ILLINOIS POLLUTION CONTROL BOARD
July 25, 1991

IN THE MATTER OF:	)	
	)	
RACT DEFICIENCIES IN THE	)	
METRO-EAST AREA: AMENDMENTS	)	R91-8
TO 35 ILL.ADM.CODE PART 215	)	(Rulemaking)
AND THE ADDITION OF PART 219	)	

ADOPTED RULE. FINAL ORDER.

OPINION AND ORDER OF THE BOARD (by J. Theodore Meyer):

This matter is before the Board on a regulatory proposal filed by the Illinois Environmental Protection Agency (Agency). The Board today adopts the proposed rules, as previously modified at second notice and as modified after agreement with the Joint Committee on Administrative Rules (JCAR), as final rules. This opinion will contain only the procedural history of the proceeding, and some additional comments. For more information on the course of the proceeding, please refer to the Board's second notice opinion and order (June 11, 1991) and the supplemental second notice opinion (June 20, 1991).

Procedural History

On January 17, 1991, the Agency filed this proposal for rulemaking. The proposal seeks to correct deficiencies identified by the United States Environmental Protection Agency (USEPA) in Illinois' state implementation plan (SIP) for ozone in the Metro-East area, and contains regulations requiring the implementation of reasonably available control technology (RACT) for certain sources of volatile organic material (VOM). The Board accepted the proposal for hearing on February 7, 1991. The Board also accepted the Agency's certification that this rulemaking is federally required pursuant to Section 28.2 of the Environmental Protection Act (Act) (Ill.Rev.Stat. 1989, ch. 111 1/2, par. 1028.2), as amended by P.A. 86-1409. The Board sent the rules, as proposed by the Agency, to first notice on February 28, 1991. The rules were published in the Illinois Register on March 15, 1991, at 15 Ill.Reg. 3892. On March 28, 1991, the Board found that no economic impact study was necessary in this proceeding. Hearings were held on April 10 and 15, 1991. The first notice comment period in this rulemaking expired on April 29, 1991.

On May 2, 1991, the Agency filed a motion to suspend emergency rulemaking. The Board had previously expressed its intention to proceed with these proposed rules on an emergency basis, as provided by Section 5.02 of the Administrative Procedure Act (APA) (Ill.Rev.Stat. 1989, ch. 127, par. 1005.02) and Section 27(c) of the Act. The Board intended to adopt the rules on an emergency basis in order to meet the May 15, 1991 deadline set forth in the federal Clean Air Act Amendments of 1990, and also proceed with "regular" rulemaking. The Agency moved that the Board suspend consideration of the proposal as an emergency rulemaking, alleging that the proposal was not appropriate for emergency rulemaking. Among other things, the Agency noted that a representative from the United States Environmental Protection Agency (USEPA) had stated at hearing that USEPA believed that only "permanent" rules were sufficient to meet the May 15 deadline, and that USEPA did not view emergency rules to be "permanent". On May 3, 1991, the Illinois Environmental Regulatory Group (IERG) filed a motion in support of the Agency's motion to suspend emergency rulemaking. IERG stated that emergency rules would be a "futile" attempt to meet the May 15 date. IERG also stated that it was involved in serious negotiations with USEPA and the Agency on points of disagreement in these proposed rules. At a May 6, 1991 Board meeting, the Board deferred action on the motion for one week, in order to allow the participants additional time to continue discussions with USEPA.

On May 13, 1991, the Agency filed a status report and a "motion to extend first notice". The Agency updated that Board on the continuing discussions between USEPA, IERG, and the Agency. The Agency stated that the negotiations involved discussions on maximum theoretical emissions (MTE), compliance and applicability dates for the proposed rules, and the rules proposed as Subpart TT. The status report included a letter from Stephen Rothblatt, Chief of the Regulation Development Branch for Region V of USEPA. That letter confirmed that USEPA was involved with "serious" negotiations with IERG and the Agency. The Agency moved that the Board delay moving into second notice until May 30, 1991. The Agency contended that it looked very favorable that all participants would reach an agreement, and noted that if the Board moved to second notice before the completion of the negotiations, it would be unable to make changes in the proposed rule (as a result of any agreement) without returning to first notice. The Agency also noted that Illinois is working within a very tight time frame for this rulemaking, so that there would be no time to return to first notice. The Agency summarized:

> Therefore, despite the Agency's earlier, fervent pleas that the Board go to second notice May 9, 1991, the Agency requests that the Board delay second notice until May 30, 1991. Once the Board goes to second notice, no changes, other than in response to comment from [the Joint Committee on Administrative Rules] JCAR, can be made to the rules. The Agency, then, would submit the rules at second notice to USEPA as our [state implementation plan] SIP. We would supplement the SIP submittal with the final rules once they are promulgated. These activities should have the effect of having Illinois removed from the deficiency list prior to

> publication while at the same time allowing the negotiating parties the opportunity to complete negotiations.
>
> (Agency motion to extend first notice, p. 6.)

On May 14, 1991, in reliance on the statements and requests made by the Agency, IERG, and USEPA, the Board granted the Agency's motions to suspend emergency rulemaking and to delay second notice until after May 30, 1991.

The Agency filed a motion to amend its proposal on June 3, 1991. The Agency stated that its proposed amendments were a result of negotiations between the Agency, USEPA, and IERG. Although no formal agreement between the three participants had been reached, the Agency contended that its proposed changes are approvable by USEPA. On June 4, 1991, IERG filed a motion in support of the Agency's motion to amend the proposal. On June 11, 1991, the Board granted the motion to amend. The Board stated that based on the statements made by the Agency and IERG, the proposed changes are federally approvable, and will protect the viability of the various federal court appeals of the FIP, on which these rules are based.

Also on June 11, 1991, the Board proposed these rules for second notice. The Board issued a supplemental second notice opinion on June 20, 1991. The rules were filed with JCAR for its review. Based on that JCAR review, the Board has agreed to make several non-substantive changes to these rules. These changes are all in the nature of typographical corrections, etc. On July 23, 1991, JCAR indicated that it had no objection to these rules.

Board Comments

Many of the motions and other filings received during the course of this proceeding have urged the Board to act as quickly as possible. As the Board has repeatedly stated, it shares the participants' concern for timely action, and has expedited this proceeding. The Board has made all possible attempts to complete this rulemaking as quickly as possible, while at the same time observing the requirements for public notice, hearing, and comment. (See Ill.Rev.Stat. 1989, ch. 111 1/2, pars. 1027, 1028, and 1028.2; Ill.Rev.Stat. 1989, ch. 127, par. 1005.01.) Based on the record of this proceeding, the Board finds that these rules will correct the RACT deficiencies previously identified by USEPA, and that these rules will satisfy the requirements of Section 182(a)(2)(A) of the federal Clean Air Act, as amended in 1990. The Board also believes that these rules are federally approvable. Therefore, the Board adopts these rules as final rules.

ORDER

The Board hereby adopts, as final, the following rules. These rules will be filed with the Secretary of State.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER c: EMISSIONS STANDARDS AND LIMITATIONS FOR STATIONARY SOURCES

PART 215
ORGANIC MATERIAL EMISSION STANDARDS AND LIMITATIONS

SUBPART A: GENERAL PROVISIONS

SUBPART B: ORGANIC EMISSIONS FROM STORAGE AND LOADING OPERATIONS

SUBPART C: ORGANIC EMISSIONS FROM MISCELLANEOUS EQUIPMENT

SUBPART E: SOLVENT CLEANING

SUBPART F: COATING OPERATIONS

SUBPART H: SPECIAL LIMITATIONS FOR SOURCES IN AREAS WHICH ARE NONATTAINMENT FOR OZONE

SUBPART I: ADJUSTED RACT EMISSIONS LIMITATIONS

SUBPART K: USE OF ORGANIC MATERIAL

SUBPART N: VEGETABLE OIL PROCESSING

SUBPART P: PRINTING AND PUBLISHING

Section

SUBPART Q: LEAKS FROM SYNTHETIC ORGANIC CHEMICAL AND POLYMER MANUFACTURING EQUIPMENT

Section

SUBPART R: PETROLEUM REFINING AND RELATED INDUSTRIES; ASPHALT MATERIALS

Section

SUBPART S: RUBBER AND MISCELLANEOUS PLASTIC PRODUCTS

Section

SUBPART T: PHARMACEUTICAL MANUFACTURING

Section

SUBPART U: COKE MANUFACTURING AND BY-PRODUCT RECOVERY

Section

SUBPART V: AIR OXIDATION PROCESSES

Section

SUBPART W: AGRICULTURE

SUBPART X: CONSTRUCTION

SUBPART Y: GASOLINE DISTRIBUTION

SUBPART Z: DRY CLEANERS

SUBPART AA: PAINT AND INK MANUFACTURING

SUBPART BB: POLYSTYRENE PLANTS

SUBPART PP: MISCELLANEOUS FABRICATED PRODUCT MANUFACTURING PROCESSES

SUBPART QQ: MISCELLANEOUS FORMULATION MANUFACTURING PROCESSES

SUBPART RR: MISCELLANEOUS ORGANIC CHEMICAL MANUFACTURING PROCESSES

AUTHORITY: Implementing Section 10 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 1010 and 1027).

SOURCE: Adopted as Chapter 2: Air Pollution, Rule 205: Organic Material Emission Standards and Limitations, R71-23, 4 PCB 191, filed and effective April 14, 1972; amended in R77-3, 33 PCB 357, at 3 Ill. Reg. 18, p. 41, effective May 3, 1979; amended in R78-3 and R78-4, 35 PCB 75, at 3 Ill. Reg. 30, p. 124, effective July 28, 1979; amended in R80-5 at 7 Ill. Reg. 1244, effective January 21, 1983; codified at 7 Ill. Reg. 13601; Notice of Corrections at 7 Ill. Reg. 14575; amended in R82-14 at 8 Ill. Reg. 13254, effective July 12, 1984; amended in R83-36 at 9 Ill. Reg. 9114, effective May 30, 1985; amended in R82-14 at 9 Ill. Reg. 13960, effective August 28, 1985; amended in R85-28 at 11 Ill. Reg. 3127, effective February 3, 1987; amended in R82-14 at 11 Ill. Reg. 7296, effective April 3, 1987; amended in R85-21(A) at 11 Ill. Reg. 11770, effective June 29, 1987; recodified in R86-39 at 11 Ill. Reg. 13541; amended in R82-14 and R86-12 at 11 Ill. Reg. 16706, effective September 30, 1987; amended in R85-21(B) at 11 Ill. Reg. 19117, effective November 9, 1987; amended in R86-36, R86-39, R86-40 at 11 Ill. Reg. 20829, effective December 14, 1987; amended in R82-14 and R86-37 at 12 Ill. Reg. 815, effective December 24, 1987; amended in R86-18 at 12 Ill. Reg. 7311, effective April 8, 1988; amended in R86-10 at 12 Ill. Reg. 7650, effective April 11, 1988; amended in R88-23 at 13 Ill. Reg. 10893, effective June 27, 1989; amended in R88-30(A) at 14 Ill. Reg. 3555, effective February 27, 1990; emergency amendments adopted in R88-30(A) at 14 Ill. Reg. 6421, effective April 11, 1990, for a maximum of 150 days; amended in R88-19 at 14 Ill. Reg. 7596, effective May 8, 1990; amended in R89-16(A) at 14 Ill. Reg. 9173, effective May 23, 1990; amended in R88-30(B) at 15 Ill. Reg. 3309, effective February 13, 1991; amended in R91-7 at 15 Ill. Reg. __________, effective __________________.

SUBPART A: GENERAL PROVISIONS

Section 215.100 Introduction

a) This Part contains standards and limitations for emissions of organic material from stationary sources located in areas other than the Chicago area counties of Cook, DuPage, Kane, Lake, McHenry, and Will and the Metro East area counties of Madison, Monroe, and St. Clair. Standards and limitations applying in the Chicago area are set forth in Part 218. Standards and limitations applying in the Metro East area are set forth in Part 219.

1) Notwithstanding any other provision of this Part, the provisions of this Part shall not apply to sources located in the Chicago area counties of Cook, DuPage, Kane, Lake, McHenry and Will unless the provisions of 35 Ill. Adm. Code Part 218 applicable to such sources are voided or otherwise made ineffective pursuant to Section 218.100 of 35

Ill. Adm. Code Part 218.

2) Notwithstanding any other provision of this Part, the provisions of this Part shall not apply to sources in the Metro East area counties of Madison, Monroe and St. Clair unless the provisions of 35 Ill. Adm. Code Part 219 applicable to such sources are voided or otherwise made ineffective pursuant to Section 219.100 of 35 Ill. Adm. Code Part 219.

b) Sources subject to this Part may be subject to the following:

1) Permits required under 35 Ill. Adm. Code 201;

2) Air quality standards under 35 Ill. Adm. Code 243.

c) This Part is divided into Subparts which are grouped as follows:

1) Subpart A: General provisions;

2) Subparts B - J: Emissions from equipment and operations in common to more than one industry;

3) Subparts K - M: Emissions from use of organic material;

4) Subparts N - end: Special rules for various industry groups.

(Source: Amended at 15 Ill. Reg. ____________, effective ________________________.)

SUBPART Y: GASOLINE DISTRIBUTION

Section 215.581 Bulk Gasoline Plants

a) Subject to subsection (e), no person may cause or allow the transfer of gasoline from a delivery vessel into a stationary storage tank located at a bulk gasoline plant unless:

1) The delivery vessel and the stationary storage tank are each equipped with a vapor collection system that meets the requirements of subsection (d)(4);

2) Each vapor collection system is operating;

3) The delivery vessel displays the appropriate sticker pursuant to the requirements of Section 215.584(b) or (d);

4) The pressure relief valve(s) on the stationary storage tank and the delivery vessel are set to release at no less than 0.7 psi or the highest pressure allowed by state or local fire codes or the guidelines of the National Fire Prevention Association; and

5) The stationary storage tank is equipped with a submerged loading pipe.

b) Subject to subsection (f), no person may cause or allow the transfer of gasoline from a stationary storage tank located at a bulk gasoline plant into a delivery vessel unless:

1) The requirements set forth in subsections (a)(1) through (a)(4) are met; and

2) Equipment is available at the bulk gasoline plant to provide for the submerged filling of the delivery vessel or the delivery vessel is equipped for bottom loading.

c) Subject to subsection (e), each owner of a stationary storage tank located at a bulk gasoline plant shall:

1) Equip each stationary storage tank with a vapor control system that meets the requirements of subsection (a) or (b), whichever is applicable;

2) Provide instructions to the operator of the bulk gasoline plant describing necessary maintenance operations and procedures for prompt notification of the owner in case of any malfunction of a vapor control system; and

3) Repair, replace or modify any worn out or malfunctioning component or element of design.

d) Subject to subsection (e), each operator of a bulk gasoline plant shall:

1) Maintain and operate each vapor control system in accordance with the owner's instructions;

2) Promptly notify the owner of any scheduled maintenance or malfunction requiring replacement or repair of a major component of a vapor control system; and

3) Maintain gauges, meters or other specified testing

devices in proper working order;

4) Operate the bulk plant vapor collection system and gasoline loading equipment in a manner that prevents:

   A) Gauge pressure from exceeding 18 inches of water and vacuum from exceeding 6 inches of water, as measured as close as possible to the vapor hose connection; and

   B) A reading equal to or greater than 100 percent of the lower explosive limit (LEL measured as propane) when tested in accordance with the procedure described in EPA 450/2-78-051 Appendix B; and

   C) Avoidable leaks of liquid during loading or unloading operations.

5) Provide a pressure tap or equivalent on the bulk plant vapor collection system in order to allow the determination of compliance with 215.581(d)(4)(A); and

6) Within 15 business days after discovery of the leak by the owner, operator, or the Agency, repair and retest a vapor collection system which exceeds the limits of subsection (d)(4)(A) or (B).

e) The requirements of subsections (a), (c) and (d) shall not apply to:

   1) Any stationary storage tank with a capacity of less than 575 gallons; or

   2) Any bulk gasoline plant whose annual gasoline throughput is less than 350,000 gallons as averaged over the preceding three calendar years.

f) The requirements of subsection (b) shall only apply to bulk gasoline plants:

   1) That have an annual gasoline throughput greater than or equal to 1,000,000 gallons, as averaged over the preceding three calendar years; and

   2) That either distribute gasoline to gasoline dispensing facilities subject to the requirements of Section 215.583(a)(2), 35 Ill. Adm. Code 218.583(b)(2) or 35 Ill. Adm. Code 219.583(a)(2) or that are located in the following counties:

Boone, Peoria, Rock Island, Tazewell, or Winnebago.

g) Bulk gasoline plants were required to take certain actions to achieve compliance which are summarized in Appendix C.

(Source: Amended at 15 Ill. Reg. ________________, effective ____________________.)

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER c: EMISSIONS STANDARDS AND LIMITATIONS FOR STATIONARY SOURCES

PART 219
ORGANIC MATERIAL EMISSION STANDARDS AND LIMITATIONS FOR THE METRO EAST AREA

SUBPART A: GENERAL PROVISIONS

Section

SUBPART B: ORGANIC EMISSIONS FROM STORAGE AND LOADING OPERATIONS

Section

SUBPART C: ORGANIC EMISSIONS FROM MISCELLANEOUS EQUIPMENT

SUBPART E: SOLVENT CLEANING

SUBPART F: COATING OPERATIONS

SUBPART G: USE OF ORGANIC MATERIAL

SUBPART H: PRINTING AND PUBLISHING

SUBPART Q: LEAKS FROM SYNTHETIC ORGANIC CHEMICAL AND POLYMER MANUFACTURING EQUIPMENT

SUBPART R: PETROLEUM REFINING AND RELATED INDUSTRIES; ASPHALT MATERIALS

SUBPART S: RUBBER AND MISCELLANEOUS PLASTIC PRODUCTS

SUBPART T: PHARMACEUTICAL MANUFACTURING

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SUBPART QQ: MISCELLANEOUS FORMULATION MANUFACTURING PROCESSES

SUBPART RR: MISCELLANEOUS ORGANIC CHEMICAL MANUFACTURING PROCESSES

SUBPART TT: OTHER EMISSION SOURCES

SUBPART UU: RECORDKEEPING AND REPORTING FOR NON-CTG SOURCES

AUTHORITY: Implementing Section 10 and authorized by Section 28.2 of the Environmental Protection Act (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 1010 and 1028.2).

SOURCE: Adopted in R91-8 at 15 Ill. Reg. ________, effective ___ ________________.

SUBPART A: GENERAL PROVISIONS

Section 219.100 Introduction

a) This Part contains standards and limitations for emissions of organic material from stationary sources located in the Metro East area, which is comprised of Madison, Monroe, and St. Clair Counties.

b) Sources subject to this Part may be subject to the following:

1) Permits required under 35 Ill. Adm. Code 201;

2) Air quality standards under 35 Ill. Adm. Code 243;

c) This Part is divided into Subparts which are grouped as follows:

1) Subpart A: General Provisions

2) Subparts B-F: Emissions from equipment and operations in common to more than one industry;

3) Subpart G: Emissions from use of organic material;

4) Subparts H-end: Special rules for various industry groups.

Section 219.101 Cleanup and Disposal Operation

Emission of organic material released during clean-up operations and disposal shall be included with other emissions of organic material from the related emission source or air pollution control equipment in determining total emissions.

Section 219.102 Abbreviations and Conversion Factors

a) The following abbreviations are used in this Part:

ASTM	American Society for Testing and Materials
bbl	barrels (42 gallons)
°C	degrees Celsius or centigrade
cm	centimeters
cu in.	cubic inches
°F	degrees Fahrenheit
FIP	Federal Implementation Plan
ft	feet
ft^2	square feet
g	grams

gpm	gallons per minute
g/mole	grams per mole
gal	gallons
hr	hours
in	inches
°K	degrees Kelvin
kcal	kilocalories
kg	kilograms
kg/hr	kilograms per hour
kPa	kilopascals; one thousand newtons per square meter
l	liters
l/sec	liters per second
lbs	pounds
lbs/hr	pounds per hour
lbs/gal	pounds per gallon
LEL	lower explosive limit
m	meters
m^2	square meters
m^3	cubic meters
mg	milligrams
Mg	Megagrams, metric tons or tonnes
ml	milliliters
min	minutes
MJ	megajoules
mm Hg	millimeters of mercury
ppm	parts per million
ppmv	parts per million by volume
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gauge
scf	standard cubic feet
scm	standard cubic meters
sec	seconds
SIP	State Implementation Plan
TTE	temporary total enclosure
sq cm	square centimeters
sq in	square inches
T	English ton
ton	English ton
USEPA	United States Environmental Protection Agency
VOC	volatile organic compounds
VOL	volatile organic liquids
VOM	volatile organic materials

b) The following conversion factors are used in this Part.

English	Metric
1 gal	3.785 l
1,000 gal	3,785 l or 3.785 m^3
1 psia	6.897 kPa (51.71 mm Hg)
2.205 lbs	1 kg
1 bbl	159.0 l
1 cu in	16.39 ml
1 lb/gal	119,800 mg/l
1 ton	0.907 Mg
1 T	0.907 Mg

Section 219.103 Applicability

The provisions of this Part shall apply to all sources located in Madison, Monroe, and St. Clair Counties.

Section 219.104 Definitions

The following terms are defined for the purpose of this Part.

"Accelacota" means a pharmaceutical coating operation which consists of a horizontally rotating perforated drum in which tablets are placed, a coating is applied by spraying, and the coating is dried by the flow of air across the drum through the perforations.

"Accumulator" means the reservoir of a condensing unit receiving the condensate from a surface condenser.

"Acid gases" means for the purposes of Section 9.4 of the Environmental Protection Act (the Act) (Ill. Rev. Stat. 1989, ch. 111 1/2, par. 1009.4), hydrogen chloride, hydrogen fluoride and hydrogen bromide, which exist as gases, liquid mist, or any combination thereof.

"Actual emissions" means the actual quantity of VOM emissions from an emission source during a particular time period.

"Actual heat input" means the quantity of heat produced by the combustion of fuel using the gross heating value of the fuel.

"Adhesive" means any substance or mixture of substances intended to serve as a joining compound.

"Afterburner" means a control device in which materials in gaseous effluent are combusted.

"Air contaminant" means any solid, liquid, or gaseous matter, any odor, or any form of energy, that is capable of being released into the atmosphere from an emission source.

"Air dried coatings" means any coatings that dry by use of air or forced air at temperatures up to 363.15 K (194°F).

"Air pollution" means the presence in the atmosphere of one or more air contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human, plant, or animal life, to health, or to property, or to unreasonably interfere with the enjoyment of life or property.

"Air pollution control equipment" means any equipment or facility of a type intended to eliminate, prevent, reduce or control the emission of specified air contaminants to the atmosphere.

"Air suspension coater/dryer" means a pharmaceutical coating operation which consists of vertical chambers in which tablets or particles are placed, and a coating is applied and then dried while the tablets or particles are kept in a fluidized state by the passage of air upward through the chambers.

"Airless spray" means a spray coating method in which the coating is atomized by forcing it through a small opening at high pressure. The coating liquid is not mixed with air before exiting from the nozzle.

"Air-assisted airless spray" means a spray coating method which combines compressed air with hydraulic pressure to atomize the coating material into finer droplets than is achieved with pure airless spray. Lower hydraulic pressure is used than with airless spray.

"Allowable emissions" means the quantity of VOM emissions during a particular time period from a stationary source calculated using the maximum rated capacity of the source (unless restricted by federally enforceable limitations on operating rate, hours of operation, or both) and the most stringent of: the applicable standards in 40 CFR Parts 60 and 61; the applicable implementation plan; or a federally enforceable permit.

"Ambient air quality standards" means those standards designed to protect the public health and welfare codified in 40 CFR Part 50 and promulgated from time to time by the USEPA pursuant to authority contained in Section 108 of the Clean Air Act, 42 U.S.C. 7401 et seq., as amended from time to time.

"Applicator" means a device used in a coating line to apply coating.

"As applied" means the exact formulation of a coating during application on or impregnation into a substrate.

"Architectural coating" means any coating used for residential or commercial buildings or their appurtenances, or for industrial buildings, which is site applied.

"Asphalt" means the dark-brown to black cementitious material (solid, semisolid, or liquid in consistency) of which the main constituents are bitumens which occur naturally or as a residue of petroleum refining.

"Asphalt prime coat" means a low-viscosity liquid asphalt applied to an absorbent surface as the first of more than one asphalt coat.

"Automobile" means a motor vehicle capable of carrying no more than 12 passengers.

"Automobile or light-duty truck assembly plant" means a facility where parts are assembled or finished for eventual inclusion into a finished automobile or light-duty truck ready for sale to vehicle dealers, but not including customizers, body shops, and other repainters.

"Automobile or light-duty truck refinishing" means the repainting of used automobiles and light-duty trucks.

"Baked coatings" means any coating which is cured or dried in an oven where the oven air temperature exceeds 90°C (194°F).

"Batch loading" means the process of loading a number of individual parts at the same time for degreasing.

"Bead-dipping" means the dipping of an assembled tire bead into a solvent-based cement.

"Binders" means organic materials and resins which do not contain VOM.

"Bituminous coatings" means black or brownish coating materials which are soluble in carbon disulfide, which consist mainly of hydrocarbons, and which are obtained from natural deposits or as residues from the distillation of crude oils or of low grades of coal.

"British thermal unit" means the quantity of heat required to raise one pound of water from 60°F to 61°F (abbreviated btu).

"Brush or wipe coating" means a manual method of applying a coating using a brush, cloth, or similar object.

"Bulk gasoline plant" means a gasoline storage and distribution facility with an average throughput of 76,000 l (20,000 gal) or less on a 30-day rolling average that distributes gasoline to gasoline dispensing facilities.

"Bulk gasoline terminal" means any gasoline storage and distribution facility that receives gasoline by pipeline, ship or barge, and distributes gasoline to bulk gasoline plants or gasoline dispensing facilities.

"Can" means any metal container, with or without a top, cover, spout or handles, into which solid or liquid materials are packaged.

"Can coating" means any coating applied on a single walled container that is manufactured from metal sheets thinner than 29 gauge (0.0141 in.).

"Can coating facility" means a facility that includes one or more can coating line(s).

"Can coating line" means a coating line in which any protective, decorative, or functional coating is applied onto the surface of cans or can components.

"Capture" means the containment or recovery of emissions from a process for direction into a duct which may be exhausted through a stack or vent to a control device. The overall abatement of emissions from a process with an add-on control device is a function both of the capture efficiency and of the control device.

"Capture device" means a hood, enclosed room floor sweep or other means of collecting solvent or other pollutants into a duct. The pollutant can then be directed to a pollution control device such as an afterburner or carbon adsorber. Sometimes the term is used loosely to include the control device.

"Capture efficiency" means the fraction of all VOM generated by a process that are directed to an abatement or recovery device.

"Capture system" means all equipment (including, but not limited to, hoods, ducts, fans, ovens, dryers, etc.) used to contain, collect and transport an air pollutant to a control device.

"Clean Air Act" means the Clean Air Act of 1963, as amended, including the Clean Air Act Amendments of 1977, (42 U.S.C. 7401 et seq.), and the Clean Air Act Amendments of 1990, (P.A. 101549).

"Clear coating" means coatings that lack color and opacity or are transparent using the undercoat as a reflectant base or undertone color.

"Clear topcoat" means the final coating which contains binders, but not opaque pigments, and is specifically formulated to form a transparent or translucent solid protective film.

"Closed purge system" means a system that is not open to the atmosphere and that is composed of piping, connections, and, if necessary, flow inducing devices that transport liquid or vapor from a piece or pieces of equipment to a control device, or return the liquid or vapor to the process line.

"Closed vent system" means a system that is not open to the atmosphere and is composed of piping, connections, and, if necessary, flow inducing devices that transport gas or vapor from an emission source to a control device.

"Coating" means a material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, adhesives, thinners, diluents, and inks.

"Coating applicator" means equipment used to apply a coating.

"Coating line" means an operation consisting of a series of one or more coating applicators and any associated flash-off areas, drying areas, and ovens wherein a surface coating is applied, dried, or cured. (It is not necessary for an operation to have an oven, or flash-off area, or drying area to be included in this definition.)

"Coating plant" means any plant that contains one or more coating line(s).

"Coil" means any flat metal sheet or strip that is rolled or wound in concentric rings.

"Coil coating" means any coating applied on any flat metal sheet or strip that comes in rolls or coils.

"Coil coating facility" means a facility that includes one or more coil coating line(s).

"Coil coating line" means a coating line in which any protective, decorative or functional coating is applied onto the surface of flat metal sheets, strips, rolls, or coils for industrial or commercial use.

"Cold cleaning" means the process of cleaning and removing soils from surfaces by spraying, brushing, flushing, or immersion while maintaining the organic solvent below its boiling point. Wipe cleaning is not included in this definition.

"Complete combustion" means a process in which all carbon contained in a fuel or gas stream is converted to carbon dioxide.

"Component" means, with respect to synthetic organic chemical and polymer manufacturing equipment, and petroleum refining and related industries, any piece of equipment which has the potential to leak VOM including, but not limited to, pump seals, compressor seals, seal oil degassing vents, pipeline valves, pressure relief devices, process drains, and open ended pipes. This definition excludes valves which are not externally regulated, flanges, and equipment in heavy liquid service. For purposes of Subpart Q of this Part, this definition also excludes bleed ports of gear pumps in polymer service.

"Concrete curing compounds" means any coating applied to freshly poured concrete to retard the evaporation of water.

"Condensate" means volatile organic liquid separated from its associated gases, which condenses due to changes in the temperature or pressure and remains liquid at standard conditions.

"Continuous process" means, with respect to polystyrene resin, a method of manufacture in which the styrene raw material is delivered on a continuous basis to the reactor in which the styrene is polymerized to polystyrene.

"Control device" means equipment (such as an afterburner or adsorber) used to remove or prevent the emission of air pollutants from a contaminated exhaust stream.

"Control device efficiency" means the ratio of the pollution prevented by a control device and the pollution introduced to the control device, expressed as a percentage.

"Conveyorized degreasing" means the continuous process of cleaning and removing soils from surfaces utilizing either cold or vaporized solvents.

"Crude oil" means a naturally occurring mixture which consists of hydrocarbons and sulfur, nitrogen, or oxygen derivatives of hydrocarbons and which is a liquid at standard conditions.

"Crude oil gathering" means the transportation of crude oil or condensate after custody transfer between a production facility and a reception point.

"Custody transfer" means the transfer of produced petroleum and/or condensate after processing and/or treating in the producing operations, from storage tanks or automatic transfer facilities to pipelines or any other forms of transportation.

"Cutback asphalt" means any asphalt which has been liquified by blending with petroleum solvents other than residual fuel oil and has not been emulsified with water.

"Daily-weighted average VOM content" means the average VOM content of two or more coatings as applied on a coating line during any day, taking into account the fraction of total coating volume that each coating represents, as calculated with the following equation:

$$VOM_w = [\sum_{i=1}^{n} V_i C_i]/V_T$$

where:

VOM_w = The average VOM content of two or more coatings as applied each day on a coating line in units of kg VOM/l (lbs VOM/gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM),

n = The number of different coatings as applied each day on a coating line,

V_i = The volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on a coating line in units of l (gal).

C_i = The VOM content of each coating as applied each day on a coating line in units of kg VOM/l (lbs VOM/gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM), and

V_T = The total volume of all coatings (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on a coating line in units of l (gal).

"Day" means the consecutive 24 hours beginning at 12:00 AM (midnight) local time.

"Degreaser" means any equipment or system used in solvent cleaning.

"Delivery vessel" means any tank truck or trailer equipped with a storage tank that is used for the transport of gasoline to a stationary storage tank at a gasoline dispensing facility, bulk gasoline plant, or bulk gasoline terminal.

"Dip coating" means a method of applying coatings in which the part is submerged in a tank filled with the coating.

"Distillate fuel oil" means fuel oils of grade No. 1 or 2 as specified in detailed requirements for fuel oil ASTM D-369-69 (1971).

"Dry cleaning facility" means a facility engaged in the cleaning of fabrics using an essentially nonaqueous solvent by means of one or more solvent washes, extraction of excess solvent by spinning and drying by tumbling in an airstream. The facility includes, but is not limited to, washers, dryers, filter and purification systems, waste disposal systems, holding tanks, pumps and attendant piping and valves.

"Effluent water separator" means any tank, box, sump or other apparatus in which any organic material floating on or entrained or contained in water entering such tank, box, sump or other apparatus is physically separated and removed from such water prior to outfall, drainage or recovery of such water.

"Electrostatic bell or disc spray" means an electrostatic spray coating method in which a rapidly-spinning bell- or disc-shaped applicator is used to create a fine mist and apply the coating with high transfer efficiency.

"Electrostatic spray" means a spray coating method in which opposite electrical charges are applied to the substrate and the coating. The coating is attracted to the object due to the electrostatic potential between them.

"Emission rate" means total quantity of any air contaminant discharge into the atmosphere in any one-hour period.

"Emission source" and "source" mean any facility from which VOM is emitted or capable of being emitted into the atmosphere.

"Enamel" means a coating that cures by chemical cross-linking of its base resin. Enamels can be distinguished from lacquers because enamels are not readily resoluble in their original solvent.

"Enclose" means to cover any VOL surface that is exposed to the atmosphere.

"End sealing compound coat" means a compound applied to can ends which functions as a gasket when the end is assembled onto the can.

"Excess air" means air supplied in addition to the theoretical quantity necessary for complete combustion of all fuel and/or combustible waste material.

"Excessive release" means a discharge of more than 295 g (0.65 lbs) of mercaptans and/or hydrogen sulfide into the atmosphere in any 5-minute period.

"Exterior base coat" means a coating applied to the exterior of a can body, or flat sheet to provide protection to the metal or to provide background for any lithographic or printing operation.

"Exterior end coat" means a coating applied to the exterior end of a can to provide protection to the metal.

"External-floating roof" means a cover over an open top storage tank consisting of a double deck or pontoon single deck which rests upon and is supported by the volatile organic liquid being contained and is equipped with a closure seal or seals to close the space between the roof edge and tank shell.

"Extreme environmental conditions" means exposure to any or all of the following: ambient weather conditions; temperatures consistently above 95°C (203°F); detergents; abrasive and scouring agents; solvents; or corrosive atmospheres.

"Extreme performance coating" means any coating which during intended use is exposed to extreme environmental conditions.

"Fabric coating" means any coating applied on textile fabric. Fabric coating includes the application of coatings by impregnation.

"Fabric coating facility" means a facility that includes one or more fabric coating lines.

"Fabric coating line" means a coating line in which any protective, decorative, or functional coating or reinforcing material is applied on or impregnated into a textile fabric.

"Federally enforceable" means all limitations and conditions which are enforceable by the Administrator including those requirements developed pursuant to 40 CFR Parts 60 and 61; requirements within any applicable implementation plan; and any permit requirements established pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR Part 51 Subpart I and 40 CFR 51.166.

"Final repair coat" means the repainting of any topcoat which is damaged during vehicle assembly.

"Firebox" means the chamber or compartment of a boiler or furnace in which materials are burned, but not the combustion chamber or afterburner of an incinerator.

"Fixed-roof tank" means a cylindrical shell with a permanently affixed roof.

"Flexographic printing" means the application of words, designs, and pictures to a substrate by means of a roll printing technique in which the pattern to be applied is raised above the printing roll and the image carrier is made of elastomeric materials.

"Flexographic printing line" means a printing line in which each roll printer uses a roll with raised areas for applying an image such as words, designs, or pictures to a substrate. The image carrier on the roll is made of rubber or other elastomeric material.

"Floating roof" means a roof on a stationary tank, reservoir, or other container which moves vertically upon change in volume of the stored material.

"Fountain solution" means the solution which is applied to the image plate to maintain hydrophilic properties of the non-image areas.

"Freeboard height" means for open top vapor degreasers, the distance from the top of the vapor zone to the top of the degreaser tank. For cold cleaning degreasers, the distance from the solvent to the top of the degreaser tank.

"Fuel combustion emission source" means any furnace, boiler, or similar equipment used for the primary purpose of producing heat or power by indirect heat transfer.

"Fuel gas system" means a system for collection of refinery fuel gas including, but not limited to, piping for collecting tail gas from various process units, mixing drums and controls, and distribution piping.

"Gas service" means that the component contains process fluid that is in the gaseous state at operating conditions.

"Gas/gas method" means either of two methods for determining capture which rely only on gas phase measurements. The first method requires construction of a temporary total enclosure (TTE) to ensure that all would-be fugitive emissions are measured. The second method uses the building or room which houses the facility as an enclosure. The second method requires that all other VOM sources within the room be shut down while the test is performed, but all fans and blowers within the room must be operated according to normal procedures.

"Gasoline" means any petroleum distillate or petroleum distillate/alcohol blend having a Reid vapor pressure of 27.6 kPa or greater which is used as a fuel for internal combustion engines.

"Gasoline dispensing facility" means any site where gasoline is transferred from a stationary storage tank to a motor vehicle gasoline tank used to provide fuel to the engine of that motor vehicle.

"Green tire spraying" means the spraying of green tires, both inside and outside, with release compounds which help remove air from the tire during molding and prevent the tire from sticking to the mold after curing.

"Green tires" means assembled tires before molding and curing have occurred.

"Gross vehicle weight" means the manufacturer's gross weight rating for the individual vehicle.

"Gross vehicle weight rating" means the value specified by the manufacturer as the maximum design loaded weight of a single vehicle.

"Heated airless spray" means an airless spray coating method in which the coating is heated just prior to application.

"Heatset" means a class of web-offset lithography which requires a heated dryer to solidify the printing inks.

"Heatset-web-offset lithographic printing line" means a lithographic printing line in which a blanket cylinder is used to transfer ink from a plate cylinder to a substrate continuously fed from a roll or an extension process and an oven is used to solidify the printing inks.

"Heavy liquid" means liquid with a true vapor pressure of less than 0.3 kPa (0.04 psi) at 294.3°K (70°F) established in a standard reference text or as determined by ASTM method D2879-86 (incorporated by reference in Section 219.112); or which has 0.1 Reid Vapor Pressure as determined by ASTM method D323-82 (incorporated by reference in Section 219.112); or which when distilled requires a temperature of 421.95°K (300°F) or greater to recover 10 percent of the liquid as determined by ASTM method D86-82 (incorporated by reference in Section 219.112).

"Heavy off-highway vehicle products" means, for the purpose of Subpart F of this Part, heavy construction, mining, farming, or material handling equipment; heavy industrial engines; diesel-electric locomotives and associated power generation equipment; and the components of such equipment or engines.

"Heavy off-highway vehicle products coating facility" means a facility that includes one or more heavy off-highway vehicle products coating line(s).

"Heavy off-highway vehicle products coating line" means a coating line in which any protective, decorative, or functional coating is applied onto the surface of heavy off-highway vehicle products.

"High temperature aluminum coating" means a coating that is certified to withstand a temperature of 537.8°C (1000°F) for 24 hours.

"Hood" means a partial enclosure or canopy for capturing and exhausting, by means of a draft, the organic vapors or other fumes rising from a coating process or other source.

"Hood capture efficiency" means the emissions from a process which are captured by the hood and directed into a control device, expressed as a percentage of all emissions.

"Hot well" means the reservoir of a condensing unit receiving the condensate from a barometric condenser.

"Hour" means a block period of 60 minutes (e.g., 1:00am to 2:00am).

"In-process tank" means a container used for mixing, blending, heating, reacting, holding, crystallizing, evaporating or cleaning operations in the manufacture of pharmaceuticals.

"In-situ sampling systems" means nonextractive samplers or in-line samplers.

"In vacuum service" means, for the purpose of Subpart Q of this Part, equipment which is operating at an internal pressure that is at least 5 kPa (0.73 psia) below ambient pressure.

"Incinerator" means a combustion apparatus in which refuse is burned.

"Indirect heat transfer" means transfer of heat in such a way that the source of heat does not come into direct contact with process materials.

"Ink" means a coating used in printing, impressing, or transferring an image onto a substrate.

"Interior body spray coat" means a coating applied by spray to the interior of a can body.

"Internal-floating roof" means a cover or roof in a fixed-roof tank which rests upon and is supported by the volatile organic liquid being contained and is equipped with a closure seal or seals to close the space between the roof edge and tank shell.

"Lacquers" means any clear wood finishes formulated with nitrocellulose or synthetic resins to dry by evaporation without chemical reaction, including clear lacquer sanding sealers.

"Large appliance" means any residential and commercial washers, dryers, ranges, refrigerators, freezers, water heaters, dishwashers, trash compactors, air conditioners, and other similar products.

"Large appliance coating" means any coating applied to the component metal parts (including, but not limited to, doors, cases, lids, panels, and interior support parts) of residential and commercial washers, dryers, ranges, refrigerators, freezers, water heaters, dish washers, trash compactors, air conditioners, and other similar products.

"Large appliance coating facility" means a facility that includes one or more large appliance coating line(s).

"Large appliance coating line" means a coating line in which any protective, decorative, or functional coating is applied onto the surface of large appliances.

"Light liquid" means VOM in the liquid state which is not defined as heavy liquid.

"Light-duty truck" means any motor vehicle rated at 3,850 kg gross vehicle weight or less, designed mainly to transport property.

"Liquid/gas method" means either of two methods for determining capture which require both gas phase and liquid phase measurements and analysis. The first method requires construction of a TTE. The second method uses the building or room which houses the facility as an enclosure. The second method requires that all other VOM sources within the room be shut down while the test is performed, but all fans and blowers within the room must be operated according to normal procedures.

"Liquid-mounted seal" means a primary seal mounted in continuous contact with the liquid between the tank wall and the floating roof edge around the circumference of the roof.

"Liquid service" means that the equipment or component contains process fluid that is in a liquid state at operating conditions.

"Liquids dripping" means any visible leaking from a seal including spraying, misting, clouding and ice formation.

"Lithographic printing line" means a printing line, except that the substrate is not necessarily fed from an unwinding roll, in which each roll printer uses a roll where both the image and non-image areas are essentially in the same plane (planographic).

"Low solvent coating" means a coating which contains less organic solvent than the conventional coatings used by the industry. Low solvent coatings include water-borne, higher solids, electro-deposition and powder coatings.

"Magnet wire" means aluminum or copper wire formed into an electromagnetic coil.

"Magnet wire coating" means any coating or electrically insulating varnish or enamel applied to magnet wire.

"Magnet wire coating facility" means a facility that includes one or more magnet wire coating line(s).

"Magnet wire coating line" means a coating line in which any protective, decorative, or functional coating is applied onto the surface of a magnet wire.

"Malfunction" means any sudden and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

"Manufacturing process" means a method whereby a process emission source or series of process emission sources is used to convert raw materials, feed stocks, subassemblies, or other components into a product, either for sale or for use as a component in a subsequent manufacturing process.

"Material recovery section" means any equipment designed to transport and recover styrene monomer and other impurities from other products and by-products in a polystyrene plant, including but not limited to the styrene devolatilizer unit and styrene recovery unit.

"Maximum theoretical emissions" means the quantity of volatile organic material emissions that theoretically could be emitted by a stationary source before add-on controls based on the design capacity or maximum production capacity of the source and 8760 hours per year. The design capacity or maximum production capacity includes use of coating(s) or ink(s) with the highest volatile organic material content actually used in practice by the source. Provided, however, the Agency shall, when appropriate, and upon request by the permit applicant, limit the "maximum theoretical emissions" of a source by the imposition of conditions in a federally enforceable operating permit for such source. Such conditions shall not be inconsistent with requirement of the Clean Air Act, as amended, or any applicable requirements established by the Board. Such conditions shall be established in place of design capacity of maximum production capacity in calculating the "maximum theoretical emissions" for such source and may include, among other things, the establishment of production limitations, capacity limitations, emission limitations, or limitations on the volatile organic material content of coatings or inks, or the hours of operation of any emission source, or a combination of any such limitations. Production or capacity limitations shall be established on basis of no longer than one month except in those cases where a limit spanning a longer period of time is appropriate. In such cases, a "rolling limit" shall be employed. Any production or capacity limitations shall be verified through appropriate recordkeeping.

(Board Note: The USEPA may deem operating permits which do not conform to the operating permit program requirements and the requirements of USEPA's underlying regulations, including the requirement that limitations be quantifiable and enforceable as a practical matter, not "federally enforceable.")

"Metal furniture" means a furniture piece including, but not limited to, tables, chairs, waste baskets, beds, desks, lockers, benches, shelving, file cabinets, lamps, and room dividers.

"Metal furniture coating" means any non-adhesive coating applied to any furniture piece made of metal or any metal part which is or will be assembled with other metal, wood, fabric, plastic or glass parts to form a furniture piece including, but not limited to, tables, chairs, waste baskets, beds, desks, lockers, benches, shelving, file cabinets, lamps, and room dividers. This definition shall not apply to any coating line coating miscellaneous metal parts or products.

"Metal furniture coating facility" means a facility that includes one or more metal furniture coating line(s).

"Metal furniture coating line" means a coating line in which any protective, decorative, or functional coating is applied onto the surface of metal furniture.

"Metallic shoe-type seal" means a primary or secondary seal constructed of metal sheets (shoes) which are joined together to form a ring, springs, or levers which attach the shoes to the floating roof and hold the shoes against the tank wall, and a coated fabric which is suspended from the shoes to the floating roof.

"Miscellaneous fabricated product manufacturing process" means:

> A manufacturing process involving one or more of the following applications, including any drying and curing of formulations, and capable of emitting VOM:
>
> > Adhesives to fabricate or assemble components or products
> >
> > Asphalt solutions to paper or fiberboard

Asphalt to paper or felt

Coatings or dye to leather

Coatings to plastic

Coatings to rubber or glass

Disinfectant material to manufactured items

Plastic foam scrap or "fluff" from the manufacture of foam containers and packaging material to form resin pallets

Resin solutions to fiber substances

Viscose solutions for food casings

The storage and handling of formulations associated with the process described above, and the use and handling of organic liquids and other substances for clean-up operations associated with the process described in this definition.

"Miscellaneous formulation manufacturing process" means:

A manufacturing process which compounds one or more of the following and is capable of emitting VOM:

Adhesives

Asphalt solutions

Caulks, sealants, or waterproofing agents

Coatings, other than paint and ink

Concrete curing compounds

Dyes

Friction materials and compounds

Resin solutions

Rubber solutions

Viscose solutions

> The storage and handling of formulations associated with the process described above, and the use and handling of organic liquids and other substances for clean-up operations associated with the process described in this definition.

"Miscellaneous metal parts or products" means any metal part or metal product, even if attached to or combined with a nonmetal part or product, except cans, coils, metal furniture, large appliances, magnet wire, automobiles, ships, and airplane bodies.

"Miscellaneous metal parts and products coating" means any coating applied to any metal part or metal product, even if attached to or combined with a nonmetal part or product, except cans, coils, metal furniture, large appliances, and magnet wire. Prime coat, prime surfacer coat, topcoat, and final repair coat for automobiles and light-duty trucks are not miscellaneous metal parts and products coatings. However, underbody anti-chip (e.g., underbody plastisol) automobile, and light-duty truck coatings are miscellaneous metal parts and products coatings. Also, automobile or light-duty truck refinishing coatings, coatings applied to the exterior of marine vessels, coatings applied to the exterior of airplanes, and the customized topcoating of automobiles and trucks if production is less than 35 vehicles per day are not miscellaneous metal parts and products coatings.

"Miscellaneous metal parts or products coating facility" means a facility that includes one or more miscellaneous metal parts or products coating lines.

"Miscellaneous metal parts or products coating line" means a coating line in which any protective, decorative, or functional coating is applied onto the surface of miscellaneous metal parts or products.

"Miscellaneous organic chemical manufacturing process" means:

> A manufacturing process which produces by chemical reaction, one or more of the following organic compounds or mixtures of organic compounds and which is capable of emitting VOM:
>
> > Chemicals listed in Appendix A of this Part
> >
> > Chlorinated and sulfonated compounds
> >
> > Cosmetic, detergent, soap, or surfactant

intermediaries or specialties and products

Disinfectants

Food additives

Oil and petroleum product additives

Plasticizers

Resins or polymers

Rubber additives

Sweeteners

Varnishes

The storage and handling of formulations associated with the process described above and the use and handling of organic liquids and other substances for clean-up operations associated with the process described in this definition.

"Monitor" means to measure and record.

"Multiple package coating" means a coating made from more than one different ingredient which must be mixed prior to using and has a limited pot life due to the chemical reaction which occurs upon mixing.

"No detectable volatile organic material emissions" means a discharge of volatile organic material into the atmosphere as indicated by an instrument reading of less than 500 ppm above background as determined in accordance with 40 CFR 60.485(c).

"Offset" means, with respect to printing and publishing operations, use of a blanket cylinder to transfer ink from the plate cylinder to the surface to be printed.

"Opaque stains" means all stains that are not semi-transparent stains.

"Open top vapor degreasing" means the batch process of cleaning and removing soils from surfaces by condensing hot solvent vapor on the colder metal parts.

"Open-ended valve" means any valve, except pressure relief devices, having one side of the valve in contact with process fluid and one side open to the atmosphere, either directly or through open piping.

"Operator of gasoline dispensing facility" means any person who is the lessee of or operates, controls or supervises a gasoline dispensing facility.

"Organic compound" means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate.

"Organic material" means any chemical compound of carbon including diluents and thinners which are liquids at standard conditions and which are used as dissolvers, viscosity reducers, or cleaning agents, but excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbonic acid, metallic carbide, metallic carbonates, and ammonium carbonate.

"Organic vapor" means the gaseous phase of an organic material or a mixture of organic materials present in the atmosphere.

"Oven" means a chamber within which heat is used for one or more of the following purposes: dry, bake, cure, or polymerize a coating or ink.

"Overall control" means the product of the capture efficiency and the control device efficiency.

"Overvarnish" means a transparent coating applied directly over ink or coating.

"Owner of gasoline dispensing facility" means any person who has legal or equitable title to a stationary storage tank at a gasoline dispensing facility.

"Owner or operator" means any person who owns, operates, leases, controls, or supervises an emission source or air pollution control equipment.

"Packaging rotogravure printing" means rotogravure printing upon paper, paper board, metal foil, plastic film, and other substrates, which are, in subsequent operations, formed into packaging products or labels for articles to be sold.

"Packaging rotogravure printing line" means a rotogravure printing line in which surface coatings are applied to paper, paperboard, foil, film, or other substrates which are to be used to produce containers, packaging products, or labels for articles.

"Paint manufacturing plant" means a plant that mixes, blends, or compounds enamels, lacquers, sealers, shellacs, stains, varnishes, or pigmented surface coatings.

"Paper coating" means any coating applied on paper, plastic film, or metallic foil to make certain products, including (but not limited to) adhesive tapes and labels, book covers, post cards, office copier paper, drafting paper, or pressure sensitive tapes. Paper coating includes the application of coatings by impregnation and/or saturation.

"Paper coating facility" means a facility that includes one or more paper coating lines.

"Paper coating line" means a coating line in which any protective, decorative, or functional coating is applied on, saturated into, or impregnated into paper, plastic film, or metallic foil to make certain products, including (but not limited to) adhesive tapes and labels, book covers, post cards, office copier paper, drafting paper, and pressure sensitive tapes.

"Parts per million (volume)" means a volume/volume ratio which expresses the volumetric concentration of gaseous air contaminant in a million unit volume of gas.

"Person" means any individual, corporation, partnership, association, State, municipality, political subdivision of a State; any agency, department, or instrumentality of the United States; and any officer, agent, or employee thereof.

"Petroleum" means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

"Petroleum liquid" means crude oil, condensate or any finished or intermediate product manufactured at a petroleum refinery, but not including Number 2 through Number 6 fuel oils as specified in ASTM D-396-69, gas turbine fuel oils Numbers 2-GT through 4-GT as specified in ASTM D-2880-71 or diesel fuel oils Numbers 2-D and 4-D, as specified in ASTM D-975-68.

"Petroleum refinery" means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through distillation of petroleum, or through redistillation, cracking, or reforming of unfinished petroleum derivatives.

"Pharmaceutical" means any compound or mixture, other than food, used in the prevention, diagnosis, alleviation, treatment, or cure of disease in human and animal.

"Pharmaceutical coating operation" means a device in which a coating is applied to a pharmaceutical, including air drying or curing of the coating.

"Photochemically reactive material" means any organic material with an aggregate of more than 20 percent of its total volume composed of the chemical compounds classified below or the composition of which exceeds any of the following individual percentage composition limitations. Whenever any photochemically reactive material or any constituent of any organic material may be classified from its chemical structure into more than one of the above groups of organic materials it shall be considered as a member of the most reactive group, that is, the group having the least allowable percent of the total organic materials.

> A combination of hydrocarbons, alcohols, aldehydes, esters, ethers or ketones having an olefinic or cyclo-olefinic types of unsaturation: 5 percent. This definition does not apply to perchloroethylene or trichloroethylene.
>
> A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene: 8 percent.
>
> A combination of ethylbenzene, ketones having branched hydrocarbon structures or toluene: 20 percent.

"Pigmented coatings" means opaque coatings containing binders and colored pigments which are formulated to conceal the wood surface either as an undercoat or topcoat.

"Plant" means all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control), except the activities of any marine vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same two-digit code) as described in the "Standard Industrial Classification

Manual, 1987" (incorporated by reference in Section 219.112).

"Plasticizers" means a substance added to a polymer composition to soften and add flexibility to the product.

"Pneumatic rubber tire manufacture" means the production of pneumatic rubber tires with a bead diameter up to but not including 20.0 inches and cross section dimension up to 12.8 inches, but not including specialty tires for antique or other vehicles when produced on equipment separate from normal production lines for passenger or truck type tires.

"Polystyrene plant" means any plant using styrene to manufacture polystyrene resin.

"Polystyrene resin" means substance consisting of styrene polymer and additives which is manufactured at a polystyrene plant.

"Pressure release" means the emission of materials resulting from system pressure being greater than set pressure of the pressure relief device.

"Pressure tank" means a tank in which fluids are stored at a pressure greater than atmospheric pressure.

"Prime coat" means the first of two or more coatings applied to a surface.

"Prime surfacer coat" means a coating used to touch up areas on the surface of automobile or light-duty truck bodies not adequately covered by the prime coat before application of the top coat. The prime surfacer coat is applied between the prime coat and topcoat. An anti-chip coating applied to main body parts (e.g., rocker panels, bottom of doors and fenders, and leading edge of roof) is a prime surfacer coat.

"Primers" means any coatings formulated and applied to substrates to provide a firm bond between the substrate and subsequent coats.

"Printing" means the application of words, designs, and pictures to a substrate using ink.

"Printing line" means an operation consisting of a series of one or more roll printers and any associated roll coaters, drying areas, and ovens wherein one or more coatings are applied, dried, and/or cured.

"Process" means any stationary emission source other than a fuel combustion emission source or an incinerator.

"Process unit" means components assembled to produce, as intermediate or final products, one or more of the chemicals listed in 35 Ill. Adm. Code 219 Appendix A. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.

"Process unit shutdown" means a work practice or operational procedure that stops production from a process unit or part of a process unit. An unscheduled work practice or operational procedure that stops production from a process unit or part of a process unit for less than 24 hours is not a process unit shutdown. The use of spare components and technically feasible bypassing of components without stopping production is not a process unit shutdown.

"Production equipment exhaust system" means a system for collecting and directing into the atmosphere emissions of volatile organic material from reactors, centrifuges, and other process emission sources.

"Publication rotogravure printing line" means a rotogravure printing line in which coatings are applied to paper which is subsequently formed into books, magazines, catalogues, brochures, directories, newspaper supplements, or other types of printed material.

"Purged process fluid" means liquid or vapor from a process unit that contains volatile organic material and that results from flushing or cleaning the sample line(s) of a process unit so that an uncontaminated sample may then be taken for testing or analysis.

"Reactor" means a vat, vessel, or other device in which chemical reactions take place.

"Reasonably Available Control Technology (RACT)" means the lowest emission limitation that an emission source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.

"Refiner" means any person who owns, leases, operates, controls, or supervises a refinery.

"Refinery fuel gas" means any gas which is generated by a petroleum refinery process unit and which is combusted at the refinery, including any gaseous mixture of natural gas and fuel gas.

"Refinery unit, process unit or unit" means a set of components which are a part of a basic process operation such as distillation, hydrotreating, cracking, or reforming of hydrocarbons.

"Refrigerated condenser" means a surface condenser in which the coolant supplied to the condenser has been cooled by a mechanical device, other than by a cooling tower or evaporative spray cooling, such as refrigeration unit or steam chiller unit.

"Reid vapor pressure" means the standardized measure of the vapor pressure of a liquid in pounds per square inch absolute (psia) at 100°F (37.8°C).

"Repair coatings" means coatings used to correct imperfections or damage to furniture surface.

"Repaired" means, for the purpose of Subpart Q of this Part, that equipment component has been adjusted, or otherwise altered, to eliminate a leak.

"Residual fuel oil" means fuel oils of grade No. 4, 5 and 6 as specified in detailed requirements for fuel oils ASTM D-396-69 (1971).

"Retail outlet" means any gasoline dispensing facility at which gasoline is sold or offered for sale for use in motor vehicles.

"Roll coater" means an apparatus in which a uniform layer of coating is applied by means of one or more rolls across the entire width of a moving substrate

"Roll printer" means an apparatus used in the application of words, designs, or pictures to a substrate, usually by means of one or more rolls each with only partial coverage.

"Roll printing" means the application of words, designs, and pictures to a substrate usually by means of a series of hard rubber or metal rolls each with only partial coverage.

"Roller coating" means a method of applying a coating to a sheet or strip in which the coating is transferred by a roller or series of rollers.

"Rolling limit" means that a limit or limitation must not exceed an annual limit rolled on a monthly basis; that is, a monthly production or capacity level must be determined for each parameter subject to a production or capacity limitations and added to the eleven prior monthly levels for monthly comparison with the annual limit.

"Rotogravure printing" means the application of words, designs, and pictures to a substrate by means of a roll printing technique in which the pattern to be applied is recessed relative to the non-image area.

"Rotogravure printing line" means a printing line in which each roll printer uses a roll with recessed areas for applying an image to a substrate.

"Safety relief valve" means a valve which is normally closed and which is designed to open in order to relieve excessive pressures within a vessel or pipe.

"Sanding sealers" means any coatings formulated for and applied to bare wood for sanding and to seal the wood for subsequent application of varnish. To be considered a sanding sealer a coating must be clearly labelled as such.

"Sealer" means a coating containing binders which seals wood prior to the application of the subsequent coatings.

"Sensor" means a device that measures a physical quantity or the change in a physical quantity such as temperature, pressure, flow rate, pH, or liquid level.

"Semi-transparent stains" means stains containing dyes or semi-transparent pigments which are formulated to enhance wood grain and change the color of the surface but not to conceal the surface, including, but not limited to, sap stain, toner, non-grain raising stains, pad stain, or spatter stain.

"Set of safety relief valves" means one or more safety relief valves designed to open in order to relieve excessive pressures in the same vessel or pipe.

"Sheet basecoat" means a coating applied to metal when the metal is in sheet form to serve as either the exterior or interior of a can for either two-piece or three-piece cans.

"Side-seam spray coat" means a coating applied to the seam of a three-piece can.

"Single coat" means one coating application applied to a metal surface.

"Solvent" means a liquid substance that is used to dissolve or dilute another substance.

"Solvent cleaning" means the process of cleaning soils from surfaces by cold cleaning, open top vapor degreasing, or conveyorized degreasing.

"Specified air contaminant" means any air contaminant as to which this Part contains emission standards or other specific limitations.

"Splash loading" means a method of loading a tank, railroad tank car, tank truck, or trailer by use of other than a submerged loading pipe.

"Stack" means a flue or conduit, free-standing or with exhaust port above the roof of the building on which it is mounted, by which air contaminants are emitted into the atmosphere.

"Standard conditions" means a temperature of 70°F and a pressure of 14.7 psia.

"Standard cubic foot (scf)" means the volume of one cubic foot of gas at standard conditions.

"Standard Industrial Classification Manual" means the Standard Industrial Classification Manual (1987), Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (incorporated by reference in Section 219.112).

"Start-up" means the setting in operation of an emission source for any purpose.

"Stationary emission source" and "Stationary source" mean an emission source which is not self-propelled.

"Storage tank or storage vessel" means any stationary tank, reservoir or container used for the storage of VOL.

"Styrene devolatilizer unit" means equipment performing the function of separating unreacted styrene monomer and other volatile components from polystyrene in a vacuum devolatilizer.

"Styrene recovery unit" means equipment performing the function of separating styrene monomer from other less volatile components of the styrene devolatilizer unit's output. The separated styrene monomer may be reused as a raw material in the polystyrene plant.

"Submerged loading pipe" means any discharge pipe or nozzle which meets either of the following conditions:

> Where the tank is filled from the top, the end of the discharge pipe or nozzle must be totally submerged when the liquid level is 15 cm (6 in.) above the bottom of the tank.
>
> Where the tank is filled from the side, the discharge pipe or nozzle must be totally submerged when the liquid level is 46 cm (18 in.) above the bottom of the tank.

"Substrate" means the surface onto which a coating is applied or into which a coating is impregnated.

"Surface condenser" means a device which removes a substance from a gas stream by reducing the temperature of the stream, without direct contact between the coolant and the stream.

"Synthetic organic chemical or polymer manufacturing plant" means a plant that produces, as intermediates or final products, one or more of the chemicals or polymers listed in 35 Ill. Adm. Code 219 Appendix A.

"Tablet coating operation" means a pharmaceutical coating operation in which tablets are coated.

"Thirty-day rolling average" means any value arithmetically averaged over any consecutive thirty-days.

"Three-piece can" means a can which is made from a rectangular sheet and two circular ends.

"Topcoat" means a coating applied in a multiple coat operation other than prime coat, final repair coat, or prime surfacer coat.

"Topcoat operation" means all topcoat spray booths, flash-off areas, and bake ovens at a facility which are used to apply, dry, or cure the final coatings (except final off-line repair) on components of automobile or light-duty truck bodies.

"Transfer efficiency" means the ratio of the amount of coating solids deposited onto a part or product to the total amount of coating solids used.

"Tread end cementing" means the application of a solvent-based cement to the tire tread ends.

"True vapor pressure" means the equilibrium partial pressure exerted by a volatile organic liquid as determined in accordance with methods described in American Petroleum Institute Bulletin 2517, "Evaporation Loss From Floating Roof Tanks," second edition, February 1980 (incorporated by reference in Section 219.112).

"Turnaround" means the procedure of shutting down an operating refinery unit, emptying gaseous and liquid contents to do inspection, maintenance and repair work, and putting the unit back into production.

"Two-piece can" means a can which is drawn from a shallow cup and requires only one end to be attached.

"Undercoaters" means any coatings formulated for and applied to substrates to provide a smooth surface for subsequent coats.

"Undertread cementing" means the application of a solvent-based cement to the underside of a tire tread.

"Unregulated safety relief valve" means a safety relief valve which cannot be actuated by a means other than high pressure in the pipe or vessel which it protects.

"Vacuum producing system" means any reciprocating, rotary, or centrifugal blower or compressor or any jet ejector or device that creates suction from a pressure below atmospheric and discharges against a greater pressure.

"Valves not externally regulated" means valves that have no external controls, such as in-line check valves.

"Vapor balance system" means any combination of pipes or hoses which creates a closed system between the vapor spaces of an unloading tank and a receiving tank such that vapors displaced from the receiving tank are transferred to the tank being unloaded.

"Vapor collection system" means all piping, seals, hoses, connections, pressure-vacuum vents, and other possible sources between the gasoline delivery vessel and the vapor processing unit and/or the storage tanks and vapor holder.

"Vapor control system" means any system that limits or prevents release to the atmosphere of organic material in the vapors displaced from a tank during the transfer of gasoline.

"Vapor-mounted primary seal" means a primary seal mounted with an air space bounded by the bottom of the primary seal, the tank wall, the liquid surface and the floating roof.

"Vapor recovery system" means a vapor gathering system capable of collecting all VOM vapors and gases discharged from the storage tank and a vapor disposal system capable of processing such VOM vapors and gases so as to prevent their emission to the atmosphere.

"Vehicle" means a device by which any person or property may be propelled, moved, or drawn upon a highway, excepting a device moved exclusively by human power or used exclusively upon stationary rails or tracks.

"Vinyl coating" means any topcoat or printing ink applied to vinyl coated fabric or vinyl sheets. Vinyl coating does not include plastisols.

"Vinyl coating facility" means a facility that includes one or more vinyl coating line(s).

"Vinyl coating line" means a coating line in which any protective, decorative or functional coating is applied onto vinyl coated fabric or vinyl sheets.

"Volatile organic liquid" means any substance which is liquid at storage conditions and which contains volatile organic compounds.

"Volatile organic material (VOM) or volatile organic compound (VOC)" means any organic compound which participates in atmospheric photochemical reactions. This includes any organic compound other than the following compounds: methane, ethane, methyl chloroform (1,1,1-trichloroethane), CFC-113 (trichlorotrifluoroethane), methylene chloride (dichloromethane), CFC-11 (trichlorofluoromethane), CFC-12 (dichlorodifluoromethane), CFC-22 (chlorodifluoromethane), FC-23 (trifluoromethane), CFC-114 (dichlorotetrafluoroethane), CFC-115 (chloropentafluoroethane), HCFC-123 (dichlorotrifluoroethane), HFC-134a (tetrafluoroethane), HCFC-141b (dichlorofluoroethane) and HCFC-142b (chlorodifluoroethane). These compounds have been determined to have negligible photochemical reactivity.

For purposes of determining compliance with emission limits, VOC will be measured by the approved test methods. Where such a method also inadvertently measures compounds with negligible photochemical reactivity, an owner or operator may exclude these negligibly reactive compounds when determining compliance with an emissions standard.

"Volatile petroleum liquid" means any petroleum liquid with a true vapor pressure that is greater than 1.5 psia (78 millimeters of mercury) at standard conditions.

"Wash coat" means a coating containing binders which seals wood surfaces, prevents undesired staining, and controls penetration.

"Wastewater (oil/water) separator" means any device or piece of equipment which utilizes the difference in density between oil and water to remove oil and associated chemicals of water, or any device, such as a flocculation tank or a clarifier, which removes petroleum derived compounds from waste water.

"Web" means a substrate which is printed in continuous roll-fed presses.

"Wood furniture" means room furnishings including cabinets (kitchen, bath, and vanity), tables, chairs, beds, sofas, shutters, art objects, wood paneling, wood flooring, and any other coated furnishings made of wood, wood composition, or fabricated wood materials.

"Wood furniture coating facility" means a facility that includes one or more wood furniture coating line(s).

"Wood furniture coating line" means a coating line in which any protective, decorative, or functional coating is applied onto wood furniture.

"Woodworking" means the shaping, sawing, grinding, smoothing, polishing, and making into products of any form or shape of wood.

Section 219.105 Test Methods and Procedures

a) Coatings, Inks and Fountain Solutions

The following test methods and procedures shall be used to determine compliance of applied coatings, inks, and fountain solutions with the limitations set forth in this Part.

1) Sampling: Samples collected for analyses shall be one-liter taken into a one-liter container at a location and time such that the sample will be representative of the coating as applied (i.e., the sample shall include any dilution solvent or other VOM added during the manufacturing process) The container must be tightly sealed immediately after the sample is taken. Any solvent or other VOM added after the sample is taken must be measured and accounted for in the calculations in subsection (a)(3). For multiple package coatings, separate samples of each component shall be obtained. A mixed sample shall not be obtained as it will cure in the container. Sampling procedures shall follow the guidelines presented in:

A) ASTM D3925-81(1985) standard practice for sampling liquid paints and related pigment coating. This practice is incorporated by reference in Section 219.112.

B) ASTM E300-86 standard practice for sampling industrial chemicals. This practice is incorporated by reference in Section 219.112.

2) Analyses: The applicable analytical methods specified below shall be used to determine the composition of coatings, inks, or fountain solutions as applied.

A) Method 24 of 40 CFR 60, Appendix A, incorporated by reference in Section 219.112, shall be used to determine the VOM content and density of coatings. If it is demonstrated to the satisfaction of the Agency and the USEPA that plant coating formulation data are equivalent to Method 24 results, formulation data may be used. In the event of any inconsistency between a Method 24 test and a facility's formulation data, the Method 24 test will govern.

B) Method 24A of 40 CFR Part 60, Appendix A, incorporated by reference in Section 219.112, shall be used to determine the VOM content and density of rotogravure printing inks and related coatings. If it is demonstrated to the satisfaction of the Agency and USEPA that the plant coating formulation data are equivalent to Method 24A results, formulation data may be used. In the event of any inconsistency between a Method 24A test and a facility's formulation data, the Method 24A test will govern.

C) The following ASTM methods are the analytical procedures for determining VOM:

i) ASTM D1475-85: Standard test method for density of paint, varnish, lacquer and related products. This test method is incorporated by reference in Section 219.112.

ii) ASTM D2369-87: Standard test method for volatile content of a coating. This test method is incorporated by reference in Section 219.112.

iii) ASTM D3792-86: Standard test method for water content of water-reducible paints by direct injection into a gas chromatograph. This test method is incorporated by reference in Section 219.112.

iv) ASTM D4017-81(1987): Standard test method for water content in paints and paint materials by the Karl Fischer method. This test method is incorporated by reference in Section 219.112.

v) ASTM D4457-85: Standard test method for determination of dichloromethane and 1,1,1, trichloroethane in paints and coatings by direct injection into a gas chromatograph. (The procedure delineated above can be used to develop protocols for any compounds specifically exempted from the definition of VOM.) This test method is incorporated by reference in Section 219.112.

vi) ASTM D2697-86: Standard test method for volume non-volatile matter in clear or pigmented coatings. This test method is incorporated by reference in Section 219.112.

vii) ASTM D3980-87: Standard practice for interlaboratory testing of paint and related materials. This practice is incorporated by reference in Section 219.112.

viii) ASTM E180-85: Standard practice for determining the precision data of ASTM methods for analysis of and testing of industrial chemicals. This practice is incorporated by reference in Section 219.112.

ix) ASTM D2372-85: Standard method of separation of vehicle from solvent-reducible paints. This method is incorporated by reference in Section 219.112.

D) Use of an adaptation to any of the analytical methods specified in subsections (a)(2)(A), (B), and (C) may not be used unless approved by the Agency and USEPA. An owner or operator must submit sufficient documentation for the Agency and USEPA to find that the analytical methods specified in subsections (a)(2)(A), (B), and (C) will yield inaccurate results and that the proposed adaptation is appropriate.

3) Calculations: Calculations for determining the VOM content, water content and the content of any compounds which are specifically exempted from the definition of VOM of coatings, inks and fountain solutions as applied shall follow the guidance provided in the following documents.

A) "A Guide for Surface Coating Calculation", EPA-340/1-86-016, incorporated by reference in Section 219.112.

B) "Procedures for Certifying Quantity of Volatile Organic Compounds Emitted by Paint, Ink and Other Coatings" (revised June 1986), EPA-450/3-84-019, incorporated by reference in Section 219.112.

C) "A Guide for Graphic Arts Calculations", August 1988, EPA-340/1-88-003, incorporated by reference in Section 219.112

b) Automobile or Light-Duty Truck Test Protocol

The protocol for testing, including determining the transfer efficiency, of coating applicators at topcoat coating operations at an automobile assembly facility shall follow the procedure in: "Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light-Duty Truck Topcoat Operations", December 1988, EPA-450/3-88-018, incorporated by reference in Section 219.112.

c) Capture System Efficiency Test Protocols

1) Applicability

The requirements of subsection (c)(2) shall apply to all VOM emitting processes employing capture equipment (e.g., hoods, ducts), except those cases noted below.

A) If a source installs a permanent total enclosure (PTE) that meets Agency and USEPA specifications, and which directs all VOM to a control device, then the source is exempted from the requirements described in subsection (c)(2). The Agency and USEPA specifications to determine whether a structure is considered a PTE are given in Procedure T of Appendix B of this Part. In this instance, the capture efficiency is assumed to be 100 percent and the source is still required to measure control efficiency using appropriate test methods as specified in subsection (d).

B) If a source uses a control device designed to collect and recover VOM (e.g., carbon adsorber), an explicit measurement of capture efficiency is not necessary provided that the conditions given below are met. The overall control of the system can be determined by directly comparing the input liquid VOM to the recovered liquid VOM. The general procedure for use in this situation is given in 40 CFR 60.433, incorporated by reference in Section 219.112, with the following additional restrictions:

i) The source must be able to equate

solvent usage with solvent recovery on a 24-hour (daily) basis, rather than a 30-day weighted average, within 72 hours following the 24-hour period. In addition, one of the following two criteria must be met:

ii) The solvent recovery system (i.e., capture and control system) must be dedicated to a single process line (e.g., one process line venting to a carbon adsorber system), or

iii) If the solvent recovery system controls multiple process lines, then the source must be able to demonstrate that the overall control (i.e., the total recovered solvent VOM divided by the sum of liquid VOM input to all process lines venting to the control system) meets or exceeds the most stringent standard applicable for any process line venting to the control system.

2) Specific Requirements

The capture efficiency of a process line shall be measured using one of the four protocols given below. Any error margin associated with a test protocol may not be incorporated into the results of a capture efficiency test. If these techniques are not suitable for a particular process, then the source may use an alternative capture efficiency protocol, provided that the alternative protocol is approved by the Agency and approved by the USEPA as a SIP revision.

A) Gas/gas method using temporary total enclosure (TTE). The Agency and USEPA specifications to determine whether a temporary enclosure is considered a TTE are given in Procedure T of Appendix B of this Part. The capture efficiency equation to be used for this protocol is:

$$CE = Gw/(Gw + Fw)$$

where: CE = capture efficiency, decimal fraction

Gw = mass of VOM captured and delivered to control device using a TTE

Fw = mass of fugitive VOM that escapes from a TTE

Procedure G.2 contained in Appendix B of this Part is used to obtain Gw. Procedure F.1 in Appendix B of this Part is used to obtain Fw.

B) Liquid/gas method using TTE. The Agency and USEPA specifications to determine whether a temporary enclosure is considered a TTE are given in Procedure T of Appendix B of this Part. The capture efficiency equation to be used for this protocol is:

$$CE = (L - F_W)/L$$

where: CE = capture efficiency, decimal fraction

L = mass of liquid VOM input to process

Fw = mass of fugitive VOM that escapes from a TTE

Procedure L contained in Appendix B of this Part is used to obtain L. Procedure F.1 in Appendix B of this Part is used to obtain Fw.

C) Gas/gas method using the building or room (building or room enclosure) in which the affected source is located as the enclosure and in which "F" and "G" are measured while operating only the affected facility. All fans and blowers in the building or room must be operated as they would under normal production. The capture efficiency equation to be used for this protocol is:

$$CE = G/(G + F_B)$$

where: CE = capture efficiency, decimal fraction

G = mass of VOM captured and delivered to control device

F_B = mass of fugitive VOM that escapes from building enclosure

Procedure G.2 contained in Appendix B of this

Part is used to obtain G. Procedure F.2 in Appendix B of this Part is used to obtain F_B.

D) Liquid/gas method using the building or room (building or room enclosure) in which the affected source is located as the enclosure and in which "F" and "L" are measured while operating only the affected facility. All fans and blowers in the building or room must be operated as they would under normal production. The capture efficiency equation to be used for this protocol is:

$$CE = (L - F_B)/L$$

where: CE = capture efficiency, decimal fraction

L = mass of liquid VOM input to process

F_B = mass of fugitive VOM that escapes from building enclosure

Procedure L contained in Appendix B of this section is used to obtain L. Procedure F.2 in Appendix B of this section is used to obtain F_B.

3) Recordkeeping and Reporting

A) All affected facilities must maintain a copy of the capture efficiency protocol submitted to the Agency and the USEPA on file. All results of the appropriate test methods and capture efficiency protocols must be reported to the Agency within sixty (60) days of the test date. A copy of the results must be kept on file with the source for a period of three (3) years.

B) If any changes are made to capture or control equipment, then the source is required to notify the Agency and the USEPA of these changes and a new test may be required by the Agency or the USEPA.

C) The source must notify the Agency 30 days prior to performing any capture efficiency or control test. At that time, the source must notify the Agency which capture efficiency protocol and control device test methods will be used.

D) Sources utilizing a PTE must demonstrate that this enclosure meets the requirement given in Procedure T (in Appendix B of this Part) for a PTE during any testing of their control device.

E) Sources utilizing a TTE must demonstrate that their TTE meets the requirements given in Procedure T (in Appendix B of this Part) for a TTE during testing of their control device. The source must also provide documentation that the quality assurance criteria for a TTE have been achieved.

d) Control Device Efficiency Testing and Monitoring

1) The control device efficiency shall be determined by simultaneously measuring the inlet and outlet gas phase VOM concentrations and gas volumetric flow rates in accordance with the gas phase test methods specified in subsection (f).

2) Any owner or operator that uses an afterburner or carbon adsorber to comply with any Section of this Part shall use USEPA approved continuous monitoring equipment which is installed, calibrated, maintained, and operated according to vendor specifications at all times the afterburner or carbon adsorber is in use. The continuous monitoring equipment must monitor the following parameters:

A) Combustion chamber temperature of each afterburner.

B) Temperature rise across each catalytic afterburner bed or VOM concentration of exhaust.

C) The VOM concentration of each carbon adsorption bed exhaust.

e) Overall Efficiency

1) The overall efficiency of the emission control system shall be determined as the product of the capture system efficiency and the control device efficiency or by the liquid/liquid test protocol as specified in 40 CFR 60.433, incorporated by reference in Section 219.112, (and revised by

subsection (c)(1)(B) for each solvent recovery system. In those cases in which the overall efficiency is being determined for an entire line, the capture efficiency used to calculate the product of the capture and control efficiency is the total capture efficiency over the entire line.

2) For coating lines which are both chosen by the owner or operator to comply with Section 219.207(a), (d), (e), (f), or (g) by the alternative in Section 219.207(b)(2) and meet the criteria allowing them to comply with Section 219.207 instead of Section 219.204, the overall efficiency of the capture system and control device, as determined by the test methods and procedures specified in subsections (c), (d) and (e)(1), shall be no less than the equivalent overall efficiency which shall be calculated by the following equation:

$$E = ([VOM_a - VOM_l]/VOM_a) \times 100$$

where:

E = Equivalent overall efficiency of the capture system and control device as a percentage,

VOM_a = Actual VOM content of a coating, or the daily-weighted average VOM content of two or more coatings (if more than one coating is used), as applied to the subject coating line as determined by the applicable test methods and procedures specified in subsection (a)(4)(i) of this Part in units of kg VOM/l (lb VOM/gal) of coating solids as applied,

VOM_l = The VOM emission limit specified in Section 219.207(a) or (b) in units of kg VOM/l (lb VOM/gal) of coating solids as applied.

f) Volatile Organic Material Gas Phase Source Test Methods

The methods in 40 CFR Part 60, Appendix A, incorporated by reference in Section 219.112 delineated below shall be used to determine control device efficiencies.

1) 40 CFR Part 60, Appendix A, Method 18, 25 or 25A, incorporated by reference in Section 219.112 as

appropriate to the conditions at the site, shall be used to determine VOM concentration. Method selection shall be based on consideration of the diversity of organic species present and their total concentration and on consideration of the potential presence of interfering gases. Except as indicated in subsections (f)(1)(A) and (B) below, the test shall consist of three separate runs, each lasting a minimum of 60 min, unless the Agency and the USEPA determine that process variables dictate shorter sampling times.

A) When the method is to be used to determine the efficiency of a carbon adsorption system with a common exhaust stack for all the individual adsorber vessels, the test shall consist of three separate runs, each coinciding with one or more complete sequences through the adsorption cycles of all the individual adsorber vessels.

B) When the method is to be used to determine the efficiency of a carbon adsorption system with individual exhaust stacks for each adsorber vessel, each adsorber vessel shall be tested individually. The test for each adsorber vessel shall consist of three separate runs. Each run shall coincide with one or more complete adsorption cycles.

2) 40 CFR Part 60, Appendix A, Method 1 or 1A, incorporated by reference in Section 219.112, shall be used for sample and velocity traverses.

3) 40 CFR Part 60, Appendix A, Method 2, 2A, 2C or 2D, incorporated by reference in Section 219.112, shall be used for velocity and volumetric flow rates.

4) 40 CFR Part 60, Appendix A, Method 3, incorporated by reference in Section 219.112, shall be used for gas analysis.

5) 40 CFR Part 60, Appendix A, Method 4, incorporated by reference in Section 219.112, shall be used for stack gas moisture.

6) 40 CFR Part 60, Appendix A, Methods 2, 2A, 2C, 2D, 3 and 4, incorporated by reference in Section 219.112, shall be performed, as applicable, at least twice during each test run.

7) Use of an adaptation to any of the test methods specified in subsections (f)(1), (2), (3), (4), (5) and (6) may not be used unless approved by the Agency and the USEPA. An owner or operator must submit sufficient documentation for the Agency and the USEPA to find that the test methods specified in subsections (f)(1), (2), (3), (4), (5) and (6) will yield inaccurate results and that the proposed adaptation is appropriate.

g) Leak Detection Methods for Volatile Organic Material

Owners or operators required by this Part to carry out a leak detection monitoring program shall comply with the following requirements:

1) Leak Detection Monitoring

A) Monitoring shall comply with 40 CFR 60, Appendix A, Method 21, incorporated by reference in Section 219.112.

B) The detection instrument shall meet the performance criteria of Method 21.

C) The instrument shall be calibrated before use on each day of its use by the methods specified in Method 21.

D) Calibration gases shall be:

i) Zero air (less than 10ppm of hydrocarbon in air); and

ii) A mixture of methane or n-hexane and air at a concentration of approximately, but no less than, 10,000 ppm methane or n-hexane.

E) The instrument probe shall be traversed around all potential leak interfaces as close possible as described in Method 21.

2) When equipment is tested for compliance with no detectable emissions as required, the test shall comply with the following requirements:

A) The requirements of subsections (g)(1)(A) through (g)(1)(E) above shall apply.

B) The background level shall be determined as set forth in Method 21.

3) Leak detection tests shall be performed consistent with:

A) "APTI Course SI 417 controlling Volatile Organic Compound Emissions from Leaking Process Equipment", EPA-450/2-82-015, incorporated by reference in Section 219.112.

B) "Portable Instrument User's Manual for Monitoring VOC Sources", EPA-340/1-86-015, incorporated by reference in Section 219.112.

C) "Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and VHAP", EPA-450/3-88-010, incorporated by reference in Section 219.112.

D) "Petroleum Refinery Enforcement Manual", EPA-340/1-80-008, incorporated by reference in Section 219.122.

h) Bulk Gasoline Delivery System Test Protocol

1) The method for determining the emissions of gasoline from a vapor recovery system are delineated in 40 CFR 60, Subpart XX, Section 60.503, incorporated by reference in Section 219.112.

2) Other tests shall be performed consistent with:

A) "Inspection Manual for Control of Volatile Organic Emissions from Gasoline Marketing Operations: Appendix D", EPA-340/1-80-012, incorporated by reference in Section 219.112.

B) "Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals: Appendix A", EPA-450/2-77-026, incorporated by reference in Section 219.112.

i) Notwithstanding other requirements of this Part, upon request of the Agency where it is necessary to demonstrate compliance, an owner or operator of an emission source which is subject to this Part shall, at his own expense, conduct tests in accordance with the applicable test methods and procedures specified in this Part. Nothing in the Section shall limit the authority of the USEPA pursuant to the Clean Air Act, as amended, to require testing.

Section 219.106 Compliance Dates

Compliance with the requirements of all rules is required by May 15, 1992, consistent with the provisions of Section 219.103.

Section 219.107 Afterburners

The operation of any natural gas fired afterburner and capture system used to comply with this Part is not required during the period of November 1 of any year to April 1 of the following year provided that the operation of such devices is not required for purposes of occupational safety or health, or for the control of toxic substances, odor nuisances, or other regulated pollutants.

Section 219.108 Exemptions, Variations, and Alternative Means of Control or Compliance Determinations

Notwithstanding the provisions of any other Sections of this Part, any exemptions, variations or alternatives to the control requirements, emission limitations, or test methods set forth in this Part shall be effective only when approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.109 Vapor Pressure of Volatile Organic Liquids

a) If the VOL consists of only a single compound, the vapor pressure shall be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112) or the vapor pressure may be obtained from a published source such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973); Perry's Chemical Engineer's Handbook, McGraw-Hill Book Company (1984); CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-87); and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985).

b) If the VOL is a mixture, the vapor pressure shall be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112) or by the following equation:

$$P_{vol} = \sum_{i=1}^{n} P_i \; X_i$$

where:

P_{vol} = Total vapor pressure of the mixture,

n = Number of components in the

mixture,

i = Subscript denoting an individual component,

P_i = Vapor pressure of a component determined in accordance with Subpart A of this Part

X_i = Mole fraction of the component in the total mixture.

Section 219.110 Vapor Pressure of Organic Material or Solvent

a) If the organic material or solvent consists of only a single compound, the vapor pressure shall be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112) or the vapor pressure may be obtained from a published source such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973); Perry's Chemical Engineer's Handbook, McGraw-Hill Book Company (1984); CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-87); and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985).

b) If the organic material or solvent is in a mixture made up of both organic material compounds and compounds which are not organic material, the vapor pressure shall be determined by the following equation:

$$P_{om} = \frac{\sum_{i=1}^{n} P_i X_i}{\sum_{i=1}^{n} X_i}$$

where:

P_{om} = Total vapor pressure of the portion of the mixture which is composed of organic material,

n = Number of organic material components in the mixture,

i = Subscript denoting an individual component,

P_i = Vapor pressure of an organic material component determined in accordance with Subpart A of this Part,

X_i = Mole fraction of the organic material component of the total mixture.

c) If the organic material or solvent is in a mixture made up of only organic material compounds, the vapor pressure shall be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112) or by the above equation.

Section 219.111 Vapor Pressure of Volatile Organic Material

a) If the VOM consists of only a single compound, the vapor pressure shall be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112) or the vapor pressure may be obtained from a published source such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973); Perry's Chemical Engineer's Handbook, McGraw-Hill Book Company (1984); CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-87); and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985).

b) If the VOM is in a mixture made up of both VOM compounds and compounds which are not VOM, the vapor pressure shall be determined by the following equation:

$$P_{vom} = \frac{\sum_{i=1}^{n} P_i X_i}{\sum_{i=1}^{n} X_i}$$

where:

P_{vom} = Total vapor pressure of the portion of the mixture which is composed of VOM,

n = Number of VOM components in the mixture,

i = Subscript denoting an individual component,

P_i = Vapor pressure of a VOM component determined in accordance with Subpart A of this Part,

X_i = Mole fraction of the VOM component of the total mixture.

c) If the VOM is in a mixture made up of only VOM compounds, the vapor pressure shall be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112) or by the above equation.

Section 219.112 Incorporations by Reference

The following materials are incorporated by reference. These incorporations include no later amendments or editions.

a) American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103:

1) ASTM D2879-86
2) ASTM D323-82
3) ASTM D86-82
4) ASTM D-369-69 (1971)
5) ASTM D-396-69
6) ASTM D2880-71
7) ASTM D-975-68
8) ASTM D3925-81 (1985)
9) ASTM E300-86
10) ASTM D1475-85
11) ASTM D2369-87
12) ASTM D3792-86
13) ASTM D4017-81 (1987)
14) ASTM D4457-85
15) ASTM D2697-86
16) ASTM D3980-87
17) ASTM E180-85
18) ASTM D2372-85
19) ASTM D97-66
20) ASTM E-168
21) ASTM E-169
22) ASTM E-260
23) ASTM D2504-83
24) ASTM D2382-83

b) Standard Industrial Classification Manual, published by Executive Office of the President, Office of Management and Budget, Washington, D.C., 1987.

c) American Petroleum Institute Bulletin 2517, "Evaporation Loss From Floating Roof Tanks", Second ed., February, 1980.

d) 40 CFR 60 (July 1, 1990).

e) 40 CFR 61 (July 1, 1990).

f) 40 CFR 50 (July 1, 1989).

g) 40 CFR 51 (July 1, 1989).

h) 40 CFR 52 (July 1, 1989).

i) United States Environmental Protection Agency, Washington, D.C., EPA-340/1-86-016.

j) United States Environmental Protection Agency, Washington D.C., EPA-450/3-84-019.

k) United States Environmental Protection Agency, Washington D.C., EPA-340/1-88-003.

l) United States Environmental Protection Agency, Washington D.C., EPA-450/3-88-018.

m) United States Environmental Protection Agency, Washington, D.C., EPA-450/2-78-029.

n) United States Environmental Protection Agency, Washington, D.C., EPA-450/2-78-051.

o) United States Environmental Protection Agency, Washington, D.C., EPA-450/3-82-009.

SUBPART B: ORGANIC EMISSIONS FROM STORAGE AND LOADING OPERATIONS

Section 219.121 Storage Containers

No person shall cause or allow the storage of any VOL with a vapor pressure of 17.24 kPa (2.5 psia) or greater at 294.3°K (70°F) or any gaseous organic material in any stationary tank, reservoir or other container of more than 151 cubic meters (40,000 gal) capacity unless such tank, reservoir or other container:

a) Is a pressure tank capable of withstanding the vapor pressure of such liquid or the pressure of the gas, so as to prevent vapor or gas loss to the atmosphere at all times; or,

b) Is designed and equipped with one of the following vapor loss control devices:

   1) A floating roof which rests on the surface of the VOL and is equipped with a closure seal or seals between the roof edge and the tank wall. Such

floating roof shall not be permitted if the VOL has a vapor pressure of 86.19 kPa (12.5 psia) or greater at 294.3°K (70°F). No person shall cause or allow the emission of air contaminants into the atmosphere from any gauging or sampling devices attached to such tanks, except during sampling or maintenance operations.

2) A vapor recovery system consisting of:

A) A vapor gathering system capable of collecting 85% or more of the uncontrolled VOM that would be otherwise emitted to the atmosphere; and,

B) A vapor disposal system capable of processing such VOM so as to prevent its emission to the atmosphere. No person shall cause or allow the emission of air contaminants into the atmosphere from any gauging or sampling devices attached to such tank, reservoir or other container except during sampling.

3) Other equipment or means of equal efficiency approved by the Agency according to the provisions of 35 Ill. Adm. Code 201, and further processed consistent with Section 219.108.

Section 219.122 Loading Operations

a) No person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere during the loading of any organic material from the aggregate loading pipes of any loading facility having through-put of greater than 151 cubic meters per day (40,000 gal/day) into any railroad tank car, tank truck or trailer unless such loading facility is equipped with submerged loading pipes, submerged fill or a device that is equally effective in controlling emissions and is approved by the Agency according to the provisions of 35 Ill. Adm. Code 201, and further processed consistent with Section 219.108.

b) No person shall cause or allow the loading of any organic material into any stationary tank having a storage capacity of greater than 946 l (250 gal), unless such tank is equipped with a permanent submerged loading pipe, submerged fill or an equivalent device approved by the Agency according to the provisions of 35 Ill. Adm. Code 201, and further processed consistent with Section 219.108, or unless such tank is a pressure tank as described in Section 219.121(a) or is fitted with a recovery system as described in Section 219.121(b)(2).

c) Exception: If no odor nuisance exists the limitations of this Section shall only apply to the loading of VOL with a vapor pressure of 17.24 kPa (2.5 psia) or greater at 294.3°K (70°F).

Section 219.123 Petroleum Liquid Storage Tanks

a) The requirements of subsection (b) shall not apply to any stationary storage tank:

1) Equipped before January 1, 1979 with one of the vapor loss control devices specified in Section 219.121(b), except Section 219.121(b)(1);

2) With a capacity of less than 151.42 cubic meters (40,000 gal);

3) With a capacity of less than 1,600 cubic meters (422,400 gal) and used to store produced crude oil and condensate prior to custody transfer;

4) With a capacity of less than 1,430 cubic meters (378,000 gal) and used to store produced oil or condensate in crude oil gathering;

5) Subject to new source performance standards for storage vessels of petroleum liquid, 35 Ill. Adm. Code 230;

6) In which volatile petroleum liquid is not stored; or

7) Which is a pressure tank as described in Section 219.121(a).

b) Subject to subsection (a) no owner or operator of a stationary storage tank shall cause or allow the storage of any VOL in the tank unless:

1) The tank is equipped with one of the vapor loss control devices specified in Section 219.121(b);

2) There are no visible holes, tears or other defects in the seal or any seal fabric or material of any floating roof;

3) All openings of any floating roof deck, except stub drains, are equipped with covers, lids or seals such that:

A) The cover, lid or seal is in the closed position at all times except when petroleum liquid is transferred to or from the tank;

B) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports; and

C) Rim vents, if provided, are set to open when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting;

4) Routine inspections of floating roof seals are conducted through roof hatches once every six months;

5) A complete inspection of the cover and seal of any floating roof tank is made whenever the tank is emptied for reasons other than the transfer of petroleum liquid during the normal operation of the tank, or whenever repairs are made as a result of any semi-annual inspection or incidence of roof damage or defect; and

6) A record of the results of each inspection conducted under subsection (b)(4) or (b)(5) is maintained.

c) Owners and operators of petroleum liquid storage tanks were required to have compliance schedules as summarized in Appendix C, to 35 Ill Adm. Code 215.

Section 219.124 External Floating Roofs

a) In addition to meeting the requirements of Section 219.123(b), no owner or operator of a stationary storage tank equipped with an external floating roof shall cause or allow the storage of any volatile petroleum liquid in the tank unless:

1) The tank has been fitted with a continuous secondary seal extending from the floating roof to the tank wall (rim mounted secondary seal) or any other device which controls VOM emissions with an effectiveness equal to or greater than a rim mounted secondary seal;

2) Each seal closure device meets the following requirements:

A) The seal is intact and uniformly in place around the circumference of the floating roof between the floating roof and tank wall; and

B) The accumulated area of gaps exceeding 0.32 centimeter (1/8 inch) in width between the secondary seal and the tank wall shall not exceed 21.2 square centimeters per meter of tank diameter (1.0 square inches per foot of tank diameter).

3) Emergency roof drains are provided with slotted membrane fabric covers or equivalent covers across at least 90 percent of the area of the opening;

4) Openings are equipped with projections into the tank which remain below the liquid surface at all times;

5) Inspections are conducted prior to May 1 of each year to insure compliance with subsection (a);

6) The secondary seal gap is measured prior to May 1 of each year;

7) Records of the types of volatile petroleum liquid stored, the maximum true vapor pressure of the liquid as stored, the results of the inspections and the results of the secondary seal gap measurements are maintained and available to the Agency, upon verbal or written request, at any reasonable time for a minimum of two years after the date on which the record was made.

b) Subsection (a) does not apply to any stationary storage tank equipped with an external floating roof:

1) Exempted under Section 219.123(a)(2) through 219.123(a)(6);

2) Of welded construction equipped with a metallic type shoe seal having a secondary seal from the top of the shoe seal to the tank wall (shoe-mounted secondary seal);

3) Of welded construction equipped with a metallic type shoe seal, a liquid-mounted foam seal, a liquid-mounted liquid-filled-type seal, or other closure device of equivalent control efficiency approved by the Agency in which a petroleum liquid with a true vapor pressure less than 27.6 kPa (4.0 psia) at 294.3°K (70°F) is stored; or

4) Used to store crude oil with a pour point of 50°F or higher as determined by ASTM Standard D97-66 incorporated by reference in Section 219.112.

Section 218.125 Compliance Dates

Every owner or operator of an emission source subject to 35 Ill. Adm. Code 215, Subpart B as of December 31, 1987 shall have complied with its standards and limitations by December 31, 1987.

Section 219.126 Compliance Plan

a) The owner or operator of an emission source previously subject to Section 215.125 shall have submitted to the Agency a compliance plan as required by 35 Ill. Adm. Code 201.241, including a project completion schedule where applicable, no later than April 21, 1983.

b) Unless the submitted compliance plan or schedule was disapproved by the Agency, the owner or operator of a facility or emission source subject to the rules specified in subsection (a) may operate the emission source according to the plan and schedule as submitted.

c) The plan and schedule shall meet the requirements of 35 Ill. Adm. Code 201.241 including specific interim dates as required in 35 Ill. Adm. Code 201.242.

SUBPART C: ORGANIC EMISSIONS FROM MISCELLANEOUS EQUIPMENT

Section 219.141 Separation Operations

a) No person shall use any single or multiple compartment effluent water separator which receives effluent water containing 757 l/day (200 gal/day) or more of organic material from any equipment processing, refining, treating, storing or handling organic material unless such effluent water separator is equipped with air pollution control equipment capable of reducing by 85 percent or more the uncontrolled organic material emitted to the atmosphere. Exception: If no odor nuisance exists the limitations of this subsection shall not apply if the vapor pressure of the organic material is below 17.24 kPa (2.5 psia) at 294.3°K (70°F).

b) Subsection (a) shall not apply to water and crude oil separation in the production of Illinois crude oil, if the vapor pressure of such crude oil is less than 34.5 kPa (5 psia).

Section 219.142 Pumps and Compressors

No person shall cause or allow the discharge of more than 32.8 ml (2 cu in) of VOL with vapor pressure of 17.24 kPa (2.5 psia) or greater at 294.3°K (70°F) into the atmosphere from any pump or compressor in any 15 minute period at standard conditions.

Section 219.143 Vapor Blowdown

No person shall cause or allow the emission of organic material into the atmosphere from any vapor blowdown system or any safety relief valve, except such safety relief valves not capable of causing an excessive release, unless such emission is controlled:

a) To 10 ppm equivalent methane (molecular weight 16.0) or less; or,

b) By combustion in a smokeless flare; or,

c) By other air pollution control equipment approved by the Agency according to the provisions of 35 Ill. Adm. Code 201, and further processed consistent with Section 219.108.

Section 219.144 Safety Relief Valves

Section 219.143 shall not apply to any set of unregulated safety relief valves capable of causing excessive releases, provided the owner or operator thereof, by October 1, 1972, supplied the Agency with the following:

a) A historical record of each such set (or, if such records were unavailable, of similar sets which, by virtue of operation under similar circumstances, may reasonably have been presumed to have the same or greater frequency of excessive releases) for a three-year period immediately preceding October 1, 1972, indicating:

  1) Dates on which excessive releases occurred from each such set; and,

  2) Duration in minutes of each such excessive release; and,

  3) Quantities (in pounds) of mercaptans and/or hydrogen sulfide emitted into the atmosphere during each such excessive release.

b) Proof, using such three-year historical records, that no excessive release is likely to occur from any such set either alone or in combination with such excessive releases from other sets owned or operated by the same person and located within a ten-mile radius from the center point of any such set, more frequently than 3 times in any 12 month period;

c) Accurate maintenance records pursuant to the requirements of subsection (a); and,

d) Proof, at three-year intervals, using such three-year historical records, that such set conforms to the requirements of subsection (c).

SUBPART E: SOLVENT CLEANING

Section 219.181 Solvent Cleaning in General

The requirements of this Subpart shall apply to all cold cleaning, open top vapor degreasing, and conveyorized degreasing operations.

Section 219.182 Cold Cleaning

a) Operating Procedures: No person shall operate a cold cleaning degreaser unless:

   1) Waste solvent is stored in covered containers only and not disposed of in such a manner that more than 20% of the waste solvent (by weight) is allowed to evaporate into the atmosphere;

   2) The cover of the degreaser is closed when parts are not being handled; and

   3) Parts are drained until dripping ceases.

b) Equipment Requirements: No person shall operate a cold cleaning degreaser unless:

   1) The degreaser is equipped with a cover which is closed whenever parts are not being handled in the cleaner. The cover shall be designed to be easily operated with one hand or with the mechanical assistance of springs, counter-weights or a powered system if:

      A) The solvent vapor pressure is greater than 2 kPa (15 mmHg or 0.3 psi) measured at 38•C (100•F);

      B) The solvent is agitated; or

      C) The solvent is heated above ambient room temperature.

2) The degreaser is equipped with a facility for draining cleaned parts. The drainage facility shall be constructed so that parts are enclosed under the cover while draining unless:

A) The solvent vapor pressure is less than 4.3 kPa (32 mmHg or 0.6 psi) measured at 38°C (100°F); or

B) An internal drainage facility cannot be fitted into the cleaning system, in which case the drainage facility may be external.

3) The degreaser is equipped with one of the following control devices if the vapor pressure of the solvent is greater than 4.3 kPa (32 mmHg or 0.6 psi) measured at 38°C (100°F) or if the solvent is heated above 50°C (120°F) or its boiling point:

A) A freeboard height of 7/10 of the inside width of the tank or 91 cm (36 in), whichever is less; or

B) Any other equipment or system of equivalent emission control as approved by the Agency and further processed consistent with Section 219.108. Such a system may include a water cover, refrigerated chiller or carbon adsorber.

4) A permanent conspicuous label summarizing the operating procedure is affixed to the degreaser; and

5) If a solvent spray is used, the degreaser is equipped with a solid fluid stream spray, rather than a fine, atomized or shower spray.

Section 219.183 Open Top Vapor Degreasing

a) Operating Requirements: No person shall operate an open top vapor degreaser unless:

1) The cover of the degreaser is closed when workloads are not being processed through the degreaser;

2) Solvent carryout emissions are minimized by:

A) Racking parts to allow complete drainage;

B) Moving parts in and out of the degreaser at less than 3.3 m/min (11 ft/min);

C) Holding the parts in the vapor zone until condensation ceases;

D) Tipping out any pools of solvent on the cleaned parts before removal from the vapor zone; and,

E) Allowing parts to dry within the degreaser until visually dry.

3) Porous or absorbent materials, such as cloth, leather, wood or rope are not degreased;

4) Less than half of the degreaser's open top area is occupied with a workload;

5) The degreaser is not loaded to the point where the vapor level would drop more than 10 cm (4 in) when the workload is removed from the vapor zone;

6) Spraying is done below the vapor level only;

7) Solvent leaks are repaired immediately;

8) Waste solvent is stored in covered containers only and not disposed of in such a manner that more than 20% of the waste solvent (by weight) is allowed to evaporate into the atmosphere;

9) Water is not visually detectable in solvent exiting from the water separator; and

10) Exhaust ventilation exceeding 20 cubic meters per minute per square meter (65 cubic feet per minute per square foot) of degreaser open area is not used, unless necessary to meet the requirements of the Occupational Safety and Health Act (29 U.S.C. Section 651 et seq.).

b) Equipment Requirements: No person shall operate an open top vapor degreaser unless:

1) The degreaser is equipped with a cover designed to open and close easily without disturbing the vapor zone;

2) The degreaser is equipped with the following

switches:

A) A device which shuts off the sump heat source if the amount of condenser coolant is not sufficient to maintain the designed vapor level; and

B) A device which shuts off the spray pump if the vapor level drops more than 10 cm (4 in) below the bottom condenser coil; and

C) A device which shuts off the sump heat source when the vapor level exceeds the design level.

3) A permanent conspicuous label summarizing the operating procedure is affixed to the degreaser;

4) The degreaser is equipped with one of the following devices:

A) A freeboard height of 3/4 of the inside width of the degreaser tank or 91 cm (36 in), whichever is less; and if the degreaser opening is greater than 1 square meter (10.8 ft^2), a powered or mechanically assisted cover; or

B) Any other equipment or system of equivalent emission control as approved by the Agency and further processed consistent with Section 219.108. Such equipment or system may include a refrigerated chiller, an enclosed design or a carbon adsorption system.

Section 219.184 Conveyorized Degreasing

a) Operating Requirements: No person shall operate a conveyorized degreaser unless:

1) Exhaust ventilation exceeding 20 cubic meters per minute per square meter (65 cubic feet per minute per square foot) of area of loading and unloading opening is not used, unless necessary to meet the requirements of the Occupational Safety and Health Act (29 U.S.C. Section 651 et seq.).

2) Solvent carryout emissions are minimized by:

A) Racking parts for best drainage; and

B) Maintaining the vertical conveyor speed at less than 3.3 m/min (11 ft/min);

3) Waste solvent is stored in covered containers only and not disposed of in such a manner that more than 20% of the waste solvent (by weight) is allowed to evaporate into the atmosphere;

4) Solvent leaks are repaired immediately;

5) Water is not visually detectable in solvent exiting from the water separator; and

6) Downtime covers are placed over entrances and exits of conveyorized degreasers immediately after the conveyors and exhausts are shut down and not removed until just before start-up.

b) Equipment Requirements: No person shall operate a conveyorized degreaser unless:

1) The degreaser is equipped with a drying tunnel, rotating (tumbling) basket or other equipment sufficient to prevent cleaned parts from carrying out solvent liquid or vapor;

2) The degreaser is equipped with the following switches:

A) A device which shuts off the sump heat source if the amount of condenser coolant is not sufficient to maintain the designed vapor level;

B) A device which shuts off the spray pump or the conveyor if the vapor level drops more than 10 cm (4 in) below the bottom condenser coil; and

C) A device which shuts off the sump heat source when the vapor level exceeds the design level;

3) The degreaser is equipped with openings for entrances and exits that silhouette workloads so that the average clearance between the parts and the edge of the degreaser opening is less than 10 cm (4 in) or less than 10 percent of the width of the opening;

4) The degreaser is equipped with downtime covers for closing off entrances and exits when the degreaser is shut down; and

5) The degreaser is equipped with one of the following control devices, if the air/vapor interface is larger than 2.0 square meters (21.6 ft^2):

   A) A carbon adsorption system with ventilation greater than or equal to 15 cubic meters per minute per square meter (50 cubic feet per minute per square foot) of air/vapor area when downtime covers are open, and exhausting less than 25 ppm of solvent by volume averaged over a complete adsorption cycle; or

   B) Any other equipment or system of equivalent emission control as approved by the Agency, and further processed consistent with Section 219.108. Such equipment or system may include a refrigerated chiller.

Section 219.185 Compliance Schedule

Every owner or operator of an emission source which was previously exempt from the requirements of Subpart E of 35 Ill. Adm. Code 215 (Sections 215.182-215.184) because it satisfied the criteria in either 35 Ill. Adm. Code 215.181(a) or 35 Ill. Adm. Code 215.181(b), shall comply with the requirements of this Subpart on and after a date consistent with Section 219.106. A source which did not satisfy the criteria in either 35 Ill. Adm. Code 215.181(a) or 35 Ill. Adm. Code 215.181(b) shall comply with the requirements of this Subpart upon adoption.

Section 219.186 Test Methods

The following test methods shall be used to demonstrate compliance with this Subpart:

a) Vapor pressures shall be determined by using the procedure specified in Section 219.110.

b) Exhaust ventilation rates shall be determined by using the procedures specified in Section 219.105(f)(3).

c) The performance of control devices shall be determined by using the procedures specified in Section 219.105(f).

SUBPART F: COATING OPERATIONS

Section 219.204 Emission Limitations for Manufacturing Plants

Except as provided in Section 219.208, no owner or operator of a coating line shall apply at any time any coating in which the VOM content exceeds the following emission limitations for the specified coating. The following emission limitations are expressed in units of VOM per volume of coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied at each coating applicator, except where noted. Compounds which are specifically exempted from the definition of VOM should be treated as water for the purpose of calculating the "less water" part of the coating composition.

Compliance with this Subpart must be demonstrated through the applicable coating analysis test methods and procedures specified in Section 219.105(a) and the recordkeeping and reporting requirements specified in Section 219.211(c). (Note: The equation presented in Section 219.206 shall be used to calculate emission limitations for determining compliance by add-on controls, credits for transfer efficiency, emissions trades and cross-line averaging.) The emission limitations are as follows:

a) Automobile or Light-Duty Truck Coating	kg/l	lb/gal
1) Prime coat	0.14	(1.2)
2) Prime surfacer coat	0.34	(2.8)

(Note: The prime surfacer coat limitation is based upon a transfer efficiency of 30 percent. The use of transfer efficiency credits can be allowed only if approved by the Agency and approved by the USEPA as a SIP revision.

3) Topcoat	1.81	(15.1)

(Note: The topcoat limitation is in units of kg (lbs) of VOM per l (gal) of coating solids deposited. Compliance with the limitation shall be based on the daily-weighted average VOM content from the entire topcoat operation (all topcoat spray booths, flash-off areas and bake ovens). Compliance shall be demonstrated in accordance with the topcoat protocol for automobiles and light-duty trucks referenced in Section 219.105(b). Section 219.205 does not apply to the topcoat limitation.) At least 180 days prior to the initial compliance date, the owner or operator of a coating line subject to the topcoat limitation shall have submitted to the USEPA a detailed proposal specifying the method of demonstrating compliance with the protocol. The proposal shall have included, at a minimum, a comprehensive plan (including a rationale) for determining the transfer efficiency at each booth through the use of in-plant, or pilot testing; the selection of coatings to be tested (for the purpose of determining transfer efficiency) including the rationale for coating groupings; and the method for determining the analytic VOM content of as appliedcoatings and the formulation solvent content of as applied coatings. Upon approval of the protocol by the USEPA, the source may proceed with the compliance demonstration.

		kg/l	lb/gal
4)	Final repair coat	0.58	(4.8)

b)	Can Coating	kg/l	lb/gal
1)	Sheet basecoat and overvarnish	0.34	(2.8)
2)	Exterior basecoat and overvarnish	0.34	(2.8)
3)	Interior body spray coat	0.51	(4.2)
4)	Exterior end coat	0.51	(4.2)
5)	Side seam spray coat	0.66	(5.5)
6)	End sealing compound coat	0.44	(3.7)

		kg/l	lb/gal
c)	Paper Coating	0.35	(2.9)

(Note: The paper coating limitation shall not apply to any owner or operator of any paper coating line on which printing is performed if the paper coating line complies with the emissions limitations in Subpart H: Printing and Publishing, Sections 219.401 through 219.404.)

		kg/l	lb/gal
d)	Coil Coating	0.31	(2.6)
e)	Fabric Coating	0.35	(2.9)
f)	Vinyl Coating	0.45	(3.8)
g)	Metal Furniture Coating	0.36	(3.0)
h)	Large Appliance Coating	0.34	(2.8)

(Note: The limitation shall not apply to the use of quick-drying lacquers for repair of scratches and nicks that occur during assembly, provided that the volume of coating does not exceed 0.95 l (1 quart) in any one rolling eight-hour period.)

		<u>kg/l</u>	<u>lb/gal</u>
i)	Magnet Wire Coating	0.20	(1.7)
j)	Miscellaneous Metal Parts and Products Coating		
	1) Clear coating	0.52	(4.3)
	2) Air-dried coating	0.42	(3.5)
	3) Extreme performance coating	0.42	(3.5)
	4) All other coatings	0.36	(3.0)

		<u>kg/l</u>	<u>lb/gal</u>
k)	Heavy Off-Highway Vehicle Products Coating		
	1) Extreme performance prime coat	0.42	(3.5)
	2) Extreme performance topcoat (air dried)	0.42	(3.5)
	3) Final repair coat (air dried)	0.42	(3.5)

4) All other coatings are subject to the emission limitations for miscellaneous metal parts and products coatings in subsection (j) above.

		<u>kg/l</u>	<u>lb/gal</u>
l)	Wood Furniture Coating		
	1) Clear topcoat	0.67	(5.6)
	2) Opaque stain	0.56	(4.7)
	3) Pigmented coat	0.60	(5.0)
	4) Repair coat	0.67	(5.6)

5)	Sealer	0.67	(5.6)
6)	Semi-transparent stain	0.79	(6.6)
7)	Wash coat	0.73	(6.1)

(Note: An owner or operator of a wood furniture coating operation subject to this Section shall apply all coatings, with the exception of no more than 37.8 l (10 gal) of coating per day used for touch-up and repair operations, using one or more of the following application systems: airless spray application system, air-assisted airless spray application system, electrostatic spray application system, electrostatic bell or disc spray application system, heated airless spray application system, roller coating, brush or wipe coating application system, or dip coating application system.)

Section 219.205 Daily-Weighted Average Limitations

No owner or operator of a coating line subject to the limitations of Section 219.204 and complying by means of this Section shall operate the subject coating line unless the owner or operator has demonstrated compliance with subsection (a), (b), (c), (d), (e) or (f) (depending upon the source category) through the applicable coating analysis test methods and procedures specified in Section 219.105(a) and the recordkeeping and reporting requirements specified in Section 219.211(d):

a) No owner or operator of a coating line subject to only <u>one</u> of the limitations from among Section 219.204(a)(1), (a)(2), (a)(4), (c), (d), (e), (f), (g), (h), or (i) shall apply coatings on any such coating line, during any day, whose daily-weighted average VOM content exceeds the emission limitation to which the coatings are subject.

b) No owner or operator of a miscellaneous metal parts and products coating line subject to the limitations of Section 219.204(j) shall apply coatings to miscellaneous metal parts or products on the subject coating line unless the requirements in subsection (b)(1) or (b)(2) below are met.

  1) For each coating line which applies multiple coatings, all of which are subject to the same numerical emission limitation within Section 219.204(j) above, during the same day (e.g., all coatings used on the line are subject to 0.42 kg/l [3.5 lbs/gal]), the daily-weighted average VOM

content shall not exceed the coating VOM content limit corresponding to the category of coating used, or

2) For each coating line which applies coatings from more than one of the four coating categories in Section 219.204(j) above, during the same day, the owner or operator shall have a site-specific proposal approved by the Agency and approved by the USEPA as a SIP revision. To receive approval, the requirements of USEPA's Emissions Trading Policy Statement (and related policy), 51 Fed.Reg. 43814 (December 4, 1986), must be satisfied.

c) No owner or operator of a can coating facility subject to the limitations of Section 215.204(b) shall operate the subject coating facility using a coating with a VOM content in excess of the limitations specified in Section 215.204(b) unless all of the following requirements are met:

1) An alternative daily emission limitation shall be determined according to subsection (c)(2) below. Actual daily emissions shall never exceed the alternative daily emission limitation and shall be calculated by use of the following equation.

$$E_d = \sum_{i=1}^{n} V_i C_i$$

where:

E_d = Actual VOM emissions for the day in units of kg/day (lbs/day),

i = Subscript denoting a specific coating applied,

n = Total number of coatings applied in the can coating operation,

V_i = Volume of each coating applied for the day in units of l/day (gal/day) of coating (minus water and any compounds which are specifically exempted from the definition of VOM), and

C_i = The VOM content of each coating as applied in units of kg VOM/l (lbs VOM/gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM).

2) The alternative daily emission limitation (A_d) shall be determined on a daily basis as follows:

$$A_d = \sum_{i=1}^{n} V_i \, L_i \, \frac{(D_i - C_i)}{(D_i - L_i)}$$

where:

A_d = The VOM emissions allowed for the day in units of kg/day (lbs/day),

i = Subscript denoting a specific coating applied,

n = Total number of surface coatings applied in the can coating operation,

C_i = The VOM content of each surface coating as applied in units of kg VOM/l (lbs VOM/gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM),

D_i = The density of VOM in each coating applied. For the purposes of calculating A_d, the density is 0.882 kg VOM/l VOM (7.36 lbs VOM/gal VOM),

V_i = Volume of each surface coating applied for the day in units of l (gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM),

L_i = The VOM emission limitation for each surface coating applied as specified in Section 219.204(b) in units of kg VOM/l (lbs VOM/gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM).

d) No owner or operator of a heavy off-highway vehicle products coating line subject to the limitations of Section 219.204(k) shall apply coatings to heavy off-highway vehicle products on the subject coating line unless the requirements of subsection (d)(1) or (d)(2) below are met.

1) For each coating line which applies multiple coatings, all of which are subject to the same numerical emission limitation within Section 219.204(k) above, during the same day (e.g., all coatings used on the line are subject to 0.42 kg/l [3.5 lbs/gal]), the daily-weighted average VOM content shall not exceed the coating VOM content limit corresponding to the category of coating used, or

2) For each coating line which applies coatings subject to more than one numerical emission limitation in Section 219.204(k) above, during the same day, the owner or operator shall have a site specific proposal approved by the Agency and approved by the USEPA as a SIP revision. To receive approval, the requirements of USEPA's Emissions Trading Policy Statement (and related policy) must be satisfied.

e) No owner or operator of a wood furniture coating line subject to the limitations of Section 219.204(l) shall apply coatings to wood furniture on the subject coating line unless the requirements of subsection (e)(1) or (e)(2), in addition to the requirements specified in the note to Section 219.204(l), are met.

1) For each coating line which applies multiple coatings, all of which are subject to the same numerical emission limitation within Section 219.204(l) above, during the same day (e.g., all coatings used on the line are subject to 0.67 kg/l [5.6 lbs/gal]), the daily-weighted average VOM content shall not exceed the coating VOM content limit corresponding to the category of coating used, or

2) For each coating line which applies coatings subject to more than one numerical emission limitation in Section 219.204(l) above, during the same day, the owner or operator shall have a site specific proposal approved by the Agency and approved by the USEPA as a SIP revision. To receive approval, the requirements of USEPA's Emissions Trading Policy Statement (and related policy) must be satisfied.

Section 219.206 Solids Basis Calculation

Limitations in terms of kg (lbs) of VOM emissions per l (gal) of solids as applied at each coating applicator shall be determined by the following equation:

$$S = \frac{C}{1 - (C/D)}$$

where:

S = The limitation on VOM emissions in terms of kg VOM/l (lbs VOM/gal) of solids,

C = The limitation on VOM emissions in terms of kg/l (lbs/gal) of coating (minus water and any compounds which are specifically excluded from the definition of VOM) specified in Section 219.204,

D = The density of VOM in the coating. For the purposes of calculating S, the density is 0.882 kg VOM/l VOM (7.36 lbs VOM/gal VOM).

Section 219.207 Alternative Emission Limitations

a) Any owner or operator of a coating line subject to Section 219.204 may comply with this Section, rather than with Section 219.204, if a capture system and control device are operated at all times and the owner or operator demonstrates compliance with subsections (c), (d), (e), (f), (g) or (h) (depending upon the source category) through the applicable coating analysis and capture system and control device efficiency test methods and procedures specified in Section 219.105 and the recordkeeping and reporting requirements specified in Section 219.211(e); and the control device is equipped with the applicable monitoring equipment specified in Section 219.105(d) and the monitoring equipment is installed, calibrated, operated and maintained according to vendor specifications at all times the control device is in use. A capture system and control device, which does not demonstrate compliance with subsection (c), (d), (e), (f), (g) or (h) may be used as an alternative to compliance with Section 219.204 only if the alternative is approved by the Agency and approved by the USEPA as a SIP revision.

b) Alternative Add-On Control Methodologies

1) The coating line is equipped with a capture system and control device that provides 81 percent reduction in the overall emissions of VOM from the coating line and the control device has a 90

percent efficiency, or

2) The system used to control VOM from the coating line is demonstrated to have an overall efficiency sufficient to limit VOM emissions to no more than what is allowed under Section 219.204. Use of any control system other than an afterburner, carbon adsorption, condensation, or absorption scrubber system can be allowed only if approved by the Agency and approved by the USEPA as a SIP revision. The use of transfer efficiency credits can be allowed only if approved by the Agency and approved by the USEPA as a SIP revision. Baseline transfer efficiencies and transfer efficiency test methods must be approved by the Agency and the USEPA.

Such overall efficiency is to be determined as follows:

A) obtain the emission limitation from the appropriate subsection in Section 219.204,

B) calculate "S" according to the equation in Section 219.206,

3) calculate the overall efficiency required according to Section 219.105(e). For the purposes of calculating this value, according to the equation in Section 219.105(e)(2), VOM_1 is equal to the value of "S" as determined above in subsection (b)(2)(B).

c) No owner or operator of a coating line subject to only one of the emission limitations from among Section 219.204(a)(1), (a)(2), (a)(4), (c), (d), (e), (f), (g), (h) or (i) and equipped with a capture system and control device shall operate the subject coating line unless the requirements in subsection (b)(1) or (b)(2) above are met. No owner or operator of a coating line subject to Section 219.204(a)(3) and equipped with a capture system and control device shall operate the coating line unless the owner or operator demonstrates compliance with the topcoat limitation in accordance with the topcoat protocol for automobile or light-duty trucks referenced in Section 219.105(b).

d) No owner or operator of a miscellaneous metal parts and products coating line which applies one or more coatings during the same day, all of which are subject to the same numerical emission limitation within Section 219.204(j) (e.g., all coatings used on the line are subject to 0.42 kg/l [3.5 lbs/gal]), and which is equipped with a capture system and control device shall operate the subject coating line unless the requirements in subsection (b)(1) or (b)(2) above are met.

e) No owner or operator of a heavy off-highway vehicle products coating line which applies one or more coatings during the same day, all of which are subject to the same numerical emission limitation within Section 219.204(k) (e.g., all coatings used on the line are subject to 0.42 kg/l [3.5 lbs/gal]), and which is equipped with a capture system and control device shall operate the subject coating line unless the requirements in subsection (b)(1) or (b)(2) above are met.

f) No owner or operator of a wood furniture coating line which applies one or more coatings during the same day, all of which are subject to the same numerical emission limitation within Section 219.204(l) (e.g., all coatings used on the line are subject to 0.67 kg/l [5.6 lbs/gal]), and which is equipped with a capture system and control device shall operate the subject coating line unless the requirements in subsection (b)(1) or (b)(2) are met. If compliance is achieved by meeting the requirements in subsection (b)(2), then the provisions in the note to Section 219.204(l) must also be met.

g) No owner or operator of a can coating facility and equipped with a capture system and control device shall operate the subject coating facility unless the requirements in subsection (h)(1) or (h)(2) below are met.

1) An alternative daily emission limitation shall be determined according to Section 219.205(c)(2). Actual daily emissions shall never exceed the alternative daily emission limitation and shall be calculated by use of the following equation:

$$E_d = \sum_{i=1}^{n} V_i \; C_i \; (1-F_i)$$

where:

E_d = Actual VOM emissions for the day in units of kg/day (lbs/day),

i = Subscript denoting the specific coating applied,

n = Total number of surface coatings as applied in the can coating operation,

V_i = Volume of each coating as applied for the day in units of l/day (gal/day) of coating (minus water and any compounds which are specifically exempted from the definition of VOM),

C_i = The VOM content of each coating as applied in units of kg VOM/l (lbs VOM/gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM), and

F_i = Fraction, by weight, of VOM emissions from the surface coating, reduced or prevented from being emitted to the ambient air. This is the overall efficiency of the capture system and control device.

2) The coating line is equipped with a capture system and control device that provide 75 percent reduction in the overall emissions of VOM from the coating line and the control device has a 90 percent efficiency.

Section 219.208 Exemptions From Emission Limitations

a) Exemptions for all source categories except wood furniture coating. The limitations of this Subpart shall not apply to coating lines within a facility, that otherwise would be subject to the same subsection of Section 219.204 (because they belong to the same source category, e.g. can coating), provided that combined actual emissions of VOM from all lines at the facility subject to that subsection never exceed 6.8 kg/day (15 lbs/day) before the application of capture systems and control devices. (For example, can coating lines within a plant would not be subject to the limitations of Section 219.204(b) if the combined actual emissions of VOM from the can coating lines never exceed 6.8 kg/day (15 lbs/day) before the application of capture systems and control devices.) Volatile organic material emissions from heavy off-highway vehicle products coating lines must be combined with VOM emissions from miscellaneous metal parts and products coating lines to determine applicability. Any owner or operator of a coating facility shall comply with the applicable coating analysis test methods and procedures specified in Section 219.105(a) and the recordkeeping and reporting requirements specified in Section 219.211(a) if total VOM emissions from the subject coating lines are always less than or equal to 6.8 kg/day (15 lbs/day) before the application of capture systems and control devices and, therefore, are not subject to the limitations of Section 219.204. Once a category of coating lines at a facility is subject to the limitations in Section 219.204, the coating lines are always subject to the limitations in Section 219.204.

b) Applicability for wood furniture coating

1) The limitations of this Subpart shall apply to a plant's wood furniture coating lines if the plant contains process emission sources, not regulated by Subparts B, E, F (excluding Section 219.204(l)), H (excluding Section 219.405), Q, R, S, V, X, Y, or Z of this Part, which as a group both:

A) have maximum theoretical emissions of 91 Mg (100 tons) or more per calendar year of VOM if no air pollution control equipment were used, and

B) are not limited to less than 91 Mg (100 tons) of VOM per calendar year if no air pollution control equipment were used, through production or capacity limitations contained in a federally enforceable construction permit or SIP revision.

2) If a plant ceases to fulfill the criteria of subsection (b)(1), the limitations of Section 219.204(l) shall continue to apply to any wood furniture coating line which was ever subject to the limitations of Section 219.204(l).

3) For the purposes of subsection (b), an emission source shall be considered regulated by a Subpart if it is subject to the limitations of that Subpart. An emission source is not considered regulated by a Subpart if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

4) Any owner or operator of a wood furniture coating line to which the limitations of this Subpart are

not applicable due to the criteria in subsection (b) shall, upon request by the Agency or the USEPA, submit records to the Agency and the USEPA within 30 calendar days from the date of the request that document that the coating line is exempt from the limitations of this Subpart.

Section 219.209 Exemption From General Rule on Use of Organic Material

No owner or operator of a coating line subject to the limitations of Section 219.204 is required to meet the limitations of Subpart G (Section 219.301 or 219.302) of this Part, after the date by which the coating line is required to meet Section 219.204.

Section 219.210 Compliance Schedule

Every owner or operator of a coating line (of a type included within Section 219.204) shall comply with the requirements of Section 219.204, 219.207 or 219.208 and Section 219.211 in accordance with the appropriate compliance schedule as specified in subsection (a), (b), (c) or (d) below:

a) No owner or operator of a coating line which is exempt from the limitations of Section 219.204 because of the criteria in Section 219.208(a) shall operate said coating line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Section 219.211(b). Wood furniture coating lines are not subject to Section 219.211(b).

b) No owner or operator of a coating line complying by means of Section 219.204 shall operate said coating line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Sections 219.204 and 219.211(c).

c) No owner or operator of a coating line complying by means of Section 219.205 shall operate said coating line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Sections 219.205 and 219.211(d).

d) No owner or operator of a coating line complying by means of Section 219.207 shall operate said coating line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Sections 219.207

and 219.211(e).

Section 219.211 Recordkeeping and Reporting

a) The VOM content of each coating and the efficiency of each capture system and control device shall be determined by the applicable test methods and procedures specified in Section 219.105 to establish the records required under this Section.

b) Any owner or operator of a coating line which is exempted from the limitations of Section 219.204 because of Section 219.208(a) shall comply with the following:

1) By a date consistent with Section 219.106, the owner or operator of a facility referenced in this subsection shall certify to the Agency that the facility is exempt under the provisions of Section 219.208(a). Such certification shall include:

A) A declaration that the facility is exempt from the limitations of Section 219.204 because of Section 219.208(a); and

B) Calculations which demonstrate that the combined VOM emissions from all coating lines at the facility never exceed 6.8 kg (15 lbs) per day before the application of capture systems and control devices. The following equation shall be used to calculate total VOM emissions:

$$T_e = \sum_{j=1}^{m} \sum_{i=1}^{n} (A_i B_i)_j$$

where:

T_e = Total VOM emissions from coating lines at a facility each day before the application of capture systems and control devices in units of kg/day (lbs/day),

m = Number of coating lines at the facility,

j = Subscript denoting an individual coating line,

n = Number of different coatings as

applied each day on each coating line at the facility,

i = Subscript denoting an individual coating,

A_i = Weight of VOM per volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line at the facility in units of kg VOM/l (lbs VOM/gal), and

B_i = Volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line at the facility in units of l/day (gal/day). The instrument or method by which the owner or operator accurately measured or calculated the volume of each coating as applied on each coating line each day shall be described in the certification to the Agency.

2) On and after a date consistent with Section 219.106, the owner or operator of a facility referenced in this subsection shall collect and record all of the following information each day for each coating line and maintain the information at the facility for a period of three years:

A) The name and identification number of each coating as applied on each coating line.

B) The weight of VOM per volume and the volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line.

3) On and after a date consistent with Section 219.106, the owner or operator of a facility exempted from the limitations of Section 219.204 because of Section 219.208(a) shall notify the Agency of any record showing that total VOM emissions from the coating facility exceed 6.8 kg (15 lbs) in any day before the application of capture systems and control devices by sending a copy of such record to the Agency within 30 days after the exceedance occurs.

c) Any owner or operator of a coating line subject to the limitations of Section 219.204 and complying by means of Section 219.204 shall comply with the following:

  1) By a date consistent with Section 219.106, or upon initial start-up of a new coating line, or upon changing the method of compliance from an existing subject coating line from Section 219.205 or Section 219.207 to Section 219.204; the owner or operator of a subject coating line shall certify to the Agency that the coating line will be in compliance with Section 219.204 on and after a date consistent with Section 219.106, or on and after the initial start-up date. Such certification shall include:

    A) The name and identification number of each coating as applied on each coating line.

    B) The weight of VOM per volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line.

    C) For coating lines subject to Section 219.204(a)(3), certification shall include:

      i) The name and identification number of each coating line which will comply by means of Section 219.204(a)(3),

      ii) The name and identification number of each coating as applied on each coating line,

      iii) The weight of VOM per volume of each coating as applied on each coating line,

      iv) The instrument or method by which the owner or operator will accurately measure or calculate the volume of each coating as applied each day on each coating line,

      v) The method by which the owner or operator will create and maintain records each day as required in subsection (c)(2) below for coating lines subject to Section 219.204(a)(3),

      vi) An example format in which the records required in subsection (c)(2) below for coating lines subject to Section 219.204(a)(3).

2) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a coating line subject to the limitations of Section 219.204 and complying by means of Section 219.204 shall collect and record all of the following information each day for each coating line and maintain the information at the facility for a period of three years:

A) The name and identification number of each coating as applied on each coating line.

B) The weight of VOM per volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line.

C) For coating lines subject to Section 219.204(a)(3), the owner or operator shall maintain all records necessary to calculate the daily-weighted average VOM content from the coating line in accordance with the proposal submitted, and approved by the USEPA, pursuant to Section 219.204(a)(3).

3) On and after a date consistent with Section 219.106, the owner or operator of a subject coating line shall notify the Agency in the following instances:

A) Any record showing violation of Section 219.204 shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation, except that any record showing a violation of Section 219.204(a)(3) shall be reported by sending a copy of such record to the Agency within 15 days from the end of the month in which the violation occurred.

B) At least 30 calendar days before changing the method of compliance with Section 219.204 from Section 219.204 to Section 219.205 or Section 219.207, the owner or operator shall comply with all requirements of subsection (d)(1) or (e)(1) below, respectively. Upon changing the method of compliance with Section 219.204 from Section 219.204 to Section 219.205 or Section 219.207, the owner or operator shall comply with all requirements of subsection (d) or (e), respectively.

C) For coating lines subject to Section 219.204(a)(3), the owner or operator shall notify the Agency of any change to the topcoating operation at least 30 days before the change is effected. The Agency shall determine whether or not recertification testing is required. If the Agency determines that recertification testing is required, then the owner or operator shall submit a proposal to the Agency to test within 30 days and retest within 30 days of the Agency's approval of the proposal.

d) Any owner or operator of a coating line subject to the limitations of Section 219.204 and complying by means of Section 219.205 shall comply with the following:

1) By a date consistent with Section 219.106, or upon initial start-up of a new coating line, or upon changing the method of compliance for an existing subject coating line from Section 219.204 or Section 219.207 to Section 219.205; the owner or operator of the subject coating line shall certify to the Agency that the coating line will be in compliance with Section 219.205 on and after a date consistent with Section 219.106, or on and after the initial start-up date. Such certification shall include:

A) The name and identification number of each coating line which will comply by means of Section 219.205.

B) The name and identification number of each coating as applied on each coating line.

C) The weight of VOM per volume and the volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line.

D) The instrument or method by which the owner or operator will accurately measure or calculate the volume of each coating as applied each day on each coating line.

E) The method by which the owner or operator will create and maintain records each day as required in subsection (d)(2).

F) An example of the format in which the records required in subsection (d)(2) will be kept.

2) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a coating line subject to the limitations of Section 219.204 and complying by means of Section 219.205, shall collect and record all of the following information each day for each coating line and maintain the information at the facility for a period of three years:

A) The name and identification number of each coating as applied on each coating line.

B) The weight of VOM per volume and the volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line.

C) The daily-weighted average VOM content of all coatings as applied on each coating line as defined in Section 219.104.

3) On and after a date consistent with Section 219.106, the owner or operator of a subject coating line shall notify the Agency in the following instances:

A) Any record showing violation of Section 219.205 shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

B) At least 30 calendar days before changing the method of compliance with this subpart from Section 219.205 to Section 219.204 or Section 219.207, the owner or operator shall comply with all requirements of subsection (c)(1) or (e)(1), respectively. Upon changing the method of compliance with this subpart from Section 219.205 to Section 219.204 or Section 219.207, the owner or operator shall comply with all requirements of subsection (c) or (e), respectively.

e) Any owner or operator of a coating line subject to the limitations of Section 219.207 and complying by means of Section 219.207(c), (d), (e), (f), (g) or (h) shall comply with the following:

1) By a date consistent with Section 219.106, or upon initial start-up of a new coating line, or upon changing the method of compliance for an existing coating line from Section 219.204 or Section 219.205 to Section 219.207, the owner or operator of the subject coating line shall perform all tests and submit to the Agency the results of all tests and calculations necessary to demonstrate that the subject coating line will be in compliance with Section 219.207 on and after a date consistent with Section 219.106, or on and after the initial start-up date.

2) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a coating line subject to the limitations of Section 219.207 and complying by means of Section 219.207(c), (d), (e), (f), (g), or (h) shall collect and record all of the following information each day for each coating line and maintain the information at the facility for a period of three years:

A) The weight of VOM per volume of coating solids as applied each day on each coating line, if complying pursuant to Section 219.207(b)(2).

B) Control device monitoring data.

C) A log of operating time for the capture system, control device, monitoring equipment and the associated coating line.

D) A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

3) On and after a date consistent with Section 219.106, the owner or operator of a subject coating line shall notify the Agency in the following instances:

A) Any record showing violation of Section 219.207 shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

B) At least 30 calendar days before changing the method of compliance with this Subpart from Section 219.207 to Section 219.204 or Section 219.205, the owner or operator shall comply with all requirements of subsection (c)(1) or (d)(1) of this Section, respectively. Upon changing the method of compliance with this subpart from Section 219.207 to Section 219.204 or Section 219.205, the owner or operator shall comply with all requirements of subsection (c) or (d) of this Section, respectively.

SUBPART G: USE OF ORGANIC MATERIAL

Section 219.301 Use of Organic Material

No person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere from any emission source, except as provided in Sections 219.302, 219.303, 219.304 and the following exception: If no odor nuisance exists the limitation of this Subpart shall apply only to photochemically reactive material.

Section 219.302 Alternative Standard

Emissions of organic material in excess of those permitted by Section 219.301 are allowable if such emissions are controlled by one of the following methods:

a) Flame, thermal or catalytic incineration so as either to reduce such emissions to 10 ppm equivalent methane (molecular weight 16) or less, or to convert 85 percent of the hydrocarbons to carbon dioxide and water; or,

b) A vapor recovery system which adsorbs and/or condenses at least 85 percent of the total uncontrolled organic material that would otherwise be emitted to the atmosphere; or,

c) Any other air pollution control equipment approved by the Agency and approved by the USEPA as a SIP revision capable of reducing by 85 percent or more the uncontrolled organic material that would be otherwise emitted to the atmosphere.

Section 219.303 Fuel Combustion Emission Sources

The provisions of Sections 219.301 and 219.302 shall not apply to fuel combustion emission sources.

Section 219.304 Operations with Compliance Program

The provisions of Sections 219.301 and 219.302 shall not apply to any owner, operator, user or manufacturer of paint, varnish, lacquer, coatings or printing ink whose compliance program and project completion schedule, as required by 35 Ill. Adm. Code 201, provided for the reduction of organic material used in such process to 20 percent or less of total volume by May 30, 1977.

SUBPART H: PRINTING AND PUBLISHING

Section 219.401 Flexographic and Rotogravure Printing

a) No owner or operator of a subject flexographic, packaging rotogravure or publication rotogravure printing line shall apply at any time any coating or ink unless the VOM content does not exceed the limitation specified in either subsection (a)(1) or (a)(2) below. Compliance with this Section must be demonstrated through the applicable coating or ink analysis test methods and procedures specified in Section 219.105(a) and the recordkeeping and reporting requirements specified in Section 219.404(c). As an alternative to compliance with this subsection, a subject printing line may meet the requirements of subsection (b) or (c) below.

1) Forty percent VOM by volume of the coating and ink (minus water and any compounds which are specifically exempted from the definition of VOM), or

2) Twenty-five percent VOM by volume of the volatile content in the coating and ink.

b) No owner or operator of a subject flexographic, packaging rotogravure or publication rotogravure printing line shall apply coatings or inks on the subject printing line unless the weighted average, by volume, VOM content of all coatings and inks as applied each day on the subject printing line does not exceed the limitation specified in either subsection (a)(1) (as determined by subsection (b)(1)) or subsection (a)(2) (as determined by subsection (b)(2)). Compliance with this subsection must be demonstrated through the applicable coating or ink analysis test methods and procedures specified in Section 219.105(a) and the recordkeeping and reporting requirements specified in Section 219.404(d).

1) The following equation shall be used to determine if the weighted average VOM content of all coatings and inks as applied each day on the subject printing line exceeds the limitation

$$VOM_{(i)(A)} = \frac{\sum_{i=i}^{n} C_i L_i \ (V_{si} + V_{VOMi})}{\sum_{i=i}^{n} L_i (V_{si} + V_{VOMi})}$$

Where:

$VOM_{(i)(A)}$ = The weighted average VOM content in units of percent VOM by volume of all coatings and inks (minus water and any compounds which are specifically exempted from the definition of VOM) used each day,

i = Subscript denoting a specific coating or ink as applied,

n = The number of different coatings and/or inks as applied each day on a printing line,

C_i = The VOM content in units of percent VOM by volume of each coating or ink as applied (minus water and any compounds which are specifically exempted from the definition of VOM),

L_i = The liquid volume of each coating or ink as applied in units of l (gal),

V_{si} = The volume fraction of solids in each coating or ink as applied, and

V_{VOMi} = The volume fraction of VOM in each coating or ink as applied.

2) The following equation shall be used to determine if the weighted average VOM content of all coatings and inks as applied each day on the subject printing line exceeds the limitation

specified in subsection (a)(2).

$$VOM_{(i)(B)} = \frac{\sum_{i=1}^{n} C_i L_i V_{VMi}}{\sum_{i=1}^{n} L_i V_{VMi}}$$

where:

$VOM_{(i)(B)}$ = The weighted average VOM content in units of percent VOM by volume of the volatile content of all coatings and inks used each day,

i = Subscript denoting a specific coating or ink as applied,

n = The number of different coatings and/or inks as applied each day on each printing line,

C_i = The VOM content in units of percent VOM by volume of the volatile matter in each coating or ink as applied,

L_i = The liquid volume of each coating or ink as applied in units of l (gal), and

V_{VMi} = The volume fraction of volatile matter in each coating or ink as applied.

c) No owner or operator of a subject flexographic, packaging rotogravure or publication rotogravure printing line equipped with a capture system and control device shall operate the subject printing line unless the owner or operator meets the requirements in subsection (c)(1), (c)(2), or (c)(3) and subsections (c)(4), (c)(5) and (c)(6) below.

1) A carbon adsorption system is used which reduces the captured VOM emissions by at least 90 percent by weight, or

2) An incineration system is used which reduces the captured VOM emissions by at least 90 percent by weight, or

3) An alternative VOM emission reduction system is

used which is demonstrated to have at least a 90 percent control device efficiency, approved by the Agency and approved by USEPA as a SIP revision, and

4) The printing line is equipped with a capture system and control device that provides an overall reduction in VOM emissions of at least:

   A) 75 percent where a publication rotogravure printing line is employed, or

   B) 65 percent where a packaging rotogravure printing line is employed, or

   C) 60 percent where a flexographic printing line is employed, and

5) The control device is equipped with the applicable monitoring equipment specified in Section 219.105(d)(2) and the monitoring equipment is installed, calibrated, operated and maintained according to vendor specifications at all times the control device is in use, and

6) The capture system and control device are operated at all times when the subject printing line is in operation. The owner or operator shall demonstrate compliance with this subsection by using the applicable capture system and control device test methods and procedures specified in Section 219.105(c) through Section 219.105(f) and by complying with the recordkeeping and reporting requirements specified in Section 219.404(e).

Section 219.402 Applicability

a) The limitations of Section 219.401 apply to all flexographic and rotogravure printing lines at a subject facility. All facilities with flexographic and/or rotogravure printing lines are subject facilities unless:

   1) Total maximum theoretical emissions of VOM from all flexographic and rotogravure printing line(s) at the facility never exceed 90.7 Mg (100 tons) per calendar year before the application of capture systems and control devices, or

   2) A federally enforceable construction permit or SIP revision for all flexographic and rotogravure printing line(s) at a facility requires the owner

or operator to limit production or capacity of these printing line(s) to reduce total VOM emissions from all flexographic and rotogravure printing line(s) to 90.7 Mg (100 tons) or less per calendar year before the application of capture systems and control devices.

b) Upon achieving compliance with this Subpart, the emission source is not required to meet Subpart G (Sections 219.301 or 219.302). Emission sources exempt from this Subpart are subject to Subpart G (Sections 219.301 or 215.802). Rotogravure or flexographic equipment used for both roll printing and paper coating is subject to this Subpart.

c) Once subject to the limitations of Section 219.401, a flexographic or rotogravure printing line is always subject to the limitations of Section 219.401.

d) Any owner or operator of any flexographic or rotogravure printing line that is exempt from the limitations of Section 219.401 because of the criteria in this Section is subject to the recordkeeping and reporting requirements specified in Section 219.404(b).

Section 219.403 Compliance Schedule

Every owner or operator of a flexographic and/or rotogravure printing line shall comply with the applicable requirements of Section 219.401 and Section 219.404 in accordance with the applicable compliance schedule specified in subsection (a), (b), (c) or (d) below:

a) No owner or operator of a flexographic or rotogravure printing line which is exempt from the limitations of Section 219.401 because of the criteria in Section 219.402 shall operate said printing line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Section 219.404(b).

b) No owner or operator of a flexographic or rotogravure printing line complying by means of Section 219.401(a) shall operate said printing line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Section 219.401(a) and Section 219.404(c).

c) No owner or operator of a flexographic or rotogravure printing line complying by means of Section 219.401(b) shall operate said printing line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Section 219.401(b) and Section 219.404(d).

d) No owner or operator of a flexographic or rotogravure printing line complying by means of Section 219.401(c) shall operate said printing line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, Section 219.401(c) and Section 219.404(e).

Section 219.404 Recordkeeping and Reporting

a) The VOM content of each coating and ink and the efficiency of each capture system and control device shall be determined by the applicable test methods and procedures specified in Section 219.105 to establish the records required under this Section.

b) Any owner or operator of a printing line which is exempted from the limitations of Section 219.401 because of the criteria in Section 219.402 shall comply with the following:

1) By a date consistent with Section 219.106, the owner or operator of a facility to which this subsection is applicable shall certify to the Agency that the facility is exempt under the provisions of Section 219.402. Such certification shall include:

A) A declaration that the facility is exempt from the limitations of the criteria in Section 219.401 because of Section 219.402, and

B) Calculations which demonstrate that total maximum theoretical emissions of VOM from all flexographic and rotogravure printing lines at the facility never exceed 90.7 Mg (100 tons) per calendar year before the application of capture systems and control devices. Total maximum theoretical emissions of VOM for a flexographic or rotogravure printing facility is the sum of maximum theoretical emissions of VOM from each flexographic and rotogravure printing line at the facility. The following equation shall be used to calculate total maximum theoretical emissions of VOM per calendar year before the application of capture systems and control devices for each flexographic and rotogravure printing line at the facility:

$E_p = A \times B$

where:

E_p = Total maximum theoretical emissions of VOM from one flexographic or rotogravure printing line in units of kg/year (lbs/year),

A = Weight of VOM per volume of solids of the coating or ink with the highest VOM content as applied each year on the printing line in units of kg VOM/l (lbs VOM/gal) of coating or ink solids, and

B = Total volume of solids for all coatings and inks that can potentially be applied each year on the printing line in units of l/year (gal/year). The instrument and/or method by which the owner or operator accurately measured or calculated the volume of each coating and ink as applied and the amount that can potentially be applied each year on the printing line shall be described in the certification to the Agency.

2) On and after a date consistent with Section 219.106, the owner or operator of a facility referenced in this subsection shall collect and record all of the following information each year for each printing line and maintain the information at the facility for a period of three years:

A) The name and identification number of each coating and ink as applied on each printing line.

B) The VOM content and the volume of each coating and ink as applied each year on each printing line.

3) On and after a date consistent with Section 219.106, the owner or operator of a facility exempted from the limitations of Section 219.401 because of the criteria in Section 219.402 shall notify the Agency of any record showing that total maximum theoretical emissions of VOM from all

printing lines exceed 90.7 Mg (100 tons) in any calendar year before the application of capture systems and control devices by sending a copy of such record to the Agency within 30 days after the exceedance occurs.

c) Any owner or operator of a printing line subject to the limitations of Section 219.401 and complying by means of Section 219.401(a) shall comply with the following:

1) By a date consistent with Section 219.106, or upon initial start-up of a new printing line, or upon changing the method of compliance from an existing subject printing line from Section 219.401(b) or Section 219.401(c) to Section 219.401(a), the owner or operator of a subject printing line shall certify to the Agency that the printing line will be in compliance with Section 219.401(a) on and after a date consistent with Section 219.106, or on and after the initial start-up date. Such certification shall include:

A) The name and identification number of each coating and ink as applied on each printing line.

B) The VOM content of each coating and ink as applied each day on each printing line.

2) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of Section 219.401 and complying by means of Section 219.401(a) shall collect and record all of the following information each day for each coating line and maintain the information at the facility for a period of three years:

A) The name and identification number of each coating and ink as applied on each printing line.

B) The VOM content of each coating and ink as applied each day on each printing line.

3) On and after a date consistent with Section 219.106, the owner or operator of a subject printing line shall notify the Agency in the following instances:

A) Any record showing violation of Section

219.401(a) shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

B) At least 30 calendar days before changing the method of compliance with Section 219.401 from Section 219.401(a) to Section 219.401(b) or (c), the owner or operator shall comply with all requirements of subsection (b)(1) or (c)(1), respectively. Upon changing the method of compliance with Section 219.401 from Section 219.401(a) to Section 219.401(b) or (c), the owner or operator shall comply with all requirements of subsection (b) or (c), respectively.

d) Any owner or operator of a printing line subject to the limitations of Section 219.401 and complying by means of Section 219.401(b) shall comply with the following:

1) By a date consistent with Section 219.106, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing subject printing line from Section 219.401(a) or (c) to Section 219.401(b), the owner or operator of the subject printing line shall certify to the Agency that the printing line will be in compliance with Section 219.401(b) on and after a date consistent with Section 219.106, or on and after the initial start-up date. Such certification shall include:

A) The name and identification number of each printing line which will comply by means of Section 219.401(b).

B) The name and identification number of each coating and ink available for use on each printing line.

C) The VOM content of each coating and ink as applied each day on each printing line.

D) The instrument or method by which the owner or operator will accurately measure or calculate the volume of each coating and ink as applied each day on each printing line.

E) The method by which the owner or operator will create and maintain records each day as required in subsection (b)(2).

F) An example of the format in which the records required in subsection (b)(2) will be kept.

2) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of Section 219.401 and complying by means of Section 219.401(b) shall collect and record all of the following information each day for each printing line and maintain the information at the facility for a period of three years:

A) The name and identification number of each coating and ink as applied on each printing line.

B) The VOM content and the volume of each coating and ink as applied each day on each printing line.

C) The daily-weighted average VOM content of all coatings and inks as applied on each printing line.

3) On and after a date consistent with Section 219.106, the owner or operator of a subject printing line shall notify the Agency in the following instances:

A) Any record showing violation of Section 219.401(b) shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

B) At least 30 calendar days before changing the method of compliance with Section 219.401 from Section 219.401(b) to Section 219.401(a) or 219.401(c), the owner or operator shall comply with all requirements of subsection (c)(1) or (e)(1), respectively. Upon changing the method of compliance with Section 219.401 from Section 219.401(b) to Section 219.401(a) or (c), the owner or operator shall comply with all requirements of subsection (c) or (e), respectively.

e) Any owner or operator of a printing line subject to the limitations of Section 219.401 and complying by means of Section 219.401(c) shall comply with the following:

1) By a date consistent with Section 219.106, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing printing line from Section 219.401(a) or (b) to Section 219.401(c), the owner or operator of the subject printing line shall perform all tests and submit to the Agency the results of all tests and calculations necessary to demonstrate that the subject printing line will be in compliance with Section 219.401(c) on and after a date consistent with Section 219.106, or on and after the initial start-up date.

2) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of Section 219.401 and complying by means of Section 219.401(c) shall collect and record all of the following information each day for each printing line and maintain the information at the facility for a period of three years:

   A) Control device monitoring data.

   B) A log of operating time for the capture system, control device, monitoring equipment and the associated printing line.

   C) A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

3) On and after a date consistent with Section 219.106, the owner or operator of a subject printing line shall notify the Agency in the following instances:

   A) Any record showing violation of Section 219.401(c), shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

   B) At least 30 calendar days before changing the method of compliance with Section 219.401 from Section 219.401(c) to Section 219.401(a) or (b), the owner or operator shall comply with all requirements of subsection (c)(1) or (d)(1), respectively. Upon changing the method of compliance with Section 219.401 from Section 219.401(c) to Section 219.401(a) or (b), the owner or operator shall comply with all requirements of subsection (c) or (d), respectively.

Section 219.405 Heatset-Web-Offset Lithographic Printing

a) Applicability

1) The limitations of subsection (b) below apply to all heatset-web-offset lithographic printing lines at a subject facility. All facilities with heatset-web-offset lithographic printing lines are subject facilities unless:

A) Total maximum theoretical emissions of VOM from all heatset-web-offset lithographic printing lines at the facility never exceed 90.7 Mg (100 tons) per calendar year in the absence of air pollution control equipment, or

B) A federally enforceable construction permit or SIP revision for all heatset-web-offset lithographic printing lines(s) at a facility requires the owner or operator to limit production or capacity of these printing line(s) to reduce total VOM emissions from all heatset-web-offset lithographic printing line(s) to 90.7 Mg (100 tons) per calendar year or less in the absence of air pollution control equipment, and

2) Any owner or operator of any heatset-web-offset lithographic printing line that is exempt from the limitations in subsection (b) because of the criteria in subsection (a)(1) shall be subject to the recordkeeping and reporting requirements in subsection (c)(1).

b) Specific Provisions. No owner or operator of a subject heatset-web- offset printing line may cause or allow the operation of the subject heatset-web-offset printing line unless the owner or operator meets the requirements in subsection (b)(1) or (b)(2) and the requirements in subsections (b)(3) and (b)(4) below.

1) An afterburner system is installed and operated that reduces 90 percent of the VOM emissions from the dryer exhaust, or

2) The fountain solution contains no more than 8 percent, by weight, of VOM and a condensation recovery system is installed and operated that removes at least 75 percent of the non-isopropyl alcohol organic materials from the dryer exhaust, and

3) The control device is equipped with the applicable monitoring equipment specified in Section 219.105(d)(2) and the monitoring equipment is installed, calibrated, operated and maintained according to vendor specifications at all times the control device is in use, and

4) The control device is operated at all times when the subject printing line is in operation. The owner or operator shall demonstrate compliance with this Section by using the applicable test methods and procedures specified in Section 219.105(a), (d), and (f) and by complying with the recordkeeping and reporting requirements specified in subsection (c) below.

c) Recordkeeping and Reporting. The VOM content of each fountain solution and ink and the efficiency of each control device shall be determined by the applicable test methods and procedures specified in Section 219.105 to establish the records required under this subsection.

1) Any owner or operator of a printing line which is exempted from the limitations of subsection (b) because of the criteria in subsection (a) shall comply with the following:

A) By a date consistent with Section 219.106, the owner or operator of a facility to which subsection (c)(1) is applicable shall certify to the Agency that the facility is exempt under the provisions of subsection (a). Such certification shall include:

i) A declaration that the facility is exempt from the limitations of subsection (b) because of the criteria in subsection (a), and

ii) Calculations which demonstrate that total maximum theoretical emissions of VOM from all heatset-web-offset lithographic printing lines at the facility never exceed 90.7 Mg (100 tons) per calendar year before the application of air pollution control equipment. Total maximum theoretical emissions of VOM for a heatset-web-offset lithographic printing facility is the sum of maximum theoretical emissions of VOM from each heatset-web-offset lithographic printing line at the facility. The following equation shall be used to calculate total maximum theoretical emissions of VOM per calendar year in the absence of air pollution control equipment for each heatset-web-offset lithographic printing line at the facility.

$$E_p = (A \times B) + \frac{(C \times D)}{100}$$

where:

E_p = Total maximum theoretical emissions of VOM from one heatset-web-offset printing line in units of kg/year (lbs/year),

A = Weight of VOM per volume of solids of ink with the highest VOM content as applied each year on the printing line in units of kg VOM/l (lbs VOM/gal) of solids, and

B = Total volume of solids for all inks that can potentially be applied each year on the printing line in units of l/year (gal/year). The instrument or method by which the owner or operator accurately measured or calculated the volume of each ink as applied and the amount that can potentially be applied each year on the printing line shall be described in the certification to the Agency.

C = The weight percent VOM of the fountain solution with the highest VOM content.

D = The total volume of fountain solution that can potentially be used each year on the printing line in units of l/year (gal/year). The instrument and/or method by which the owner or operator accurately measured or calculated the volume of each fountain solution used and the amount that can potentially be used each year on the printing line shall be described in the certification to the Agency.

B) On and after a date consistent with Section 219.106, the owner or operator of a facility to which subsection (c)(1) is applicable shall collect and record all of the following information each year for each printing line and maintain the information at the facility for a period of three years:

i) The name and identification of each fountain solution and ink as applied on each printing line.

ii) The VOM content and the volume of each fountain solution and ink as applied each year on each printing line.

C) On and after a date consistent with Section 219.106, the owner or operator of a facility exempted from the limitations of subsection (b) because of the criteria in subsection (a) shall notify the Agency of any record showing that total maximum theoretical emissions of VOM from all printing lines exceed 90.7 Mg (100 tons) in any calendar year in the absence of air pollution control equipment by sending a copy of such record to the Agency within 30 days after the exceedance occurs.

2) Any owner or operator of a printing line subject to the limitations of subsection (b) and complying by means of subsection (b)(1) shall comply with the following:

A) By a date consistent with Section 219.106, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing printing line from subsection (b)(2) to subsection (b)(1); the owner or operator of the subject printing line shall perform all tests and submit to the Agency the results of all tests and calculations necessary to demonstrate that the subject printing line will be in compliance with subsection (b)(1) on and after a date consistent with Section 219.106, or on and after the initial start-up date.

B) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of subsection (b) and complying by means of subsection (b)(1) shall collect and record the following information each day for each printing line and maintain the information at the facility for a period of three years:

i) Control device monitoring data.

ii) A log of operating time for the control device, monitoring equipment and the associated printing line.

iii) A maintenance log for the control device and monitoring equipment detailing all routine and nonroutine maintenance performed including dates and duration of any outages.

C) On and after a date consistent with Section 219.106, the owner or operator of a subject printing line shall notify the Agency in the following instances:

i) Any record showing violation of subsection (b)(1) shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

ii) At least 30 calendar days before changing the method of compliance with subsection (b) from subsection (b)(1) to (b)(2), the owner or operator shall comply with all requirements of subsection (c)(3)(A). Upon changing the method of compliance with subsection (b) from subsection (b)(1) to (b)(2), the owner or operator shall comply with all requirements of subsection (c)(3).

3) Any owner or operator of a printing line subject to the limitations of subsection (b) and complying

by means of subsection (b)(2) shall comply with the following:

A) By a date consistent with Section 219.106, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing printing line from subsection (b)(1) to (b)(2); the owner or operator of the subject printing line shall perform all tests and submit to the Agency and the USEPA the results of all tests and calculations necessary to demonstrate that the subject printing line will be in compliance with subsection (b)(2) on and after a date consistent with Section 219.106, or on and after the initial start-up date.

B) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of subsection (b) and complying by means of subsection (b)(2) shall collect and record the following information each day for each printing line and maintain the information at the facility for a period of three years:

  i) The VOM content of the fountain solution used each day on each printing line.

  ii) A log of operating time for the control device and the associated printing line.

  iii) A maintenance log for the control device detailing all routine and non-routine maintenance performed including dates and duration of any outages.

C) On and after a date consistent with Section 219.106, the owner or operator of a subject printing line shall notify the Agency in the following instances:

  i) Any record showing violation of subsection (b)(2) shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

  ii) At least 30 calendar days before changing the method of compliance with subsection (b) from subsection (b)(2) to (b)(1), the owner or operator shall comply with all requirements of subsection (c)(2)(A). Upon changing the method of compliance with subsection (b) from subsection (b)(2) to (b)(1), the owner or operator shall comply with all requirements of subsection (c)(2).

d) Compliance Schedule. Every owner or operator of a heatset-web-offset lithographic printing line shall comply with the applicable requirements of subsections (b) and (c) in accordance with the applicable compliance schedule specified in subsection (d)(1), (d)(2), or (d)(3) below:

1) No owner or operator of a heatset-web-offset lithographic printing line which is exempt from the limitations of subsection (b) because of the criteria in subsection (a) shall operate said printing line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, subsection (b)(1) and (c)(1).

2) No owner or operator of a heatset-web-offset lithographic printing line complying by means of subsection (b)(1) shall operate said printing line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, subsection (b)(2) and (c)(2).

3) No owner or operator of a heatset-web-offset lithographic printing line complying by means of subsection (b)(2) shall operate said printing line on or after a date consistent with Section 219.106, unless the owner or operator has complied with, and continues to comply with, subsection (c)(3).

SUBPART Q: LEAKS FROM SYNTHETIC ORGANIC CHEMICAL AND POLYMER MANUFACTURING EQUIPMENT

Section 219.421 General Requirements

The owner or operator of a plant which processes more than 3660 mg/yr (4033 tons/year) gaseous and light liquid VOM, and whose components are used to manufacture the synthetic organic chemicals or polymers listed in Appendix A, shall comply with this Subpart. The provisions of this Subpart are applicable to components containing 10 percent or more by weight VOM as determined by ASTM method E-168, E-169 and E-260, incorporated by reference in Section 219.112. Those components that are not process unit components are exempt from this Subpart. A component shall be considered to be leaking if the VOM is equal to, or is greater than 10,000 ppmv as methane or hexane as determined by USEPA Reference Method 21, as specified at 40 CFR 60, Appendix A, incorporated by reference in Section 219.112, indication of liquids dripping, or indication by a sensor that a seal or barrier fluid system has failed. The provisions of this Subpart are not applicable if the equipment components are used to produce heavy liquid chemicals only from heavy liquid feed or raw materials.

Section 219.422 Inspection Program Plan for Leaks

The owner or operator of a synthetic organic chemical or polymer manufacturing plant subject to Section 219.421 shall prepare an inspection program plan which contains, at a minimum:

a) An identification of all components and the period in which each will be monitored pursuant to Section 219.423.

b) The format for the monitoring log required by Section 219.425.

c) A description of the monitoring equipment to be used when complying with Section 219.423, and

d) A description of the methods to be used to identify all pipeline valves, pressure relief valves in gaseous service, all leaking components, and components . exempted under Section 219.423(i) such that they are obvious and can be located by both plant personnel performing monitoring and Agency personnel performing inspections.

Section 219.423 Inspection Program for Leaks

The owner or operator of a synthetic organic chemical or polymer manufacturing plant subject to this subpart shall, for the purposes of detecting leaks, conduct a component inspection program using the test methods specified in Method 21, 40 CFR 60, Appendix A (1986), incorporated by reference in Section 219.112, consistent with the following provisions:

a) Test annually those components operated near extreme temperature or pressure such that they would be unsafe to routinely monitor and those components which would require the elevation of monitoring personnel higher than two meters above permanent worker access structures or surfaces.

b) Test quarterly all other pressure relief valves in gas service, pumps in light liquid service, valves in light liquid service and in gas service, and compressors.

c) If less than or equal to 2 percent of the valves in light liquid service and in gas service tested pursuant to subsection (b) are found not to leak for five consecutive quarters, no leak tests shall be required for three consecutive quarters. Thereafter, leak tests shall resume for the next quarter. If that test shows less than or equal to 2 percent of the valves in light liquid service and in gas service are leaking, then no tests are required for the next three quarters. If more than 2 percent are leaking, then tests are required for the next five quarters.

d) Observe visually all pump seals weekly.

e) Test immediately any pump seal from which liquids are observed dripping.

f) Test any relief valve within 24 hours after it has vented to the atmosphere.

g) Routine instrument monitoring of valves which are not externally regulated, flanges, and equipment in heavy liquid service, is not required. However, any valve which is not externally regulated, flange or piece of equipment in heavy liquid service that is found to be leaking on the basis of sight, smell or sound shall be repaired as soon as practicable but no later than 30 days after the leak is found.

h) Test immediately after repair any component that was found leaking.

i) Within one hour of its detection, a weatherproof, readily visible tag, in bright colors such as red or yellow, bearing an identification number and the date on which the leak was detected must be affixed on the leaking component and remain in place until the leaking component is repaired.

j) The following components are exempt from the monitoring requirements in this Section:

    1) Any component that is in vacuum service, and

    2) Any pressure relief valve that is connected to an operating flare header or vapor recovery device.

Section 219.424 Repairing Leaks

All leaking components must be repaired and retested as soon as practicable but no later than 15 days after the leak is found unless the leaking component cannot be repaired until the process unit is shut down. Records of repairing and retesting must be maintained in accordance with Section 219.425 and 219.426.

Section 219.425 Recordkeeping for Leaks

a) The owner or operator of a synthetic organic chemical or polymer manufacturing plant shall maintain a leaking components monitoring log which shall contain, at a minimum, the following information:

   1) The name of the process unit where the component is located;

   2) The type of component (e.g., valve, seal);

   3) The identification number of the component;

   4) The date on which a leaking component is discovered;

   5) The date on which a leaking component is repaired;

   6) The date and instrument reading of the recheck procedure after a leaking component is repaired;

   7) A record of the calibration of the monitoring instrument;

   8) The identification number of leaking components which cannot be repaired until process unit shutdown; and

   9) The total number of valves in light liquid service and in gas service inspected; the total number and the percentage of these valves found leaking during the monitoring period.

b) Copies of the monitoring log shall be retained by the owner or operator for a minimum of two years after the date on which the record was made or the report was prepared.

c) Copies of the monitoring log shall be made available to the Agency upon verbal or written request prior to or at the time of inspection pursuant to Section 4(d) of the Environmental Protection Act (Act) (Ill. Rev. Stat. 1989, ch. 111 1/2, pars. 1001 et seq.) at any reasonable time.

Section 219.426 Report for Leaks

The owner or operator of a synthetic organic chemical or polymer manufacturing plant subject to Section 219.421 through 219.430 shall:

a) Submit quarterly reports to the Agency on or before March 31, June 30, September 30, and December 31 of each year, listing all leaking components identified pursuant to Section 219.423 but not repaired within 15 days, all leaking components awaiting process unit shutdown, the total number of components inspected, the type of components inspected, and the total number of components found leaking, the total number of valves in light liquid service and in gas service inspected and the number and percentage of valves in light liquid service and in gas service found leaking.

b) Submit a signed statement with the report attesting that all monitoring and repairs were performed as required under Section 219.421 through 219.427.

Section 219.427 Alternative Program for Leaks

The Agency shall approve an alternative program of monitoring, recordkeeping, or reporting to that prescribed in this Subpart upon a demonstration by the owner or operator of such plant that the alternative program will provide plant personnel and Agency personnel with an equivalent ability to identify and repair leaking components. Any alternative program can be allowed when approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.428 Open-Ended Valves

a) Each open-ended valve shall be equipped with a cap, blind flange, plug, or a second valve, except during operations requiring fluid flow through the open-ended valve.

b) Each open-ended valve equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed.

c) Components which are open-ended valves and which serve as a sampling connection shall be controlled such that:

   1) A closed purge system or closed vent system shall return purged process fluid to the process line with no detectable volatile organic material

emissions to the atmosphere, or

2) A closed purge system or closed vent system shall collect and recycle purged process fluid to the process line with no detectable volatile organic material emissions to the atmosphere, or

3) Purged process fluid shall be transported to a control device that complies with the requirements of Section 219.429.

d) In-situ sampling systems are exempt from subsection (c).

Section 219.429 Standards for Control Devices

Control devices used to comply with Section 219.428(c) shall comply with the following:

a) If the control device is a vapor recovery system (for example, condensers and adsorbers), it shall be designed and operated to recover the volatile organic material emissions vented to it with an efficiency of 95 percent or greater.

b) If the control device is an enclosed combustion device, it shall be designed and operated to reduce the volatile organic material emissions vented to it with an efficiency of 95 percent or greater, or to provide a minimum residence time of 0.75 seconds at a minimum temperature of 816°C.

c) If the control device is a flare, it shall:

1) Be designed for and operated with no visible emissions as determined by USEPA Reference Method 22, 40 CFR 60, Appendix A (1986), incorporated by reference in Section 219.112, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

2) Be operated with a pilot flame present at all times and shall be monitored with a thermocouple or any other equivalent device to detect the presence of the pilot flame.

3) Be steam-assisted, air-assisted, or nonassisted.

4) Be used only with the net heating value of the gas being combusted being 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the

gas being combusted being 7.45 MJ/scm or greater if the flare is nonassisted. The net heating value of the gas being combusted shall be calculated using the following equation:

$$H_r = K \sum_{i=1}^{n} C_i H_i$$

Where:

H_r = Net heating value of the sample in MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25∘C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20∘C.

K = Constant,

1.740×10^{-7} (1/ppm)(g-mole/scm)(MJ/Kcal)

where

standard temperature for (g-mole/scm) is 20∘C.

C_i = Concentration of sample component i, in ppm, as measured by USEPA Reference Method 18, 40 CFR 60, Appendix A (1986), and ASTM D 2504-83, both incorporated by reference in Section 219.112.

H_i = Net heat of combustion of sample component i, kcal/g mole. The heats of combustion may be determined using ASTM D 2382-83, incorporated by reference in Section 219.112, if published values are not available or cannot be calculated.

5) Steam-assisted and nonassisted flares shall be designed and operated with an exit velocity, as determined by dividing the volumetric flowrate (in units of standard temperature and pressure), as determined by USEPA Reference Method 2 or 2A, 40 CFR 60, Appendix A (1986) incorporated by reference in Section 219.112, as appropriate; by the unobstructed (free) cross sectional area of the flare tip, less than 18 m/sec (60 ft/sec).

6) Air-assisted flares shall be designed and operated with an exit velocity less than the maximum permitted velocity, V_{max}, as determined by the following equation:

V_{max} = 8.706 + 0.7084(H_r).
V_{max} = Maximum permitted velocity, m/sec.
8.706 = Constant.
0.7084 = Constant.
H_r = The net heating value as determined in subsection (c)(4) of this section.

d) If the control device is a closed container, it shall be designed and operated to reduce the volatile organic material emissions, vented from purged process fluid after transfer, to no detectable volatile organic material emissions as determined by USEPA Reference Method 21 as specified at 40 CFR 60, Appendix A (1986), incorporated by reference in Section 219.112. For purposes of this Section, the phrase "after transfer" shall refer to the time at which the entire amount of purged process fluid resulting from a flushing or cleaning of the sample line enters the closed container or containers including the final container(s) prior to disposal.

e) The owner or operator of a control device shall monitor the control device to ensure that it is operated and maintained in conformance with the manufacturer's specifications, modified to the particular process design.

f) The control device shall be operated at all times when emissions may be vented to it.

Section 219.430 Compliance Date

The owner or operator of a synthetic organic chemical or polymer manufacturing plant subject to 35 Ill. Adm. Code 215.430 through 215.438 as of December 31, 1987 shall have complied with the standards and limitations of those Sections no later than December 31, 1987.

SUBPART R: PETROLEUM REFINING AND RELATED INDUSTRIES; ASPHALT MATERIALS

Section 219.441 Petroleum Refinery Waste Gas Disposal

a) Except as provided in subsection (b) or (c), no person shall cause or allow the discharge of organic materials in excess of 100 ppm equivalent methane (molecular weight 16.0) into the atmosphere from:

1) Any catalyst regenerator of a petroleum cracking system; or

2) Any petroleum fluid coker; or

3) Any other waste gas stream from any petroleum or petrochemical manufacturing process.

b) Exception. Existing sources subject to subsection (a)(3) may, alternatively, at their election, comply with the organic material emission limitations imposed by 35 Ill. Adm. Code 215.301 or 215.302; provided, however, that there shall be no increase in emissions from such sources above the level of emissions in existence on May 3, 1979.

c) New Sources. Sources subject to subsection (a)(3), construction of which commenced on or after January 1, 1977, may, at their election, comply with the following emission limitations:

1) A maximum of eight pounds per hour of organic material; or

2) Emission of organic material in excess of the limitation of subsection (c)(1) is allowable if such emissions are controlled by air pollution control methods or equipment approved by the Agency capable of reducing by 85 percent or more the uncontrolled organic material that would otherwise be emitted to the atmosphere. Such methods or equipment must be approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.442 Vacuum Producing Systems

No owner or operator of a petroleum refinery shall cause or allow the operation of any vacuum producing system unless the condensers, hot wells and accumulators of any such system are equipped with vapor loss control equipment including, but not limited to, piping, valves, flame arrestors and hot well covers, to vent any volatile organic material with a vapor pressure of 10.34 kPa (1.5 psia) or greater at 294.3•K (70•F) to a heater, fire box, flare, refinery fuel gas system, or other equipment or system of equal emission control as approved by the Agency and approved by the USEPA as a SIP revision. This Section shall not apply to vacuum producing systems on lube units.

Section 219.443 Wastewater (Oil/Water) Separator

No owner or operator of a petroleum refinery shall operate any wastewater (oil/water) separator at a petroleum refinery unless the separator is equipped with air pollution control equipment capable of reducing by 85 percent or more the uncontrolled organic material emitted to the atmosphere. If no odor nuisance exists, the limitation of this Section shall not apply if the vapor pressure of the organic material is below 10.34 kPa (1.5 psia) at 204.3°K (70°F) at all times.

Section 219.444 Process Unit Turnarounds

a) No owner or operator of a petroleum refinery shall cause or allow a refinery process unit turnaround except in compliance with an operating procedure as approved by the Agency.

b) Unless a procedure was already on file with the Agency as part of an approved operating permit no later than November 1, 1979, the owner or operator of a petroleum refinery shall submit to the Agency for approval a detailed procedure for reducing emissions of volatile organic material during refinery process unit turnarounds from organic material with a vapor pressure of 10.34 kPa (1.5 psia) or greater at 294.3°K (70°F). The Agency shall not approve the procedure unless it provides for:

1) Depressurization of the refinery process unit or vessel to a flare, refinery fuel gas system, or other equipment or system of equal emission control, as approved by the Agency and approved by the USEPA as a SIP revision, until the internal pressure from the vessel or unit is less than 5.0 psig before allowing the vessel to be vented to the atmosphere;

2) Recordkeeping of the following items:

A) Each date that a refinery unit or vessel is shut down; and

B) The total estimated quantity of volatile organic material emitted to the atmosphere and the duration of the emission in hours.

Section 219.445 Leaks: General Requirements

a) The owner or operator of a petroleum refinery shall:

1) Develop a monitoring program plan consistent with the provisions of Section 219.446;

2) Conduct a monitoring program consistent with the provisions of Section 219.447;

3) Record all leaking components which have a

volatile organic material concentration exceeding 10,000 ppm consistent with the provisions of Section 219.448;

4) Identify each component consistent with the monitoring program plan submitted pursuant to Section 219.446;

5) Repair and retest the leaking components as soon as possible within 22 days after the leak is found, but no later than June 1 for the purposes of Section 219.447(a)(1), unless the leaking components cannot be repaired until the unit is shut down for turnaround; and

6) Report to the Agency consistent with the provisions of Section 219.449.

Section 219.446 Monitoring Program Plan for Leaks

The owner or operator of a petroleum refinery shall prepare a monitoring program plan which contains, at a minimum:

a) An identification of all refinery components and the period in which each will be monitored pursuant to Section 219.447;

b) The format for the monitoring log required by Section 219.448;

c) A description of the monitoring equipment to be used pursuant to Section 219.447; and

d) A description of the methods to be used to identify all pipeline valves, pressure relief valves in gaseous service and all leaking components such that they are obvious to both refinery personnel performing monitoring and Agency personnel performing inspections.

Section 219.447 Monitoring Program for Leaks

a) The owner or operator of a petroleum refinery subject to Section 219.445 shall, for the purpose of detecting leaks, conduct a component monitoring program consistent with the following provisions:

    1) Test once between March 1 and June 1 of each year, by methods referenced in Section 219.105(g), all pump seals, pipeline valves in liquid service and process drains.

    2) Test once each quarter of each calendar year, by

methods referenced in Section 219.105(g), all pressure relief valves in gaseous service, pipeline valves in gaseous service and compressor seals.

3) Inaccessible valves may be tested once each calendar year instead of once each quarter of each calendar year.

4) Observe visually all pump seals weekly.

5) Test immediately any pump seal from which liquids are observed dripping,

6) Test any relief valve within 24 hours after it has vented to the atmosphere, and

7) Test immediately after repair any component that was found leaking.

b) Storage tank valves and pressure relief devices connected to an operating flare header or vapor recovery device are exempt from the monitoring requirements in subsection (a).

c) The Agency may require more frequent monitoring than would otherwise be required by subsection (a) for components which are demonstrated to have a history of leaking.

Section 219.448 Recordkeeping for Leaks

a) The owner or operator of a petroleum refinery shall maintain a leaking components monitoring log which shall contain, at a minimum, the following information:

1) The name of the process unit where the component is located;

2) The type of component (e.g., valve, seal);

3) The identification number of the component;

4) The date on which a leaking component is discovered;

5) The date on which a leaking component is repaired;

6) The date and instrument reading of the recheck procedure after a leaking component is repaired;

7) A record of the calibration of the monitoring

instrument;

8) The identification number of leaking components which cannot be repaired until turnaround; and

9) The total number of components inspected and the total number of components found leaking during that monitoring period.

b) Copies of the monitoring log shall be retained by the owner or operator for a minimum of two years after the date on which the record was made or the report prepared.

c) Copies of the monitoring log shall be made available to the Agency, upon verbal or written request, at any reasonable time.

Section 219.449 Reporting for Leaks

The owner or operator of a petroleum refinery shall:

a) Submit a report to the Agency prior to the 1st day of both July and September listing all leaking components identified pursuant to Section 219.447 but not repaired within 22 days, all leaking components awaiting unit turnaround, the total number of components inspected and the total number of components found leaking;

b) Submit a signed statement with the report attesting that all monitoring and repairs were performed as required under Sections 219.445 through 219.448.

Section 219.450 Alternative Program for Leaks.

The Agency may approve an alternative program of monitoring, recordkeeping or reporting to that prescribed in Sections 219.446 through 219.449 upon a demonstration by the owner or operator of a petroleum refinery that the alternative program will provide refinery, Agency and USEPA personnel with an equivalent ability to identify and repair leaking components. Any alternative program can be allowed only if approved by the USEPA as a SIP revision.

Section 219.451 Sealing Device Requirements

Except for safety pressure relief valves, no owner or operator of a petroleum refinery shall install or operate a valve at the end of a pipe or line containing volatile organic materials unless the pipe or line is sealed with a second valve, blind flange, plug, cap or other sealing device. The sealing device may be removed only when a sample is being taken or during maintenance operations.

Section 219.452 Compliance Schedule for Leaks

The owner or operator of a petroleum refinery shall adhere to the increments of progress contained in the following schedule:

a) Submit to the Agency a monitoring program consistent with Section 219.446 prior to July 1, 1991 or a date consistent with Section 219.106.

b) Submit to the Agency the first monitoring report pursuant to Section 219.449 prior to August 1, 1991 or a date consistent with Section 219.106.

Section 218.453 Compliance Dates

Every owner or operator of a petroleum refinery subject to 35 Ill. Adm. Code 215, Subpart R as of December 31, 1987 shall have complied with its standards and limitations by December 31, 1987.

SUBPART S: RUBBER AND MISCELLANEOUS PLASTIC PRODUCTS

Section 219.461 Manufacture of Pneumatic Rubber Tires

The owner or operator of an undertread cementing, treadend cementing or bead dipping operation at a pneumatic rubber tire manufacturing facility shall install and operate:

a) A capture system, with minimum capture efficiency of 65 percent by weight of VOM for treadend cementing or bead dipping operations and a capture system with a minimum capture efficiency of 55.5 percent by weight of VOM for undertread cementing; and

b) A control device that meets the requirements of one of the following:

   1) A carbon adsorption system designed and operated in a manner such that there is at least a 90 percent removal of VOM by weight from the gases ducted to the control device;

   2) An afterburning system that oxidizes at least 90 percent of the captured nonmethane VOM (VOM measured as total combustible carbon) to carbon dioxide and water; and

   3) An alternative VOM emission reduction system demonstrated to have at least a 90 percent overall reduction efficiency and approved by the Agency and approved by the USEPA.

Section 219.462 Green Tire Spraying Operations

The owner or operator of a green tire spraying operation at a pneumatic rubber tire manufacturing facility shall:

a) Install and operate:

1) A capture system with a minimum capture efficiency of 90 percent by weight of VOM; and

2) A control device that meets the requirements of one of the following:

A) A carbon adsorption system designed and operated in a manner such that there is at least 90 percent removal of VOM by weight from the bases ducted to the control device;

B) An afterburning system that oxidizes at least 90 percent of the captured nonmethane VOM (measured as total combustible carbon) to carbon dioxide and water; or

C) An alternative VOM emission reduction system demonstrated to have at least a 90 percent overall reduction efficiency approved by the Agency and approved by the USEPA as a SIP revision.

b) Substitute for the normal solvent-based mold release compound water-based sprays containing:

1) No more than five percent by volume of VOM as applied for the inside of tires;

2) No more than ten percent by volume of VOM as applied for the outside of tires.

Section 219.463 Alternative Emission Reduction Systems

In lieu of complying with Section 219.461 or 219.462, the owner or operator of an emission source may utilize an alternative volatile organic emission reduction system, including an alternative production process, which is demonstrated to be equivalent to Section 219.461 or 219.462 on the basis of emissions of volatile organic matter. A treadend cementing operation shall be considered equivalent to Section 219.461 or 219.462 for the purposes of this Section if the total volatile organic emission from such operation is 10 grams or less per tire.

Section 219.464 Testing and Monitoring

a) Upon a reasonable request by the Agency, the owner or operator of a VOM emission source required to comply with a limit of Sections 219.461 through 219.464 shall conduct emissions testing, at such person's own expense, to demonstrate compliance.

b) A person planning to conduct a VOM emission test to demonstrate compliance shall notify the Agency of that intent not less than 30 days before the planned initiation of the tests so the Agency may observe the test.

Section 218.465 Compliance Dates

Every owner or operator of an emission source subject to 35 Ill. Adm. Code 215, Subpart S, as of December 31, 1987 shall have complied with its standards and limitations by December 31, 1987.

Section 219.466 Compliance Plan

a) The owner or operator of an emission source shall have submitted to the Agency a compliance plan, pursuant to 35 Ill. Adm. Code 201, Subpart H, including a project completion schedule where applicable, no later than April 21, 1983.

b) Unless the submitted compliance plan or schedule was disapproved by the Agency, the owner or operator of a facility or emission source may operate the emission source according to the plan and schedule as submitted.

c) The plan and schedule shall meet the requirements of 35 Ill. Adm. Code 201, Subpart H, including specific interim dates as required in 35 Ill. Adm. Code 201.242.

SUBPART T: PHARMACEUTICAL MANUFACTURING

Section 219.480 Applicability

a) The rules of this Subpart, except for Sections 219.483 through 219.485, apply to all emission sources of VOM, including but not limited to reactors, distillation units, dryers, storage tanks for VOL, equipment for the transfer of VOL, filters, crystallizers, washers, laboratory hoods, pharmaceutical coating operations, mixing operations and centrifuges used in manufacturing, including packaging, of pharmaceuticals, and emitting more than 6.8 kg/day (15 lbs/day) and more than 2,268 kg/year (2.5 tons/year) of VOM. If an emission source emits less than 2,268 kg/year (2.5

tons/year) of VOM, the requirements of this Subpart still apply to the emission source if VOM emissions from the emission source exceed 45.4 kg/day (100 lbs/day).

b) Notwithstanding subsection (a), the air suspension coater/dryer, fluid bed dryers, tunnel dryers, and Accelacotas located in Libertyville Township, Lake County, Illinois shall be exempt from the rules of this Subpart, except for Sections 219.483 through 219.485, if emissions of VOM not vented to air pollution control equipment do not exceed the following levels:

1) for the air suspension coater/dryer: 2,268 kg/year (2.5 tons/year);

2) for each fluid bed dryer: 4,535 kg/year (5.0 tons/year);

3) for each tunnel dryer: 6,803 kg/year (7.5 tons/year); and

4) for each Accelacota: 6,803 kg/year (7.5 tons/year).

c) Sections 219.483 through 219.485 apply to a plant having one or more emission sources that:

1) Are used to manufacture pharmaceuticals, and

2) Emit more than 6.8 kg/day (15 lbs/day) of VOM and more than 2,268 kg/year (2.5 tons/year) of VOM, or, if less than 2,268 kg/year (2.5 tons/year), these Sections still apply if emissions from one or more sources exceed 45.4 kg/day (100 lbs/day)

d) No owner or operator shall violate any condition in a permit when the condition results in exclusion of an emission source from this Subpart.

e) Any pharmaceutical manufacturing source that becomes subject to the provisions of this Subpart at any time shall remain subject to the provisions of this Subpart at all times.

f) Emissions subject to this Subpart shall be controlled at all times consistent with the requirements set forth in this Subpart.

g) Any control device required pursuant to this Subpart shall be operated at all times when the source it is controlling is operated.

h) Determinations of daily and annual emissions for purposes of this Section shall be made using both data on the hourly emission rate (or the emissions per unit of throughput) and appropriate daily and annual data from records of emission source operation (or material throughput or material consumption data). In the absence of representative test data pursuant to Section 219.487 for the hourly emission rate (or the emissions per unit of throughput), such items shall be calculated using engineering calculations, including the methods described in Appendix B of "Control of Volatile Organic Emissions from Manufacturing of Synthesized Pharmaceutical Products" (EPA-450/2-78-029), incorporated by reference in Section 219.112. (This subsection shall not affect the Agency's or the USEPA's authority to require emission tests to be performed pursuant to Section 219.487.)

Section 219.481 Control of Reactors, Distillation Units, Crystallizers, Centrifuges and Vacuum Dryers

a) The owner or operator shall equip all reactors, distillation units, crystallizers, centrifuges and vacuum dryers that are used to manufacture pharmaceuticals with surface condensers or other air pollution control equipment listed in subsection (b). If a surface condenser is used, it shall be operated such that the condenser outlet gas temperature does not exceed:

1) 248.2°K (-13°F) when condensing VOM of vapor pressure greater than 40.0 kPa (5.8 psi) at 294.3°K (70°F), or

2) 258.2°K (5°F) when condensing VOM of vapor pressure greater than 20.0 kPa (2.9 psi) at 294.3°K (70°F), or

3) 273.2°K (32°F) when condensing VOM of vapor pressure greater than 10.0 kPa (1.5 psi) at 294.3°K (70°F), or

4) 283.2°K (50°F) when condensing VOM of vapor pressure greater than 7.0 kPa (1.0 psi) at 294.3°K (70°F), or

5) 298.2°K (77°F) when condensing VOM of vapor pressure greater than 3.45 kPa (0.5 psi) at 294.3°K (70°F).

b) If a scrubber, carbon adsorber, thermal afterburner, catalytic afterburner, or other air pollution control equipment other than a surface condenser is used, such equipment shall provide a reduction in the emissions of VOM of 90 percent or more.

c) The owner or operator shall enclose all centrifuges used to manufacture pharmaceuticals and that have an exposed VOL surface, where the VOM in the VOL has a vapor pressure of 3.45 kPa (0.5 psi) or more at 294.3∘K (70∘F), except as production, sampling, maintenance, or inspection procedures require operator access.

Section 219.482 Control of Air Dryers, Production Equipment Exhaust Systems and Filters

a) The owner or operator of an air dryer or production equipment exhaust system used to manufacture pharmaceuticals shall control the emissions of VOM from such emission sources by air pollution control equipment which reduces by 90 percent or more the VOM that would otherwise be emitted into the atmosphere.

b) The owner or operator shall enclose all rotary vacuum filters and other filters used to manufacture pharmaceuticals and that have an exposed VOL surface, where the VOM in the VOL has a vapor pressure of 3.45 kPa (0.5 psi) or more at 294∘K (70∘F), except as production, sampling, maintenance, or inspection procedures require operator access.

Section 219.483 Material Storage and Transfer

The owner or operator of a pharmaceutical manufacturing plant shall:

a) Provide a vapor balance system that is at least 90 percent effective in reducing VOM emissions from truck or railcar deliveries to storage tanks with capacities equal to or greater than 7.57 m^3 (2,000 gal) that store VOL with vapor pressures greater than 28.0 kPa (4.1 psi) at 294.3∘K (70∘F), and

b) Install, operate, and maintain pressure/vacuum conservation vents set at 0.2 kPa (0.03 psi) or greater on all storage tanks that store VOL with vapor pressures greater than 10 kPa (1.5 psi) at 294.3∘K (70∘F).

Section 219.484 In-Process Tanks

The owner or operator shall install covers on all in-process tanks used to manufacture pharmaceuticals and containing a VOL at any time. These covers must remain closed, except as production, sampling, maintenance or inspection procedures require operator access.

Section 219.485 Leaks

The owner or operator of a pharmaceutical manufacturing plant shall repair any component from which a leak of VOL can be observed. The repair shall be completed as soon as practicable but no later than 15 days after the leak is found. If the leaking component cannot be repaired until the process unit is shut down, the leaking component must then be repaired before the unit is restarted.

Section 219.486 Other Emission Sources

The owner or operator of a washer, laboratory hood, tablet coating operation, mixing operation or any other process emission source not subject to Sections 219.481 through 219.485, and used to manufacture pharmaceuticals shall control the emissions of VOM from such emission sources by:

a) Air pollution control equipment which reduces by 81 percent or more the VOM that would otherwise be emitted to the atmosphere, or

b) A surface condenser which captures all the VOM which would otherwise be emitted to the atmosphere and which meets the requirements of Section 219.481(a) and (b).

Section 219.487 Testing

a) Upon request by the Agency or the USEPA, the owner or operator of any VOM emission source subject to this Subpart or exempt from this Subpart by virtue of the provisions of Section 219.480 shall, at his own expense, demonstrate compliance to the Agency and the USEPA by the methods or procedures listed in Section 219.105(f)(1).

b) A person planning to conduct a VOM emissions test to demonstrate compliance with this Subpart shall notify the Agency and the USEPA of that intent not less than 30 calendar days before the planned initiation of the test.

Section 219.488 Monitoring for Air Pollution Control Equipment

a) At a minimum, continuous monitors for the following parameters shall be installed on air pollution control equipment used to control sources subject to this

Subpart:

1) Destruction device combustion temperature.

2) Temperature rise across a catalytic afterburner bed.

3) VOM concentration on a carbon adsorption unit to determine breakthrough.

4) Outlet gas temperature of a refrigerated condenser.

5) Temperature of a non-refrigerated condenser coolant supply system.

b) Each monitor shall be equipped with a recording device.

c) Each monitor shall be calibrated quarterly.

d) Each monitor shall operate at all times while the associated control equipment is operating.

Section 219.489 Recordkeeping for Air Pollution Control Equipment

a) The owner or operator of a pharmaceutical manufacturing facility shall maintain the following records:

1) Parameters listed in Section 219.488(a)(1) shall be recorded.

2) For sources subject to Section 219.481, the vapor pressure of VOM being controlled shall be recorded for every process.

b) For any leak subject to Section 219.485 which cannot be readily repaired within one hour after detection, the following records shall be kept:

1) The name of the leaking equipment,

2) The date and time the leak is detected,

3) The action taken to repair the leak, and

4) The data and time the leak is repaired.

c) The following records shall be kept for emission sources subject to Section 219.484 which contain VOL:

1) For maintenance and inspection:

A) The date and time each cover is opened,

B) The length of time the cover remains open, and

C) The reason why the cover is opened.

2) For production and sampling, detailed written procedures or manufacturing directions specifying the circumstances under which covers may be opened and the procedures for opening covers.

d) For each emission source used in the manufacture of pharmaceuticals for which the owner or operator of a pharmaceutical manufacturing plant claims emission standards are not applicable, because the emissions are below the applicability cutoffs in Section 219.480(a) or 219.480(b), the owner or operator shall:

1) Maintain a demonstration including detailed engineering calculations of the maximum daily and annual emissions for each such emission source showing that the emissions are below the applicability cutoffs in Section 219.480(a) or 219.480(b), as appropriate, for the current and prior calendar years;

2) Maintain appropriate operating records for each such emission source to identify whether the applicability cutoffs in Section 219.480(a) or 219.480(b), as appropriate, are ever exceeded; and

3) Provide written notification to the Agency and the USEPA within 30 days of a determination that such an emission source has exceeded the applicability cutoffs in Section 219.480(a) or 219.480(b), as appropriate.

e) Records required under subsection (a) shall be maintained by the owner or operator for a minimum of two years after the date on which they are made.

f) Copies of the records shall be made available to the Agency or the USEPA upon verbal or written request.

SUBPART V: AIR OXIDATION PROCESSES

Section 219.521 Definitions

In addition to the definitions of 35 Ill. Adm. Code 211, the following definitions apply to this Subpart:

"Air Oxidation Process": any unit process including ammoxidation and oxychlorination which uses air or a combination of air and oxygen as an oxidant in combination with one or more organic reactants to produce one or more organic compounds.

"Cost Effectiveness": the annual expense for cost of control of a given process stream divided by the reduction in emissions of organic material of that stream.

"Flow (F)": Vent stream flowrate (scm/min) at a standard temperature of 20°C.

"Full Operating Flowrate": Maximum operating capacity of the facility.

"Hourly Emissions (E)": Hourly emissions reported in kg/hr measured at full operating flowrate.

"Net Heating Value (H)": Vent stream net heating value (MJ/scm), where the net enthalpy per mole of offgas is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C, as in the definition of "Flow."

"Process Vent Stream": An emission stream resulting from an air oxidation process.

"Total Resource Effectiveness Index (TRE)": Cost effectiveness in dollars per megagram of controlling any gaseous stream vented to the atmosphere from an air oxidation process divided by $1600/Mg, using the criteria and methods set forth in this Subpart and Appendices C and D.

Section 219.525 Emission Limitations for Air Oxidation Processes

a) No person shall cause or allow the emission of volatile organic material (VOM) from any process vent stream unless the process vent stream is vented to a combustion device which is designed and operated either:

1) To reduce the volatile organic emissions vented to it with an efficiency of at least ninety eight percent (98%) by weight; or

2) To emit VOM at a concentration less than twenty

parts per million by volume, dry basis.

b) Air oxidation facilities for which an existing combustion device is employed to control process VOM emissions are not required to meet the 98 percent emissions limit until the combustion device is replaced for other reasons, which shall be considered to include, but not be limited to, normal maintenance, malfunction, accident, and obsolescence. The combustion device is considered to be replaced when:

1) All of the device is replaced; or

2) When the cost of the repair of the device or the cost of replacement of part of the device exceeds 50% of the cost of replacing the entire device with a device which complies.

c) The limitations of subsection (a) do not apply to any process vent stream or combination of process vent streams which has a Total Resource Effectiveness Index (TRE) greater than 1.0, as determined by the following methods:

1) If an air oxidation process has more than one process vent stream, TRE shall be based upon a combination of the process vent streams.

2) TRE of a process vent stream shall be determined according to the following equation:

$$TRE = E^{-1} [a + bF^{n} + cF + dFH + e(FH)^{n} + fF^{0.5}]$$

where:

n = 0.88

TRE = Total resource effectiveness index.

F = Vent stream flowrate (scm/min), at a standard temperature of 20∘C.

E = Hourly measured emissions in kg/hr.

H = Net heating value of vent stream (MJ/scm), where the net enthalpy per mole of offgas is based on combustion at 25∘C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20∘C, as in the definition of "Flow".

a,b,c,d,
e and f = Coefficients obtained by use of Appendix F.

3) For nonchlorinated process vent streams, if the net heating value, H, is greater than 3.6 MJ/scm, F shall be replaced by F^1 for purposes of calculating TRE. F^1 is computed as follows:

$F^1 = FH / 3.6$

where F and H are as defined in subsection (c)(2).

4) The actual numerical values used in the equation described in subsection (c)(2) shall be determined as follows:

A) All reference methods and procedures for determining the flow, (F), hourly emissions, (E), and net heating, (H), value shall be in accordance with Appendix C.

B) All coefficients described in subsection (c)(2) shall be in accordance with Appendix D.

Section 219.526 Testing and Monitoring

a) Upon reasonable request by the Agency, the owner or operator of an air oxidation process shall demonstrate compliance with this Subpart by use of the methods specified in Appendix C. This Section does not limit the USEPA's authority, under the Clean Air Act, to require demonstrations of compliance.

b) A person planning to conduct a VOM emissions test to demonstrate compliance with this Subpart shall notify the Agency of that intent not less than 30 days before the planned initiation of the tests so that the Agency may observe the test.

Section 219.527 Compliance Date

Each owner or operator of an emission source subject to 35 Ill. Adm. Code 215, Subpart V, as of December 31, 1987 shall have complied with the standards and limitations of 35 Ill. Adm. Code 215, Subpart V, by December 31, 1987.

SUBPART W: AGRICULTURE

Section 219.541 Pesticide Exception

The provisions of Sections 219.301 and 219.302 shall not apply to the spraying or use of insecticides, herbicides or other pesticides.

SUBPART X: CONSTRUCTION

Section 219.561 Architectural Coatings

No person shall cause or allow the sale or use of any architectural coating containing more than 20 percent by volume of photo-chemically reactive material in containers having a capacity of more than one gallon.

Section 219.562 Paving Operations

The provisions of Sections 219.301 and 219.302 shall not apply to the application of paving asphalt and pavement marking paint from sunrise to sunset.

Section 219.563 Cutback Asphalt

a) No person shall cause or allow the use or application of cutback asphalt for paving, resurfacing, reconditioning, repairing or otherwise maintaining a roadway unless:

    1) The use or application of the cutback asphalt commences on or after October 1 of any year and such use or application is completed by April 30 of the following year; or

    2) The cutback asphalt is a long-life stockpile material which remains in stock after April 30 of each year and as such it may be used until depleted for patching potholes and for other similar repair work; or

    3) The cutback asphalt is to be used solely as an asphalt prime coat.

b) Sources subject to this Section are not required to submit or obtain an Agency approved compliance plan or project completion schedule under 35 Ill. Adm. Code 201, Subpart H.

SUBPART Y: GASOLINE DISTRIBUTION

Section 219.581 Bulk Gasoline Plants

a) Subject to Subsection (e), no person may cause or allow the transfer of gasoline from a delivery vessel into a stationary storage tank located at a bulk gasoline plant unless:

1) The delivery vessel and the stationary storage tank are each equipped with a vapor collection system that meets the requirements of subsection (d)(4),

2) Each vapor collection system is operating,

3) The delivery vessel displays the appropriate sticker pursuant to the requirements of Sections 219.584 (b) or (d),

4) The pressure relief valve(s) on the stationary storage tank and the delivery vessel are set to release at no less than 0.7 psi or the highest pressure allowed by state or local fire codes or the guidelines of the National Fire Prevention Association, and

5) The stationary storage tank is equipped with a submerged loading pipe.

b) Subject to subsection (f), no person may cause or allow the transfer of gasoline from a stationary storage tank located at a bulk gasoline plant into a delivery vessel unless:

1) The requirements set forth in subsections (a)(1) through (a)(4) are met, and

2) Equipment is available at the bulk gasoline plant to provide for the submerged filling of the delivery vessel or the delivery vessel is equipped for bottom loading.

c) Subject to subsection (e), each owner of a stationary storage tank located at a bulk gasoline plant shall:

1) Equip each stationary storage tank with a vapor control system that meets the requirements of subsection (a) or (b), whichever is applicable,

2) Provide instructions to the operator of the bulk gasoline plant describing necessary maintenance operations and procedures for prompt notification of the owner in case of any malfunction of a vapor control system, and

3) Repair, replace or modify any worn out or malfunctioning component or element of design.

d) Subject to subsection (e), each operator of a bulk gasoline plant shall:

  1) Maintain and operate each vapor control system in accordance with the owner's instructions,

  2) Promptly notify the owner of any scheduled maintenance or malfunction requiring replacement or repair of a major component of a vapor control system, and

  3) Maintain gauges, meters or other specified testing devices in proper working order,

  4) Operate the bulk plant vapor collection system and gasoline loading equipment in a manner that prevents:

    A) Gauge pressure from exceeding 45.7 cm (18 in.) of water and vacuum from exceeding 15.2 cm (6 in.) of water, as measured as close as possible to the vapor hose connection, and

    B) A reading equal to or greater than 100 percent of the lower explosive limit (LEL measured as propane) when tested in accordance with the procedure described in "Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems", Appendix B, EPA 450/2-78-051, (incorporated by reference in Section 219.112), and

    C) Avoidable leaks of liquid during loading or unloading operations.

  5) Provide a pressure tap or equivalent on the bulk plant vapor collection system in order to allow the determination of compliance with subsection (d)(4)(A), and

  6) Within 15 business days after discovery of any leak by the owner, the operator, the Agency or the USEPA, repair and retest a vapor collection system which exceeds the limits of subsection (d)(4)(A) or (B).

e) The requirements of subsections (a), (c) and (d) shall not apply to:

  1) Any stationary storage tank with a capacity of less than 2,177 l (575 gal), or

2) Any bulk gasoline plant whose daily gasoline throughput is less than 15,140 l (4,000 gal/day) on a thirty-day rolling average.

f) The requirements of subsection (b) shall apply only to bulk gasoline plants whose daily gasoline throughput is greater than or equal to 15,140 l (4,000 gal/day) on a thirty-day rolling average.

g) Any bulk gasoline plant which is ever subject to subsections (a), (b), (c), or (d) shall always be subject to these paragraphs.

Section 219.582 Bulk Gasoline Terminals

a) No person shall cause or allow the transfer of gasoline into any delivery vessel from any bulk gasoline terminal unless:

1) The bulk gasoline terminal is equipped with a vapor control system that limits emission of VOM to 80 mg/l (0.00067 lbs/gal) of gasoline loaded;

2) The vapor control system is operating and all vapors displaced in the loading of gasoline to the delivery vessel are vented only to the vapor control system;

3) There is no liquid drainage from the loading device when it is not in use;

4) All loading and vapor return lines are equipped with fittings which are vapor tight; and

5) The delivery vessel displays the appropriate sticker pursuant to the requirements of Section 219.584(b) or (d); or, if the terminal is driver-loaded, the terminal owner or operator shall be deemed to be in compliance with this Section when terminal access authorization is limited to those owners and/or operators of delivery vessels who have provided a current certification as required by Section 219.584(c)(3).

b) Bulk gasoline terminals were required to take certain actions to achieve compliance which are summarized in 35 Ill. Adm. Code 215, Appendix C.

c) The operator of a bulk gasoline terminal shall:

1) Operate the terminal vapor collection system and gasoline loading equipment in a manner that prevents:

   A) Gauge pressure from exceeding 18 inches of water and vacuum from exceeding 6 inches of water as measured as close as possible to the vapor hose connection; and

   B) A reading equal to or greater than 100 percent of the lower explosive limit (LEL measured as propane) when tested in accordance with the procedure described in EPA 450/2-78-051 Appendix B incorporated by reference in Section 219.112; and

   C) Avoidable leaks of liquid during loading or unloading operations.

2) Provide a pressure tap or equivalent on the terminal vapor collection system in order to allow the determination of compliance with Section 219.582(d)(1)(A); and

3) Within 15 business days after discovery of the leak by the owner, operator, or the Agency repair and retest a vapor collection system which exceeds the limits of subsection (c)(1)(A) or (B).

Section 219.583 Gasoline Dispensing Facilities

a) Subject to subsection (b), no person shall cause or allow the transfer of gasoline from any delivery vessel into any stationary storage tank at a gasoline dispensing facility unless:

   1) The tank is equipped with a submerged loading pipe; and

   2) The vapors displaced from the storage tank during filling are processed by a vapor control system that includes one or more of the following:

      A) A vapor collection system that meets the requirements of subsection (d)(4); or

      B) A refrigeration-condensation system or any other system approved by the Agency and approved by the USEPA as a SIP revision, that recovers at least 90 percent by weight of all vaporized organic material from the equipment being controlled; and

C) The delivery vessel displays the appropriate sticker pursuant to the requirements of Section 219.584(b) or (d).

b) The requirements of subsection (a)(2) shall not apply to transfers of gasoline to a stationary storage tank at a gasoline dispensing facility if:

1) The tank is equipped with a floating roof, or other system of equal or better emission control as approved by the Agency and approved by the USEPA as a SIP revision;

2) The tank has a capacity of less than 2000 gallons and was in place and operating before January 1, 1979; or

3) The tank has a capacity of less than 575 gallons.

c) Subject to subsection (b), each owner of a gasoline dispensing facility shall:

1) Install all control systems and make all process modifications required by subsection (a);

2) Provide instructions to the operator of the gasoline dispensing facility describing necessary maintenance operations and procedures for prompt notification of the owner in case of any malfunction of a vapor control system; and

3) Repair, replace or modify any worn out or malfunctioning component or element of design.

d) Subject to subsection (b), each operator of a gasoline dispensing facility shall:

1) Maintain and operate each vapor control system in accordance with the owner's instructions;

2) Promptly notify the owner of any scheduled maintenance or malfunction requiring replacement or repair of a major component of a vapor control system;

3) Maintain gauges, meters or other specified testing devices in proper working order;

4) Operate the vapor collection system and delivery vessel unloading points in a manner that prevents:

A) A reading equal to or greater than 100 percent of the lower explosive limit (LEL measured as propane) when tested in accordance with the procedure described in EPA 450/2-78-051 Appendix B, and

B) Avoidable leaks of liquid during the filling of storage tanks; and

5) Within 15 business days after discovery of the leak by the owner, operator, or the Agency, repair and retest a vapor collection system which exceeds the limits of subsection (d)(4)(A).

e) Gasoline dispensing facilities were required to take certain actions to achieve compliance which are summarized in 35 Ill. Adm. Code 215, Appendix C.

Section 219.584 Gasoline Delivery Vessels

a) Any delivery vessel equipped for vapor control by use of vapor collection equipment:

1) Shall have a vapor space connection that is equipped with fittings which are vapor tight;

2) Shall have its hatches closed at all times during loading or unloading operations, unless a top loading vapor recovery system is used;

3) Shall not internally exceed a gauge pressure of 18 inches of water or a vacuum of 6 inches of water;

4) Shall be designed and maintained to be vapor tight at all times during normal operations;

5) Shall not be refilled in Illinois at other than:

A) A bulk gasoline terminal that complies with the requirements of Section 219.582 or

B) A bulk gasoline plant that complies with the requirements of Section 219.581(b).

6) Shall be tested annually in accordance with Method 27, 40 CFR 60, Appendix A, incorporated by reference in Section 219.105. Each vessel must be repaired and retested within 15 business days after discovery of the leak by the owner, operator, or the Agency, when it fails to sustain:

A) A pressure drop of no more than three inches of water in five minutes; and

B) A vacuum drop of no more than three inches of water in five minutes.

b) Any delivery vessel meeting the requirements of subsection (a) shall have a sticker affixed to the tank adjacent to the tank manufacturer's data plate which contains the tester's name, the tank identification number and the date of the test. The sticker shall be in a form prescribed by the Agency, and, for those delivery vessels subject to 35 Ill. Adm. Code 215 as of December 31, 1987 shall have been displayed no later than December 31, 1987.

c) The owner or operator of a delivery vessel shall:

1) Maintain copies of any test required under subsection (a)(6) for a period of 3 years;

2) Provide copies of these tests to the Agency upon request; and

3) Provide annual test result certification to bulk gasoline plants and terminals where the delivery vessel is loaded.

d) Any delivery vessel which has undergone and passed a test in another state which has a USEPA-approved leak testing and certification program will satisfy the requirements of subsection (a). Delivery vessels must display a sticker, decal or stencil approved by the state where tested or comply with the requirements of subsection (b). All such stickers, decals or stencils shall have been displayed no later than December 31, 1987, for delivery vessels subject to 35 Ill. Adm. Code 215 as of December 31, 1987.

Section 219.585 Gasoline Volatility Standards

a) No person shall sell, offer for sale, dispense, supply, offer for supply, or transport for use in Illinois gasoline whose Reid vapor pressure exceeds the applicable limitations set forth in subsections (b) and (c) during the regulatory control periods, which shall be July 1 to August 31 for retail outlets, wholesale purchaser-consumer facilities, and all other facilities.

b) The Reid vapor pressure of gasoline, a measure of its volatility, shall not exceed 9.5 psi (65.5 kPa) during the regulatory control period in 1990 and each year thereafter.

c) The Reid vapor pressure of ethanol blend gasolines shall not exceed the limitations for gasoline set forth in subsection (b) by more than 1.0 psi (6.9 kPa). Notwithstanding this limitation, blenders of ethanol blend gasolines whose Reid vapor pressure is less than 1.0 psi above the base stock gasoline immediately after blending with ethanol are prohibited from adding butane or any product that will increase the Reid vapor pressure of the blended gasoline.

d) All sampling of gasoline required pursuant to the provisions of this Section shall be conducted by one or more of the following approved methods or procedures which are incorporated by reference in Section 215.105.

1) For manual sampling, ASTM D4057;

2) For automatic sampling, ASTM D4177;

3) Sampling procedures for Fuel Volatility, 40 CFR 80 Appendix D.

e) The Reid vapor pressure of gasoline shall be measured in accordance with either test method ASTM D323 or a modification of ASTM D323 known as the "dry method" as set forth in 40 CFR 80, Appendix E, incorporated by reference in 35 Ill. Adm. Code 215.105. For gasoline oxygenate blends which contain water-extractable oxygenates, the Reid vapor pressure shall be measured using the dry method test.

f) The ethanol content of ethanol blend gasolines shall be determined by use of one of the approved testing methodologies specified in 40 CFR 80, Appendix F, incorporated by reference in 35 Ill. Adm. Code 215.105.

g) Any alternate to the sampling or testing methods or procedures contained in subsections (d), (e), and (f) must be approved by the Agency, which shall consider data comparing the performance of the proposed alternative to the performance of one or more approved test methods or procedures. Such data shall accompany any request for Agency approval of any alternate test procedure. If the Agency determines that such data demonstrates that the proposed alternative will achieve results equivalent to the approved test methods or will achieve results equivalent to the approved test methods or procedures, the Agency shall approve the proposed alternative.

h) Each refiner or supplier that distributes gasoline or ethanol blends shall:

1) During the regulatory control period, state that the Reid vapor pressure of all gasoline or ethanol blends leaving the refinery or distribution facility for use in Illinois complies with the Reid vapor pressure limitations set forth in 35 Ill. Adm. Code 215.585(b) and (c). Any facility receiving this gasoline shall be provided with a copy of an invoice, bill of lading, or other documentation used in normal business practice stating that the Reid vapor pressure of the gasoline complies with the State Reid vapor pressure standard.

2) Maintain records for a period of one year on the Reid vapor pressure, quantity shipped and date of delivery of any gasoline or ethanol blends leaving the refinery or distribution facility for use in Illinois. The Agency shall be provided with copies of such records if requested.

SUBPART Z: DRY CLEANERS

Section 219.601 Perchloroethylene Dry Cleaners

The owner or operator of a dry cleaning facility which uses perchloroethylene shall:

a) Vent the entire dryer exhaust through a properly designed and functioning carbon adsorption system or equally effective control device; and

b) Emit no more than 100 ppmv of VOM from the dryer control device before dilution, or achieve a 90 percent average reduction before dilution; and

c) Immediately repair all components found to be leaking liquid VOM; and

d) Cook or treat all diatomaceous earth filters so that the residue contains 25 kg (55 lb) or less of volatile organic material per 100 kg (220 lb) of wet waste material; and

e) Reduce the vVOM from all solvent stills to 60 kg (132 lb) or less per 100 kg (220 lb) of wet waste material; and

f) Drain all filtration cartridges in the filter housing or other sealed container for at least 24 hours before discarding the cartridges; and

g) Dry all drained filtration cartridges in equipment connected to an emission reduction system or in a manner that will eliminate emission of volatile organic material to the atmosphere.

Section 219.602 Exemptions

The provisions of Section 219.601 are not applicable to perchloroethylene dry cleaning operations which are coin-operated or to dry cleaning facilities consuming less than 30 gal per month (360 gal per year) of perchloroethylene.

Section 219.603 Leaks

The presence of leaks shall be determined for purposes of Section 219.601(c) by a visual inspection of the following: hose connections, unions, couplings and valves; machine door gaskets and seatings; filter head gasket and seating; pumps; base tanks and storage containers; water separators; filter sludge recovery; distillation unit; diverter valves; saturated lint from lint baskets; and cartridge filters.

Section 219.604 Compliance Dates

Every owner or operator of an emission source previously subject to 35 Ill. Adm. Code 215, Subpart Z shall have complied with its standards and limitations in accordance with the applicable dates set forth in 35 Ill. Adm. Code 215.604.

Section 219.605 Compliance Plan

a) The owner or operator of an emission source subject to this Subpart shall have submitted to the Agency a compliance plan, pursuant to 35 Ill. Adm. Code 201, Subpart H, including a project completion schedule where applicable, no later than, for Section 219.601(a) and (b), April 21, 1983.

b) Unless the submitted compliance plan or schedule was disapproved by the Agency, the owner or operator of a facility or emission source may operate the emission source according to the plan and schedule as submitted.

c) The plan and schedule shall meet the requirements of 35 Ill. Adm. Code 201, Subpart H, including specific interim dates as required in 35 Ill. Adm. Code 201.242.

Section 219.606 Exception to Compliance Plan

Coin-operated dry cleaning operations and dry cleaning facilities consuming less than 30 gal per month (360 gal per year) of perchloroethylene are not required to submit or obtain an Agency approved compliance plan or project completion schedule.

Section 219.607 Standards for Petroleum Solvent Dry Cleaners

a) The owner or operator of a petroleum solvent dry cleaning dryer shall either:

1) Limit emissions of volatile organic material to the atmosphere to an average of 3.5 kilograms of VOM per 100 kilograms dry weight of articles dry cleaned, or

2) Install and operate a solvent recovery dryer in a manner such that the dryer remains closed and the recovery phase continues until a final solvent flow rate of 50 ml per minute is attained.

b) The owner or operator of a petroleum solvent filtration system shall either:

1) Reduce the VOM content in all filtration wastes to 1.0 kilogram or less per 100 kg dry weight of articles dry cleaned, before disposal, and exposure to the atmosphere, or

2) Install and operate a cartridge filtration system, and drain the filter cartridges in their sealed housings for 8 hours or more before their removal.

Section 219.608 Operating Practices for Petroleum Solvent Dry Cleaners

In order to minimize fugitive solvent emissions, the owner or operator of a petroleum solvent dry cleaning facility shall employ good housekeeping practices including the following:

a) General Housekeeping Requirements

1) Equipment containing solvent (washers, dryers, extractors and filters) shall remain closed at all times except during load transfer and maintenance. Lint filter and button trap covers shall remain closed except when solvent-laden material is being removed.

2) Cans, buckets, barrels and other containers of solvent or of solvent-laden material shall be covered except when in use.

3) Solvent-laden material shall be exposed to the

atmosphere only for the minimum time necessary for load transfer.

b) Installation and operation of equipment:

1) All cartridge filters shall be enclosed and operated in accordance with the procedures and specifications recommended by the manufacturer for the cartridge filter. After installation, the cartridges shall be inspected, monitored and maintained in accordance with the manufacturer's recommendations; and

2) Vents on containers for new solvent and for solvent-containing waste shall be constructed and maintained so as to minimize solvent vapor emissions. Criteria for the minimization of solvent vapor emissions include the elimination of solvent buckets and barrels standing open to the atmosphere, and the repair of gaskets and seals that expose solvent-rich environments to the atmosphere, to be determined through visual inspection.

Section 219.609 Program for Inspection and Repair of Leaks

a) The owner or operator of a petroleum solvent dry cleaning facility shall conduct the following visual inspections on a weekly basis:

1) Washers, dryers, solvent filters, settling tanks, vacuum stills and containers and conveyors of petroleum solvent shall be inspected for visible leaks of solvent liquid.

2) Pipes, hoses and fittings shall be inspected for active dripping or dampness.

3) Pumps and filters shall be inspected for leaks around seals and access covers.

4) Gaskets and seals shall be inspected for wear and defects.

b) Leaks of petroleum solvent liquid and vapors shall be repaired within three working days of detection, unless necessary replacement parts are not on site.

1) If necessary, repair parts shall be ordered within three working days of detection of the leak.

2) The leak shall be repaired within three days of delivery of necessary parts.

Section 219.610 Testing and Monitoring

a) Compliance with Sections 219.607(b)(2), 215.608 and 215.609 shall be determined by visual inspection; and

b) Compliance with Sections 219.607(a)(2) and (b)(1) shall be determined by methods described in EPA-450/3-82-009 (1982) incorporated by reference in Section 219.112.

c) If a control device is used to comply with Section 219.607(a)(1), then compliance shall be determined using 40 CFR 60 Appendix A, Method 25 (1984) incorporated by reference in Section 219.112.

Section 219.611 Exemption for Petroleum Solvent Dry Cleaners

The provisions of Sections 219.607 through 219.610 shall not apply to petroleum solvent dry cleaning facilities whose emissions of volatile organic material do not exceed 91 Mg (100 tons) per year in the absence of pollution control equipment or whose emissions of VOM, as limited by the operating permit, will not exceed 91 Mg (100 tons) per year in the absence of pollution control equipment.

Section 219.612 Compliance Dates

Owners and operators of emission sources subject to 35 Ill. Adm. Code 215.607 through 215.609 as of December 31, 1987 shall have complied with the requirements set forth therein no later than December 31, 1987.

Section 219.613 Compliance Plan

a) The owner or operator of an emission source formerly subject to 35 Ill. Adm. Code 215.610(a) as of May 31, 1987 shall have submitted to the Agency a compliance plan, including a project completion schedule where applicable, no later than May 31, 1987.

b) The plan and schedule shall meet the requirements of 35 Ill. Adm. Code 201.

SUBPART AA: PAINT AND INK MANUFACTURING

Section 219.620 Applicability

a) This subpart shall apply to all paint and ink manufacturing plants which:

1) Include process emission sources not subject to Subparts B, E, F (excluding Section 219.204(l)), H excluding Section 219.405), Q, R, S, V, X, Y or Z of this Part; and which as a group both:

   A) have maximum theoretical emissions of 91 Mg (100 tons) or more per calendar year of VOM if no air pollution control equipment were used, and

   B) are not limited to less than 91 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment, through production or capacity limitations contained in a federally enforceable construction permit or a SIP revision, or

2) Produce more than 7,570,820 l (2,000,000 gal) per calendar year of paint or ink formulations, which contain less than 10 percent (by weight) water, and ink formulations not containing as the primary solvents water, Magie oil or glycol.

b) For the purposes of this Subpart, uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

Section 219.621 Exemption for Waterbase Material and Heatset-Offset Ink

The requirements of Sections 219.624 and 219.625 and Section 219.628(a) shall not apply to equipment while it is being used to produce either:

a) paint or ink formulations which contain 10 percent or more (by weight) water, or

b) inks containing Magie oil and glycol as the primary solvent.

Section 219.623 Permit Conditions

No person shall violate any condition in a permit when the condition results in exclusion of the plant or an emission source from this Subpart.

Section 219.624 Open-top Mills, Tanks, Vats or Vessels

No person shall operate an open-top mill, tank, vat or vessel with a volume of more than 45 l (12 gal) for the production of paint or ink unless:

a) The mill, tank, vat or vessel is equipped with a cover which completely covers the mill, tank, vat or vessel opening except for an opening no larger than necessary to allow for safe clearance for a mixer shaft. Such cover shall extend at least 1.27 cm (0.5 in.) beyond the outer rim of the opening or be attached to the rim.

b) The cover remains closed except when production, sampling, maintenance or inspection procedures require access.

c) The cover is maintained in good condition such that, when in place, it maintains contact with the rim of the opening for at least 90 percent of the circumference of the rim.

Section 219.625 Grinding Mills

a) No person shall operate a grinding mill for the production of paint or ink which is not maintained in accordance with the manufacturer's specifications.

b) No person shall operate a grinding mill fabricated or modified after the effective date of this Subpart which is not equipped with fully enclosed screens.

c) The manufacturer's specifications shall be kept on file at the plant by the owner or operator of the grinding mill and be made available to any person upon verbal or written request during business hours.

Section 219.626 Storage Tanks

a) The owner or operator shall equip tanks storing VOL with a vapor pressure greater than 10 kPa (1.5 psi) at 20°C (68°F) with pressure/vacuum conservation vents set as a minimum at +/-0.2 kPa (0.029 psi). These controls shall be operated at all times. An alternative air pollution control system may be used if it results in a greater emission reduction than these controls. Any alternative control system can be allowed only if approved by the Agency and approved by the USEPA as a SIP revision.

b) Stationary VOL storage containers with a capacity greater than 946 l (250 gal) shall be equipped with a submerged-fill pipe or bottom fill. These controls shall be operated at all times. An alternative control system can be allowed only if approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.628 Leaks

The owner or operator of a paint or ink manufacturing plant shall, for the purpose of detecting leaks, conduct an equipment monitoring program as set forth below:

a) Each pump shall be checked by visual inspection each calendar week for indications of leaks, that is, liquids dripping from the pump seal. If there are indications of liquids dripping from the pump seal, the pump shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected.

b) Any pump, valve, pressure relief valve, sampling connection, open-ended valve and flange or connector containing a fluid which is at least 10 percent VOM by weight which appears to be leaking on the basis of sight, smell or sound shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected.

c) A weather proof, readily visible tag, in bright colors such as red or yellow, bearing an identification number and the date on which the leak was detected shall be attached to leaking equipment. The tag may be removed upon repair, that is, when the equipment is adjusted or otherwise altered to allow operation without leaking.

d) When a leak is detected, the owner or operator shall record the date of detection and repair and the record shall be retained at the plant for at least two years from the date of each detection or each repair attempt. The record shall be made available to any person upon verbal or written request during business hours.

Section 219.630 Clean Up

a) No person shall clean paint or ink manufacturing equipment with organic solvent unless the equipment being cleaned is completely covered or enclosed except for an opening no larger than necessary to allow safe clearance for proper operation of the cleaning equipment, considering the method and materials being used.

b) No person shall store organic wash solvent in other than closed containers, unless closed containers are demonstrated to be a safety hazard, or dispose of organic wash solvent in a manner such that more than 20 percent by weight is allowed to evaporate into the atmosphere.

Section 219.636 Compliance Schedule

Every owner or operator of an emission source subject to the control requirements of this Subpart shall comply with the requirements thereof on and after a date consistent with Section 219.106.

Section 219.637 Recordkeeping and Reporting

a) Upon request by the Agency, the owner or operator of an emission source which claims to be exempt from the requirements of this Subpart shall submit records to the Agency within 30 calendar days from the date of the request which document that the emission source is in fact exempt from this Subpart. These records shall include (but are not limited to) the percent water (by weight) in the paint or ink being produced and the quantity of Magie oil, glycol and other solvents in the ink being produced.

b) Every owner or operator of an emission source which is subject to the requirements of this Subpart shall maintain all records necessary to demonstrate compliance with those requirements at the facility for three years.

SUBPART BB: POLYSTYRENE PLANTS

Section 219.875 Applicability of Subpart BB

The provisions of this Subpart shall apply to polystyrene plants:

a) Which use continuous processes to manufacture polystyrene - polybutadiene co-polymer; and

b) Which fall within Standard Industrial Classification Group No. 282, Industry No. 2821, except that the manufacture of polystyrene resins need not be the primary manufacturing process at the plant.

Section 219.877 Emissions Limitation at Polystyrene Plants

No person shall cause or allow the emissions of VOM from the material recovery section to exceed 0.12 kg of VOM per 1000 kg of polystyrene resin produced.

Section 219.879 Compliance Date

Every owner and operator of an emission source subject to 35 Ill. Adm. Code 215, Subpart BB as of December 31, 1987, shall have complied with its standards and limitations by December 31, 1987.

Section 219.881 Compliance Plan

a) The owner or operator of an emission source formerly subject to the requirements of 35 Ill. Adm. Code 215 Subpart BB shall have submitted to the Agency a compliance plan in accordance with 35 Ill. Adm. Code 201, Subpart H, including a project completion schedule on or before December 1, 1987.

b) Unless the submitted compliance plan or schedule was disapproved by the Agency, the owner or operator of a facility or emission source subject to this Subpart may operate the emission source according to the plan and schedule as submitted.

c) The plan and schedule shall meet the requirements of 35 Ill. Adm. Code 201, Subpart H and Section 219.883.

Section 219.883 Special Requirements for Compliance Plan

For sources subject to this Subpart, an approvable compliance plan shall include:

a) A description of each process which is subject to an emissions limitation;

b) Quantification of the emissions from each process;

c) A description of the procedures and methods used to determine the emissions of VOM;

d) A description of the methods which will be used to demonstrate compliance with the allowable plantwide emission limitation (Section 215.877), including a method of inventory, recordkeeping and emission calculation or measurement.

Section 219.886 Emissions Testing

a) Upon a reasonable request by the Agency, the owner or operator of a polystyrene plant subject to this Subpart shall at his own expense demonstrate compliance by use of the following method: 40 CFR 60, Appendix A, Method 25 - Determination of Total Gaseous Non-Methane Organic Emissions as Carbon (1984), incorporated by reference in Section 219.112.

b) A person planning to conduct a VOM emissions test to demonstrate compliance with this Subpart shall notify the Agency of that intent not less than 30 days before the planned initiation of the tests so the Agency may observe the test.

SUBPART PP: MISCELLANEOUS FABRICATED PRODUCT MANUFACTURING PROCESSES

Section 219.920 Applicability

a) The requirements of this Subpart shall apply to a plant's miscellaneous fabricated product manufacturing process emission sources which are not included within any of the source categories specified in Subparts B, E, F, H, Q, R, S, V, X, Y or Z if the plant is subject to this Subpart. A plant is subject to this Subpart if it contains process emission sources, not regulated by Subparts B, E, F (excluding Section 219.204(l)), H (excluding Section 219.405), Q, R, S, V, X, Y or Z of this Part; which as a group both:

1) have maximum theoretical emissions of 91 Mg (100 tons) or more per calendar year of VOM if no air pollution control equipment were used, and

2) are not limited to less than 91 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment, through production or capacity limitations contained in a federally enforceable construction permit or a SIP revision.

b) If a plant ceases to fulfill the criteria of subsection (a), the requirements of this Subpart shall continue to apply to a miscellaneous fabricated products manufacturing process emission source which was ever subject to the control requirements of Section 219.926.

c) No limits under this Subpart shall apply to emission sources with emissions of VOM to the atmosphere less than or equal to 0.91 Mg (1.0 ton) per calendar year if the total emissions from such sources not complying with Section 219.926 does not exceed 4.5 Mg (5.0 tons) per calendar year.

d) For the purposes of this Subpart, an emission source shall be considered regulated by a Subpart if it is subject to the limits of that Subpart. An emission source is not considered regulated by a Subpart if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

e) For the purposes of this Subpart, uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

Section 219.923 Permit Conditions

No person shall violate any condition in a permit when the condition results in exclusion of the plant or an emission source from this Subpart.

Section 219.926 Control Requirements

Every owner or operator of an emission source subject to this Subpart shall comply with the requirements of subsection (a), (b) or (c):

a) Emission capture and control techniques which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

b) For coating lines, the daily-weighted average VOM content shall not exceed 0.42 kg VOM/l (3.5 lbs VOM/gal) of coating as applied (minus water and any compounds which are specifically exempted from the definition of VOM) during any day. Owners and operators complying with this Section are not required to comply with Section 219.301, or

c) An alternative control plan which has been approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.927 Compliance Schedule

Every owner or operator of an emission source subject to the control requirements of this Subpart shall comply with the requirements thereof on and after a date consistent with Section 219.106.

Section 219.928 Testing

a) When in the opinion of the Agency it is necessary to conduct testing to demonstrate compliance with Section 219.926, the owner or operator of a VOM emission source subject to the requirements of this Subpart shall, at his own expense, conduct such tests in accordance with the appliacable test methods and procedures specified in Section 219.105.

b) Nothing in the Section shall limit the authority of the USEPA pursuant to the Clean Air Act, as amended, to require testing.

SUBPART QQ: MISCELLANEOUS FORMULATION MANUFACTURING PROCESSES

Section 219.940 Applicability

a) The requirements of this Subpart shall apply to a plant's miscellaneous formulation manufacturing process emission sources, which are not included within any of the source categories specified in Subparts B, E, F, H, Q, R, S, V, X, Y or Z of this Part if the plant is subject to this Subpart. A plant is subject to this Subpart if it contains process emission sources, not regulated by Subparts B, E, F (excluding Section 219.204(l)), H (excluding Section 219.405), Q, R, S, V, X, Y or Z of this Part; which as a group both:

1) have maximum theoretical emissions of 91 Mg (100 tons) or more per calendar year of VOM if no air pollution control equipment were used, and

2) are not limited to less than 91 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment, through production or capacity limitations contained in a federally enforceable construction permit or a SIP revision.

b) If a plant ceases to fulfill the criteria of subsection (a), the requirements of this Subpart shall continue to apply to a miscellaneous formulation manufacturing process emission source which was ever subject to the control requirements of Section 219.946.

c) No limits under this Subpart shall apply to emission sources with emissions of VOM to the atmosphere less than or equal to 2.3 Mg (2.5 tons) per calendar year if the total emissions from such sources not complying with this Section does not exceed 4.5 Mg (5.0 tons) per calendar year.

d) For the purposes of this Subpart, an emission source shall be considered regulated by a Subpart if it is subject to the limits of that Subpart. An emission source is not considered regulated by a Subpart if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

e) For the purposes of this Subpart, uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

Section 219.943 Permit Conditions

No person shall violate any condition in a permit when the condition results in exclusion of the plant or an emission source from this Subpart.

Section 219.946 Control Requirements

Every owner or operator of an emission source subject to this Subpart shall comply with the requirements of subsection (a) or (b) below.

a) Emission capture and control techniques which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

b) An alternative control plan which has been approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.947 Compliance Schedule

Every owner or operator of an emission source subject to the control requirements of this Subpart shall comply with the requirements thereof on and after a date consistent with Section 219.106.

Section 219.948 Testing

a) When in the opinion of the Agency it is necessary to conduct testing to demonstrate compliance with Section 219.946, the owner or operator of a VOM emission source subject to the requirements of this Subpart shall, at his own expense, conduct such tests in accordance with the appliacable test methods and procedures specified in Section 219.105.

b) Nothing in the Section shall limit the authority of the USEPA pursuant to the Clean Air Act, as amended, to require testing.

SUBPART RR: MISCELLANEOUS ORGANIC CHEMICAL MANUFACTURING PROCESSES

Section 219.960 Applicability

a) The requirements of this Subpart shall apply to a plant's miscellaneous organic chemical manufacturing process emission sources which are not included within any of the source categories specified in Subparts B, E, F, H, Q, R, S, V, X, Y or Z of this Part, if the plant is subject to this Subpart. A plant is subject to this Subpart if it contains process emission sources, not regulated by Subparts B, E, F (excluding Section 219.204(l)), H (excluding Section 219.405), Q, R, S, V, X, Y or Z of this Part; which as a group both:

   1) have maximum theoretical emissions of 91 Mg (100 tons) or more per calendar year of VOM if no air pollution control equipment were used, and

2) are not limited to less than 91 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment, through production or capacity limitations contained in a federally enforceable construction permit or a SIP revision.

b) If a plant ceases to fulfill the criteria of Subsection (a), the requirements of this Subpart shall continue to apply to a miscellaneous organic chemical manufacturing process emission source which was ever subject to the control requirements of Section 219.966.

c) No limits under this Subpart shall apply to emission sources with emissions of VOM to the atmosphere less than or equal to 0.91 Mg (1.0 ton) per calendar year if the total emissions from such sources do not exceed 4.5 Mg (5.0 tons) per calendar year.

d) For the purposes of this Subpart, an emission source shall be considered regulated by a Subpart if it is subject to the limits of that Subpart. An emission source is not considered regulated by a Subpart if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

e) For the purposes of this Subpart, uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

Section 219.963 Permit Conditions

No person shall violate any condition in a permit when the condition results in exclusion of the plant or an emission source from this Subpart.

Section 219.966 Control Requirements

Every owner or operator of an emission source subject to this Subpart shall comply with the requirements of subsection (a) or (b) below.

a) Emission capture and control techniques which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

b) An alternative control plan which has been approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.967 Compliance Schedule

Every owner or operator of an emission source subject to the control requirements of this Subpart shall comply with the requirements of this Subpart on and after a date consistent with Section 219.106.

Section 219.968 Testing

a) When in the opinion of the Agency it is necessary to conduct testing to demonstrate compliance with Section 219.966, the owner or operator of a VOM emission source subject to the requirements of this Subpart shall, at his own expense, conduct such tests in accordance with the appliacable test methods and procedures specified in Section 219.105.

b) Nothing in the Section shall limit the authority of the USEPA pursuant to the Clean Air Act, as amended, to require testing.

SUBPART TT: OTHER EMISSION SOURCES

Section 219.980 Applicability

a) The requirements of this Subpart shall apply to a plant's VOM emission sources, which are not included within any of the source categories specified in Subparts B, E, F, H, Q, R, S, V, X, Y, Z, AA, PP, QQ, or RR of this Part, or are not exempted from permitting requirements pursuant to 35 Ill. Adm. Code 201.146, if the plant is subject to this Subpart. A plant is subject to this Subpart if it contains process emission sources, not regulated by Subparts B, E, F (excluding Section 219.204(l)), H (excluding Section 219.405), Q, R, S, V, X, Y or Z of this Part, which as a group both:

1) have maximum theoretical emissions of 91 Mg (100 tons) or more per calendar year of VOM if no air pollution control equipment were used, and

2) are not limited to less than 91 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment, through production or capacity limitations contained in a federally enforceable construction or operating permit or a SIP revision.

b) If a plant ceases to fulfill the criteria of subsection (a), the requirements of this Subpart shall continue to apply to an emission source which was ever subject to the control requirements of Section 219.986.

c) No limits under this Subpart shall apply to emission sources with emissions of VOM to the atmosphere less than or equal to 2.3 Mg (2.5 tons) per calendar year if the total emissions from such sources not complying with Section 219.986 does not exceed 4.5 Mg (5.0 tons) per calendar year.

d) For the purposes of this Subpart, an emission source shall be considered regulated by a Subpart if it is subject to the limits of that Subpart. An emission source is not considered regulated by a Subpart if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

e) The control requirements in Subparts QQ, RR, SS and TT shall not apply to sewage treatment plants, vegetable oil processing plants, coke ovens (including by-product recovery plants), fuel combustion sources, bakeries, barge loading facilities, jet engine test cells, pharmaceutical manufacturing, production of polystyrene foam insulation board (including storage and extrusion of scrap where blowing agent is added to the polystyrene resin at the plant), production of polystyrene foam packaging (not including storage and extrusion of scrap where blowing agent is added to the polystyrene resin at the plant), and iron and steel production.

Section 219.983 Permit Conditions

No person shall violate any condition in a permit when the condition results in exclusion of the plant or an emission source from this Subpart.

Section 219.986 Control Requirements

Every owner or operator of an emission source subject to this Subpart shall comply with the requirements of subsection (a), (b) or (c) below.

a) Emission capture and control equipment which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

b) For coating lines, the daily-weighted average VOM content shall not exceed 0.42 kg VOM/l (3.5 lbs VOM/gal) of coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied during any day. Owners and operators complying with this Section are not required to comply with Section 219.301, or

c) An alternative control plan which has been approved by the Agency and approved by the USEPA as a SIP revision.

Section 219.987 Compliance Schedule

Every owner or operator of an emissions source which is subject to this Subpart shall comply with the requirements of this Subpart on and after a date consistent with Section 219.106.

Section 219.988 Testing

a) When in the opinion of the Agency it is necessary to conduct testing to demonstrate compliance with Section 219.986, the owner or operator of a VOM emission source subject to the requirements of this Subpart shall, at his own expense, conduct such tests in accordance with the appliacable test methods and procedures specified in Section 219.105.

b) Nothing in the Section shall limit the authority of the USEPA pursuant to the Clean Air Act, as amended, to require testing.

SUBPART UU: RECORDKEEPING AND REPORTING FOR NON-CTG SOURCES

Section 219.990 Exempt Emission Sources

Upon request by the Agency, the owner or operator of an emission source which is exempt from the requirements of Subparts PP, QQ, RR, TT or Section 219.208(b) shall submit records to the Agency within 30 calendar days from the date of the request that document that the emission source is exempt from those requirements.

Section 219.991 Subject Emission Sources

a) Any owner or operator of a VOM emission source which is subject to the requirements of Subpart PP, QQ, RR or TT and complying by the use of emission capture and control equipment shall comply with the following:

1) By a date consistent with Section 219.106, or upon initial start-up of a new emission source, the owner or operator of the subject VOM emission source shall demonstrate to the Agency that the subject emission source will be in compliance on and after a date consistent with Section 219.106, or on and after the initial start-up date by submitting to the Agency all calculations and other supporting data, including descriptions and results of any tests the owner or operator may have performed.

2) On and after a date consistent with Section 219.106, or on and after the initial start-up

date, the owner or operator of a subject VOM emission source shall collect and record all of the following information each day and maintain the information at the facility for a period of three years:

A) Control device monitoring data.

B) A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

C) A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

3) On and after a date consistent with Section 219.106, the owner or operator of a subject VOM emission source shall notify the Agency in the following instances:

A) Any record showing a violation of the requirements of Subpart PP, QQ, RR or TT shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

B) At least 30 calendar days before changing the method of compliance with Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of subsection (b)(1). Upon changing the method of compliance with Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of subsection (b).

4) When in the opinion of the Agency it is necessary to conduct testing to demonstrate compliance with this Subpart, the owner or operator of a VOM emission source subject to the requirements of this Subpart shall, at his own expense, conduct such tests in accordance with the applicable test methods and procedures specified in Section 219.105. Nothing in this Section shall limit the authority of the USEPA pursuant to the Clean Air Act, as amended, to require testing.

b) Any owner or operator of a coating line which is subject to the requirements of Subpart PP or TT and complying by means of the daily-weighted average VOM content limitation shall comply with the following:

1) By a date consistent with Section 219.106, or upon initial start-up of a coating line subject to Subpart PP or TT, the owner or operator of the subject coating line shall certify to the Agency that the coating line will be in compliance on and after a date consistent with Section 219.106, or on and after the initial start-up date. Such certification shall include:

A) The name and identification number of each coating line which will comply by means of the daily-weighted average VOM content limitation.

B) The name and identification number of each coating as applied on each coating line.

C) The weight of VOM per volume and the volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line.

D) The instrument or method by which the owner or operator will accurately measure or calculate the volume of each coating as applied each day on each coating line.

E) The method by which the owner or operator will create and maintain records each day as required in subsection (b)(2).

F) An example of the format in which the records required in subsection (b)(2) will be kept.

2) On and after a date consistent with Section 219.106, or on and after the initial start-up date, the owner or operator of a subject coating line shall collect and record all of the following information each day for each coating line and maintain the information at the facility for a period of three years:

A) The name and identification number of each coating as applied on each coating line.

B) The weight of VOM per volume and the volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each day on each coating line.

C) The daily-weighted average VOM content of all coatings as applied on each coating line as defined in Section 219.104.

3) On and after a date consistent with Section 219.106, the owner or operator of a subject coating line shall notify the Agency in the following instances:

A) Any record showing violation of the requirements of Subpart PP or TT shall be reported by sending a copy of such record to the Agency within 30 days following the occurrence of the violation.

B) At least 30 calendar days before changing the method of compliance with Subpart PP or TT from the use of complying coatings to the use capture systems and control devices, the owner or operator shall comply with all requirements of subsection (a)(1). Upon changing the method of compliance with Subpart PP or TT from the use of complying coatings to the use capture systems and control devices, the owner or operator shall comply with all requirements of subsection (a).

c) Any owner or operator of a VOM emission source which is subject to the requirements of Subpart PP, QQ, RR or TT and complying by means of an alternative control plan which has been approved by the Agency and approved by the USEPA as a SIP revision shall comply with the recordkeeping and reporting requirements specified in the alternative control plan.

Appendix A List of Chemicals Defining Synthetic Organic Chemical and Polymer Manufacturing

CAS No. [a]	Chemical
105-57-7	Acetal
75-07-0	Acetaldehyde
107-89-1	Acetaldol
60-35-5	Acetamide
103-84-4	Acetanilide
64-19-7	Acetic acid
108-24-7	Acetic anhydride
67-64-1	Acetone
75-86-5	Acetone cyanohydrin
75-05-8	Acetonitrile
98-86-2	Acetophenone
75-36-5	Acetyl chloride
74-86-2	Acetylene
107-02-8	Acrolein
79-06-1	Acrylamide
79-10-7	Acrylic acid & esters
107-13-1	Acrylonitrile
124-04-9	Adipic acid
111-69-3	Adiponitrile
(b)	Alkyl naphthalenes
107-18-6	Allyl alcohol
107-05-1	Allyl chloride
1321-11-5	Aminobenzoic acid
111-41-1	Aminoethylethanolamine
123-30-8	p-aminophenol
628-63-7, 123-92-2	Amyl acetates
71-41-0[c]	Amyl alcohols
110-58-7	Amyl amine
543-59-9	Amyl chloride
110-68-7[c]	Amyl mercaptans
1322-06-1	Amyl phenol
62-53-3	Aniline
142-04-1	Aniline hydrochloride
29191-52-4	Anisidine
100-66-3	Anisole
118-92-3	Anthranilic acid
84-65-1	Anthraquinone
100-52-7	Benzaldehyde
55-21-0	Benzamide
71-43-2	Benzene
98-48-6	Benzenedisulfonic acid
98-11-3	Benzenesulfonic acid
134-81-6	Benzil
76-93-7	Benzilic acid
65-85-0	Benzoic acid
119-53-9	Benzoin

100-47-0	Benzonitrile
119-61-9	Benzophenone
98-07-7	Benzotrichloride
98-88-4	Benzoyl chloride
100-51-6	Benzyl alcohol
100-46-9	Benzylamine
120-51-4	Benzyl benzoate
100-44-7	Benzyl chloride
98-87-3	Benzyl dichloride
92-52-4	Biphenyl
80-05-7	Bisphenol A
10-86-1	Bromobenzene
27497-51-4	Bromonaphthalene
106-99-0	Butadiene
106-98-9	1-butene
123-86-4	n-butyl acetate
141-32-2	n-butyl acrylate
71-36-3	n-butyl alcohol
78-92-2	s-butyl alcohol
75-65-0	t-butyl alcohol
109-73-9	n-butylamine
13952-84-6	s-butylamine
75-64-9	t-butylamine
98-73-7	p-tert-butyl benzoic acid
107-88-0	1,3-butylene glycol
123-72-8	n-butyraldehyde
107-92-6	Butyric acid
106-31-0	Butyric anhydride
109-74-0	Butyronitrile
105-60-2	Caprolactam
75-1-50	Carbon disulfide
558-13-4	Carbon tetrabromide
55-23-5	Carbon tetrachloride
9004-35-7	Cellulose acetate
79-11-8	Chloroacetic acid
108-42-9	m-chloroaniline
95-51-2	o-chloroaniline
106-47-8	p-chloroaniline
35913-09-8	Chlorobenzaldehyde
108-90-7	Chlorobenzene
118-91-2, 535-80-8, 74-11-3[c]	Chlorobenzoic acid
2136-81-4, 2136-89-2, 5216-25-1[c]	Chlorobenzotrichloride
1321-03-5	Chlorobenzoyl chloride
75-45-6	Chlorodifluoroethane
25497-29-4	Chlorodifluoromethane
67-66-3	Chloroform
25586-43-0	Chloronaphthalene
88-73-3	o-chloronitrobenzene

100-00-5	p-chloronitrobenzene
25167-80-0	Chlorophenols
126-99-8	Chloroprene
7790-94-5	Chlorosulfonic acid
108-41-8	m-chlorotoluene
95-49-8	o-chlorotoluene
106-43-4	p-chlorotoluene
75-72-9	Chlorotrifluoromethane
108-39-4	m-cresol
95-48-7	o-cresol
106-44-5	p-cresol
1319-77-3	Mixed cresols
1319-77-3	Cresylic acid
4170-30-0	Crotonaldehyde
3724-65-0	Crontonic acid
98-82-8	Cumene
80-15-9	Cumene hydroperoxide
372-09-8	Cyanoacetic acid
506-77-4	Cyanogen chloride
108-80-5	Cyanuric acid
108-77-0	Cyanuric chloride
110-82-7	Cyclohexane
108-93-0	Cyclohexanol
108-94-1	Cyclohexanone
110-83-8	Cyclohexene
108-91-8	Cyclohexylamine
111-78-4	Cyclooctadiene
112-30-1	Decanol
123-42-2	Diacetone alcohol
27576-04-1	Diaminobenzoic acid
95-76-1,	Dichloroaniline
95-82-9,	
554-00-7,	
608-27-5,	
608-31-1,	
626-43-7,	
27134-27-6,	
57311-92-9[c]	
541-73-1	m-dichlorobenzene
95-50-1	o-dichlorobenzene
106-46-7	p-dichlorobenzene
75-71-8	Dichlorodifluoromethane
111-44-4	Dichloroethyl ether
107-06-2	1,2-dichloroethane (EDC)
96-23-1	Dichlorohydrin
26952-23-8	Dichloropropene
101-83-7	Dicyclohexylamine
109-89-7	Diethylamine
111-46-6	Diethylene glycol
112-36-7	Diethylene glycol diethyl ether
111-96-6	Diethylene glycol dimethyl ether
112-34-5	Diethylene glycol monobutyl ether

124-17-7	Diethylene glycol mononbutyl ether acetate
111-90-0	Diethylene glycol monoethyl ether
112-15-2	Diethylene glycol monoethyl ether acetate
111-77-3	Diethylene glycol monomethyl ether
64-67-5	Diethyl sulfate
75-37-6	Difluoroethane
25167-70-8	Diisobutylene
26761-40-0	Diisodecyl phthalate
27554-26-3	Diisooctyl phthalate
674-82-8	Diketene
124-40-3	Dimethylamine
121-69-7	N,N-dimethylaniline
115-10-6	N,N-dimethyl ether
68-12-2	N,N-dimethylformamide
57-14-7	Dimethylhydrazine
77-78-1	Dimethyl sulfate
75-18-3	Dimethyl sulfide
67-68-5	Dimethyl sulfoxide
120-61-6	Dimethyl terephthalate
99-34-3	3,5-dinitrobenzoic acid
51-28-5	Dinitrophenol
	Dinitrotoluene
123-91-1	Dioxane
646-06-0	Dioxilane
122-39-4	Diphenylamine
101-84-4	Diphenyl oxide
102-08-9	Diphenyl thiourea
25265-71-8	Dipropylene glycol
25378-22-7	Dodecene
28675-17-4	Dodecylaniline
27193-86-8	Dodecylphenol
106-89-8	Epichlorohydrin
64-17-5	Ethanol
141-43-5[c]	Ethanolamines
141-78-6	Ethyl acetate
141-97-9	Ethyl acetoacetate
140-88-5	Ethyl acrylate
75-04-7	Ethylamine
100-41-4	Ethylbenzene
74-96-4	Ethyl bromide
9004-57-3	Ethylcellulose
75-00-3	Ethyl chloride
105-39-5	Ethyl chloroacetate
105-56-6	Ethylcyanoacetate
74-85-1	Ethylene
96-49-1	Ethylene carbonate
107-07-3	Ethylene chlorohydrin
107-15-3	Ethylenediamine
106-93-4	Ethylene dibromide
107-21-1	Ethylene glycol
111-55-7	Ethylene glycol diacetate

110-71-4	Ethylene glycol dimethyl ether
111-76-2	Ethylene glycol monobutyl ether
112-07-2	Ethylene glycol monobutyl ether acetate
110-80-5	Ethylene glycol monoethyl ether
111-15-9	Ethylene glycol monoethyl ether acetate
109-86-4	Ethylene glycol monoethyl ether
110-49-6	Ethylene glycol monomethyl ether acetate
122-99-6	Ethylene glycol monophenyl ether
2807-30-9	Ethylene glycol monopropyl ether
75-21-8	Ethylene oxide
60-29-7	Ethyl ether
104-76-7	2-ethylhexanol
122-51-0	Ethyl orthoformate
95-92-1	Ethyl oxalate
41892-71-1	Ethyl sodium oxaloacetate
50-00-0	Formaldehyde
75-12-7	Formamide
64-18-6	Formic acid
110-17-8	Fumaric acid
98-01-1	Furfural
56-81-5	Glycerol (Synthetic)
26545-73-7	Glycerol dichlorohydrin
25791-96-2	Glycerol triether
56-40-6	Glycine
107-22-2	Glyoxal
118-74-1	Hexachlorobenzene
67-72-1	Hexachloroethane
36653-82-4	Hexadecyl alcohol
124-09-4	Hexamethylenediamine
629-11-8	Hexamethylene glycol
100-97-0	Hexamethylenetetramine
74-90-8	Hydrogen cyanide
123-31-9	Hydroquinone
99-96-7	p-hydroxybenzoic acid
26760-64-5	Isoamylene
78-83-1	Isobutanol
110-19-0	Isobutyl acetate
115-11-7	Isobutylene
78-84-2	Isobutyraldehyde
79-31-2	Isobutyric acid
25339-17-7	Isodecanol
26952-21-6	Isooctyl alcohol
78-78-4	Isopentane
78-59-1	Isophorone
121-91-5	Isophthalic acid
78-79-5	Isoprene
67-63-0	Isopropanol
108-21-4	Isopropyl acetate
75-31-0	Isopropylamine
75-29-6	Isopropyl chloride
25168-06-3	Isopropylphenol
463-51-4	Ketene

(b)	Linear alkyl sulfonate*
123-01-3	Linear alkylbenzene
110-16-7	Maleic acid
108-31-6	Maleic anhydride
6915-15-7	Malic acid
141-79-7	Mesityl oxide
121-47-1	Metanilic acid
79-41-4	Methacrylic acid
563-47-3	Methallyl chloride
67-56-1	Methanol
79-20-9	Methyl acetate
105-45-3	Methyl acetoacetate
74-89-5	Methylamine
100-61-8	n-methylaniline
74-83-9	Methyl bromide
37365-71-2	Methyl butynol
74-87-3	Methyl chloride
108-87-2	Methyl cyclohexane
1331-22-2	Methyl cyclohexanone
75-09-2	Methylene chloride
101-77-9	Methylene dianiline
101-68-8	Methylene diphenyl diisocyanate
78-93-3	Methyl ethyl ketone
107-31-3	Methyl formate
108-11-2	Methyl isobutyl carbinol
108-10-1	Methyl isobutyl ketone
80-62-6	Methyl methacrylate
77-75-8	Methylpentynol
98-83-9	B-methylstyrene
110-91-8	Morpholine
85-47-2	a-naphthalene sulfonic acid
120-18-3	B-naphthalene sulfonic acid
90-15-3	a-naphthol
135-19-3	B-naphthol
75-98-9	Neopentanoic acid
88-74-4	o-nitroaniline
100-01-6	p-nitroaniline
91-23-6	o-nitroanisole
100-17-4	p-nitroanisole
98-95-3	Nitrobenzene
27178-83-2[c]	Nitrobenzoic acid (o, m & p)
79-24-3	Nitroethane
75-52-5	Nitromethane
88-75-5	Nitrophenol
25322-01-4	Nitropropane
1321-12-6	Nitrotoluene
27215-95-8	Nonene
25154-52-3	Nonylphenol
27193-28-8	Octylphenol
123-63-7	Paraldehyde
115-77-5	Pentaerythritol
109-66-0	n-pentane

109-67-1	1-pentene
127-18-4	Perchloroethylene
594-42-3	Perchloromethyl mercaptan
94-70-2	o-phenetidine
156-43-4	p-phenetidine
108-95-2	Phenol
98-67-9, 585-38-6, 609-46-1, 133-39-7[c]	Phenolsulfonic acids
91-40-7	Phenyl anthranilic acid
(b)	Phenylenediamine
75-44-5	Phosgene
85-44-9	Phthalic anhydride
85-41-6	Phthalimide
108-99-6	b-picoline
110-85-0	Piperazine
9003-29-6, 25036-29-7[c]	Polybutenes
25322-68-3	Polyethylene glycol
25322-69-4	Polypropylene glycol
123-38-6	Propionaldehyde
79-09-4	Propionic acid
71-23-8	n-propyl alcohol
107-10-8	Propylamine
540-54-5	Propyl chloride
115-07-1	Propylene
127-00-4	Propylene chlorohydrin
78-87-5	Propylene dichloride
57-55-6	Propylene glycol
75-56-9	Propylene oxide
110-86-1	Pyridine
106-51-4	Quinone
108-46-3	Resorcinol
27138-57-4	Resorcylic acid
69-72-7	Salicylic acid
127-09-3	Sodium acetate
532-32-1	Sodium benzoate
9004-32-4	Sodium carboxymethyl cellulose
3926-62-3	Sodium chloroacetate
141-53-7	Sodium formate
139-02-6	Sodium phenate
110-44-1	Sorbic acid
100-42-5	Styrene
110-15-6	Succinic acid
110-61-2	Succinitrile
121-57-3	Sulfanilic acid
126-33-0	Sulfolane
1401-55-4	Tannic acid
100-21-0	Terephthalic acid
79-34-5[c]	Tetrachloroethanes
117-08-8	Tetrachlorophthalic anhydride

78-00-2	Tetraethyllead
119-64-2	Tetrahydronaphthalene
85-43-8	Tetrahydrophthalic anhydride
75-74-1	Tetramethyllead
110-60-1	Tetramethylenediamine
110-18-9	Tetramethylethylenediamine
108-88-3	Toluene
95-80-7	Toluene-2,4-diamine
584-84-9	Toluene-2,4-diisocyanate
26471-62-5	Toluene diisocyanates (mixture)
1333-07-9	Toluene sulfonamide
104-15-4[c]	Toluenesulfonic acids
98-59-9	Toluene sulfonyl chloride
26915-12-8	Toluidines
87-61-6, 108-70-3, 120-82-1[c]	Trichlorobenzenes
71-55-6	1,1,1-trichloroethane
79-00-5	1,1,2-trichloroethane
79-01-6	Trichloroethylene
75-69-4	Trichlorofluoromethane
96-18-4	1,2,3-trichloropropane
76-13-1	1,1,2-trichloro-1,2,2-trifluoroethane
121-44-8	Triethylamine
112-27-6	Triethylene glycol
112-49-2	Triethylene glycoldimethyl ether
7756-94-7	Triisobutylene
75-50-3	Trimethylamine
57-13-6	Urea
108-05-4	Vinyl acetate
75-01-4	Vinyl chloride
75-35-4	Vinylidene chloride
25013-15-4	Vinyl toluene
1330-20-7	Xylenes (mixed)
95-47-6	o-xylene
106-42-3	p-xylene
1300-71-6	Xylenol
1300-73-8	Xylidine
(b)	methyl tert-butyl ether
9002-88-4	Polyethylene
(b)	Polypropylene
9009-53-6	Polystyrene

a) CAS numbers refer to the Chemical Abstracts Registery numbers assigned to specific chemicals, isomers or mixtures of chemicals. Some isomers or mixtures that are covered by the standards do not have CAS numbers assigned to them. The standards apply to all of the chemicals listed, whether CAS numbers have been assigned or not.

b) No CAS number(s) have been assigned to this chemical, to its isomers, or mixtures containing these chemicals.

c) CAS numbers for some of the isomers are listed: the standards apply to all of the isomers and mixtures, even if CAS numbers have not been assigned.

Appendix B VOM Measurement Techniques for Capture Efficiency

Procedure G.1 - Captured VOC Emissions

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the volatile organic compounds (VOC) content of captured gas streams. It is intended to be used as a segment in the development of liquid/gas or gas/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations. The procedure may not be acceptable in certain site-specific situations, e.g., when: (1) direct fired heaters or other circumstances affect the quantity of VOC at the control device inlet; and (2) particulate organic aerosols are formed in the process and are present in the captured emissions.

1.2 Principle. The amount of VOC captured (G) is calculated as the sum of the products of the VOC content (C_{Gj}), the flow rate (Q_{Gj}), and the sample time (T_C) from each captured emissions point.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each captured or fugitive emissions point as follows: Q_{Gj} = 5.5 percent and C_{Gj} = ±5.0 percent. Based on these numbers, the probable uncertainty for G is estimated at about ±7.4 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Sample Probe. Stainless steel, or equivalent. The probe shall be heated to prevent VOC condensation.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer. Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to cause a response in the measurement system. The components of the pump that contact the gas stream shall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow rate control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If captured or fugitive emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold and connecting lines to the FIA must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas. High purity air with less than 1 ppm of organic material (as propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is present. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Captured Emissions Volumetric Flow Rate.

2.2.1 Method 2 or 2A Apparatus. For determining volumetric flow rate.

2.2.2 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.3 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF CAPTURED EMISSIONS

3.1 Locate all points where emissions are captured from the affected facility. Using Method 1, determine the sampling points. Be sure to check each site for cyclonic or swirling flow.

3.2 Measure the velocity at each sampling site at least once every hour during each sampling run using Method 2 or 2A.

4. DETERMINATION OF VOC CONTENT OF CAPTURED EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each captured emissions point during the entire test run or, if applicable, while the process is operating. If there are multiple captured emission locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA according to the procedure in Section 5.1.

4.2.2 Conduct a system check according to the procedure in Section 5.3.

4.2.3 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.4 Inject zero gas at the calibration valve assembly. Allow the measurement system response to reach zero. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.5 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.3. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform system drift checks during the run not to exceed one drift check per hour.

4.2.6 Verify that the sample lines, filter, and pump temperatures are 120 ± 5°C.

4.2.7 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple captured emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least 1 minute and record the concentration measurements.

4.3 Background Concentration.

4.3.1 Locate all NDO's of the TTE. A sampling point shall be centrally located outside of the TTE at 4 equivalent diameters from each NDO, ifpossible. If there are more than 6 NDO's, choose 6 sampling points evenly spaced among the NDO's.

4.3.2 Assemble the sample train as shown in Figure 2. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3. NOTE: This sample train shall be a separate sampling train from the one to measure the captured emissions.

4.3.3 Position the probe at the sampling location.

4.3.4 Determine the response time, conduct the system check and sample according to the procedures described in Sections 4.2.4 to 4.2.7.

4.4 Alternative Procedure. The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas that most closely approximates the concentration of the captured emissions for conducting the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct the system drift checks at the end of each run.

5.3 System Check. Inject the high range calibration gas at the inlet of the sampling probe and record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before and after each test run.

5.4 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

A_i = area of NDO i, ft^2.

A_N = total area of all NDO's in the enclosure, ft^2.

C_{Bi} = corrected average VOC concentration of background emissions at point i, ppm propane.

C_B = average background concentration, ppm propane.

C_{Gj} = corrected average VOC concentration of captured emissions at point j, ppm propane.

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{D0} = average system drift check concentration for zero concentration gas, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_i = uncorrected average background VOC concentration measured at point i, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

G = total VOC content of captured emissions, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Gj} = average effluent volumetric flow rate corrected to standard conditions at captured emissions point j, m^3/min.

T_C = total duration of captured emissions sampling run, min.

7. CALCULATIONS

7.1 Total VOC Captured Emissions.

$$G = \sum_{j=1}^{n} (C_{Gj} - C_B)\, Q_{Gj}\, T_C\, K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Captured Emissions at Point j.

$$C_{Gj} = (C_j - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

7.3 Background VOC Concentration at Point i.

$$C_{Bi} = (C_i - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 3}$$

7.4 Average Background Concentration.

$$C_B = \frac{\sum_{i-1}^{n} C_{Bi} \; A_i}{nA_N} \qquad \text{Eq. 4}$$

NOTE: If the concentration at each point is within 20 percent of the average concentration of all points, the terms "A_i" and "A_N" may be deleted from Equation 4.

Procedure G.2 - Captured VOC Emissions (Dilution Technique)

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the volatile organic compounds (VOC) content of captured gas streams. It is intended to be used as a segment in the development of a gas/gas protocol in which fugitive emissions are measured for determining VOC capture efficiency (CE) for surface coating and printing operations. A dilution system is used to reduce the VOC concentration of the captured emission to about the same concentration as the fugitive emissions. The procedure may not be acceptable in certain site-specific situations, e.g., when: (1) direct fired heaters or other circumstances affect the quantity of VOC at the control device inlet; and (2) particulate organic aerosols are formed in the process and are present in the captured emissions.

1.2 Principle. The amount of VOC captured (G) is calculated as the sum of the products of the VOC content (C_{Gj}), the flow rate (Q_{Gj}), and the sampling time (T_C) from each captured emissions point.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each captured or fugitive emissions point as follows: $Q_{Gj} = \pm 5.5$ percent and $C_{Gj} = \pm 5$ percent. Based on these numbers, the probable uncertainty for G is estimated at about ±7.4 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Dilution System. A Kipp in-stack dilution probe and controller or similar device may be used. The dilution rate may be changed by substituting different critical orifices or adjustments of the aspirator supply pressure. The dilution system shall be heated to prevent VOC condensation. Note: An out-of-stack dilution device may be used.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer. Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The components of the pump that contact the gas stream shall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If captured or fugitive emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold and connecting lines to the FIA must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas and Dilution Air Supply. High purity air with less than 1 ppm of organic material (as propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.9.4 Dilution Check Gas. Gas mixture standard containing propane in air, approximately half the span value after dilution.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Captured Emissions Volumetric Flow Rate.

2.2.1 Method 2 or 2A Apparatus. For determining volumetric flow rate.

2.2.2 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.3 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF CAPTURED EMISSIONS

3.1 Locate all points where emissions are captured from the affected facility. Using Method 1, determine the sampling points. Be sure to check each site for cyclonic or swirling flow.

3.2 Measure the velocity at each sampling site at least once every hour during each sampling run using Method 2 or 2A.

4. DETERMINATION OF VOC CONTENT OF CAPTURED EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each captured emissions point during the entire test run or, if applicable, while the process is operating. If there are a multiple captured emissions locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA according to the procedure in Section 5.1.

4.2.2 Set the dilution ratio and determine the dilution factor according to the procedure in Section 5.3.

4.2.3 Conduct a system check according to the procedure in Section 5.4.

4.2.4 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.5 Inject zero gas at the calibration valve assembly. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.6 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.4. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform system drift checks during the run not to exceed one drift check per hour.

4.2.7 Verify that the sample lines, filter, and pump temperatures are 120 ± 5°C.

4.2.8 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple captured emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least 1 minute and record the concentration measurements.

4.3 Background Concentration.

4.3.1 Locate all NDO's of the TTE. A sampling point shall be centrally located outside of the TTE at 4 equivalent diameters from each NDO, if possible. If there are more than 6 NDO's, choose 6 sampling points evenly spaced among the NDO's.

4.3.2 Assemble the sample train as shown in Figure 2. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.4.

4.3.3 Position the probe at the sampling location.

4.3.4 Determine the response time, conduct the system check and sample according to the procedures described in Sections 4.2.4 to 4.2.8.

4.4 Alternative Procedure. The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system after the dilution system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas that most closely approximates the concentration of the diluted captured emissions for conducting the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct the system drift check at the end of each run.

5.3 Determination of Dilution Factor. Inject the dilution check gas into the measurement system before the dilution system and record the response. Calculate the dilution factor using Equation 3.

5.4 System Check. Inject the high range calibration gas at the inlet to the sampling probe while the dilution air is turned off. Record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before and after each test run.

5.5 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

A_i = area of NDO i, ft^2.

A_N = total area of all NDO's in the enclosure, ft^2.

C_A = actual concentration of the dilution check gas, ppm propane.

C_{Bi} = corrected average VOC concentration of background emissions at point i, ppm propane.

C_B = average background concentration, ppm propane.

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{DO} = average system drift check concentration for zero concentration gas, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_i = uncorrected average background VOC concentration measured at point i, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

C_M = measured concentration of the dilution check gas, ppm propane.

DF = dilution factor.

G = total VOC content of captured emissions, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Gj} = average effluent volumetric flow rate corrected to standard conditions at captured emissions point j, m^3/min.

T_C = total duration of capture efficiency sampling run, min.

7. CALCULATIONS

7.1 Total VOC Captured Emissions.

$$G = \sum_{j=1}^{n} C_{Gj}\, Q_{Gj}\, T_C\, K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Captured Emissions at Point j.

$$C_{Gj} = DF\,(C_j - C_{DO})\,\frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

7.3 Dilution Factor.

$$D_F = \frac{C_A}{C_M} \qquad \text{Eq. 3}$$

7.4 Background VOC Concentration at Point i.

$$C_{Bi} = (C_i - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 4}$$

7.5 Average Background Concentration.

$$C_B = \frac{\sum_{i=1}^{n} C_{Bi} \; A_i}{nA_N} \qquad \text{Eq. 5}$$

NOTE: If the concentration at each point is within 20 percent of the average concentration of all points, the terms "A_i" and "A_N" may be deleted from Equation 4.

Procedure F.2 - Fugitive VOC Emissions from Building Enclosures

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the fugitive volatile organic compounds (VOC) emissions from a building enclosure (BE). It is intended to be used as a segment in the development of liquid/gas or gas/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations.

1.2 Principle. The total amount of fugitive VOC emissions (F_B) from the BE is calculated as the sum of the products of the VOC content (C_{Fj}) of each fugitive emissions point, its flow rate (Q_{Fj}), and time (T_F).

1.3 Measurement Uncertainty. The measurement uncertainties are estimated for each fugitive emissions point as follows: Q_{Fj} = ±5.0 percent and C_{Fj} = ±5.0 percent. Based on these numbers, the probable uncertainty for F_B is estimated at about ±11.2 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Sample Probe. Stainless steel, or equivalent. The probe shall be heated to prevent VOC condensation.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer. Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The components of the pump that contact the gas streamshall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow rate control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas. High purity air with less than 1 ppm of organic material (propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Fugitive Emissions Volumetric Flow Rate.

2.2.1 Flow Direction Indicators. Any means of indicating inward or outward flow, such as light plastic film or paper streamers, smoke tubes, filaments, and sensory perception.

2.2.2 Method 2 or 2A Apparatus. For determining volumetric flow rate. Anemometers or similar devices calibrated according to the manufacturer's instructions may be used when low velocities are present. Vane anemometers (Young-maximum response propeller), specialized pitots with electronic manometers (e.g., Shortridge Instruments Inc., Airdata Multimeter 860) are commercially available with measurement thresholds of 15 and 8 mpm (50 and 25 fpm), respectively.

2.2.3 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.4 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF FUGITIVE EMISSIONS

3.1 Preliminary Determinations. The purpose of this exercise is to determine which exhaust points should be measured for volumetric flow rates and VOC concentrations.

3.1.1 Forced Draft Openings. Identify all forced draft openings. Determine the volumetric flow rate according to Method 2.

3.1.2 NDO's Exhaust Points. The NDO's in the roof of a facility are considered to be exhaust points. Determine volumetric flow rate from these NDO's. Divide the cross-sectional area according to Method 1 using 12 equal areas. Use the appropriate velocity measurement devices, e.g., propeller anemometers.

3.1.3 Other NDO's.

3.1.3.1 This step is optional. Determine the exhaust flow rate, including that of the control device, from the enclosure and the intake air flow rate. If the exhaust flow rate divided by the intake air flow rate is greater than 1.1, then all other NDO's are not considered to be significant exhaust points.

3.1.3.2 If the option above is not taken, identify all other NDO's and other potential points through which fugitive emissions may escape the enclosure.
Then use the following criteria to determine whether flow rates and VOC concentrations need to be measured:

3.1.3.2.1 Using the appropriate flow direction indicator, determine the flow direction. An NDO with zero or inward flow is not an exhaust point.

3.1.3.2.2 Measure the outward volumetric flow rate from the remainder of the NDO's. If the collective flow rate is 2 percent, or less, of the flow rate from Sections 3.1.1 and 3.1.2, then these NDO's, except those within two equivalent diameters (based on NDO opening) from VOC sources, may be considered to be non-exhaust points.

3.1.3.2.3 If the percentage calculated in Section 3.1.3.2.2 is greater than 2 percent, those NDO's (except those within two equivalent diameters from VOC sources) whose volumetric flow rate total 2 percent of the flow rate from Sections 3.1.1 and 3.1.2 may be considered as non-exhaust points. All remaining NDO's shall be measured for volumetric flow rate and VOC concentrations during the CE test.

3.1.3.2.4 The tester may choose to measure VOC concentrations at the forced exhaust points and the NDO's. If the total VOC emissions from the NDO's are less than 2 percent of the emissions from the forced draft and roof NDO's, then these NDO's may be eliminated from further consideration.

3.2 Determination of Flow Rates.

3.2.1 Measure the volumetric flow rate at all locations identified as exhaust points in Section 3.1. Divide each exhaust opening into 9 equal areas for rectangular openings and 8 for circular openings.

3.2.2 Measure the velocity at each site at least once every hour during each sampling run using Method 2 or 2A, if applicable, or using the low velocity instruments in Section 2.2.2.

4. DETERMINATION OF VOC CONTENT OF FUGITIVE EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each fugitive emission point during the entire test run or, if applicable, while the process is operating. If there are multiple emissions locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3, respectively.

4.2.2 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.3 Inject zero gas at the calibration valve assembly. Allow the measurement system response to reach zero. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.4 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.3. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform drift checks during the run not to exceed one drift check per hour.

4.2.5 Verify that the sample lines, filter, and pump temperatures are 120 ±5°C.

4.2.6 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the response measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least 1 minute and record the concentration measurements.

4.3 Alternative Procedure The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner: Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas that most closely approximates the concentration of the captured emissions for conducting the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct a system drift check at the end of each run.

5.3 System Check. Inject the high range calibration gas at the inlet of the sampling probe and record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before each test run.

5.4 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{D0} = average system drift check concentration for zero concentration gas, ppm propane.

C_{Fj} = corrected average VOC concentration of fugitive emissions at point j, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

F_B = total VOC content of fugitive emissions from the building, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Fj} = average effluent volumetric flow rate corrected to standard conditions at fugitive emissions point j, m^3/min.

T_F = total duration of capture efficiency sampling run, min.

7. CALCULATIONS

7.1 Total VOC Fugitive Emissions From the Building.

$$F_B = \sum_{j=1}^{n} C_{Fj}\ Q_{Fj}\ T_F\ K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Fugitive Emissions at Point j.

$$C_{Fj} = (C_j - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

Procedure F.1 - Fugitive VOC Emissions from Temporary Enclosures

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the fugitive volatile organic compounds (VOC) emissions from a temporary total enclosure (TTE). It is intended to be used as a segment in the development of liquid/gas or gas/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations.

1.2 Principle. The amount of fugitive VOC emissions (F) from the TTE is calculated as the sum of the products of the VOC content (C_{Fj}), the flow rate (Q_{Fj}), and the sampling time (T_F) from each fugitive emissions point.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each fugitive emission point as follows: $Q_{Fj} = \pm 5.5$ percent and $CF_j = \pm 5.0$ percent. Based on these numbers, the probable uncertainty for F is estimated at about ±7.4 percent.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Gas VOC Concentration. A schematic of the measurement system is shown in Figure 1. The main components are described below:

2.1.1 Sample Probe. Stainless steel, or equivalent. The probe shall be heated to prevent VOC condensation.

2.1.2 Calibration Valve Assembly. Three-way valve assembly at the outlet of sample probe to direct the zero and calibration gases to the analyzer. Other methods, such as quick-connect lines, to route calibration gases to the outlet of the sample probe are acceptable.

2.1.3 Sample Line. Stainless steel or Teflon tubing to transport the sample gas to the analyzer. The sample line must be heated to prevent condensation.

2.1.4 Sample Pump. A leak-free pump, to pull the sample gas through the system at a flow rate sufficient to minimize the response time of themeasurement system. The components of the pump that contact the gas stream shall be constructed of stainless steel or Teflon. The sample pump must be heated to prevent condensation.

2.1.5 Sample Flow Rate Control. A sample flow rate control valve and rotameter, or equivalent, to maintain a constant sampling rate within 10 percent. The flow control valve and rotameter must be heated to prevent condensation. A control valve may also be located on the sample pump bypass loop to assist in controlling the sample pressure and flow rate.

2.1.6 Sample Gas Manifold. Capable of diverting a portion of the sample gas stream to the flame ionization analyzer (FIA), and the remainder to the bypass discharge vent. The manifold components shall be constructed of stainless steel or Teflon. If emissions are to be measured at multiple locations, the measurement system shall be designed to use separate sampling probes, lines, and pumps for each measurement location and a common sample gas manifold and FIA. The sample gas manifold and connecting lines to the FIA must be heated to prevent condensation.

2.1.7 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however, other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.1.7.1 Zero Drift. Less than ±3.0 percent of the span value.

2.1.7.2 Calibration Drift. Less than ±3.0 percent of the span value.

2.1.7.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.1.7.4 Response Time. Less than 30 seconds.

2.1.8 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.1.9 Calibration and Other Gases. Gases used for calibration, fuel, and combustion air (if required) are contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values notgenerally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.1.9.1 Fuel. A 40 percent H_2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect that reportedly occurs when oxygen concentration varies significantly from a mean value.

2.1.9.2 Carrier Gas. High purity air with less than 1 ppm of organic material (as propane or carbon equivalent) or less than 0.1 percent of the span value, whichever is greater.

2.1.9.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.1.10 Particulate Filter. An in-stack or an out-of-stack glass fiber filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated to prevent any condensation unless it can be demonstrated that no condensation occurs.

2.2 Fugitive Emissions Volumetric Flow Rate.

2.2.1 Method 2 or 2A Apparatus. For determining volumetric flow rate.

2.2.2 Method 3 Apparatus and Reagents. For determining molecular weight of the gas stream. An estimate of the molecular weight of the gas stream may be used if it can be justified.

2.2.3 Method 4 Apparatus and Reagents. For determining moisture content, if necessary.

2.3 Temporary Total Enclosure. The criteria for designing a TTE are discussed in Procedure T.

3. DETERMINATION OF VOLUMETRIC FLOW RATE OF FUGITIVE EMISSIONS

3.1 Locate all points where emissions are exhausted from the TTE. Using Method 1, determine the sampling points. Be sure to check each site for cyclonic or swirling flow.

3.2 Measure the velocity at each sampling site at least once every hour during each sampling run using Method 2 or 2A.

4. DETERMINATION OF VOC CONTENT OF FUGITIVE EMISSIONS

4.1 Analysis Duration. Measure the VOC responses at each fugitive emission point during the entire test run or, if applicable, while the process is operating. If there are multiple emission locations, design a sampling system to allow a single FIA to be used to determine the VOC responses at all sampling locations.

4.2 Gas VOC Concentration.

4.2.1 Assemble the sample train as shown in Figure 1. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3, respectively.

4.2.2 Install the sample probe so that the probe is centrally located in the stack, pipe, or duct, and is sealed tightly at the stack port connection.

4.2.3 Inject zero gas at the calibration valve assembly. Allow the measurement system response to reach zero. Measure the system response time as the time required for the system to reach the effluent concentration after the calibration valve has been returned to the effluent sampling position.

4.2.4 Conduct a system check before and a system drift check after each sampling run according to the procedures in Sections 5.2 and 5.3. If the drift check following a run indicates unacceptable performance, the run is not valid. The tester may elect to perform system drift checks during the run not to exceed one drift check per hour.

4.2.5 Verify that the sample lines, filter, and pump temperatures are 120 ± 5°C.

4.2.6 Begin sampling at the start of the test period and continue to sample during the entire run. Record the starting and ending times and any required process information as appropriate. If multiple emission locations are sampled using a single FIA, sample at each location for the same amount of time (e.g., 2 minutes) and continue to switch from one location to another for the entire test run. Be sure that total sampling time at each location is the same at the end of the test run. Collect at least 4 separate measurements from each sample point during each hour of testing. Disregard the response measurements at each sampling location until two times the response time of the measurement system has elapsed. Continue sampling for at least 1 minute and record the concentration measurements.

4.3 Background Concentration.

4.3.1 Determination of VOC Background Concentration.

4.3.1.1 Locate all NDO's of the TTE. A sampling point shall be centrally located outside of the TTE at 4 equivalent diameters from each NDO, if possible. If there are more than 6 NDO's, choose 6 sampling points evenly spaced among the NDO's.

4.3.1.2 Assemble the sample train as shown in Figure 2. Calibrate the FIA and conduct a system check according to the procedures in Sections 5.1 and 5.3.

4.3.1.3 Position the probe at the sampling location.

4.3.1.4 Determine the response time, conduct the system check and sample according to the procedures described in Sections 4.2.3 to 4.2.6.

4.4 Alternative Procedure. The direct interface sampling and analysis procedure described in Section 7.2 of Method 18 may be used to determine the gas VOC concentration. The system must be designed to collect and analyze at least one sample every 10 minutes.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. Select the calibration gas concentration that most closely approximates that of the fugitive gas emissions to conduct the drift checks. Introduce the zero and calibration gas at the calibration valve assembly and verify that the appropriate gas flow rate and pressure are present at the FIA. Record the measurement system responses to the zero and calibration gases. The performance of the system is acceptable if the difference between the drift check measurement and the value obtained in Section 5.1 is less than 3 percent of the span value. Conduct a system drift check at the end of each run.

5.3 System Check. Inject the high range calibration gas at the inlet of the sampling probe and record the response. The performance of the system is acceptable if the measurement system response is within 5 percent of the value obtained in Section 5.1 for the high range calibration gas. Conduct a system check before each test run.

5.4 Analysis Audit. Immediately before each test analyze an audit cylinder as described in Section 5.2. The analysis audit must agree with the audit cylinder concentration within 10 percent.

6. NOMENCLATURE

A_i = area of NDO i, ft^2.

A_N = total area of all NDO's in the enclosure, ft^2.

C_{Bi} = corrected average VOC concentration of background emissions at point i, ppm propane.

C_B = average background concentration, ppm propane.

C_{DH} = average measured concentration for the drift check calibration gas, ppm propane.

C_{DO} = average system drift check concentration for zero concentration gas, ppm propane.

C_{Fj} = corrected average VOC concentration of fugitive emissions at point j, ppm propane.

C_H = actual concentration of the drift check calibration gas, ppm propane.

C_i = uncorrected average background VOC concentration at point i, ppm propane.

C_j = uncorrected average VOC concentration measured at point j, ppm propane.

F = total VOC content of fugitive emissions, kg.

K_1 = 1.830×10^{-6} kg/(m^3-ppm).

n = number of measurement points.

Q_{Fj} = average effluent volumetric flow rate corrected to standard conditions at fugitive emissions point j, m^3/min.

T_F = total duration of fugitive emissions sampling run, min.

7. CALCULATIONS

7.1 Total VOC Fugitive Emissions.

$$F = \sum_{j=1}^{n} (C_{Fj} - C_B)\ Q_{Fj}\ T_F\ K_1 \qquad \text{Eq. 1}$$

7.2 VOC Concentration of the Fugitive Emissions at Point j.

$$C_{Fj} = (C_j - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

7.3 Background VOC Concentration at Point i.

$$C_{Bi} = (C_i - C_{DO}) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 3}$$

7.4 Average Background Concentration.

$$C_B = \frac{\sum_{i=1}^{n} C_{Bi} \; A_i}{nA_N} \qquad \text{Eq. 5}$$

NOTE: If the concentration at each point is within 20 percent of the average concentration of all points, the terms "A_i" and "A_N" may be deleted from Equation 4.

Procedure L - VOC Input

1. INTRODUCTION

1.1 Applicability. This procedure is applicable for determining the input of volatile organic compounds (VOC). It is intended to be used as a segment in the development of liquid/gas protocols for determining VOC capture efficiency (CE) for surface coating and printing operations.

1.2 Principle. The amount of VOC introduced to the process (L) is the sum of the products of the weight (W) of each VOC containing liquid (ink, paint, solvent, etc.) used and its VOC content (V). A sample of each VOC containing liquid is analyzed with a flame ionization analyzer (FIA) to determine V.

1.3 Estimated Measurement Uncertainty. The measurement uncertainties are estimated for each VOC containing liquid as follows: $W = \pm 2.0$ percent and $V = \pm 12.0$ percent. Based on these numbers, the probable uncertainty for L is estimated at about ±12.2 percent for each VOC containing liquid.

1.4 Sampling Requirements. A capture efficiency test shall consist of at least three sampling runs. The sampling time for each run should be at least 8 hours, unless otherwise approved.

1.5 Notes. Because this procedure is often applied in highly explosive areas, caution and care should be exercised in choosing appropriate equipment and installing and using the equipment. Mention of trade names or company products does not constitute endorsement. All gas concentrations (percent, ppm) are by volume, unless otherwise noted.

2. APPARATUS AND REAGENTS

2.1 Liquid Weight.

2.1.1 Balances/Digital Scales. To weigh drums of VOC containing liquids to within 0.2 lb.

2.1.2 Volume Measurement Apparatus (Alternative). Volume meters, flow meters, density measurement equipment, etc., as needed to achieve same accuracy as direct weight measurements.

2.2 VOC Content (Flame Ionization Analyzer Technique). The liquid sample analysis system is shown in Figures 1 and 2. The following equipment is required:

2.2.1 Sample Collection Can. An appropriately sized metal can to be used to collect VOC containing materials. The can must be constructed in such a way that it can be grounded to the coating container.

2.2.2 Needle Valves. To control gas flow.

2.2.3 Regulators. For carrier gas and calibration gas cylinders.

2.2.4 Tubing. Teflon or stainless steel tubing with diameters and lengths determined by connection requirements of equipment. The tubing between the sample oven outlet and the FIA shall be heated to maintain a temperature of 120 ± 5°C.

2.2.5 Atmospheric Vent. A tee and 0- to 0.5-liter/min rotameter placed in the sampling line between the carrier gas cylinder and the VOC sample vessel to release the excess carrier gas. A toggle valve placed between the tee and the rotameter facilitates leak tests of the analysis system.

2.2.6 Thermometer. Capable of measuring the temperature of the hot water bath to within 1°C.

2.2.7 Sample Oven. Heated enclosure, containing calibration gas coil heaters, critical orifice, aspirator, and other liquid sample analysis components, capable of maintaining a temperature of 120 ±5°C.

2.2.8 Gas Coil Heaters. Sufficient lengths of stainless steel or Teflon tubing to allow zero and calibration gases to be heated to the sample oven temperature before entering the critical orifice or aspirator.

2.2.9 Water Bath. Capable of heating and maintaining a sample vessel temperature of 100 ±5°C.

2.2.10 Analytical Balance. To measure ±0.001 g.

2.2.11 Disposable Syringes. 2-cc or 5-cc.

2.2.12 Sample Vessel. Glass, 40-ml septum vial. A separate vessel is needed for each sample.

2.2.13 Rubber Stopper. Two-hole stopper to accommodate 3.2-mm (1/8-in.) Teflon tubing, appropriately sized to fit the opening of the sample vessel. The rubber stopper should be wrapped in Teflon tape to provide a tighter seal and to prevent any reaction of the sample with the rubber stopper. Alternatively, any leak-free closure fabricated of non-reactive materials and accommodating the necessary tubing fittings may be used.

2.2.14 Critical Orifices. Calibrated critical orifices capable of providing constant flow rates from 50 to 250 ml/min at known pressure drops. Sapphire orifice assemblies (available from O'Keefe Controls Company) and glass capillary tubing have been found to be adequate for this application.

2.2.15 Vacuum Gauge. 0- to 760-mm (0- to 30-in.) Hg U-Tube manometer or vacuum gauge.

2.2.16 Pressure Gauge. Bourdon gauge capable of measuring the maximum air pressure at the aspirator inlet (e.g., 100 psig).

2.2.17 Aspirator. A device capable of generating sufficient vacuum at the sample vessel to create critical flow through the calibrated orifice when sufficient air pressure is present at the aspirator inlet. The aspirator must also provide sufficient sample pressure to operate the FIA. The sample is also mixed with the dilution gas within the aspirator.

2.2.18 Soap Bubble Meter. Of an appropriate size to calibrate the critical orifices in the system.

2.2.19 Organic Concentration Analyzer. An FIA with a span value of 1.5 times the expected concentration as propane; however other span values may be used if it can be demonstrated that they would provide more accurate measurements. The system shall be capable of meeting or exceeding the following specifications:

2.2.19.1 Zero Drift. Less than ±3.0 percent of the span value.

2.2.19.2 Calibration Drift. Less than ±3.0 percent of span value.

2.2.19.3 Calibration Error. Less than ±5.0 percent of the calibration gas value.

2.2.20 Integrator/Data Acquisition System. An analog or digital device or computerized data acquisition system used to integrate the FIA response or compute the average response and record measurement data. The minimum data sampling frequency for computing average or integrated values is one measurement value every 5 seconds. The device shall be capable of recording average values at least once per minute.

2.2.21 Chart Recorder (Optional). A chart recorder or similar device is recommended to provide a continuous analog display of the measurement results during the liquid sample analysis.

2.2.22 Calibration and Other Gases. For calibration, fuel, and combustion air (if required) contained in compressed gas cylinders. All calibration gases shall be traceable to NIST standards and shall be certified by the manufacturer to ±1 percent of the tag value. Additionally, the manufacturer of the cylinder should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change more than ±2 percent from the certified value. For calibration gas values not generally available, alternative methods for preparing calibration gas mixtures, such as dilution systems, may be used with prior approval.

2.2.22.1 Fuel. A 40 percent H2/60 percent He or 40 percent H_2/60 percent N_2 gas mixture is recommended to avoid an oxygen synergism effect thatreportedly occurs when oxygen concentration varies significantly from a mean value.

2.2.22.2 Carrier Gas. High purity air with less than 1 ppm of organic material (as propane) or less than 0.1 percent of the span value, whichever is greater.

2.2.22.3 FIA Linearity Calibration Gases. Low-, mid-, and high-range gas mixture standards with nominal propane concentrations of 20-30, 45-55, and 70-80 percent of the span value in air, respectively. Other calibration values and other span values may be used if it can be shown that more accurate measurements would be achieved.

2.2.22.4 System Calibration Gas. Gas mixture standard containing propane in air, approximating the undiluted VOC concentration expected for the liquid samples.

3. DETERMINATION OF LIQUID INPUT WEIGHT

3.1 Weight Difference. Determine the amount of material introduced to the process as the weight difference of the feed material before and after each sampling run. In determining the total VOC containing liquid usage, account for: (a) the initial (beginning) VOC containing liquid mixture; (b) any solvent added during the test run; (c) any coating added during the test run; and (d) any residual VOC containing liquid mixture remaining at the end of the sample run.

3.1.1 Identify all points where VOC containing liquids are introduced to the process. To obtain an accurate measurement of VOC containing liquids, start with an empty fountain (if applicable). After completing the run, drain the liquid in the fountain back into the liquid drum (if possible), and weigh the drum again. Weigh the VOC containing liquids to ±0.5 percent of the total weight (full) or ±0.1 percent of the total weight of VOC containing liquid used during the sample run, whichever is less. If the residual liquid cannot be returned to the drum, drain the fountain into a preweighed empty drum to determine the final weight of the liquid.

3.1.2 If it is not possible to measure a single representative mixture, then weigh the various components separately (e.g., if solvent is added during the sampling run, weigh the solvent before it is added to the mixture). If a fresh drum of VOC containing liquid is needed during the run, then weigh both the empty drum and fresh drum.

3.2 Volume Measurement (Alternative). If direct weight measurements are not feasible, the tester may use volume meters and flow rate meters (and density measurements) to determine the weight of liquids used if it can be demonstrated that the technique produces results equivalent to the direct weight measurements. If a single representative mixture cannot be measured, measure the components separately.

4. DETERMINATION OF VOC CONTENT IN INPUT LIQUIDS

4.1 Collection of Liquid Samples.

4.1.1 Collect a 100-ml or larger sample of the VOC containing liquid mixture at each application location at the beginning and end of each test run. A separate sample should be taken of each VOC containing liquid added to the application mixture during the test run. If a fresh drum is needed during the sampling run, then obtain a sample from the fresh drum.

4.1.2 When collecting the sample, ground the sample container to the coating drum. Fill the sample container as close to the rim as possible to minimize the amount of headspace.

4.1.3 After the sample is collected, seal the container so the sample cannot leak out or evaporate.

4.1.4 Label the container to identify clearly the contents.

4.2 Liquid Sample VOC Content.

4.2.1 Assemble the liquid VOC content analysis system as shown in Figure 1.

4.2.2 Permanently identify all of the critical orifices that may be used. Calibrate each critical orifice under the expected operating conditions (i.e., sample vacuum and temperature) against a volume meter as described in Section 5.3.

4.2.3 Label and tare the sample vessels (including the stoppers and caps) and the syringes.

4.2.4 Install an empty sample vessel and perform a leak test of the system. Close the carrier gas valve and atmospheric vent and evacuate the sample vessel to 250 mm (10 in.) Hg absolute or less using the aspirator. Close the toggle valve at the inlet to the aspirator and observe the vacuum for at least one minute. If there is any change in the sample pressure, release the vacuum, adjust or repair the apparatus as necessary and repeat the leak test.

4.2.5 Perform the analyzer calibration and linearity checks according to the procedure in Section 5.1. Record the responses to each of the calibration gases and the back-pressure setting of the FIA.

4.2.6 Establish the appropriate dilution ratio by adjusting the aspirator air supply or substituting critical orifices. Operate the aspirator at a vacuum of at least 25 mm (1 in.) Hg greater than the vacuum necessary to achieve critical flow. Select the dilution ratio so that the maximum response of the FIA to the sample does not exceed the high-range calibration gas.

4.2.7 Perform system calibration checks at two levels by introducing compressed gases at the inlet to the sample vessel while the aspirator and dilution devices are operating. Perform these checks using the carrier gas (zero concentration) and the system calibration gas. If the response to the carrier gas exceeds ±0.5 percent of span, clean or repair the apparatus and repeat the check. Adjust the dilution ratio as necessary to achieve the correct response to the upscale check, but do not adjust the analyzer calibration. Record the identification of the orifice, aspirator air supply pressure, FIA back-pressure, and the responses of the FIA to the carrier and system calibration gases.

4.2.8 After completing the above checks, inject the system calibration gas for approximately 10 minutes. Time the exact duration of the gas injection using a stopwatch. Determine the area under the FIA response curve and calculate the system response factor based on the sample gas flow rate, gas concentration, and the duration of the injection as compared to the integrated response using Equations 2 and 3.

4.2.9 Verify that the sample oven and sample line temperatures are 120 ±5°C and that the water bath temperature is 100 ±5°C.

4.2.10 Fill a tared syringe with approximately 1 g of the VOC containing liquid and weigh it. Transfer the liquid to a tared sample vessel. Plug the sample vessel to minimize sample loss. Weigh the sample vessel containing the liquid to determine the amount of sample actually received. Also, as a quality control check, weigh the empty syringe to determine the amount of material delivered. The two coating sample weights should agree within ±0.02 g. If not, repeat the procedure until an acceptable sample is obtained.

4.2.11 Connect the vessel to the analysis system. Adjust the aspirator supply pressure to the correct value. Open the valve on the carrier gas supply to the sample vessel and adjust it to provide a slight excess flow to the atmospheric vent. As soon as the initial response of the FIA begins to decrease, immerse the sample vessel in the water bath. (Applying heat to the sample vessel too soon may cause the FID response to exceed the calibrated range of the instrument, and thus invalidate the analysis.)

4.2.12 Continuously measure and record the response of the FIA until all of the volatile material has been evaporated from the sample and the instrument response has returned to the baseline (i.e., response less than 0.5 percent of the span value). Observe the aspirator supply pressure, FIA back-pressure, atmospheric vent, and other system operating parameters during the run; repeat the analysis procedure if any of these parameters deviate from the values established during the system calibration checks in Section 4.2.7. After each sample perform the drift check described in Section 5.2. If the drift check results are acceptable, calculate the VOC content of the sample using the equations in Section 7. Integrate the area under the FIA response curve, ordetermine the average concentration response and the duration of sample analysis.

5. CALIBRATION AND QUALITY ASSURANCE

5.1 FIA Calibration and Linearity Check. Make necessary adjustments to the air and fuel supplies for the FIA and ignite the burner. Allow the FIA to warm up for the period recommended by the manufacturer. Inject a calibration gas into the measurement system and adjust the back-pressure regulator to the value required to achieve the flow rates specified by the manufacturer. Inject the zero- and the high-range calibration gases and adjust the analyzer calibration to provide the proper responses. Inject the low- and mid-range gases and record the responses of the measurement system. The calibration and linearity of the system are acceptable if the responses for all four gases are within 5 percent of the respective gas values. If the performance of the system is not acceptable, repair or adjust the system and repeat the linearity check. Conduct a calibration and linearity check after assembling the analysis system and after a major change is made to the system.

5.2 Systems Drift Checks. After each sample, repeat the system calibration checks in Section 4.2.7 before any adjustments to the FIA or measurement system are made. If the zero or calibration drift exceeds ±3 percent of the span value, discard the result and repeat the analysis.

5.3 Critical Orifice Calibration.

5.3.1 Each critical orifice must be calibrated at the specific operating conditions that it will be used. Therefore, assemble all components of the liquid sample analysis system as shown in Figure 3. A stopwatch is also required.

5.3.2 Turn on the sample oven, sample line, and water bath heaters and allow the system to reach the proper operating temperature. Adjust the aspirator to a vacuum of 380 mm (15 in.) Hg vacuum. Measure the time required for one soap bubble to move a known distance and record barometric pressure.

5.3.3 Repeat the calibration procedure at a vacuum of 406 mm (16 in.) Hg and at 25-mm (1-in.) Hg intervals until three consecutive determinations provide the same flow rate. Calculate the critical flow rate for the orifice in ml/min at standard conditions. Record the vacuum necessary to achieve critical flow.

6. NOMENCLATURE

A_L = area under the response curve of the liquid sample, area count.

A_S = area under the response curve of the calibration gas, area count.

C_S = actual concentration of system calibration gas, ppm propane.

K = 1.830×10^{-9} g/(ml-ppm).

L = total VOC content of liquid input, kg.

M_L = mass of liquid sample delivered to the sample vessel, g.

q = flow rate through critical orifice, ml/min.

RF = liquid analysis system response factor, g/area count.

T_S = total gas injection time for system calibration gas during integrator calibration, min.

V_{Fj} = final VOC fraction of VOC containing liquid j.

V_{Ij} = initial VOC fraction of VOC containing liquid j.

V_{Aj} = VOC fraction of VOC containing liquid j added during the run.

V = VOC fraction of liquid sample.

W_{Fj} = weight of VOC containing liquid j remaining at end of the run, kg.

W_{Ij} = weight of VOC containing liquid j at beginning of the run, kg.

W_{Aj} = weight of VOC containing liquid j added during the run, kg.

7. CALCULATIONS

7.1 Total VOC Content of the Input VOC Containing Liquid.

$$L = \sum_{j=1}^{n} V_{Ij} W_{Ij} - \sum_{j=1}^{n} V_{Ej} W_{Fj} + \sum_{j=1}^{n} V_{Aj} W_{Aj} \qquad \text{Eq. 1}$$

7.2 Liquid Sample Analysis System Response Factor for Systems Using Integrators, Grams/Area Counts.

$$RF = \frac{C_S \; q \; T_S \; K}{A_S} \qquad \text{Eq. 2}$$

7.3 VOC Content of the Liquid Sample.

$$V = \frac{A_L \; RF}{M_L} \qquad \text{Eq. 3}$$

Procedure T - Criteria for and Verification of a Permanent or Temporary Total Enclosure

1. INTRODUCTION

1.1 Applicability. This procedure is used to determine whether a permanent or temporary enclosure meets the criteria of a total enclosure.

1.2 Principle. An enclosure is evaluated against a set of criteria. If the criteria are met and if all the exhaust gases are ducted to a control device, then the volatile organic compounds (VOC) capture efficiency (CE) is assumed to be 100 percent and CE need not be measured. However, if part of the exhaust gas stream is not ducted to a control device, CE must be determined.

2. DEFINITIONS

2.1 Natural Draft Opening (NDO) -- Any permanent opening in the enclosure that remains open during operation of the facility and is not connected to a duct in which a fan is installed.

2.2 Permanent Total Enclosure (PTE) -- A permanently installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through a control device.

2.3 Temporary Total Enclosure (TTE) -- A temporarily installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through ducts that allow for the accurate measurement of VOC rates.

3. CRITERIA OF A TEMPORARY TOTAL ENCLOSURE

3.1 Any NDO shall be at least 4 equivalent opening diameters from each VOC emitting point.

3.2 Any exhaust point from the enclosure shall be at least 4 equivalent duct or hood diameters from each NDO.

3.3 The total area of all NDO's shall not exceed 5 percent of the surface area of the enclosure's four walls, floor, and ceiling.

3.4 The average facial velocity (FV) of air through all NDO's shall be at least 3,600 m/hr (200 fpm). The direction of air through all NDO's shall be into the enclosure.

3.5 All access doors and windows whose areas are not included in Section 3.3 and are not included in the calculation in Section 3.4 shall be closed during routine operation of the process.

4. CRITERIA OF A PERMANENT TOTAL ENCLOSURE

4.1 Same as Sections 3.1 and 3.3 - 3.5.

4.2 All VOC emissions must be captured and contained for discharge through a control device.

5. PROCEDURE

5.1 Determine the equivalent diameters of the NDO's and determine the distances from each VOC emitting point to all NDO's. Determine the equivalent diameter of each exhaust duct or hood and its distance to all NDO's. Calculate the distances in terms of equivalent diameters. The number of equivalent diameters shall be at least 4.

5.2 Measure the total area (A_t) of the enclosure and the total area (A_N) of all NDO's of the enclosure. Calculate the NDO to enclosure area ratio (NEAR) as follows:

$$NEAR = A_N/A_t$$

The NEAR must be < 0.05.

5.3 Measure the volumetric flow rate, corrected to standard conditions, of each gas stream exiting the enclosure through an exhaust duct or hood using EPA Method 2. In some cases (e.g., when the building is the enclosure), it may be necessary to measure the volumetric flow rate, corrected to standard conditions, of each gas stream entering the enclosure through a forced makeup air duct using Method 2. Calculate FV using the following equation:

$$FV = [Q_O - Q_I]/ A_N$$

where:

Q_O = the sum of the volumetric flow from all gas streams exiting the enclosure through an exhaust duct or hood.

Q_I = the sum of the volumetric flow from all gas streams into the enclosure through a forced makeup air duct; zero, if there is no forced makeup air into the enclosure.

A_N = total area of all NDO's in enclosure.

The FV shall be at least 3,600 m/hr (200 fpm).

5.4 Verify that the direction of air flow through all NDO's is inward. Use streamers, smoke tubes, tracer gases, etc. Strips of plastic wrapping film have been found to be effective. Monitor the direction of air flow at intervals of at least 10 minutes for at least 1 hour.

6. QUALITY ASSURANCE

6.1 The success of this protocol lies in designing the TTE to simulate the conditions that exist without the TTE, i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of fugitive VOC emissions should be minimal. The TTE must enclose the application stations, coating reservoirs, and all areas from the application station to the oven. The oven does not have to be enclosed if it is under negative pressure. The NDO's of the temporary enclosure and a fugitive exhaust fan must be properly sized and placed.

6.2. Estimate the ventilation rate of the TTE that best simulates the conditions that exist without the TTE, i.e., the effect of the TTE on the normal flow patterns around the affected facility or the amount of fugitive VOC emissions should be minimal. Figure 1 may be used as an aid. Measure the concentration (C_G) and flow rate (Q_G) of the captured gas stream, specify a safe concentration (C_F) for the fugitive gas stream, estimate the CE, and then use the plot in Figure 1 to determine the volumetric flowrate of the fugitive gas stream (Q_F). A fugitive VOC emission exhaust fan that has a variable flow control is desirable.

6.2.1 Monitor the concentration of VOC into the capture device without the TTE. To minimize the effect of temporal variation on the captured emissions, the baseline measurement should be made over as long a time period as practical. However, the process conditions must be the same for the measurement in Section 6.2.3 as they are for this baseline measurement. This may require short measuring times for this quality control check before and after the construction of the TTE.

6.2.2 After the TTE is constructed, monitor the VOC concentration inside the TTE. This concentration shall not continue to increase and must not exceed the safe level according to OSHA requirements for permissible exposure limits. An increase in VOC concentration indicates poor TTE design or poor capture efficiency.

6.2.3 Monitor the concentration of VOC into the capture device with the TTE. To limit the effect of the TTE on the process, the VOC concentration with and without the TTE must be within ±10 percent. If the measurements do not agree, adjust the ventilation rate from the TTE until they agree within 10 percent.

Appendix C Reference Methods and Procedures

Introduction

This Appendix presents the reference methods and procedures required for implementing Reasonably Available Control Technology (RACT). Methods and procedures are identified for two types of ACT implementation:

a) Determination of VOC destruction efficiency for evaluating compliance with the 98 weight percent VOC reduction or 20 ppmv emission limit specified in Sections 215.520 through 215.527; and

b) Determination of offgas flowrate, hourly emissions and stream net heating value for calculating TRE.

All reference methods identified in this Appendix refer to the reference methods specified at 40 CFR 60, Appendix A, incorporated by reference in Section 215.105.

VOC DESTRUCTION EFFICIENCY DETERMINATION

The following reference methods and procedures are required for determining compliance with the percent destruction efficiency specified in Sections 215.520 through 215.527.

a) Reference Method 1 or 1A for selection of the sampling site. The control device inlet sampling site for determination of vent stream molar composition or total organic compound destruction efficiency shall be prior to the inlet of any control device and after all recovery devices.

b) Reference Methods 2, 2A, 2C or 2D for determination of the volumetric flowrate.

c) Reference Method 3 to measure oxygen concentration of the air dilution correction. The emission sample shall be corrected to 3 percent oxygen.

d) Reference Method 18 to determine the concentration of total organic compounds (minus methane and ethane) in the control device outlet and total organic compound reduction efficiency of the control device.

TRE DETERMINATION

The following reference methods and procedures are required for determining the offgas flowrate, hourly emissions, and the net heating value of the gas combusted to calculate the vent stream TRE.

a) Reference Method 1 or 1A for selection of the sampling site. The sampling site for the vent stream flowrate and molar composition determination prescribed in (b) and (c) shall be prior to the inlet of any combustion device, prior to any post-reactor dilution of the stream with air and prior to any post-reactor introduction of halogenated compounds into the vent stream. Subject to the preceding restrictions on the sampling site, it shall be after the final recovery device. If any gas stream other than the air oxidation vent stream is normally conducted through the recovery system of the affected facility, such stream shall be rerouted or turned off while the vent stream is sampled, but shall be routed normally prior to the measuring of the initial value of the monitored parameters for determining compliance with the recommended RACT. If the air oxidation vent stream is normally routed through any equipment which is not a part of the air oxidation process as defined in 35 Ill. Adm. Code 211.122, such equipment shall be bypassed by the vent stream while the vent stream is sampled, but shall not be bypassed during the measurement of the initial value of the monitored parameters for determining compliance with Subpart V.

b) The molar composition of the vent stream shall be determined using the following methods:

   1) Reference Method 18 to measure the concentration of all organics, including those containing halogens, unless a significant portion of the compounds of interest are polymeric (high molecular weight), can polymerize before analysis or have low vapor pressures, in which case Reference Method 25(a) shall be used.

   2) ASTM D1946-67 (reapproved 1977), incorporated by reference in Section 215.105, to measure the concentration of carbon monoxide and hydrogen.

   3) Reference Method 4 to measure the content of water vapor, if necessary.

c) The volumetric flowrate shall be determined using Reference Method 2, 2A, 2C or 2D, as appropriate.

d) The net heating value of the vent stream shall be calculated using the following equation:

$$H = K \sum_{i=1}^{n} C_i H_i$$

Where:

H = Net heating value of the sample, MJ/scm, where the net enthalpy per mole of offgas is based on combustion at 25•C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20•C, as in the definition of F (vent stream flowrate) below.

K = Constant, 1.740 x 10^{-7} (1/ppm) (mole/scm)(MJ/kcal) where standard temperature for mole/scm is 20•C.

Ci = Concentration of sample component i, reported on a wet basis, in ppm, as measured by Reference Method 18 or ASTM D1946-67 (reapproved 1977), incorporated by reference in Section 215.105.

Hi = Net heat of combustion of sample component i, kcal/mole based on combustion at 25 C and 760 mm Hg. If published values are not available or cannot be calculated, the heats of combustion of vent stream components are required to be determined using ASTM D2382-76, incorporated by reference in Section 215.105.

e) The emission rate of total organic compounds in the process vent stream shall be calculated using the following equation:

$$E = K \quad F \quad \sum_{i=1}^{n} \quad CiMi$$

Where:

E = Emission rate of total organic compounds (minus methane and ethane) in the sample in kg/hr.

K = Constant 2.494 x 10^{-6} (1/ppm) (mole/scm) (kg/g) (min/hr), where standard temperature for (mole/scm) is 20•C.

Mi = Molecular weight of sample component i (g/mole).

F = Vent stream flowrate (scm/min), at a standard temperature of 20•C.

f) The total vent stream concentration (by volume) of compounds containing halogens (ppmv, by compound) shall be summed from the individual concentrations of compounds containing halogens which were measured by Reference Method 18.

Appendix D Coefficients for the Total Resource Effectiveness Index (TRE) Equation

This Appendix contains values for the total resource effectiveness index (TRE) equation in Subpart V.

If a flow rate falls exactly on the boundary between the indicated ranges, the operator shall use the row in which the flow rate is maximum.

COEFFICIENTS FOR TRE EQUATION FOR CHLORINATED PROCESS VENT STREAMS WITH NET HEATING VALUE LESS THAN OR EQUAL TO 3.5 MJ/scm

FLOW RATE (scm/min)							
Min.	Max.	a	b	c	d	e	f
0.0	13.5	48.73	0.	0.404	-0.1632	0.	0.
13.5	700.	42.35	0.624	0.404	-0.1632	0.	0.0245
700.	1400.	84.38	0.678	0.404	-0.1632	0.	0.0346
1400.	2100.	126.41	0.712	0.404	-0.1632	0.	0.0424
2100.	2800.	168.44	0.747	0.404	-0.1632	0.	0.0490
2800.	3500.	210.47	0.758	0.404	-0.1632	0.	0.0548

COEFFICIENTS FOR TRE EQUATION FOR CHLORINATED PROCESS VENT STREAMS WITH NET HEATING VALUE GREATER THAN 3.5 MJ/scm

FLOW RATE (scm/min)							
Min.	Max.	a	b	c	d	e	f
0.	13.5	47.76	0.	-0.292	0.	0.	0.
13.5	700.	41.58	0.605	-0.292	0.	0.	0.0245
700.	1400.	82.84	0.658	-0.292	0.	0.	0.0346
1400.	2100.	123.10	0.691	-0.292	0.	0.	0.0424
2100.	2800.	165.36	0.715	-0.292	0.	0.	0.0490
2800.	3500.	206.62	0.734	-0.292	0.	0.	0.0548

COEFFICIENTS FOR TRE EQUATION FOR NONCHLORINATED PROCESS VENT STREAMS WITH NET HEATING VALUE LESS THAN OR EQUAL TO 0.48 MJ/scm

FLOW RATE (scm/min) Min.	Max.	a	b	c	d	e	f
0.	13.5	19.05	0.	0.113	-0.214	0.	0.
13.5	1350.	16.61	0.239	0.113	-0.214	0.	0.0245
1350.	2700.	32.91	0.260	0.113	-0.214	0.	0.0346
2700.	4050.	49.21	0.273	0.113	-0.214	0.	0.0424

COEFFICIENTS FOR TRE EQUATION FOR NONCHLORINATED PROCESS VENT STREAMS WITH NET HEATING VALUE GREATER THAN 0.48 AND LESS THAN OR EQUAL TO 1.9 MJ/scm

FLOW RATE (scm/min) Min.	Max.	a	b	c	d	e	f
0.	13.5	19.74	0.	0.400	-0.202	0.	0.
13.5	1350.	18.30	0.138	0.400	-0.202	0.	0.0245
1350.	2700.	36.28	0.150	0.400	-0.202	0.	0.0346
2700.	4050.	54.26	0.158	0.400	-0.202	0.	0.0424

COEFFICIENTS FOR TRE EQUATION FOR NONCHLORINATED PROCESS VENT STREAMS WITH NET HEATING VALUE GREATER THAN 1.9 AND LESS THAN OR EQUAL TO 3.6 MJ/scm

FLOW RATE (scm/min) Min.	Max.	a	b	c	d	e	f
.0	13.5	15.24	0.	0.033	0.	0.	0.
13.5	1190.	13.63	0.157	0.033	0.	0.	0.0245
1190.	2380.	26.95	0.171	0.033	0.	0.	0.0346
2380.	3570.	40.27	0.179	0.033	0.	0.	0.0424

COEFFICIENTS FOR TRE EQUATION FOR NONCHLORINATED PROCESS VENT STREAMS WITH NET HEATING VALUE GREATER THAN 3.6 MG/scm

FLOW RATE (scm/min) Min.	Max.	a	b	c	d	e	f
0.	13.5	15.24	0.	0.	0.0090	0.	0.
13.5	1190.	13.63	0.	0.	0.0090	0.0503	0.0245
1190.	2380.	26.95	0.	0.	0.0090	0.0546	0.0346
2380.	3570.	40.27	0.	0.	0.0090	0.0573	0.0424

IT IS SO ORDERED.

J. Marlin and B. Forcade were not present.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 25th day of July, 1991, by a vote of 5-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board