substrates or equipment or both. [OAC rule 3745-21-01(D)]

Exempt solvents: any of the compounds which are specifically identified as not being volatile organic compounds under the definition of "volatile organic compound" in OAC rule 3745-21-01(B).

Organic compound: any chemical compound containing carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, metallic carbonates, ammonium carbonate, methane (except methane from landfill gases), and ethane. [OAC rule 3745-21-01(B)]

Solids: all nonvolatile matter in a coating material. Percent solids + percent volatile matter = 100%.

Volatile matter: all non-solid matter in a coating material, including water. Percent solids + percent volatile matter = 100%.

Volatile organic compounds (VOC): a subset of organic compounds which participate in atmospheric photochemical reactions. Organic compounds which are specifically identified as not being volatile organic compounds are listed under the definition of "volatile organic compound" in OAC rule 3745-21-01(B).

C. Emissions Unit Terms and Conditions

1. K004, Spray Booth 4

Operations, Property and/or Equipment Description:

Paint spray booth for coating trailer units and miscellaneous metal parts, manufactured by VOC Containment Systems, Model 500 semi-down draft, including 4.4 mmBtu/hr natural gas-fired make-up air unit (28,410 cfm, 150 deg F max.) to provide heated air to reduce coating drying time. Particulate emissions are controlled by a 99% efficient passive dry filter.

a) This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

(1) For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.

a. b)(1)g., d)(11) – d)(14) and e)(5)

(2) For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.

a. None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	ORC 3704.03(T) [Best Available Technology (BAT) via SB265]	<p>Volatile organic compound (VOC) emissions shall not exceed 15.62 tons per year, based upon a rolling, 12-month summation of the monthly emissions from coatings, surface-preparation cleaning materials, and cleanup materials combined.</p> <p>See b)(2)b. and c. below.</p>
b.	OAC rule 3745-31-05(A)(3), as effective 11/30/2001 [Best Available Technology (BAT)]	<p>Filterable particulate emissions (PE) shall not exceed 0.25 lb/hr and 0.19 tons per year.</p> <p>See b)(2)d. and e. below.</p> <p>The requirements established pursuant to this rule also include the requirements of</p>



	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
		OAC rules 3745-21-09(U)(1)(d) and 3745-17-11(C).
c.	OAC rule 3745-31-05(A)(3), as effective 12/01/06 [Less than 10 ton/yr BAT exemption]	See b)(2)f. below.
d.	OAC rule 3745-21-09(U)(1)(d)	See b)(2)a. below.
e.	OAC rule 3745-17-07(A)(1)	The visible particulate emission limitations established pursuant to this rule do not apply to this emissions unit because it is not subject to any mass emission limitation in any of the rules listed in OAC rule 3745-17-07(A)(3)(h). [More specifically, because this emissions unit is a surface coating process, it is not subject to any mass emission limitation in OAC rule 3745-17-11(B)].
f.	OAC rule 3745-17-11(C)	The control measure and work practice requirements established pursuant to this rule are equivalent to the control measure and work practice requirements established pursuant to OAC rule 3745-31-05(A)(3), as effective 11/30/2001. See b)(2)f. below.
g.	OAC rule 3745-114 and ORC 3704.03(F)	See d)(11) – d)(14) and e)(5) below.

(2) Additional Terms and Conditions

- a. Coatings applied in the coating operations shall not exceed a daily volume-weighted average of 3.5 pounds of VOC per gallon of coating, excluding water and exempt solvents, as applied.
- b. To ensure enforceability of the rolling, 12-month VOC emissions limitation during the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the permittee shall not exceed the emission levels specified in the following table:



Month(s)	Maximum Allowable Cumulative Emissions of VOC (Tons)
1	1.30
1-2	2.60
1-3	3.90
1-4	5.20
1-5	6.50
1-6	7.80
1-7	9.10
1-8	10.40
1-9	11.70
1-10	13.0
1-11	14.30
1-12	15.62

After the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, compliance with the annual emission limitation for VOC shall be based upon a rolling, 12-month summation of the monthly emissions.

- c. Compliance with ORC 3704.03(T) shall also be demonstrated as follows:
 - i. compliance with Monitoring and/or Recordkeeping Requirements d)(1) thru d)(4) below.
- d. Compliance with OAC rule 3745-31-05(A)(3), shall also be demonstrated as follows:
 - i. compliance with Operational Restrictions c)(1) - c)(2) below; and
 - ii. compliance with Monitoring and/or Recordkeeping Requirements d)(5) thru d)(10) below.
- e. With the emissions limits and control measures mentioned in term b)(1) b. above, the permittee has satisfied the Best Available Technology (BAT) requirements pursuant to OAC rule 3745-31-05(A)(3), as effective November 30, 2001. On December 1, 2006, paragraph (A)(3) of OAC rule 3745-31-05 was revised to conform with ORC changes effective August 3, 2006 (S.B. 265 changes), such

that BAT is no longer required by State regulations for sources having potential to emit, taking into account controls, less than ten tons per year of emissions of an NAAQS pollutant or precursor. However, that rule revision has not yet been approved by U.S. EPA as a revision to Ohio's State Implementation Plan (SIP). Therefore, until the SIP revision occurs and the U.S. EPA approves the revisions to OAC rule 3745-31-05, the requirements to satisfy BAT still exist as part of the federally-approved SIP for Ohio. Once U.S. EPA approves the December 1, 2006 version of 3745-31-05, then the emission limits above under b)(1)b. no longer apply to PE* – see next section, b)(2)f.

* For the purposes of this permit, all emissions of the NAAQS pollutant PE/PM₁₀ are assumed to be filterable (i.e., there is no condensable PM₁₀), and therefore all PE/PM₁₀ is assumed to be a subset of total filterable PE, for which the potential to emit, taking into account controls, is less than ten tons per year.

- f. This term only applies once U.S. EPA approves the December 1, 2006 version of OAC rule 3745-31-05 as part of the State Implementation Plan. In that case only, the following Terms and Conditions will apply instead of those listed under b)(1)b.:
- i. The Best Available Technology (BAT) requirements under OAC rule 3745-31-05(A)(3) do not apply to the PE* emissions from this emissions unit since the calculated annual emission rate for PE* is less than ten tons per year taking into account the controls described in term c)(1) – c(2) below.
 - ii. Control measures and work practices shall be utilized as described in terms c)(1) – c)(2) and d)(5) -- d)(9) below, not as BAT requirements, but rather as compliance with the requirements of OAC rule 3745-17-11(C), requirements for surface coating processes. [Note: because this emissions unit is a surface coating process, OAC rule 3745-17-11(C) applies instead of OAC rule 3745-17-11(B).]
 - iii. Operational restriction c)(3) shall be applicable, not as a BAT requirement, but rather as a voluntary restriction accepted by the permittee.
 - iv. Recordkeeping requirement d)(10) shall be applicable, not as a BAT requirement, but rather as a voluntary requirement accepted by the permittee.
- c) Operational Restrictions
- (1) The permittee shall install and operate a dry filtration system for the control of particulate emissions whenever this emissions unit is in operation, and shall maintain the dry particulate filter in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications deemed necessary by the permittee.

- (2) In the event the particulate filter system is not operating in accordance with the manufacturer's recommendations, instructions, or operating manual, with any modifications deemed necessary by the permittee, the control device shall be expeditiously repaired or otherwise returned to these documented operating conditions.
 - (3) Natural gas shall be the only fuel used to supply heat to the make-up air unit in this emissions unit.
- d) Monitoring and/or Recordkeeping Requirements
- (1) The permittee, having chosen to demonstrate compliance by means of a daily volume-weighted average VOC content, shall collect and record the following information each day regarding the coatings employed in this emissions unit:
 - a. The name and/or identification number of each coating material or component employed, as-received from the supplier (examples include coatings, thinners, catalysts and additives).
 - b. The volumetric mix ratio for each coating as-applied. Also, the name and/or identification number of each coating as-applied, if the as-applied formulation is uniquely identified by the permittee.
 - c. The number of gallons for each coating as-applied.
 - d. The VOC content, in pounds per gallon of coating, excluding the volume of water and exempt solvents, of each coating as-applied, calculated in accordance with the procedure described for $C_{VOC,2}$ in g)(1) below, under "Miscellaneous Requirements."
 - e. The daily (24-hr) volume-weighted average VOC content in pounds per gallon of coating, excluding water and exempt solvents, as-applied, of all coatings used, calculated in accordance with the procedure described for $(C_{VOC,2})_{AVG}$ in g)(2) below, under "Miscellaneous Requirements."
 - f. The actual VOC content, in pounds per gallon of coating, of each coating as-applied, calculated in accordance with the procedure described for $C_{VOC,1}$ in g)(3) below, under "Miscellaneous Requirements."
 - g. The daily VOC emissions from all the coatings employed, in pounds [i.e., the sum of "c." multiplied by "f." for each coating employed].
 - (2) The permittee shall collect and record the following information each month for the coatings employed in this emissions unit:
 - a. The monthly VOC emissions from all the coatings employed, in pounds [i.e., the sum of the daily VOC emissions from d)(1)g. for all days in the preceding calendar month].
 - (3) The permittee shall collect and record the following information each month for the cleaning materials employed in this emissions unit:

- a. The name and/or identification number of each cleaning material employed.
 - b. The actual VOC content in pounds per gallon for each cleaning material, calculated in accordance with procedure described for $C_{VOC,1}$ in g)(4) below, under "Miscellaneous Requirements."
 - c. The number of gallons of each cleaning material employed.
 - d. The number of gallons of each cleaning material recovered and/or sent off-site for disposal.
 - e. The net number of gallons of each cleaning material consumed [i.e., "c." minus "d."].
 - f. The total monthly VOC emissions from all cleaning materials employed, in pounds [i.e., the sum of "b." multiplied by "e." for each such material employed].
- (4) The permittee shall maintain monthly records of the following information:
- a. the total VOC emissions in pounds for each month of operation from coatings and cleaning materials [i.e., the monthly VOC emissions from the coating materials from d)(2)a. plus the monthly VOC emissions from cleaning materials from d)(3)f.]; and
 - b. beginning after the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the rolling 12-month summation of the VOC emissions.
 - i. Also, during the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the permittee shall record at the end of each calendar month the cumulative VOC emissions.
- (5) The permittee shall maintain documentation of the manufacturer's recommendations, instructions, or operating manuals for the dry particulate filter system, along with documentation of any modifications deemed necessary by the permittee.
- (6) The permittee shall conduct periodic inspections of the dry particulate filter system to determine whether it is operating in accordance with the manufacturer's recommendations, instructions, or operating manuals, with any modifications deemed necessary by the permittee. These periodic inspections shall be performed at a frequency that shall be based upon the recommendation of the manufacturer, and the permittee shall maintain a copy of the manufacturer's recommended inspection frequency.
- (7) In addition to the periodic inspections described above, not less than once each calendar year the permittee shall conduct a comprehensive inspection of the dry particulate filter system while the emissions unit is shut down, and perform any needed maintenance and repair to ensure that it is operated in accordance with the manufacturer's recommendations.

- (8) The permittee shall document each inspection (periodic and annual) of the dry particulate filter system, and shall maintain the following information:
- the date of the inspection;
 - a description of each/any problem identified and the date it was corrected;
 - a description of any maintenance and repairs performed; and
 - the name of the person who performed the inspection.
- (9) The permittee shall maintain records that document any time periods when the dry particulate filter system was not in service when the emissions unit was in operation, as well as a record of all operations during which the dry particulate filter was not operated according to the manufacturer's recommendations with any documented modifications made by the permittee.
- (10) For each day during which the permittee burns a fuel other than natural gas in the make-up air unit used to provide heated air to reduce coating drying time in this emissions unit, the permittee shall maintain a record of the type and quantity of fuel burned.
- (11) The permit-to-install and operate (PTIO) application for this emissions unit, K004, was evaluated based on the actual materials and the design parameters of the emissions unit's exhaust system, as specified by the permittee. The "Toxic Air Contaminant Statute," ORC 3704.03(F), was applied to this emissions unit for each toxic air contaminant listed in OAC rule 3745-114-01, using data from the permit application; and modeling was performed for each toxic air contaminant emitted at over one ton per year using an air dispersion model such as SCREEN3, AERMOD, or ISCST3, or other Ohio EPA approved model. The predicted 1-hour maximum ground-level concentration result(s) from the approved air dispersion model, was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC), calculated as described in the Ohio EPA guidance document entitled "Review of New Sources of Air Toxic Emissions, Option A," as follows:
- the exposure limit, expressed as a time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, for each toxic compound(s) emitted from the emissions unit, (as determined from the raw materials processed and/or coatings or other materials applied) has been documented from one of the following sources and in the following order of preference (TLV was and shall be used, if the chemical is listed):
 - threshold limit value (TLV) from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices;" or
 - STEL (short term exposure limit) or the ceiling value from the American Conference of Governmental Industrial Hygienists' (ACGIH) "Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices;" the STEL or ceiling value is multiplied by 0.737 to convert the 15-minute exposure limit to an equivalent 8-hour TLV.

- b. The TLV is divided by ten to adjust the standard from the working population to the general public (TLV/10).
- c. This standard is/was then adjusted to account for the duration of the exposure or the maximum potential operating hours of this specific emissions unit, K004, which are 20 hours per day and 7 days per week, from that of 8 hours per day and 5 days per week. The resulting calculation was (and shall be) used to determine the Maximum Acceptable Ground-Level Concentration (MAGLC):

$$(TLV/10) \times (8/20) \times (5/7) = (4)(TLV)/(20)(7) = MAGLC$$

- d. The following summarizes the results of dispersion modeling for the significant toxic contaminants (emitted at 1 or more tons/year) or "worst case" toxic contaminant(s):

Toxic Contaminant: xylene (CAS No. 01330-20-7)

TLV (mg/m³): 434

Maximum Hourly Emission Rate (lb/hr): 0.49 lb/hr

Predicted 1-Hour Maximum Ground-Level Concentration (µg/m³): 58.4

MAGLC (µg/m³): 12,400

[The MAGLC was calculated based on 20 hr/day, 7 days/wk source operation:

$$(4)(434 \text{ mg/m}^3)/(20)(7) = 12.4 \text{ mg/m}^3 = 12,400 \text{ µg/m}^3]$$

The permittee, has demonstrated that emissions of xylene from emissions unit K004 is calculated to be less than eighty per cent of the maximum acceptable ground level concentration (MAGLC); any new raw material or processing agent shall not be applied without evaluating each component toxic air contaminant in accordance with the "Toxic Air Contaminant Statute," ORC 3704.03(F).

- (12) Prior to making any physical changes to or changes in the method of operation of the emissions unit that could impact the parameters or values that were used in the predicted 1-hour maximum ground-level concentration, the permittee shall re-model the change(s) to demonstrate that the MAGLC has not been exceeded. Changes that can affect the parameters/values used in determining the 1-hour maximum ground-level concentration include, but are not limited to, the following:
- a. changes in the composition of the materials used or the use of new materials, that would result in the emission of a new toxic air contaminant with a lower Threshold Limit Value (TLV) than the lowest TLV previously modeled;
 - b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any toxic air contaminant listed in OAC rule 3745-114-01, that was modeled from the initial (or last) application; and

- c. physical changes to the emissions unit or its exhaust parameters (e.g., increased/ decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the "Toxic Air Contaminant Statute" will be satisfied for the above changes, Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to a non-restrictive change to a parameter or process operation, where compliance with the "Toxic Air Contaminant Statute," ORC 3704.03(F), has been documented. If the change(s) meet(s) the definition of a "modification", the permittee shall apply for and obtain a final PTIO prior to the change. The Director may consider any significant departure from the operations of the emissions unit, described in the permit application, as a modification that results in greater emissions than the emissions rate modeled to determine the ground level concentration; and he/she may require the permittee to submit a permit application for the increased emissions.

- (13) The permittee shall collect, record, and retain the following information for each toxic evaluation conducted to determine compliance with the "Toxic Air Contaminant Statute," ORC 3704.03(F):
 - a. a description of the parameters/values used in each compliance demonstration and the parameters or values changed for any re-evaluation of the toxic(s) modeled (the composition of materials, new toxic contaminants emitted, change in stack/exhaust parameters, etc.);
 - b. the Maximum Acceptable Ground-Level Concentration (MAGLC) for each significant toxic contaminant or worst-case contaminant, calculated in accordance with the "Toxic Air Contaminant Statute," ORC 3704.03(F);
 - c. a copy of the computer model run(s), that established the predicted 1-hour maximum ground-level concentration that demonstrated the emissions unit(s) to be in compliance with the "Toxic Air Contaminant Statute," ORC 3704.03(F), initially and for each change that requires re-evaluation of the toxic air contaminant emissions; and
 - d. the documentation of the initial evaluation of compliance with the "Toxic Air Contaminant Statute," ORC 3704.03(F), and documentation of any determination that was conducted to re-evaluate compliance due to a change made to the emissions unit(s) or the materials applied.
 - (14) The permittee shall maintain a record of any change made to a parameter or value used in the dispersion model, used to demonstrate compliance with the "Toxic Air Contaminant Statute," ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration. The record shall include the date and reason(s) for the change and if the change would increase the ground-level concentration.
- e) Reporting Requirements
- (1) If the facility's current Permitting Classification is "FEPTIO" and/or its Emissions Reporting Category for the most recent calendar year is "SMTV" (Synthetic Minor Title

V), then all reports required by this permit must be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal. If the facility's current Permitting Classification is "NTV" (non-Title V) and its Emissions Reporting Category for the most recent calendar year is also "NTV," then reports required by this permit may be delivered in hard copy form to the Canton City Health Department, Air Pollution Control Division as an alternative to the Ohio EPA's eBusiness Center: Air Services online web portal.

- (2) The permittee shall notify the Canton City Health Department, Air Pollution Control Division in writing (see (1) above) of any daily record, as recorded in d)(1)e. above, showing that the daily volume-weighted average VOC content was greater than 3.5 pounds VOC per gallon of coating, excluding water and exempt solvents, as-applied. The notification shall include a copy of such record and shall be submitted within 45 days after the exceedance occurs.
- (3) The permittee shall notify the Canton City Health Department, Air Pollution Control Division in writing (see (1) above) of any record showing that the dry filtration system was not in service or was not operating in accordance with the manufacturer's recommendations, instructions, or operating manuals when this emissions unit was in operation. The notification shall include a copy of such record and shall be submitted within 30 days after the event occurs.
- (4) The permittee shall submit an annual Permit Evaluation Report (PER) to the Canton City Health Department, Air Pollution Control Division by the due date identified in the Authorization section of this permit. The permit evaluation report shall cover a reporting period of no more than twelve-months for each air contaminant source identified in this permit. See (1) above regarding the form and manner for submitting this report. The permittee shall also provide the following information in the annual PER for this emissions unit:
 - a. all exceedances of the rolling, 12-month emission limitation for VOC and, for the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, all exceedances of the maximum allowable cumulative VOC emission levels; and
 - b. beginning after the first 12 calendar months of operation or the first 12 calendar months following the issuance of this permit, the rolling 12-month summation of the VOC emissions, as recorded in d)(4)b. above, for the same twelve-month period covered by the annual permit evaluation report.
- (5) The permittee shall include any changes made to a parameter or value used in the dispersion model that was used to demonstrate compliance with the Toxic Air Contaminant Statute, ORC 3704.03(F), through the predicted 1-hour maximum ground-level concentration, in the annual Permit Evaluation Report (PER). If no changes to the emissions, emissions unit, or the exhaust stack have been made, the PER shall include a statement to this effect.

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emissions Limitation:

A daily volume-weighted average of 3.5 pounds VOC per gallon of coating, excluding water and exempt solvents, of all coatings, as-applied.

Applicable Compliance Method:

Compliance shall be based upon the record keeping specified in d)(1)e. above.

b. Emissions Limitation:

15.62 tons of VOC per year, based upon a rolling, 12-month summation of the monthly emissions from coatings, surface-preparation cleaning materials, and cleanup materials combined.

Applicable Compliance Method:

Compliance shall be based upon the record keeping specified in d)(4)b. above.

This emissions limitation was established by calculating the maximum annual potential-to-emit for the following processes combined:

1. The parts-cleaning process.
2. The spray process based upon the maximum potential usage of all coating materials combined.
3. Cleanup material usage.

[Note: VOC emissions from a fourth process, combustion of natural gas in the 4.4 mmBtu/hr heater, were not included in establishing the annual emissions limitation for the following two reasons:

1. Calculations submitted by the permittee with the permit application showed that potential VOC emissions from natural gas combustion are 0.09 ton/yr, which was considered negligible because it represents just 0.57% of the overall potential-to-emit for the emissions unit. Plus, the 0.09 ton/yr value was based on a very conservative estimate of 20 hr/day, 365 days/yr operation.
2. Also, unlike the other three processes that contribute VOC emissions, the VOC emissions from natural gas combustion are not measurable by material usage recordkeeping, so considering the negligible amount, it was decided that inclusion of these emissions in setting the emissions limit was neither reasonable nor practicably enforceable because recordkeeping on actual

hours of operation for the heater would be required for this reason alone, which would represent an unreasonable burden on the permittee.]

Parts-Cleaning Process:

In the permit application, the permittee conservatively estimated the maximum cleaning material usage rate as 40 gal/yr. The actual VOC content for the cleaning material is 6.94 lb_{VOC}/gal (ref PPG DX437, Heavy Duty Wax and Grease Remover).

$$(40 \text{ gal/yr}) \times (6.94 \text{ lb}_{\text{VOC}}/\text{gal}) \div (2000 \text{ lb/ton}) = 0.14 \text{ ton}_{\text{VOC}}/\text{yr}$$

Spray Process:

Emissions for the primer and topcoat mixtures were calculated separately because of different mix ratios used in the formulations. For the primer mixture, the actual VOC content is 2.06 lb_{VOC}/gal. For the topcoat mixture, the paint color with the highest percent VOC was used to represent all paint colors as a conservative measure. This is the red mixture, at 3.00 lb_{VOC}/gal (actual). The primer and topcoat VOC content values were multiplied by their respective maximum gallons per year. These results are shown below, but first, the following is an explanation of how the permittee estimated the maximum annual coating usage:

The permittee estimated that up to 70% of all future painting would be performed in the new paint spray booth, K004, with the balance performed in existing booths K001 – K003 combined. So the maximum annual coating usage for K004 was calculated based on 70% of the maximum plant-wide painting capacity, which is limited based on the bottleneck created by upstream production capacity. The permittee estimated that total 2011 production for the plant was at 75% of capacity, so full capacity would be the 2011 total divided by 0.75. Since $1/0.75 = 1.33$, this can be rewritten as 1.33 times the 2011 total, or a 33% increase.

Broken down by primer and topcoat mixtures (with all topcoat colors combined), the maximum coating usage for K004 was calculated as follows:

$$(70\%) \times (1.33) \times (3240 \text{ gal})_{2011 \text{ PRIMER MIXTURE TOTAL}} = 3016 \text{ gal}_{\text{MAXIMUM PRIMER MIXTURE FOR K004}}$$

$$(70\%) \times (1.33) \times (3902 \text{ gal})_{2011 \text{ TOPCOAT MIXTURE TOTAL}} = 3551 \text{ gal}_{\text{MAXIMUM TOPCOAT MIXTURE FOR K004}}$$

Returning to the VOC calculations:

$$(3016 \text{ gal/yr})_{\text{PRIMER MIXTURE}} \times (2.06 \text{ lb}_{\text{VOC}}/\text{gal}) = 6213 \text{ lb}_{\text{VOC}}/\text{yr}$$

$$(3551 \text{ gal/yr})_{\text{TOTAL ALL TOPCOAT MIXTURES}} \times (3.00 \text{ lb}_{\text{VOC}}/\text{gal}) = 10,653 \text{ lb}_{\text{VOC}}/\text{yr}$$

$$[(6213 \text{ lb}_{\text{VOC}}/\text{yr})_{\text{PRIMER}} + (10,653 \text{ lb}_{\text{VOC}}/\text{yr})_{\text{TOPCOAT}}] \div (2000 \text{ lb}/\text{ton}) = 8.43 \text{ ton}_{\text{VOC}}/\text{yr total}$$

Cleanup Material Usage:

In the permit application, the permittee conservatively estimated the maximum net cleanup material usage rate as 2612 gal/yr. The actual VOC content for the cleanup material is 5.40 lb/gal (ref Sherwin Williams FT220).

$$(2612 \text{ gal}/\text{yr}) \times (5.40 \text{ lb}_{\text{VOC}}/\text{gal}) \div (2000 \text{ lb}/\text{ton}) = 7.05 \text{ ton}_{\text{VOC}}/\text{yr}$$

Summation:

$$(0.14 \text{ ton}_{\text{VOC}}/\text{yr})_{\text{CLEANING}} + (8.43 \text{ ton}_{\text{VOC}}/\text{yr})_{\text{SPRAY}} + (7.05 \text{ ton}_{\text{VOC}}/\text{yr})_{\text{CLEANUP}} = 15.62 \text{ ton}_{\text{VOC}}/\text{yr}$$

WHY NG COMBUSTION VOCs OMITTED?

c. Emissions Limitation:

If term b)(1)b. above is applicable (BAT limitation) the following limitations apply:

Filterable particulate emissions (PE) shall not exceed 0.25 lb/hr and 0.19 tons per year.

Applicable Compliance Method:

The hourly emissions limitation was established by calculating the maximum hourly potential-to-emit, with controls, for the following processes combined:

1. The spray process based on the coating with the highest solids content, which is the primer mixture.
2. The natural gas-fired heater (products of combustion).

Spray Process:

In the permit application, the permittee conservatively estimated the maximum primer mixture usage rate at 9.0 gal/hr.

The minimum transfer efficiency of coating-to-part was estimated as 70% by the permittee in the permit application, with the balance of the solids becoming particulate emissions (before controls).

The solids content for the primer mixture is 8.07 lb_{SOLIDS}/gal as applied, based on the following mix ratio:

3 parts F3970 primer @ 11.48 lb_{SOLIDS}/gal
 1 part GXH1086 catalyst @ 7.93 lb_{SOLIDS}/gal
 0.5 parts Q70 methyl amyl ketone thinner @ 0.00 lb_{SOLIDS}/gal
 0.5 parts Q30 acetone thinner @ 0.00 lb_{SOLIDS}/gal
 0.25 parts UA11 additive @ 0.138 lb_{SOLIDS}/gal

$$(9.0 \text{ gal/hr}) \times (8.07 \text{ lb}_{\text{SOLIDS}}/\text{gal}) \times (1 - 0.70_{\text{TRANSFER EFF.}}) = 21.79 \text{ lb}_{\text{PE}}/\text{hr}$$

Natural Gas Combustion:

First, maximum natural gas usage was calculated as follows based upon the maximum heat input capacity of the heater (4.4 mmBtu/hr):

$$(4.4 \times 10^6 \text{ Btu/hr}) \div (1020 \text{ Btu/scf gas}) = 0.00431 \times 10^6 \text{ scf gas/hr}$$

Next, the following emissions factor was applied: 7.6 lb PE per million scf natural gas burned (AP 42, Fifth Edition, Table 1.4-2).

$$(7.6 \text{ lb}_{\text{PE}}/10^6 \text{ scf gas}) \times (0.00431 \times 10^6 \text{ scf gas/hr}) = 0.033 \text{ lb}_{\text{PE}}/\text{hr}$$

Summation:

$$(21.79 \text{ lb/hr})_{\text{SPRAY}} + (0.033 \text{ lb/hr})_{\text{NG COMBUSTION}} = 21.82 \text{ lb}_{\text{PE}}/\text{hr} \text{ (before controls)}$$

Based on an overall control efficiency of 99% for the filter system, the potential-to-emit for the spraying operation is reduced, while the NG combustion is considered to be unaffected:

$$[(21.79 \text{ lb/hr})_{\text{SPRAY}} \times (1 - 0.99)] + (0.033 \text{ lb/hr})_{\text{NG COMBUSTION}} = 0.25 \text{ lb}_{\text{PE}}/\text{hr} \text{ (after controls)}$$

If required, hourly PE emissions compliance shall be demonstrated based upon emissions testing performed according to Method 5 in Appendix A of 40 CFR Part 60.

The annual emissions limitation for PE was established by calculating the maximum potential-to-emit, with controls, for the following processes combined:

1. The spray process based upon the maximum potential usage of all coating materials combined, in gallons.
2. The natural gas-fired heater (products of combustion).

Spray Process:

Uncontrolled emissions were calculated based on a 70% transfer efficiency in the coating process. Emissions for the primer and topcoat mixtures were calculated separately because of different mix ratios used in the formulations. For the primer mixture, the solids content is 8.07 lb_{SOLIDS}/gal. For the topcoat mixture, the paint color with the highest percent solids was used to represent all paint colors as a conservative measure. This was the white mixture, at 6.26 lb_{SOLIDS}/gal.

The primer and topcoat solids content values were multiplied by the respective maximum gallons per year (see f)(1)b. above for an explanation of the gallons per year calculations). The results were as follows:

$$(3016 \text{ gal/yr})_{\text{PRIMER MIXTURE}} \times (8.07 \text{ lb}_{\text{SOLIDS}}/\text{gal}) \times (1 - 0.70_{\text{TRANSFER EFF.}}) = 7302 \text{ lb}_{\text{PE}}/\text{yr}$$

$$(3551 \text{ gal/yr})_{\text{TOTAL ALL TOPCOAT MIXTURES}} \times (6.26 \text{ lb}_{\text{SOLIDS}}/\text{gal}) \times (1 - 0.70_{\text{TRANSFER EFF.}}) = 6669 \text{ lb}_{\text{PE}}/\text{yr}$$

Total: 13,971 lb_{PE}/yr

Natural Gas Combustion:

The heater only operates when the paint spray booth is in operation, which, in the permit application, the permittee conservatively estimated as a maximum of 20 hours per day based on the bottleneck created by upstream production capacity.

Maximum natural gas usage was calculated as follows based upon the maximum heat input capacity of the heater (4.4 mmBtu/hr):

$$(4.4 \times 10^6 \text{ Btu/hr}) \div (1020 \text{ Btu/scf gas}) = 0.00431 \times 10^6 \text{ scf gas/hr}$$

Next, the following emissions factor was applied: 7.6 lb PE per million scf natural gas burned (AP 42, Fifth Edition, Table 1.4-2).

$$(7.6 \text{ lb}_{\text{PE}}/10^6 \text{ scf gas}) \times (0.00431 \times 10^6 \text{ scf gas/hr}) = 0.033 \text{ lb}_{\text{PE}}/\text{hr}$$

$$(0.033 \text{ lb}_{\text{PE}}/\text{hr}) \times (20 \text{ hr/day}) \times (365 \text{ days/yr}) = 240.9 \text{ lb}_{\text{PE}}/\text{yr}$$

Summation:

$$[(13,971 \text{ lb}_{\text{PE}}/\text{yr})_{\text{SPRAY}} + (240.9 \text{ lb}_{\text{PE}}/\text{yr})_{\text{NG COMBUSTION}}] \div (2000 \text{ lb/ton}) = 7.11 \text{ ton}_{\text{PE}}/\text{yr} \text{ (before controls)}$$

Based on an overall control efficiency of 99% for the filter system, the potential-to-emit for the spraying operation is reduced, while the NG combustion is considered to be unaffected:

$$[(13,971 \text{ lb}_{\text{PE}}/\text{yr}_{\text{SPRAY}}) \times (1 - 0.99)] + (240.9 \text{ lb}_{\text{PE}}/\text{yr})_{\text{NG COMBUSTION}} \div (2000 \text{ lb/ton}) = 0.19 \text{ ton}_{\text{PE}}/\text{yr}$$

If required, compliance with the annual PE emissions limitation can only be demonstrated by first requiring a demonstration of compliance with the hourly limitation, at which point compliance with the annual limitation shall also be assumed provided the records show that the gallons of primer mixture and total topcoat mixtures, as well as the respective maximum solids contents, do not exceed the values shown above to calculate maximum potential-to-emit.

g) Miscellaneous Requirements

- (1) The following method shall be used to calculate the VOC content for regulatory compliance purposes, in pounds per gallon, excluding water and exempt solvents, of each coating, in accordance with paragraph (B)(8) of OAC rule 3745-21-10 for $C_{VOC,2}$:

$$C_{VOC,2} = (D_C)(W_{VOC}) / (V_S + V_{VOC})$$

(See below* for an alternative version of the above formula for $C_{VOC,2}$)

where:

D_C = the overall density of the coating, in pounds of coating per gallon of coating.

W_{VOC} = the weight fraction of VOC in the coating, in pounds VOC per pound of coating, = $W_{VM} - W_W - W_{ES}$

where:

W_{VM} = weight fraction of volatile matter in the coating, in pounds of volatile matter per pound of coating.

W_W = weight fraction of water in the coating, in pounds of water per pound of coating.

W_{ES} = weight fraction of exempt solvent(s) in the coating, in pounds of exempt solvent(s) per pound of coating.

V_S = the volume fraction of solids in the coating, in gallons of solids per gallon of coating.

V_{VOC} = the volume fraction of VOC in the coating, in gallons VOC per gallon of coating, = $V_{VM} - V_W - V_{ES}$

where:

V_{VM} = volume fraction of volatile matter in the coating, in gallons of volatile matter per gallon of coating.

V_W = volume fraction of water in the coating, in gallons of water per gallon of coating.

V_{ES} = volume fraction of exempt solvents in the coating, in gallons of exempt solvent(s) per gallon of coating.

* Alternatively, the following formula may be used to calculate $C_{VOC,2}$:

$$C_{VOC,2} = (C_{VOC,1}) / (1 - V_W - V_{ES})$$

where:

$C_{VOC,1} = (D_C)(W_{VOC})$ = the actual VOC concentration in pounds VOC per gallon of coating (see g)(3) below).

V_W = see definition above

V_{ES} = see definition above

Notes:

- a. If a coating is applied as-received without the addition of any thinner or any other material, then the “as-applied” value for $C_{VOC,2}$ is the same as the “as-received” value.
- b. If, however, a coating is not applied as-received, but rather is mixed with thinner and/or catalyst and/or other additive before application, then the value for $C_{VOC,2}$ shall be calculated as shown below for the specific coating formulation, as-applied after mixing:

- i. First, the equation above for $C_{VOC,2}$ shall be used to calculate a separate $C_{VOC,2}$ value for each component material in a coating formulation using the as-received data from the supplier. When calculating $C_{VOC,2}$ values for components such as thinners, catalysts, or other additives, the word “coating” used in the general definition for each parameter above should be replaced by the appropriate term for each type of material. For example, for a *thinner* material, D_C would be defined as “the overall density of the *thinner*, in pounds of *thinner* per gallon of *thinner*.”

- ii. Next, $C_{VOC,2}$ for the coating formulation, as-applied after mixing, shall be calculated as a volume-weighted average:

$$(C_{VOC,2})_{AS-APPLIED} = (V_{COATING})(C_{VOC,2 COATING}) + (V_X)(C_{VOC,2 X}) + (V_Y)(C_{VOC,2 Y}) + (V_Z)(C_{VOC,2 Z}), \text{ etc.}$$

where:

COATING refers to the coating material itself as-received.

X, Y, and Z refer to other materials as-received, such as thinners, catalysts, or other additives.

$V_{COATING}$ = volume fraction of the coating material itself in the coating formulation as-applied, based on the volumetric mix ratio.

$V_{X, Y \text{ OR } Z}$ = volume fraction of any other material in the coating formulation as applied, based on the volumetric mix ratio.

- (2) The following method shall be used to calculate the daily volume-weighted average VOC content for regulatory compliance purposes, in pounds per gallon, excluding water and exempt solvents, for all coatings as-applied during a single 24-hr day:

$$(C_{VOC,2})_{AVG} = [(C_{VOC,2} \times \text{gal used})_{COATING1 \text{ AS-APPLIED}} + (C_{VOC,2} \times \text{gal used})_{COATING2 \text{ AS-APPLIED}} + (C_{VOC,2} \times \text{gal used})_{COATING3 \text{ AS-APPLIED}} \text{ etc.}] / (\text{total gallons used during the 24-hr period})$$

- (3) The following method shall be used to calculate the actual VOC content, in pounds per gallon, of each coating as-applied, in accordance with paragraph (B)(8) of OAC rule 3745-21-10 for $C_{VOC,1}$:

$$C_{VOC,1} = (D_C)(W_{VOC})$$

where:

D_C = the overall density of the coating, in pounds of coating per gallon of coating.

W_{VOC} = the weight fraction of VOC in the coating, in pounds VOC per pound of coating, = $W_{VM} - W_W - W_{ES}$

where:

W_{VM} = weight fraction of volatile matter in the coating, in pounds of volatile matter per pound of coating.

W_W = weight fraction of water in the coating, in pounds of water per pound of coating.

W_{ES} = weight fraction of exempt solvent(s) in the coating, in pounds of exempt solvent(s) per pound of coating.

Notes:

- a. If a coating is applied as-received without the addition of any thinner or any other material, then the "as-applied" value for $C_{VOC,1}$ is the same as the "as-received" value.
- b. If, however, a coating is not applied as-received, but rather is mixed with thinner and/or catalyst and/or other additive before application, then the value for $C_{VOC,1}$ shall be calculated as shown below for the specific coating formulation, as-applied after mixing:
 - i. First, the equation above for $C_{VOC,1}$ shall be used to calculate a separate $C_{VOC,1}$ value for each component material in a coating formulation using the as-received data from the supplier. When calculating $C_{VOC,1}$ values for components such as thinners, catalysts, or other additives, the word "coating" used in the general definition for each parameter above should be replaced by the appropriate term for each type of material. For example, for a *thinner* material, D_C would be defined as "the overall density of the *thinner*, in pounds of *thinner* per gallon of *thinner*."

- ii. Next, $C_{VOC,1}$ for the coating formulation, as-applied after mixing, shall be calculated as a volume-weighted average:

$$(C_{VOC,1})_{AS-APPLIED} = (V_{COATING})(C_{VOC,1 COATING}) + (V_X)(C_{VOC,1 X}) + (V_Y)(C_{VOC,1 Y}) + (V_Z)(C_{VOC,1 Z}), \text{ etc.}$$

where:

COATING refers to the coating material itself as-received.

X, Y, and Z refer to other materials as-received, such as thinners, catalysts, or other additives.

$V_{COATING}$ = volume fraction of the coating material itself in the coating formulation as-applied, based on the volumetric mix ratio.

$V_X, Y \text{ OR } Z$ = volume fraction of any other material in the coating formulation as applied, based on the volumetric mix ratio.

- (4) The following method shall be used to calculate the actual VOC content, in pounds per gallon, of each cleaning material, in accordance with paragraph (B)(8) of OAC rule 3745-21-10 for $C_{VOC,1}$:

$$C_{VOC,1} = (D_{CLEANER})(W_{VOC}) = (\text{VOC content})_{CLEANER}$$

where:

$D_{CLEANER}$ = the overall density of the cleaning material, in pounds per gallon.

W_{VOC} = the weight fraction of VOC in the cleaning material, in pounds VOC per pound of cleaning material, = $W_{VM} - W_W - W_{ES}$

where:

W_{VM} = weight fraction of volatile matter in the cleaning material, in pounds of volatile matter per pound of cleaning material.

W_W = weight fraction of water in the cleaning material, in pounds of water per pound of cleaning material.

W_{ES} = weight fraction of exempt solvents in the cleaning material, in pounds of exempt solvents per pound of cleaning material.