

**5% RACT EQUIVALENCY ANALYSIS  
PARAGRAPH (A)(3)(f)(i) OF OAC RULE 3745-21-26**

**BACKGROUND**

In 2008 U.S. EPA revised the previously adopted Control Technique Guideline (CTG) for Miscellaneous Metal and Plastic Coating Operations. Prior to then, the existing CTG Ohio adopted as RACT was contained in paragraph (U) of OAC rule 3745-21-09 for the Cleveland-Akron-Lorain ozone nonattainment area. With the previous CTG, Ohio performed an equivalency analysis to incorporate an option that would exempt metal coating lines from the VOC content limitations, provided the lines each use less than 3 gallons/day. In order to adopt this option with the previous CTG into Ohio's RACT rules we had to prove that the increase in emissions from this option would be no more than 5% compared to adopting the CTG exactly as U.S. EPA had issued it.

Because Ohio EPA is required to adopt the newer 2008 CTG in the same nonattainment area, we are again required to update the 5% RACT equivalency analysis if we intend to incorporate the 3 gallons/day exemption in our updated RACT rule.

Ohio EPA performed an analysis that compared emissions that would have resulted for two options; the Ohio EPA option that includes a 3 gallons/day exemption and the option that does not allow a 3 gallons/day exemption but direct compliance with the applicable emissions limitations from the revised CTG. The analysis uses a baseline period of 2008. Incorporated below is the protocol Ohio EPA used to perform this analysis and the attached spreadsheet shows the results. The results found incorporating the option for a 3 gallons/day exemption in Ohio's updated RACT rules for the Cleveland-Akron-Lorain area is within 4% equivalency. Therefore, Ohio EPA has incorporated this exemption into paragraph (A)(3)(f)(i) of Ohio's updated RACT rule 3745-21-26 for miscellaneous metal and plastic coating operations in this area.

**PROTOCOL**

**DATA RETRIEVAL**

1. We identified a list of all coating sources in Ohio (EU ID: Kxxx and Rxxx) located in Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, or Summit county and pre-populated an Excel spreadsheet with information from STARS2 (our electronic reporting system) such as emission units, processes, controls, permits and applications. This also included 2008 actual VOC emissions reported by the company. 2008 is the baseline period selected. We performed our analysis for all emissions units currently in existence using 2008 reported emissions as the basis for the analysis. If an emissions unit shut down after 2008, they were omitted even if they were in existence in 2008. If an emissions unit was installed in 2008, we included them and estimated 2008 emissions based on current operations. For sources that were installed after 2008, for each

question below, when it refers to supplying information indicative of 2008, we supplied information based on current operations. In the spreadsheet you will notice the first column marked “year.” In this column you will see either “curr” or “2008”. In the column marked “EU ID” you will see the specific emissions unit ID (e.g., K001). “Curr” represents information that was most current in STARS2 whereas 2008 represented what was applicable that year (e.g, permits and associated applications). There may be multiple rows for the same year for the same unit. For example, for 2008 there may be three rows for K001. This would represent three different processes that were identified for that unit. If there is newer information not identified in STARS2 related to the shutdown of one of these units or a change in operations so that they are no longer metal or plastic coaters, they were removed and not analyzed. If we became aware of additional units or processes that for some reason are not on the list but are metal or plastic coaters, we added these units/processes.

### **APPLICABILITY INFORMATION**

1. We identified which metal or plastic coating lines (all Kxxx and Rxxx sources) are subject to new rule 3745-21-26. We identified in the table by placing an “X” under the Q1 and/or Q2 columns. Q1 is for those lines that coat metal, and Q2 is for those lines that coat plastic. We identified either or both if it was applicable to the coating line in 2008. We used the information provided in the pre-populated table and our knowledge of the facility to identify subject sources. If necessary, we contacted the company to verify that this information is accurate and indicative of operations in the baseline period – 2008. We used the source categories/products contained in paragraph (A)(2) of OAC rule 3745-21-26 as a starting point for applicability for all metal and plastic coating lines.
2. We identified sources (in table as Q3) that are exempt per one of the exemptions contained in paragraph (A)(3) of OAC rule 3745-21-26, except for the 3 gallons/day exemption contained in paragraph (A)(3)(f)(i). We entered “N” if not exempt. We entered the appropriate paragraph reference from the rule if exempt (e.g., if exempt because the line coats metal furniture and complies with 21-09(l), entered “3.a.i.d”). If the line was exempt, there was no more information needed for the remaining questions below for this line. If only a portion of the emissions were exempt per one of the exemptions, only that portion of emissions is exempt and not the entire line; therefore, it was not be marked entirely exempt. In this case we provided a brief explanation in the “Notes” column. Under additional steps below we apportioned the appropriate metal or plastic coating emissions.

Note: Many of these units showed a permit-by-rule (PBR) as being effective. Those that are exempt or not subject to the rule because Ohio only has PBR source categories for metal coaters that are exempted per one of the rules exemption paragraphs or because they do not coat metal or plastic.

3. Of those sources remaining in #1, we identified which emit less than 2.7 TPY per rolling 12-month for ALL miscellaneous metal and/or plastic parts coating operations and related cleaning operations (note we included BOTH metal and plastic coating lines). This is not unit by unit (see paragraph (A) of the rule). If this is applicable to these subject operations, we identified such by placing an “X” in Q4 of the table and skipped to #5 and #15 below to answer those questions only. If subject operations were equal to or greater than 2.7 TPY we proceeded to #4 below.
4. Of the sources in #1 BUT NOT #2 and #3, we reviewed the currently effective permit applicable during the baseline period (2008). If this unit was currently complying with the 3 gal/day PER LINE exemption limit in OAC rule 3745-21-09 (U)(2)(e) in lieu of one of the limits in in OAC rule 3745-21-09 (U)(1), we marked the Q5 column with an “X”. Current permit numbers and effective dates, based on information in STARS2, were included in the appropriate section of the table (“Current PTI/PTIO and PTO permit ID for the EU”). However, it may have been necessary to verify you we were using the appropriate permit information that would be indicative of operations during the 2008 baseline year.
5. Of the sources in #1 and #3 BUT NOT #2, we verified, and if necessary, updated, the column for Q6, base year inventory actual VOC tons/year. This number is set to default to being equal to the column AS “2008 VOC (TPY)”. If there was a reason to believe this number should be adjusted, we entered the new TPY number under this column and provided justification in the “Notes” column. For example, if the line coats both metal and wood parts it was necessary to determine the portion of 2008 reported emissions attributable to the metal coating only.

Values in the 2008 VOC TPY column may have been blank, contained a “0”, “permX”, “deMin”, or “low”:

- If there is a “0” in this column or it is blank it likely meant one of two scenarios, 1) it is a true minor source (NTV), or 2) the unit is newer than 2008; therefore, emissions inventory information was not available.
- If there is “permX” in the column that means the unit was permit exempt and did not require reporting.
- If there is “deMin” in the column that means the unit was de minimis and did not require reporting.
- If there is “low” in the columns it means emission were under the reporting threshold (e.g., < 1 TPY)

Those were corrected. It was necessary to calculate representative 2008 (or more recent if not in existence in 2008) actual VOC emissions based on information from the recent application and/or by contacting the company. The most recent application numbers and effective dates, based on information in

STARS2, were included in the appropriate section of the table as discussed under #1 above. However, it may have been necessary to verify we used the appropriate application information that would be indicative of operations during the 2008 (or more recent if not in existence) baseline year.

6. Of the sources in #1 BUT NOT #2 and #3, we verified the column for Q7, gallons VOC/year actual at existing limits. This column is set to auto calculate (when applying the formula from the formula row) the following:

$$\frac{(Q6) \text{ tons VOC}}{\text{year}} \times \frac{\text{gal VOC}}{7.36^* \text{ lb VOC}} \times \frac{2000 \text{ lbs}}{\text{ton}} = \frac{(Q7) \text{ gal VOC}}{\text{year}}$$

\*average solvent density

7. Of the sources in #1 BUT NOT #2 and #3, we completed the column for Q8, TOTAL gal base year usage per year. This information was available in the 2008 fee emissions reports although it may have been necessary to review the application or contact the company to verify gallons used during the 2008 baseline period. If the company reported tons of mix as applied as throughput in the emissions report, we contacted the company to obtain gallons or if the data was not readily available we assumed an average mix density of 10.0 lbs/gallon and convert ton applied to gallons applied (e.g., (19.6 tons applied) x (2000lb/ton) x 1 gallon/10.0 lbs) = 3920 gallons applied).
8. Of the sources in #1 BUT NOT #2 and #3, we verified the column for Q9, gal solids/year base year usage. This column is set to auto calculate (when applying the formula from the formula row) the following:

$$\frac{(Q8) \text{ TOTAL gal}}{\text{year}} - \frac{(Q7) \text{ gal VOC}}{\text{year}} = \frac{(Q9) \text{ gal solids}}{\text{year}}$$

9. We determined which new limit(s) would apply to the coating line from the newer CTG/RACT rule. Limits from Tables 1 through 5 are applicable for units that are not controlled and are expressed in units of pounds of VOC per gallon of coating (depending upon whether the coatings are air dried or baked in some cases). Limits in Tables 6 through 9 are applicable for units with add-on controls that achieve less than a 90% reduction in VOCs and are expressed in units of pounds of VOC per gallon of solids (depending upon whether the coatings are air dried or baked in some cases). There are no limits if the unit is controlled at or above 90%.
- a. If the unit is controlled at greater than or equal to 90%, we entered "X" into Q14, controlled at 90%, and skipped to completing Q15 addressed under #13 below.
  - b. If the unit is uncontrolled or controlled at less than 90% and more than one limit is applicable, we added additional rows to the table. Unlike the

previous RACT rule, the least stringent of limits do not apply but rather each individual limit per coating line does apply in the newer RACT rule. For each row we added, we copied the pre-populated formula for Q11 and Q13 to the additional rows.

- c. Of the uncontrolled lines in #1 BUT NOT #2 and #3, we completed the column for Q10, new limit(s) lb VOC/gal coating (excluding water and exempt solvents).
- d. For lines with add-on controls that achieve less than a 90% reduction in VOCs, we entered the lb VOC/gallon solid limit from the appropriate table of the rule into Q11, over-riding the formula.

10. Of the UNCONTROLLED sources in #1 BUT NOT #2 and #3, we verified the column for Q11, new limit lb VOC/gal solids. This column is set to auto calculate (when applying the formula from the formula row or when we did not manually entered a value as instructed above) the following:

$$\frac{(Q10) \text{ new limit lb VOC}}{\text{gallon coating}} \times \frac{1}{1 - A} = \frac{(Q11) \text{ lbs VOC}}{\text{gallon solids}}$$

Where,

$$A \frac{\text{gallons VOC}}{\text{gallon coating}} = \frac{(Q10) \text{ new limit lb VOC}}{\text{gallon coating}} \times \frac{\text{gal VOC}}{7.36^* \text{ lb VOC}}$$

\*average solvent density

11. Of the sources in #1 BUT NOT #2 and #3, we completed the column for Q12, “% use”. We consulted all available information (e.g., applications, company contact) to determine the percentage of usage for coatings that fall under each limit for the coating line. These percentages should sum to 100% and were based on usage during the 2008 baseline period. If only one limit applied to the line, it would be 100%. If there are multiple limits that applied to the line, the following example is provided:

For each NEW LIMIT that is applicable to the line, we determined the percentage of total gallons used annually in 2008 that would be applicable for each NEW LIMIT. In the base year of 2008, this line used 30 gallons of coatings total. It was determined that three NEW LIMITS will apply to this line:

- General One-Component, baked, 2.3 lbs VOC/gallon – 30% of the 30 gallons of coating used in 2008 fell into this category.
- Extreme High-Gloss, baked, 3.0 lbs VOC/gallon – 50% of the 30 gallons of coating used in 2008 fell into this category.
- Extreme Performance, baked, 3.0 lbs VOC/gallon – 20% of the 30 gallons of coating used in 2008 fell into this category.

12. Of the sources in #1 BUT NOT #2 and #3, we verified the column for Q13, new limit emissions lb VOC/year. This column is set to auto calculate (when applying the formula from the formula row) the following:

$$\frac{(Q9) \text{ gal solids}}{\text{year}} \times \frac{(Q11) \text{ lbs VOC}}{\text{gal solids}} \times (Q12) \% \text{ use} \times \frac{\text{ton}}{2000 \text{ lb}} = \frac{(Q13) \text{ new limit ton VOC}}{\text{year}}$$

13. If under #9 above, we identified the unit as controlled at greater than or equal to 90% and therefore, entered "X" into Q14, controlled at 90%, we completed Q15, new limit emissions lb VOC/year at 90% control. We set this column as equal to the column containing Q6. This assumes that the actual emissions in 2008 were controlled at 90%. If for some reason this data needed corrected, we corrected the data by manually entering your calculated number and provided an explanation in the "Notes" column.

14. If we marked an "X" under the column containing Q5, we completed the column for Q19, if 21-09(U)(2)(e) 3 gal/day is applicable, tons VOC/year. We set this column as equal to the column containing Q6. This assumes that the actual emissions in 2008 were in compliance with the 3 gal/day limit. If for some reason this data needed corrected, we corrected the data by manually entering the calculated number and provided an explanation in the "Notes" column.

15. If we entered "X" in the column containing Q4, we completed the column for Q17, if less than 2.7 TPY per rolling 12-month is applicable, tons VOC/year. We set this column as equal to the column containing Q6. This assumes that the actual emissions in 2008 for this line were in compliance with the exemption of 2.7 TPY for all metal and plastic coating line operations<sup>1</sup>. If for some reason this data needed corrected, we corrected the data by manually entering our calculated number and provided an explanation in the "Notes" column.

### Ohio EPA Scenario

- IF we determined the line was operating under a 3 gal/day limit in 2008 and therefore, placed an "X" in the column under Q5 and calculated a tons VOC/year value under Q16, we set the column identified as "Coating lines employing less than 3 gallons/day applicable (tons VOC/year)" equal to the column containing Q16.
- IF we determined all metal and plastic coating line operations in 2008 were under 2.7 TPY and therefore, placed an "X" in the column under Q4 and we calculated a tons VOC/year value under Q17, we set the column identified as "Combined coating lines exempt per 2.7 TPY U.S. EPA exemption applicable (tons VOC/year)" equal to the column containing Q17.

---

<sup>1</sup> The sum of actual emissions for all metal and plastic coating operations, including cleaning operations, for this facility ID should not be greater than 2.7 TPY.

- IF we determined the line was subject to a NEW RACT limit and we calculated a tons VOC/year value for either the column for Q13 or Q15, we set the column identified as “New RACT limit applicable (tons VOC/year)” equal to:
  - Q13 for uncontrolled sources or sources controlled at less than 90%, or
  - Q15 for sources controlled at 90% or above.

### **U.S. EPA Scenario**

- IF we determined all metal and plastic coating line operations in 2008 were under 2.7 TPY and therefore, placed an “X” in the column under Q4 and we calculated a tons VOC/year value under Q17, we set the column identified as “Combined coating lines exempt per 2.7 TPY U.S. EPA exemption applicable (tons VOC/year)” equal to the column containing Q17.
- For all other lines - we set the column identified as “New RACT limit applicable (tons VOC/year)” equal to:
  - Q13 for uncontrolled sources or sources controlled at less than 90%, or
  - Q15 for sources controlled at 90% or above.