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Category: 26 – Bubbling

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

DATE: September 11, 1981

SUBJECT: Review of the Final Pennsylvania Group II VOC Regulations

FROM: Tom Williams and Bill Polglase
Technical Guidance Section

TO: G. T. Helms

THRU: Brock Nicholson, Chief
Technical Guidance Section

The final Pennsylvania Group II VOC regulations have been reviewed and the following comments are offered.

1. Section 129.53 Internal Offsets – The equation cited in this section is incorrect for determining allowable emissions. The equation overstates the allowable emissions by not correcting for the greater coverage resulting from the higher solids content of complying coatings. All else being equal, the amount of coating required to coat a specific object depends on the amount of solids in the coating. The Pennsylvania regulation assumes the current usage of coating will not change when a source goes from its existing coating to a high solids coating. Less total coating will, in fact, be used because a high solids coating contains a greater amount of solids, therefore, less coating is required to coat a specific object.

Example (one of several coating lines):

Current coating =

$$= \left(\frac{5.5 \text{ lbs VOC}}{\text{gal coating}} \right) \times 10 \left(\frac{\text{gals coating used}}{\text{hr}} \right) = 55 \left(\frac{\text{lbs VOC}}{\text{hr}} \right)$$

Pennsylvania allowable emissions with complying coating =

$$= \left(\frac{3.0 \text{ lbs VOC}}{\text{gal coating}} \right) \times 10 \left(\frac{\text{gals coating used}}{\text{hr}} \right) = 30 \left(\frac{\text{lbs VOC}}{\text{hr}} \right)$$

Actual allowable emissions =

$$= \left(\frac{3.0 \text{ lbs VOC}}{\text{gal coating}} \right) \times 4.24 \left(\frac{\text{gals coating used}}{\text{hr}} \right) = 12.7 \left(\frac{\text{lbs VOC}}{\text{hr}} \right)$$

The difference in usage of from 10 to 4.24 gals/hr is because fewer gallons are needed to coat the same number of objects as before. See Attachment 1 for calculating the complying coating usage.

2. Section 129.58 Refinery Leaks – Paragraph (b) exempts fittings on all valves one inch or smaller from the requirement of a second valve, flange, plug, or cap. It appears that this exemption is aimed at pipes and lines that are inch or less in size. The summary of the State public hearing comments (see issue 21) indicated that the State agreed to delete this exemption. This exemption should be deleted unless the State can make a showing that the emissions from smaller lines are insignificant.

3. Section 129.62 General Standards for Gasoline Marketing (Tank Truck Testing) – Paragraph (C)(5) exempts gasoline trucks with a capacity of less than 4,800 gallons from the leak test requirements. The State should provide information on the effect of this exemption. What is the number of gallons annually transported in small trucks and what percent is this of the total gallons transported?

4. Section 129.64 Cutback Asphalt – Paragraph (b)(3) exempts cutback used as a tack coat. The State hearing summary indicated that tack coat emissions are less than five percent of total emissions from all asphalt paving. Verification of the State emission inventory data should be adequate documentation for approving this regulation.

5. Section 126.69 Rubber Tires – Paragraph (d) allows a bubble of 72.9 grams/tire for the 4 covered processes. The State should show that this is equivalent to RACT for the sources that will be affected. What are the current emissions in grams/tire? Will the plants achieve any reductions if they meet the bubble number?

6. Section 129.70 Perchloroethylene Dry Cleaning – This section requires venting of emissions through a properly functioning condenser or carbon adsorber but does not have an emission limit stated. The CTG recommended 100 ppm limit for carbon adsorbers. Additional information indicates that the 100 ppm limit may not be applicable for all types of control equipment. A 90 percent recovery rate for the dryer would be a reasonable emission limit and would allow the source several choices in adding control equipment. A perchloroethylene mileage rate would also be an acceptable method to limit emissions while giving the sources maximum flexibility.

The States regulation is deficient for the following reasons: (1) All plants have a water-cooled surface condenser on the dryer. The condenser requirement in the regulation would, therefore, not reduce emissions from dry cleaners. Emissions from a dryer with a water-cooled condenser during the dryer exhaust cycle range from 3 to 6 kgs per 100 kgs of clothes cleaned. A 90 percent recovery rate would reduce this to 0.3 - 0.6 kg/100 kgs clothes cleaned. A carbon adsorber would reduce the emissions to less than 0.3 kg/100 kgs clothes cleaned. (2) The requirement that the condenser or adsorber be "properly functioning" is so general that it would not be enforceable.

We are sympathetic to the State's reluctance to require these small sources to stack test and to the State's concern over the burden of enforcement. Earlier guidance suggested a small size exemption from the requirement to install a control device. See memo from G. T. Helms dated August 4, 1980, "Issues Concerning VOC RACT II Regulation Development." The sample regulation contained in EPA-450/2-79-004 suggested additional exemptions for dry cleaners.

There are several options open to the State that would satisfy an emission limit without requiring stack testing by the source. (1) An emission limit of 100 ppm for adsorbers or 90 percent recovery rate for other control devices could be met by requiring the manufacturers to demonstrate equivalence with the limits. Once this was documented, any dry cleaner installing and using the equipment, per the operating parameters at the time of the test, would be considered to be in compliance. (2) An emission limit based on perc mileage would require recordkeeping but not testing. Such a limit of 5 kgs/100 kgs clothes cleaned (for the entire plant operation) would be the easiest to enforce if the proper records were kept.

Attachments

cc: Ray Cunningham
Neil Swanson

Attachment

GROUP I VOC REGULATIONS

State of Pennsylvania

CTG document	RACT limits	Compliance dates	Test methods	Exemptions
1. Auto & lt. duty trucks	yes	low solvent - *3 yrs add-on *2 yrs	yes	50 tons/yr
2. Cans	"	"	"	"
3. Paper	"	"	"	"
4. Fabric	"	"	"	"
5. Metal furn.	"	"	"	"
6. Large appl.	"	"	"	"
7. Magnet wire	"	"	"	"
8. Coils	"	"	"	"
9. Fixed-roof tks	yes	*2 yrs	yes	< 40,000 gals
10. Bulk terminals	yes	*2 yrs	yes	trucks < 250 gals
11. Bulk plants		*2 yrs	yes	trucks < 250 gals
				a. submerged fill of trucks b. vapor bal. incoming trucks c. vapor bal. outgoing trucks
				b. < 2,000 gals/ day throughput c. < 16,000 gals/ day throughput
12. Stage I	yes	*2 yrs	yes	< 2,000 gal tank < 60,000 gal annual throughput
13. Pet. ref. sources	yes	*2 yrs	yes	
14. Cutback asphalt	yes	4/30/82	yes	tack coat, prime coat, dust palliative, pre- coating of aggregate
15. Degreasers	yes	*2 yrs	yes	

*From date of adoption of the regulation.

Attachment

GROUP II VOC REGULATIONS

State of Pennsylvania

CTG category	RACT limits	Compliance dates	Test methods	Exemptions
Tank Trucks	yes	plan due *15 months start tests 1/1/83 complete initial test 1/1/84	yes	< 4,800 gals
Refinery Leaks	yes	*18 months	yes	fittings on valves 1 inch or smaller from a second valve, cap, etc.
Floating Roof Tanks	yes	*2 years	yes	< 40,000 gals
Miscellaneous Metals	yes	low solvent - *3 yrs add-on *2 yrs	yes	< 50 tons/yr
Paneling	---	----	---	----
Pharmaceutical	yes	*2 years	yes	< 50 tons/yr
Rubber Tires	yes?	*2 years	yes	< 5,000 tires/ day < 100 tons/yr
Dry Cleaning	no	7/1/82	yes	
Graphic Arts	yes	add-on - *2 yrs LSI - *3 yrs porous substrate LSI - 12/31/85 non- porous substrate	yes	< 1,000 lbs/day or < 100 tons/yr proof presses

*From date of adoption of the regulation.

Attachment

Allowable Emissions for One of Several Coating Lines in a Bubble Calculation

Given:

Existing coating - 5.5 lbs VOC/gal coating
Existing coating solvent density = 7.36 lbs/gal
Existing coating usage = 10 gals/hr

Complying coating = 3.0 lbs VOC/gal coating
Complying coating solvent density = 7.36

Assumption - transfer efficiency and film thickness stays constant

Existing coating:

$$\frac{5.5 \text{ lbs VOC/gal coating}}{7.36 \text{ lbs/gal (density)}} \times 100 = 0.75 \text{ volume\% solvent}$$

$$1.00 - 0.75 \text{ volume\% solvent} = 0.25 \text{ volume\% solids}$$

$$10 \left(\frac{\text{gal}}{\text{hr}} \text{ coating used} \right) \times 0.25 \text{ volume\% solids} = 2.5 \text{ gal solids applied}$$

Complying coating:

$$\frac{3.0 \text{ lbs VOC/gal coating}}{7.36 \text{ lbs/gal (density)}} \times 100 = 0.41 \text{ volume\% solvent}$$

$$1.00 - 0.41 \text{ volume\% solvent} = 0.59 \text{ volume\% solids}$$

application rate = 2.5 gals solids/hr (see above)

$$\left(\frac{\text{gallons coating}}{\text{required}} \right) = \frac{2.5 \text{ gals solids applied}}{0.59 \text{ volume\% solids}} = 4.24 \frac{\text{gals coating required}}{\text{hr}}$$

Allowable emissions:

$$\text{Allowable emissions} = 3.0 \frac{\text{lbs VOC}}{\text{gal}} \times 4.24 \frac{\text{gals coating}}{\text{hr}} = 12.72 \frac{\text{lbs VOC}}{\text{hr}}$$

Attachment

Calculation of Percent Reduction
for Table 1

Coating A

1. % of VOC in a gallon of Complying Coating

$$\frac{\text{lbs VOC compliance coating}}{\text{Density}} = \frac{2.9 \times 100}{7.36} = 39.4\%$$

2. % of solids in a gallon of Complying Coating 60.6%

3. % of VOC in Coating A

$$\frac{\text{lbs/gal VOC Coating A}}{\text{Density Coating A}} = \frac{6.0 \times 100}{9.0} = 66.6\%$$

4. % of solids in Coating A 33.3%

5. Number of gallons of Coating A needed to coat same amount as one gallon of a Compliance Coating

$$\frac{\% \text{ Solids Compliance}}{\% \text{ Solids Coating A}} = \frac{60.6}{33.3} = 1.82 \text{ gallons}$$

6. Amount of VOC in 1.82 gallons of Coating A

$$1.82 \text{ gals} \times 6.0 \text{ lbs/gal} = 10.9 \text{ lbs}$$

7. Percent reduction in emissions from Coating A

$$\frac{10.9 - 2.8}{10.9} = 73.4\%$$

8. Uncontrolled historic emissions from Coating A = 150 lbs/day

9. Allowable emissions with a Compliance Coating

$$150 \times \left(1 - \frac{73.4\%}{100\%}\right) = 40 \text{ lbs/day}$$

Coatings B and C

1. % VOC in Complying Coating = 39.4%

2. % solids in a Complying Coating = 60.6%

3. % VOC in Coating B/C

$$\left(\frac{8.0}{9.0}\right) \times 100 = 88.9\%$$

4. % solids in Coating B/C = 11.1%

5. Number of gallons of Coating B needed to Coat same amount as 1 gallon of a Compliance Coating

$$\left(\frac{60.0}{11.1}\right) = 5.40 \text{ gal}$$

6. Amount of VOC in 5.46 gallons of Coating B/C

$$5.46 \times 8 \text{ lbs/gal} = 43.2 \text{ lbs}$$

7. Percent reduction needed to achieve RACT

$$\left(\frac{43.2 - 2.9}{43.2}\right) \times 100\% = 93.3\%$$

8. Uncontrolled historic emissions from Coating B 400 lbs/day

9. Allowable emissions with a Compliance Coating 27 lbs/day

10. Uncontrolled historic emissions from Coating C 800 lbs/day

11. Allowable emissions with a Compliance Coating 54 lbs/day