§§ 52.731–52.735 [Reserved]

§ 52.736 Review of new sources and modifications.

(a) [Reserved]

(b) The rules submitted by the State on March 24, 1988, to satisfy the requirements of the Clean Air Act are approved. These rules are part 203: Major Stationary Sources Construction and Modification as effective March 22, 1991. The moratorium on construction and modification of new sources in nonattainment areas as provided in section 110(a)(2)(I) of the Clean Air Act is revoked.

[57 FR 59935, Dec. 17, 1992]

§ 52.737 Operating permits.

Emission limitation and other provisions contained in operating permits issued by the State in accordance with the provisions of the federally approved permit program shall be the applicable requirements of the federally approved Illinois SIP for the purpose of section 113 of the Clean Air Act and shall be enforceable by USEPA and by any person in the same manner as other requirements of the SIP. USEPA reserves the right to deem an operating permit not federally enforceable. Such a determination will be made according to appropriate procedures, and be based upon the permit, permit approval procedures or permit requirements which do not conform with the operating permit program requirements or the requirements of USEPA's underlying regulations.

[57 FR 59936, Dec. 17, 1992]

§ 52.738 Significant deterioration of air quality.

(a) The requirements of sections 160 through 165 of the Clean Air Act are not met, since the plan does not include approvable procedures for preventing the significant deterioration of air quality.

(b) *Regulations for preventing significant deterioration of air quality.* The provisions of § 52.21 except paragraph (a)(1) are hereby incorporated and made a part of the applicable State plan for the State of Illinois.

(c) All applications and other information required pursuant to § 52.21 from sources located in the State of Illinois shall be submitted to the Director of the Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706 instead of the EPA Region V office.

[45 FR 52741, Aug. 7, 1980, as amended at 46 FR 9584, Jan. 29, 1981; 68 FR 11323, Mar. 10, 2003; 68 FR 74489, Dec. 24, 2003]

§ 52.739 Permit fees.

(a) The requirements of section 110(a)(2)(K) of the Clean Air Act as amended in 1977 are not met since the state has not submitted to EPA, as a part of its State Implementation Plan, provisions for a permit fee system.

[46 FR 23237, Apr. 24, 1981]

§ 52.740 Interstate pollution.

(a) The requirements of section 126(a)(2) of the Clean Air Act as amended in 1977 are not met since the state has not submitted to EPA, as a part of its State Implementation Plan, the procedures on which the state is relying to notify nearby states of any proposed major stationary source which may significantly contribute to levels of air pollution in excess of the National Ambient Air Quality Standards in that state.

[46 FR 23237, Apr. 24, 1981]

§ 52.741 Control strategy: Ozone control measures for Cook, DuPage, Kane, Lake, McHenry and Will Counties.

(a) *General Provisions*—(1) *Abbreviations and conversion factors.* (i) The following abbreviations are used in § 52.741:

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 cubmic 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
sq cm square centimeters
sq in square inches
USEPA United States Environmental Protection Agency
VOC volatile organic compounds
VOL volatile organic liquids
VOM volatile organic materials

(ii) The following conversion factors are used in § 52.741.

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.

(2) *Applicability.* (i) Any source that received a stay, as indicated in § 218.103(a)(2), remains subject to the stay if still in effect, or (if the stay is no longer in effect) the federally-promulgated or federally-approved rule applicable to such source.

(ii)(A) Effective November 20, 1996 Illinois Administrative Code Title 35: Environmental Protection, Subtitle B: Air pollution, Chapter I: Pollution Control Board, Subchapter c: Emissions Standards and Limitations for Stationary Sources, Part 211: Definitions and General Provisions, and Part 218: Organic Material Emission Standards and Limitations for the Chicago Area replace the requirements of 40 CFR 52.741 Control strategy: Ozone control measures for Cook, DuPage, Kane, Lake, McHenry and Will County as the federally enforceable control measures in these counties for the major non-Control Technique Guideline (CTG) sources in the Chicago area, previously subject to paragraph u, v, w, or x because of the applicability criteria in these paragraphs.

(B) In accordance with § 218.101(b), for the major non-CTG sources subject to paragraphs u, v, w, or x because of the applicability criteria of those paragraphs, the requirements of paragraphs u, v, w, and x, and the recordkeeping requirements in paragraph y and any related parts of § 52.741 necessary to implement these paragraphs (including, but not limited to, those paragraphs containing test methods and definitions), shall remain in effect and are enforceable after November 20, 1996 for the period from July 30, 1990 until November 20, 1996.

(iii)(A) Except as provided in paragraphs (a)(2) (i) and (ii) of this section, effective October 11, 1994, Illinois Administrative Code Title 35: Environmental Protection, Subtitle B: Air pollution, Chapter I: Pollution Control Board, Subchapter c: Emissions Standards and Limitations for Stationary Sources, Part 211: Definitions and General Provisions, and Part 218: Organic Material Emission Standards and Limitations for the Chicago Area replace the requirements of this § 52.741 Control strategy: Ozone control measures for Cook, DuPage, Kane, Lake, McHenry and Will County as the federally enforceable control measures in these counties.

(B) In accordance with § 218.101(b), the requirements of § 52.741 shall remain in effect and are enforceable after October 11, 1994, for the period from July 30, 1990, to October 11, 1994.

(3) *Definitions.* The following terms are defined for the purpose of § 52.741.

NOTE: The Federal definitions supersede the State definitions for these terms, which were previously approved by USEPA as part of the SIP. The federally approved definitions for all other terms remain in effect and applicable to these Federal rules.

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.

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

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

Administrator means the Administrator of the USEPA or that person's designee.

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.

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.

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.

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:

(A) The applicable standards in 40 CFR parts 60 and 61:

(B) The applicable implementation plan; or

(C) 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.

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.

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).

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

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.

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.

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 sent 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.*).

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 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.

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 paragraph (i) of this section, 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 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.

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:

$$\mathrm{VOM}_w = \left[\frac{\sum_{i=1}^{n} V_i C_i}{V_T} \right]$$

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 a.m. (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.

Drum means any cylindrical metal shipping container of 13- to 110-gallon capacity.

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 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.

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 elastome

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.

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/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.

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

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.

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 as specified in 40 CFR 52.742); or which has 0.1 Reid Vapor Pressure as determined by ASTM method D323–82 (incorporated by reference as specified in 40 CFR 52.742); 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 as specified in 40 CFR 52.742).

Heavy off-highway vehicle products means, for the purpose of paragraph (e) of this section, 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 a.m. to 2 a.m.).

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

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

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, dish washers, 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 service means that the equipment or component contains process fluid that is in a liquid state at operating conditions.

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).

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.

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.

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) A manufacturing process involving one or more of the following applications, including any drying and curing of formulations, and capable of emitting VOM:

(*1*) Adhesives to fabricate or assemble components or products.

(*2*) Asphalt solutions to paper or fiberboard.

(*3*) Asphalt to paper or felt.

(*4*) Coatings or dye to leather.

(*5*) Coatings to plastic.

(*6*) Coatings to rubber or glass.

(*7*) Disinfectant material to manufactured items.

(*8*) Plastic foam scrap or “fluff” from the manufacture of foam containers and packaging material to form resin pallets.

(*9*) Resin solutions to fiber substances.

(*10*) Viscose solutions for food casings.

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

(*1*) Adhesives.

(*2*) Asphalt solutions.

(*3*) Caulks, sealants, or waterproofing agents.

(*4*) Coatings, other than paint and ink.

(*5*) Concrete curing compounds.

(*6*) Dyes.

(*7*) Friction materials and compounds.

(*8*) Resin solutions.

(*9*) Rubber solutions.

(*10*) Viscose solutions.

(B) 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 nonmental 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) 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:

(*1*) Chemicals listed in appendix A of this section.

(*2*) Chlorinated and sulfonated compounds.

(*3*) Cosmetic, detergent, soap, or surfactant intermediaries or specialties and products.

(*4*) Disinfectants.

(*5*) Food additives.

(*6*) Oil and petroleum product additives.

(*7*) Plasticizers.

(*8*) Resins or polymers.

(*9*) Rubber additives.

(*10*) Sweeteners.

(*11*) Varnishes.

(B) 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.

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 depressing 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.

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 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.

Pail means any cylindrical metal shipping container of 1- to 12-gallon capacity and constructed of 29-gauge and heavier metal.

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 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 man 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.

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 as specified in 40 CFR 52.742).

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

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.

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.

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

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

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.

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

Repaired means, for the purpose of paragraph (i) of this section, that equipment component has been adjusted, or otherwise altered, to eliminate a leak.

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.

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.

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 Section 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.

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 as specified in 40 CFR 52.742).

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's.

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

(A) 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.

(B) 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.

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.

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 as specified in 40 CFR 52.742).

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.

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 meterial in the vapors displaced from a tank during the transfer of gasoline.

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 compounds (VOC) is as defined in § 51.100(s) of this chapter.

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

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.

(4) *Testing methods and procedures*—(i) Coatings, inks and fountain solutions. The following test methods and procedures shall be used to determine compliance of as applied coatings, inks, and fountain solutions with the limitations set forth in § 52.741.

(A) *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 paragraph(a)(4)(i)(C) of this section. 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:

(*1*) ASTM D3925–81 (Reapproved 1985) Standard Practice for Sampling Liquid Paints and Related Pigment Coating. This practice is incorporated by reference as specified in 40 CFR 52.742.

(*2*) ASTM E300–86 Standard Practice for Sampling Industrial Chemicals. This practice is incorporated by reference as specified in 40 CFR 52.742.

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

(*1*) Method 24 of 40 CFR part 60, appendix A, shall be used to determine the VOM content and density of coatings. If it is demonstrated to the satisfaction of the Administrator 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.

(*2*) Method 24A of 40 CFR part 60, appendix A, 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 Administrator 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.

(*3*) 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 as specified in 40 CFR 52.742.

(*ii*) ASTM D2369–87: Standard Test Method for Volatile Content of Coatings. This test method is incorporated by reference as specified in 40 CFR 52.742.

(*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 as specified in 40 CFR 52.742.

(*iv*) ASTM D4017–81 (Reapproved 1987): Standard Test Method for Water in Paints and Paint Materials by the Karl Fischer Method. This test method is incorporated by reference as specified in 40 CFR 52.742.

(*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 as specified in 40 CFR 52.742.

(*vi*) ASTM D2697–86: Standard Test Method for Volume Non-Volatile Matter in Clear or Pigmented Coatings. This test method is incorporated by reference as specified in 40 CFR 52.742.

(*vii*) ASTM D3980–87: Standard Practice for Interlaboratory Testing of Paint and Related Materials. This practice is incorporated by reference as specified in 40 CFR 52.742.

(*viii*) ASTM E180–85: Standard Practice for Determining the Precision of ASTM Methods for Analysis of and Testing of Industrial Chemicals. This practice is incorporated by reference as specified in 40 CFR 52.742.

(*ix*) ASTM D2372–85: Standard Method of Separation of Vehicle from Solvent-reducible Paints. This method is incorporated by reference as specified in 40 CFR 52.742.

(*4*) Use of an adaptation to any of the analytical methods specified in paragraphs (a)(4)(i)(B)(*1*), (*2*) and (*3*) may be approved by the Administrator on a case-by-case basis. An owner or operator must submit sufficient documentation for the Administrator to find that the analytical methods specified in paragraphs (a)(4)(i)(B)(*1*), (*2*) and (*3*) will yield inaccurate results and that the proposed adaptation is appropriate.

(C) *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.

(1) "A Guide for Surface Coating Calculation" EPA–340/1–86–016 (which is available from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(2) "Procedures for Certifying Quantity of Volatile Organic Compounds Emitted by Paint, Ink and Other Coatings" (revised June 1986) EPA–450/3–84–019 (which is available from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(3) "A Guide for Graphic Arts Calculations" August 1988 EPA–340/1–88–003 (which is available from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(ii) *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 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(iii) *Capture system efficiency test protocols*—(A) *Applicability.* The requirements of paragraphs (a)(4)(iii)(B) of this section shall apply to all VOM emitting processes employing capture equipment (*e.g.*, hoods, ducts), except those cases noted below.

(*1*) If a source installs a permanent total enclosure (PTE) that meets USEPA specifications, and which directs all VOM to a control device, then the source is exempted from the requirements described in paragraph (B). The USEPA specifications to determine whether a strucutre is considered a PTE are given in Procedure T of appendix B of this section. 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 (a)(4)(iv) of this section.

(*2*) 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, 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.

(B) *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 must present an alternative capture efficiency protocol and obtain approval for it by the Administrator as a SIP or FIP revisions.

(*1*) Gas/gas method using temporary total enclosure (TTE). The USEPA specifications to determine whether a temporary enclosure is considered a TTE are given in Procedure T of appendix B of this section. 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 section is used to obtain Gw. Procedure F.1 in appendix B of this section is used to obtain Fw.

(*2*) *Liquid/gas method using TTE.* The USEPA specifications to determine whether a temporary enclosure is considered a TTE are given in Procedure T of appendix B of this section. The capture efficiency equation to be used for this protocol is:

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

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 section is used to obtain L. Procedure F.1 in appendix B of this section is used to obtain Fw.

(*3*) 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 section is used to obtain G. Procedure F.2 in appendix B of this section is used to obtain F_B.

(*4*) 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.

(C) *Recordkeeping and reporting.* (*1*) All affected facilities must maintain a copy of the capture efficiency protocol submitted to USEPA on file. All results of the appropriate test methods and capture efficiency protocols must be reported to USEPA 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.

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

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

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

(*5*) Sources utilizing a TTE must demonstrate that their TTE meets the requirements given in Procedure T (in appendix B of this section) 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.

(iv) *Control device efficiency testing and monitoring.* (A) 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 paragraph (a)(4)(vi) of this section.

(B) Any owner or operator that uses an afterburner or carbon adsorber to comply with any paragraph of §52.741 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:

(*1*) Combustion chamber temperature of each afterburner.

(*2*) Temperature rise across each catalytic afterburner bed or VOM concentration of exhaust.

(*3*) The VOM concentration of each carbon adsorption bed exhaust.

(v) *Overall efficiency.* (A) 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 (and revised by paragraph (a)(4)(iii)(A)(*2*) of this section 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.

(B) For coating lines which are both chosen by the owner or operator to comply with paragraphs (e)(2)(ii), (e)(2)(iii), (e)(2)(iv), (e)(2)(v), or (e)(2)(vi) of this section by the alternative in paragraph (e)(2)(i)(B) of this section and meet the criteria allowing them to comply with paragraph (e)(2) of this section instead of paragraph (e)(1) of this section, the overall efficiency of the capture system and control device, as determined by the test methods and procedures specified in paragraphs (a)(4) (iii), (iv) and (v)(A) of this section, 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 paragraph (a)(4)(i) of this section in units of kg VOM/l (lb VOM/gal) of coating solids as applied,

VOM_l = The VOM emission limit specified in paragraph (e)(2) (i) or (ii) of this section in units of kg VOM/l (lb VOM/gal) of coating solids as applied.

(vi) *Volatile organic material gas phase source test methods.* The methods in 40 CFR part 60, appendix A, delineated below shall be used to determine control device efficiencies.

(A) 40 CFR part 60, appendix A, Method 18, 25 or 25A, 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 paragraphs (a)(4)(vi)(A)(*1*) and (*2*) of this section, the test shall consist of three separate runs, each lasting a minimum of 60 min, unless the Administrator determines that process variables dictate shorter sampling times.

(*1*) When the method is to be used to determine the efficiency of a carbon adsoption 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.

(*2*) 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.

(B) 40 CFR part 60, appendix A, Method 1 or 1A shall be used for sample and velocity traverses.

(C) 40 CFR part 60, appendix A, Method 2, 2A, 2C or 2D shall be used for velocity and volumetric flow rates.

(D) 40 CFR part 60, appendix A, Method 3 shall be used for gas analysis.

(E) 40 CFR part 60, appendix A, Method 4 shall be used for stack gas moisture.

(F) 40 CFR part 60, appendix A, Methods 2, 2A, 2C, 2D, 3 and 4 shall be performed, as applicable, at least twice during each test run.

(G) Use of an adaptation to any of the test methods specified in paragraphs (a)(4)(vi) (A), (B), (C), (D), (E), and (F) of this section may be approved by the Administrator on a case-by-case basis. An owner or operator must submit sufficient documentation for the Administrator to find that the test methods specified in paragraphs (a)(4)(vi) (A), (B), (C), (D), (E), and (F) of this section will yield inaccurate results and that the proposed adaptation is appropriate.

(vii) *Leak detection methods for volatile organic material.* Owners or operators required by the various subparts of this regulation to carry out a leak detection monitoring program shall comply with the following requirements:

(A) *Leak detection monitoring.* (*1*) Monitoring shall comply with 40 CFR part 60, appendix A. Method 21.

(*2*) The detection instrument shall meet the performance criteria of Method 21.

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

(*4*) Calibration gases shall be:

(*i*) Zero air (less than 10 ppm 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.

(*5*) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Method 21.

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

(*1*) The requirements of paragraphs (a)(4) (vii)(A)(*1*) through (vii)(A)(*5*) of this section shall apply.

(*2*) The background level shall be determined as set forth in Method 21.

(*C*) Leak detection tests shall be performed consistent with:

(*1*) "APTI Course SI 417 controlling Volatile Organic Compound Emissions from Leaking Process Equipment" EPA–450/2–82–015 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(*2*) "Portable Instrument User's Manual for Monitoring VOC Sources" EPA–340/1–86–015 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(*3*) "Protocols for Generating Unit-Specific Emission Estimates for Equipment Leaks of VOC and VHAP" EPA–450/3–88–010 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(*4*) "Petroleum Refinery Enforcement Manual" EPA–340/1–80–008 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(viii) *Bulk gasoline delivery system test protocol.* (A) The method for determining the emissions of gasoline from a vapor recovery system are delineated in 40 CFR part 60, subpart XX, § 60.503.

(B) Other tests shall be performed consistent with:

(*1*) "Inspection Manual for Control of Volatile Organic Emissions from Gasoline Marketing Operations: Appendix D" EPA–340/1–80–012 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(*2*) "Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals: Appendix A" EPA–450/2–77–026 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161)

(5) *Compliance dates.* Compliance with the requirements of all rules is required by July 1, 1991, unless otherwise indicated by compliance dates contained in specific rules. This paragraph shall not operate to provide additional time for compliance under section 113(d) of the Act, 42 U.S.C. 7413(d), for sources subject to compliance upon promulgation.

(6) *Afterburners.* The operation of any natural gas fired afterburner and capture system used to comply with § 52.741 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.

(7) *Exemptions, variances, and alternative means of control or compliance determinations.* Notwithstanding the provisions of any other paragraphs of this section, any exemptions, variances or alternatives to the control requirements, emission limitations, or test methods in the Illinois SIP or FIP can only be allowed if approved by the Administrator as a SIP or FIP revision.

(8) *Vapor pressure of volatile organic liquids.* (i) If the VOL consists of only a single compound, the vapor pressure

shall be determined by ASTM Method D2879–86 (incorporated by reference as specified in 40 CFR 52.742) 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).

(ii) If the VOL is a mixture, the vapor pressure shall be determined by ASTM Method D2879–86 (incorporated by reference as specified in 40 CFR 52.742) 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 paragraph (a) of this section
X_i=Mole fraction of the component in the total mixture.

(9) *Vapor pressure of organic material or solvent.* (i) 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 as specified in 40 CFR 52.742) 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).

(ii) 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 paragraph (a) of this section,
X_i=Mole fraction of the organic material component of the total mixture.

(iii) 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 as specified in 40 CFR 52.742) or by the above equation.

(10) *Vapor pressure of volatile organic material.* (i) If the VOM consists of only a single compound, the vapor pressure shall be determined by ASTM Method D2879–86 (incorporated by reference as specified in 40 CFR 52.742) 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).

(ii) 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 paragraph (a) of this section,
X_i=Mole fraction of the VOM component of the total mixture.

(iii) 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 as specified in 40 CFR 52.742) or by the above equation.

(b)–(c) [Reserved]

(d) *Solvent cleaning*—(1) *Solvent cleaning in general.* The requirements of subpart E (sections 215.182–215.184) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) shall apply to all cold cleaning, open top vapor degreasing, and conveyorized degreasing operations.

NOTE: For Federal purposes, paragraph (d)(1) supersedes subpart E (section 215.181) of 35 Ill. Adm. Code 215.)

(2) *Compliance schedule.* Every owner or operator of an emission source which was previously exempt from the requirements of subpart E (sections 215.182–215.184) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) because it satisfied the criteria in either (d)(a)(i) or (d)(2)(ii) of this section, shall comply with the requirements of subpart E (sections 215.182–215.184) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) on and after July 1, 1991. A source which did not satisfy the criteria in either (d)(a)(i) or (d)(2)(ii) of this section, shall comply with the requirements of subpart E (sections 215.182–215.184) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) upon promulgation.

(i) If emissions of VOM exceed neither 6.8 kg (15 lbs) in any one day, nor 1.4 kg (3 lbs) in any one hour, or

(ii) If the source is used exclusively for chemical or physical analysis or for determination of product quality and commercial acceptance, provided that the operation of the source is not an integral part of the production process, the emissions of VOM from the source do not exceed 363 kg (800 lbs) in any calendar month, and the exemption had been approved in writing by the Illinois Environmental Protection Agency.

(3) *Test methods.* The following test methods shall be used to demonstrate compliance with subpart E (sections 215.182–215.184) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742):

(i) Vapor pressures shall be determined by using the procedure specified in paragraph (a)(9) of this section.

(ii) Exhaust ventilation rates shall be determined by using the procedures specified in paragraph (a)(4)(vi)(C) of this section.

(iii) The performance of control devices shall be determined by using the procedures specified in paragraph (a)(4)(vi) of this section.

(e) *Coating operations*—(1) *Emission limitations for manufacturing plants.* (i) Except as provided in paragraph (e)(3) of this section, 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 paragraph must be demonstrated through the applicable coating analysis test methods and procedures specified in paragraph (a)(4)(i) of this section and the recordkeeping and reporting requirements specified in paragraph (e)(6)(ii) of this section. As an alternative to compliance with this paragraph, the owner or operator of a coating line may meet the requirements of paragraph (e)(1)(ii) or paragraph (e)(2) of this section. The equation presented in paragraph (e)(1)(iii) of this section shall be used to calculate emission limitations for determining compliance by add-on controls, credits for transfer efficiency, emissions trades and cross-line averaging.

	kg/l	lb/gal
(A) Automobile or Light-Duty Truck Coating		
(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. Transfer efficiency credits can only be allowed if approved by the Administrator as a SIP or FIP 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 paragraph (a)(4)(ii) of this section. Paragraph (e)(1)(ii) of this section 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 submit to the Administrator a detailed proposal specifying the method of demonstrating compliance with the protocol. The proposal shall include, 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 applied coatings and the formulation solvent content of as applied coatings. Upon approval of the protocol by the Administrator, the source may proceed with the compliance demonstration.		
(4) Final repair coat	0.58	(4.8)
(B) Can Coating		
(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)
(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 paragraph (h)(1) of this section: Printing and Publishing.		
(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.		
(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) Steel pail and drum interior coating	0.52	(4.3)
(5) All other coatings	0.36	(3.0)

	kg/l	lb/gal
(K) Heavy Off-Highway Vehicle Products Coating		
(1) Extreme performance prime coat	0.42	(3.5)
(2) Extreme performance top-coat (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 paragraph (e)(1)(i)(J) of this section.		
(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)

	kg/l	lb/gal
(7) Wash coat	0.73	(6.1)

NOTE: An owner or operator of a wood furniture coating operation subject to this paragraph 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.

	kg/l	lb/gal
(M) Existing Diesel-Electric Locomotive Coating Lines in Cook County		
(1) Extreme performance prime coat	0.42	(3.5)
(2) Extreme performance top-coat (air dried)	0.42	(3.5)
(3) Final repair coat (air dried)	0.42	(3.5)
(4) High-temperature aluminum coating	0.72	(6.0)
(5) All other coatings	0.36	(3.0)

(ii) *Daily-weighted average limitations.* No owner or operator of a coating line subject to the limitations of paragraph (e)(1)(i) of this section and complying by means of paragraph (e)(1)(ii) of this section shall operate the subject coating line unless the owner or operator has demonstrated compliance with paragraph (e)(1) (ii)(A), (ii)(B), (ii)(C), (ii)(D), (ii)(E) or (ii)(F) of this section (depending upon the source category) through the applicable coating analysis test methods and procedures specified in paragraph (a)(4)(i) of this section and the recordkeeping and reporting requirements specified in paragraph (e)(6)(iii) of this section.

(A) No owner or operator of a coating line subject to only one of the limitations from among paragraph (e)(1) (i)(A)*(1)*, (i)(A)*(2)*, (i)(A)*(4)*, (i)(C), (i)(D), (i)(E), (i)(F), (i)(G), (i)(H), or (i)(I) of this section shall apply coating 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 paragraph (e)(1)(i)(J) of this section shall apply coatings to miscellaneous metal parts or products on the subject coating line unless the requirements in paragraph (e)(1)(ii)(B) (*1*) or (*2*) of this section are met.

(*1*) For each coating line which applies multiple coatings, all of which are subject to the same numerical emission limitation within paragraph (e)(1)(i)(J) of this section, 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 paragraph (e)(1)(i)(J) of this section, during the same day, the owner or operator shall submit to and receive approval from the Administrator for a site-specific FIP revision. To receive approval, the requirements of USEPA's Emissions Trading Policy Statement (and related policy) must be satisfied.

(C) No owner or operator of a can coating facility subject to the limitations of pargraph (e)(1)(i)(B) of this section shall operate the subject coating facility using a coating with a VOM content in excess of the limitations specified in paragrpah (e)(1)(i)(B) of this section unless all of the following requirements are met:

(*1*) An alternative daily emission limitation shall be determined according to paragraph (e)(1)(ii)(C)(*2*) of this section. 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:

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

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 paragraph (e)(1)(i)(B) of this section 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 paragraph (e)(1)(i)(K) of this section shall apply coatings to heavy off-highway vehicle products on the subject coating line unless the requirements of paragraph (e)(1)(ii)(D) (*1*) or (*2*) of this section are met.

(*1*) For each coating line which applies multiple coatings, all of which are subject to the same numerical emission limitation within paragraph (e)(1)(i)(K) of this section, 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 paragraph (e)(1)(i)(K) of this section, during the same day, the owner or operator shall submit to and receive approval from the Administrator for a site-specific FIP 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 paragraph (e)(1)(i)(L) of this section shall apply coatings to wood furniture on the subject coating line unless the requirements of paragraph (e)(1)(ii)(E) (*1*) or (*2*) of this section, in addition to the requirements specified in the note to paragraph (e)(1)(i)(L) of this section, are met.

(*1*) For each coating line which applies multiple coatings, all of which are subject to the same numerical emission limitation within paragraph (e)(1)(i)(L) of this section, 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 paragraph (e)(1)(i)(L) of this section, during the same day, the owner or operator shall submit to and receive approval from the Administrator for a site-specific FIP revision. To receive approval, the requirements of USEPA's Emissions Trading Policy Statement (and related policy) must be satisfied.

(F) No owner or operator of an existing diesel-electric locomotive coating line in Cook County, subject to the limitations of paragraph (e)(1)(i)(M) of this section shall apply coatings to diesel-electric locomotives on the subject coating line unless the requirements of paragraph (e)(1)(ii)(F) (*1*) or (*2*) of this section are met.

(*1*) For each coating line which applies multiple coatings, all of which are subject to the same numerical emission limitation within paragraph (e)(1)(i)(M) of this section, 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 paragraph (e)(1)(i)(M) of this section, during the same day, the owner or operator shall submit to and receive approval from the Administrator for a site-specific FIP revision. To receive approval, the requirements of USEPA's Emissions Trading Policy Statement (and related policy) must be satisfied.

(iii) 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:

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

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 paragraph (e)(1)(i) of this section,
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).

(2) *Alternative emission limitations.* Any owner or operator of a coating line subject to paragraph (e)(1) of this section may comply with this paragraph, rather than with paragraph (e)(1) of this section, if a capture system and control device are operated at all times and the owner or operator demonstrates compliance with paragraphs (e)(2) (ii), (iii), (iv), (v), (vi) or (vii) of this section (depending upon the source category) through the applicable coating analysis and capture system and control device efficiency test methods and procedures specified in paragraph (a)(4) of this section and the recordkeeping and reporting requirements specified in paragraph (e)(6)(iv) of this section; and the control device is equipped with the applicable monitoring equipment specified in paragraph (a)(4)(iv) of this section and the monitoring equipment is installed, calibrated, operated and maintained according to vendor specifications at all times the control device is in use. The use of a capture system and control device, which does not demonstrate compliance with paragraph (e)(2) (ii), (iii), (iv), (v), (vi), or (vii), may only be used as an alternative to compliance with paragraph (e)(1) of this section if approved as a FIP revision.

(i) *Alternative add-on control methodologies.* (A) 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

(B) 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 paragraph (e)(1) of this section. Use of any control system other than an afterburner, carbon absorption, condensation, or absorption scrubber system can only be allowed if approved by the Administrator as a SIP or FIP revision. Transfer efficiency credits can only be allowed if approved by the Administrator as a SIP or FIP revision. Baseline transfer efficiencies and transfer efficiency test methods must be approved by the Administrator.

Such overall efficiency is to be determined as follows:

(*1*) Obtain the emission limitation from the appropriate paragraph in (e)(1) of this section,

(*2*) Calculate "S" according to the equation in paragraph (e)(1)(iii) of this section,

(*3*) Calculate the overall efficiency required according to paragraph (a)(4)(v) of this section. For the purposes of calculating this value, according to the equation in (a)(4)(v)(B) of this section VOM_1 is equal to the value of "S" as determined above in (i)(B)(*2*).

(ii) No owner or operator of a coating line subject to only one of the emission limitations from among paragraph (e)(1)(i)(A)(*1*), (e)(1)(i)(A)(*2*), (e)(1)(i)(A)(*4*), (e)(1)(i)(C), (e)(1)(i)(D), (e)(1)(i)(E), (e)(1)(i)(F), (e)(1)(i)(G), (e)(1)(i)(H), or (e)(1)(i)(I) of this section and equipped with a capture system and control device shall operate the subject coating line unless the requirements in paragraph (e)(2)(i) (A) or (B) of this section are met. No owner or operator of a coating line subject to paragraph (e)(1)(i)(A)(*3*) of this section 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 paragraph (a)(4)(ii) of this section.

(iii) 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 paragraph (e)(1)(i)(J) of this section (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 paragraph (e)(2)(i) (A) or (B) of this section are met.

(iv) 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 paragraph (e)(1)(i)(K) of this section (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 paragraph (e)(2)(i) (A) or (B) of this section are met.

(v) No owner or operator of an existing diesel-electric locomotive coating line in Cook County which applies one or more coatings during the same day, all of which are subject to the same numerical emission limitation within paragraph (e)(1)(i)(M) of this section (e.g., all coatings used on the line are subject to 0.42 kg/l [3.5 lbs/gals]), and which is equipped with a capture system and control device shall operate the subject coating line unless the requirements in paragraph (e)(2)(i) (A) or (B) of this section are met.

(vi) 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 paragraph (e)(1)(i)(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 paragraph (e)(2)(i) (A) or (B) of this section are met. If compliance is achieved by meeting the requirements in paragraph (e)(2)(i)(B) of this section, then the provisions in the note to paragraph (e)(1)(i)(L) of this section must also be met.

(vii) 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 paragraph (e)(2)(vii) (A) or (B) of this section are met.

(A) An alternative daily emission limitation shall be determined according to paragraph (e)(1)(ii)(C)(*2*) of this section. Actual daily emissions shall never exceed the alternative daily emission limitation and shall be calculated by use of the following equation:

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

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 1/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.

(B) 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.

(3) *Exemptions from emission limitations*—(i) *Exemptions for all source categories except wood furniture coating.* The limitations of paragraph (e) of this section shall not apply to coating lines within a facility, that otherwise would be subject to the same subparagraph of paragraph (e)(1)(i) of this section (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 subparagraph 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 subparagraph (e)(1)(i)(B) of this section 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 paragraph (a)(4)(i) of this section and the recordkeeping and reporting requirements specified in paragraph (e)(6)(i) of this section 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 paragraph (e)(1) of this section. Once a category of coating lines at a facility is subject to the limitations in paragraph (e)(1) of this section, the coating lines are always subject to the limitations in paragraph (e)(1) of this section.

(ii) *Applicability for wood furniture coating.* (A) The limitations of paragraph (e) of this section shall apply to a plant's wood furniture coating lines if the plant contains process emission sources, not regulated by paragraphs (d), (e) (excluding paragraph (e)(1)(i)(L)), (h) (excluding paragraph (h)(5)), (i), (j), or (q)(1), or subparts B, Q (excluding sections 215.432 and 215.436), R (excluding sections 215.447, 215.450, and 215.452), S, V, X, Y (sections 215.582–215.584), or Z of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), 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 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 or FIP version.

(B) If a plant ceases to fulfill the criteria of paragraph (e)(3)(ii)(A) of this section, the limitations of paragraph (e)(1)(i)(L) of this section shall continue to apply to any wood furniture coating line which was ever subject to the limitations of paragraph (e)(1)(i)(L) of this section.

(C) For the purposes of paragraph (e)(3)(ii) of this section, an emission source shall be considered regulated by a subpart (of the Illinois rules), section, or paragraph if it is subject to the limitations of that subpart (of the Illinois rules), section, or paragraph. An emission source is not considered regulated by a subpart (of the Illinois rules), section, or paragraph if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

(D) Any owner or operator of a wood furniture coating line to which the limitations of paragraph (e) of this section are not applicable due to the criteria in paragraph (e)(3)(ii) of this section shall, upon request by the Administrator, submit records to the Administrator within 30 calendar days from the date of the request that document that the coating line is exempt from the limitations of paragraph (e) of this section.

(4) *Exemption from general rule on use of organic material.* No owner or operator of a coating line subject to the limitations of paragraph (e)(1) of this

section is required to meet the limitations of subpart K (section 215.301 or 215.302) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), after the date by which the coating line is required to meet paragraph (e)(1) of this section.

(5) *Compliance schedule.* Except as specified in paragraph (e)(7) of this section, every owner or operator of a coating line (of a type included within paragraph (e)(1)(i) of this section) shall comply with the requirements of paragraph (e)(1),(e)(2) or (e)(3) of this section and paragraph (e)(6) of this section in accordance with the appropriate compliance schedule as specified in paragraph (e)(5)(i),(ii),(iii) or (iv) of this section.

(i) No owner or operator of a coating line which is exempt from the limitations of paragraph (e)(1) of this section because of the criteria in paragraph (e)(3)(i) of this section shall operate said coating line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraph (e)(6)(i) of this section. Wood furniture coating lines are not subject to paragraph (e)(6)(i) of this section.

(ii) No owner or operator of a coating line complying by means of paragraph (e)(1)(i) of this section shall operate said coating line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (e)(1)(i) and (e)(6)(ii) of this section.

(iii) No owner or operator of a coating line complying by means of paragraph (e)(1)(ii) of this section shall operate said coating line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (e)(1)(ii) and (e)(6)(iii) of this section.

(iv) No owner or operator of a coating line complying by means of paragraph (e)(2) of this section shall operate said coating line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (e)(2) and (e)(6)(iv) of this section.

(6) *Recordkeeping and reporting.* 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 paragraph (a)(4) of this section to establish the records required under paragraph (e)(6) of this section.

(i) Any owner or operator of a coating line which is exempted from the limitations of paragraph (e)(1) of this section because of paragraph (e)(3)(i) of this section shall comply with the following:

(A) By July 1, 1991, the owner or operator of a facility referenced in paragraph (e)(6)(i) of this section shall certify to the Administrator that the facility is exempt under the provisions of paragraph (e)(3)(i) of this section. Such certification shall include:

(*1*) A declaration that the facility is exempt from the limitations of paragraph (e)(1) of this section because of paragraph (e)(3)(i) of this section; and

(*2*) 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:

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

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 Administrator.

(B) On and after July 1, 1991, the owner or operator of a facility referenced in paragraph (e)(6)(i) of this section 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:

(*1*) The name and identification number of each coating as applied on each coating line.

(*2*) 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) On and after July 1, 1991, the owner or operator of a facility exempted from the limitations of paragraph (e)(1) of this section because of paragraph (e)(3)(i) of this section shall notify the Administrator 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 shall be reported by sending a copy of such record to the Administrator within 30 days after the exceedance occurs.

(ii) Any owner or operator of a coating line subject to the limitations of paragraph (e)(1) of this section and complying by means of paragraph (e)(1)(i) of this section shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a new coating line, or upon changing the method of compliance from an existing subject coating line from paragraph (e)(1)(ii) or paragraph (e)(2) to paragraph (e)(1)(i) of this section; the owner or operator of a subject coating line shall certify to the Administrator that the coating line will be in compliance with paragraph (e)(1)(i) of this section on and after July 1, 1991, or on and after the initial start-up date. Such certification shall include:

(*1*) The name and identification number of each coating as applied on each coating line.

(*2*) 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.

(*3*) For coating lines subject to paragraph (e)(1)(i)(A)(*3*) of this section, certification shall include:

(*i*) The name and identification number of each coating line which will comply by means of paragraph (e)(1)(i)(A)(*3*) of this section,

(*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 paragraph (e)(6)(ii)(B) of this section for coating lines subject to paragraph (e)(1)(i)(A)(*3*) of this section,

(*vi*) An example format in which the records required in paragraph (e)(6)(ii)(B) of this section for coating lines subject to paragraph (e)(1)(i)(A)(*3*) of this section.

(B) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a coating line subject to the limitations of paragraph (e)(1) of this section and complying by means of paragraph (e)(1)(i) of this section 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:

(*1*) The name and identification number of each coating as applied on each coating line.

(*2*) 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.

(*3*) For coating lines subject to paragraph (e)(1)(i)(A)(*3*) of this section, 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 Administrator, pursuant to paragraph (e)(1)(A)(*3*) of this section.

(C) On and after July 1, 1991, the owner or operator of a subject coating line shall notify the Administrator in the following instances:

(*1*) Any record showing violation of paragraph (e)(1)(i) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation, except that any record showing a violation of paragraph (e)(1)(i)(A)(*3*) of this section shall be reported by sending a copy of such record to the Administrator within 15 days from the end of the month in which the violation occurred.

(*2*) At least 30 calendar days before changing the method of compliance with paragraph (e)(1) of this section from paragraph (e)(1)(i) to paragraph (e)(1)(ii) or paragraph (e)(2) of this section, the owner or operator shall comply with all requirements of paragraph (e)(6) (iii)(A) or (iv)(A) of this section, respectively. Upon changing the method of compliance with paragraph (e)(1) of this section from paragraph (e)(1)(i) to paragraph (e)(1)(ii) or paragraph (e)(2) of this section, the owner or operator shall comply with all requirements of paragraph (e)(6) (iii) or (iv) of this section, respectively.

(*3*) For coating lines subject to paragraph (e)(1)(i)(A)(*3*) of this section, the owner or operator shall notify the Administrator of any change to the topcoating operation at least 30 days before the change is effected. The Administrator shall determine whether or not recertification testing is required. If the Administrator determines that recertification testing is required, then the owner or operator shall submit a proposal to the Administrator to test within 30 days and retest within 30 days of the Administrator's approval of the proposal.

(iii) Any owner or operator of a coating line subject to the limitations of paragraph (e)(1) of this section and complying by means of paragraph (e)(1)(ii) of this section shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a new coating line, or upon changing the method of compliance for an existing subject coating line from paragraph (e)(1)(i) or paragraph (e)(2) to paragraph (e)(1)(ii) of this section; the owner or operator of the subject coating line shall certify to the Administrator that the coating line will be in compliance with paragraph (e)(1)(ii) of this section on and after July 1, 1991, or on and after the initial start-up date. Such certification shall include:

(*1*) The name and identification number of each coating line which will comply by means of paragraph (e)(1)(ii) of this section.

(*2*) The name and identification number of each coating as applied on each coating line.

(*3*) 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.

(*4*) 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.

(*5*) The method by which the owner or operator will create and maintain records each day as required in paragraph (e)(6)(iii)(B) of this section.

(*6*) An example of the format in which the records required in paragraph (e)(6)(iii)(B) of this section will be kept.

(B) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a coating line subject to the limitations of paragraph (e)(1) of this section and complying by means of paragraph (e)(1)(ii) of this section, 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:

(*1*) The name and identification number of each coating as applied on each coating line.

(*2*) 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*) The daily-weighted average VOM content of all coatings as applied on each coating line as defined in paragraph (a)(3) of this section.

(C) On and after July 1, 1991, the owner or operator of a subject coating line shall notify the Administrator in the following instances:

(*1*) Any record showing violation of paragraph (e)(1)(ii) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*2*) At least 30 calendar days before changing the method of compliance with paragraph (e) from paragraph (e)(1)(ii) to paragraph (e)(1)(i) or paragraph (e)(2) of this section, the owner or operator shall comply with all requirements of paragraph (e)(6)(ii)(A) or (iv)(A), respectively. Upon changing the method of compliance with paragraph (e) from paragraph (e)(1)(ii) to paragraph (e)(1)(i) or paragraph (e)(2) of this section, the owner or operator shall comply with all requirements of paragraph (e)(6)(ii) or (iv), respectively.

(iv) Any operator or owner of a coating line subject to the limitations of paragraph (e)(2) of this section and complying by means of paragraph (e)(2)(ii), (iii), (iv), (v), (vi) or (vii) of this section shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a new coating line, or upon changing the method of compliance for an existing coating line from paragraph (e)(1) (i) or (ii) to paragraph (e)(2) of this section; the owner or operator of the subject coating line shall perform all tests and submit to the Administrator the results of all tests and calculations necessary to demonstrate that the subject coating line will be in compliance with paragraph (e)(2) of this section on and after July 1, 1991, or on and after the initial start-up date.

(B) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a coating line subject to the limitations of paragraph (e)(2) of this section and complying by means of paragraph (e)(2) (ii), (iii), (iv), (v), (vi) or (vii) of this section 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:

(*1*) The weight of VOM per volume of coating solids as applied each day on each coating line, if complying pursuant to paragraph (e)(2)(i)(B) of this section.

(*2*) Control device monitoring data.

(*3*) A log operating time for the capture system, control device, monitoring equipment and the associated coating line.

(*4*) 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.

(C) On and after July 1, 1991, the owner or operator of a subject coating line shall notify the Administrator in the following instances:

(*1*) Any record showing violation of paragraph (e)(2) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*2*) At least 30 calendar days before changing the method of compliance with paragraph (e) from paragraph (e)(2) to paragraph (e)(1)(i) or paragraph (e)(1)(ii) of this section, the owner or operator shall comply with all requirements of paragraph (e)(6)(ii)(A) or (iii)(A) of this section, respectively. Upon changing the method of compliance with paragraph (e) from paragraph (e)(2) to paragraph (e)(1)(i) or paragraph (e)(1)(ii) of this section, the owner or operator shall comply with all requirements of paragraph (e)(6)(ii) or (iii) of this section, respectively.

(7) *Compliance schedule for diesel electric locomotive coatings.* Notwithstanding any other provision of this subpart, the compliance date for the emission limitations and standards for “topcoat” and “final repair coat” operations only as applied to General Motors Corporation at their diesel electric locomotive coating lines in Cook County, Illinois, codified at 40 CFR 52.741(e)(1)(i)(M) (*2*) and (*3*) is specified in this paragraph (e)(7). Compliance with the requirements of paragraph (e)(1), (e)(2) or (e)(3) of this section and paragraph (e)(6) of this section must be in accordance with the appropriate compliance schedule as specified in paragraph (e)(7)(i),(ii),(iii), or (iv) of this section.

(i) No owner or operator of a coating line which is exempt from the limitations of paragraph (e)(1) of this section because of the criteria in paragraph (e)(3)(i) of this section shall operate said coating line on or after March 25, 1995, unless the owner or operator has complied with, and continues to comply with, paragraph (e)(6)(i) of this section.

(ii) No owner or operator of a coating line complying by means of paragraph (e)(1)(i) of this section shall operate said coating line on or after March 25, 1995, unless the owner or operator has complied with, and continues to comply with, paragraph (e)(1)(i) and (e)(6)(ii) of this section.

(iii) No owner or operator of a coating line complying by means of paragraph (e)(1)(ii) of this section shall operate said coating line on or after March 25, 1995, unless the owner or operator has complied with, and continues to comply with, paragraphs (e)(1)(ii) and (e)(6)(iii) of this section.

(iv) No owner or operator of a coating line complying by means of paragraph (e)(2) of this section shall operate said coating line on or after March 25, 1995, unless the owner or operator has complied with, and continues to comply with, paragraphs (e)(2) and (e)(6)(iv) of this section.

(8) The control requirements in this paragraph apply to the wood coating line, which coats wooden globe stand components, at Replogle Globes, Inc. (Replogle) Broadview facility in Cook County, Illinois, instead of the control requirements in paragraphs (e)(1) and (e)(2) of this section. Compliance with this paragraph must be demonstrated through the applicable coating analysis test methods and procedures specified in paragraph (a)(4)(i) of this section.

(i) After October 6, 1991, no coatings shall at any time be applied which exceed the following emission limitations for the specified coating.

(A) 6.59 pounds (lbs) Volatile Organic Material (VOM) per gallon of stain (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to coat wooden globe stand components. Such stain consists of #9250 Walnut NGR Stain (RGI # W06000100), #9974 Cherry NGR Stain (RGI # W06003500) and #9943 Ash NGR Stain (RGI # W06003600). The Administrator must be notified at least ten (10) days prior to the use of any replacement stains.

(B) 5.53 lbs VOM per gallon of Sanding Sealer (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to coat wooden globe stand components. Such sealer consists of #15304 High Build Sanding Sealer (RGI # W06003700). The Administrator must be notified at least ten (10) days prior to the use of any replacement sanding sealer.

(C) 5.20 lbs VOM per gallon of lacquer (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to coat wooden globe stand components. Such lacquer consists of #15352 High Build Lacquer (RGI # W06003300). The Administrator shall be notified at least ten (10) days prior to the use of any replacement lacquer.

(ii) After October 6, 1991, the volume of coatings used shall not exceed the following:

(A) 5,000 gallons per year total for all coatings specified in paragraph (e)(8)(i)(A) of this section. The yearly volume of coatings used are to be calculated as follows:

(*1*) Compute the volume of specified coating used each month by the 15th of the following month.

(*2*) By the 15th of each month, add the monthly coating use for the 12 previous months (to obtain the yearly volume of coatings used).

(B) 4,000 gallons per year total for all coatings specified in paragraph (e)(8)(i)(B) of this section. The yearly volume of the coatings used are to be calculated as specified in paragraphs (e)(8)(ii)(A)(1) and (e)(8)(ii)(A)(2) of this section.

(C) 5,000 gallons per year total for all coatings specified in paragraph (e)(8)(i)(C) of this section. The yearly volume of coatings used are to be calculated as specified in paragraphs (e)(8)(ii)(A)(1) and (e)(8)(ii)(A)(2) of this section.

(iii) Beginning on October 6, 1991, the owner and operator of the Replogle Globes, Inc. plant in Broadview, Illinois shall keep the following records for each month. All records shall be retained at Replogle Globes, Inc. for three (3) years and shall be made available to the Administrator on request.

(A) the name and identification number of each coating as applied on any wood coating line.

(B) The weight of VOM per volume (determined in accordance with the procedures in paragraph (a)(4)(i) of this section) and the volume of each coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each month on any wood coating line.

(9) [Reserved]

(10) Until December 31, 1996, the control and recordkeeping requirements in this paragraph apply to the three solvent-based polyester paper coating lines (Lines C, D and E) at Riverside Laboratories' Kane County, Illinois facility, instead of the control requirements in paragraphs (e)(1) and (e)(2) of this section and the recordkeeping requirements in paragraph (e)(6) of this section. Compliance with this paragraph must be demonstrated through the applicable coating analysis test methods and procedures specified in paragraph (a)(4)(i) of this section. The requirements in paragraphs (e)(1), (e)(2), and (e)(6) of this section shall apply to Riverside on and after December 31, 1996.

(i) After December 21, 1995, no coatings shall at any time be applied on Lines C, D or E which exceed 3.5 pounds (lbs.) volatile organic material (VOM) per gallon of coating (minus water and any compounds which are specifically exempted from the definition of VOM), except as provided in paragraph (e)(10)(ii) of this section.

(ii) After December 21, 1995, the following specifically identified coatings may exceed 3.5 lbs. VOM per gallon of coating (minus water and any compounds which are specifically exempted from the definition of VOM) only if they are applied on Line E and they do not exceed the limits indicated below (minus water and any compounds which are specifically exempted from the definition of VOM):

EXP–5027—4.34 lbs./gallon
PD 75 CLR—4.19 lbs./gallon
PD 75 BRN—4.18 lbs./gallon
SQZ–54—3.88 lbs./gallon
SPX–34GL—3.51 lbs./gallon

(iii) That portion of Riverside's polyester production which is manufactured with the use of any VOC, from Lines C, D, and E, may not exceed the following levels: 35 million square feet per year during and after 1992, 29 million square feet per year during and after 1994, and 25 million square feet during 1996. Compliance with this requirement shall be determined by adding the polyester production from any 12 consecutive months during and after the years indicated, through 1996. That is, the polyester production for any 12 consecutive months starting with January 1992 cannot exceed 35 million square feet; the polyester production from any 12 consecutive months starting with January 1994 cannot exceed 29 million square feet; and the polyester production for the twelve months from January through December 1996 cannot exceed 25 million square feet. Only those square feet of polyester whose production involves the use of VOC need to be restricted by the production levels in this paragraph (e)(10)(iii) of this section.

(iv) By December 21, 1995, Riverside shall certify to the Administrator that its polyester coating operations will be in compliance with paragraphs (e)(10)(i), (e)(10)(ii), and (e)(10)(iii) of this section. Such certification shall include the following:

(A) The name and identification number of each coating as applied on coating lines C, D and E.

(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 on each coating line.

(v) The Administrator must be notified at least 10 days prior to the use of any polyester coating not previously identified pursuant to paragraph (e)(10)(iv) of this section. This notification must include the information specified in paragraphs (e)(10)(iv)(A) and (e)(10)(iv)(B) of this section.

(vi) On and after December 21, 1995, Riverside shall collect and record all of the following information each day for each coating and maintain the information at the facility for a period of 3 years:

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

(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.

(C) Any record showing a VOM content in excess of the emission limits in paragraph (e)(10)(i) or (e)(10)(ii) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following its collection.

(D) Any VOM besides acetone used in any coating must be identified.

(vii) Starting with the first full month after December 21, 1995, Riverside shall collect and record the figures on polyester production (in square feet), for each month and maintain the information at the facility for a period of at least 3 years.

(viii) Regardless of any other provision of paragraph (e)(10) of this section, after August 21, 1995 no coating which contains any VOM other than acetone shall at any time be applied on Line C, D, or E which exceeds 2.9 lbs. VOM per gallon of coating (minus water and any compounds which are specifically exempted from the definition of VOM).

(f)–(g) [Reserved]

(h) *Printing and publishing*—(1) *Flexographic and rotogravure printing.* (i) 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 paragraph (h)(1)(i)(A) or (B) of this section. Compliance with this paragraph must be demonstrated through the applicable coating or ink analysis test methods and procedures specified in paragraph (a)(4)(i) of this section and the recordkeeping and reporting requirements specified in paragraph (h)(4)(ii) of this section. As an alternative to compliance with paragraph (h)(1)(i) of this section, a subject printing line may meet the requirements of paragraph (h)(1)(ii) or (iii) of this section.

(A) 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

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

(ii) 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 paragraph (h)(1)(i)(A) (as determined by paragraph (h)(1)(ii)(A) or (h)(1)(i)(B) (as determined by paragraph (h)(1)(ii)(B) of this section. Compliance with this paragraph must be demonstrated through the applicable coating or ink analysis test methods and procedures specified in paragraph (a)(4)(i) of this section and the recordkeeping and reporting requirements specified in paragraph (h)(4)(iii) of this section.

(A) 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 paragraph (h)(1)(i)(A) of this section.

$$\mathrm{VOM}_{(i)(A)} = \frac{\sum_{i=1}^{n} C_i L_i \left(V_{si} + V_{VOMi}\right)}{\sum_{i=1}^{n} L_i \left(V_{si} + V_{VOMi}\right)}$$

Where:

$\mathrm{VOM}_{(i)(A)}$=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.

(B) 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 paragraph (h)(1)(i)(B) of this section.

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

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.

(iii) 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 paragraph (h)(1)(iii) (A), (B) or (C) and paragraphs (h)(1)(iii) (D), (E) and (F) of this section.

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

(B) An incineration system is used which reduces the captured VOM emissions by at least 90 percent by weight, or

(C) An alternative VOM emission reduction system is demonstrated to have at least a 90 percent control device efficiency and the alternative emission reduction system is approved by the Administrator as a SIP or FIP revisions, and

(D) The printing line is equipped with a capture system and control device that provides an overall reduction in VOM emissions of at least:

(*1*) 75 percent where a publication rotogravure printing line is employed, or

(*2*) 65 percent where a packaging rotogravure printing line is employed, or

(*3*) 60 percent where a flexographic printing line is employed, and

(E) The control device is equipped with the applicable monitoring equipment specified in paragraph (a)(4)(iv)(B) of this section and the monitoring equipment is installed, calibrated, operated and maintained according to vendor specifications at all times the control device is in use, and

(F) 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 paragraph by using the applicable capture system and control device test methods and procedures specified in paragraphs (a)(4) (iii) through (vi) of this section and by complying with the recordkeeping and reporting requirements specified in paragraph (h)(4)(iv) of this section.

(2) *Applicability*. (i) The limitations of paragraph (h)(1) of this section 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:

(A) 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

(B) A federally enforceable construction permit or SIP or FIP 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.

(ii) Upon achieving compliance with paragraph (h) of this section, the emission source is not required to meet subpart K (sections 215.301 or 215.302) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742).

Emission sources exempt from paragraph (h) of this section are subject to subpart K (sections 215.301 or 215.302). Rotogravure or flexographic equipment used for both roll printing and paper coating are subject to paragraph (h) of this section.

(iii) Once subject to the limitations of paragraph (h)(1) of this section, a flexographic or rotogravure printing line is always subject to the limitations of paragraph (h)(1) of this section.

(iv) Any owner or operator of any flexographic or rotogravure printing line that is exempt from the limitations of paragraph (h)(1) of this section because of the criteria in paragraph (h)(2) of this section is subject to the recordkeeping and reporting requirements specified in paragraph (h)(4)(i) of this section.

(3) *Compliance schedule.* Every owner or operator of a flexographic and/or rotogravure printing line shall comply with the applicable requirements of paragraph (h)(1) of this section and paragraph (h)(4) of this section in accordance with the applicable compliance schedule specified in paragraph (h)(3) (i), (ii), (iii) or (iv) of this section.

(i) No owner or operator of a flexographic or rotogravure printing line which is exempt from the limitations of paragraph (h)(1) of this section because the criteria in paragraph (h)(2) of this section shall operate said printing line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraph (h)(4)(i) of this section.

(ii) No owner or operator of a flexographic or rotogravure printing line complying by means of paragraph (h)(1)(i) of this section shall operate said printing line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (h)(1)(i) and (h)(4)(ii) of this section.

(iii) No owner or operator of a flexographic or rotogravure printing line complying by means of paragraph (h)(1)(ii) of this section shall operate said printing line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (h)(1)(ii) and (h)(4)(iii) of this section.

(iv) No owner or operator of a flexographic or rotogravure printing line complying by means of paragraph (h)(1)(iii) of this section shall operate said printing line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (h)(1)(iii) and (h)(4)(iv) of this section.

(4) *Recordkeeping and reporting.* 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 paragraph (a)(4) of this section to establish the records required under paragraph (h)(4) of this section.

(i) Any owner or operator of a printing line which is exempted from the limitations of paragraph (h)(1) of this section because of the criteria in paragraph (h)(2) of this section shall comply with the following:

(A) By July 1, 1991, the owner or operator of a facility to which paragraph (h)(4)(i) of this section is applicable shall certify to the Administrator that the facility is exempt under the provisions of paragraph (h)(2) of this section. Such certification shall include:

(*1*) A declaration that the facility is exempt from the limitations of the criteria in paragraph (h)(1) of this section because of paragraph (h)(2) of this section, and

(*2*) 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 flexograhpic 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 Administrator.

(B) On and after July 1, 1991, the owner or operator of a facility referenced in paragraph (h)(4)(i) of this section 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:

(*1*) The name and identification number of each coating and ink as applied on each printing line.

(*2*) The VOM content and the volume of each coating and ink as applied each year on each printing line.

(C) On and after July 1, 1991, the owner or operator of a facility exempted from the limitations of paragraph (h)(1) of this section because of the criteria in paragraph (h)(2) of this section shall notify the Administrator 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, shall be reported by sending a copy of such record to the Administrator within 30 days after the exceedance occurs.

(ii) Any owner or operator of a printing line subject to the limitations of paragraph (h)(1) of this section and complying by means of paragraph (h)(1)(i) of this section shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a new printing line, or upon changing the method of compliance from an existing subject printing line from paragraph (h)(1) (ii) or (iii) of this section to paragraph (h)(1)(i) of this section, the owner or operator of a subject printing line shall certify to the Administrator that the printing line will be in compliance with paragraph (h)(1)(i) of this section on and after July 1, 1991, or on and after the initial start-up date. Such certification shall include:

(*1*) The name and identification number of each coating and ink as applied on each printing line.

(*2*) The VOM content of each coating and ink as applied each day on each printing line.

(B) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of paragraph (h)(1) of this section and complying by means of paragraph (h)(1)(i) of this section 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:

(*1*) The name and identification number of each coating and ink as applied on each printing line.

(*2*) The VOM content of each coating and ink as applied each day on each printing line.

(C) On and after July 1, 1991, the owner or operator of a subject printing line shall notify the Administrator in the following instances:

(*1*) Any record showing violation of paragraph (h)(1)(i) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*2*) At least 30 calendar days before changing the method of compliance with paragraph (h)(1) of this section from paragraph (h)(1)(i) of this section to paragraph (h)(1) (ii) or (iii) of this section, the owner or operator shall comply with all requirements of paragraph (h)(4) (iii)(A) or (iv)(A) of this section respectively. Upon changing the method of compliance with paragraph (h)(1) from paragraph (h)(1)(i) to paragraph (h)(1) (ii) or (iii) of this section, the owner or operator shall comply with all requirements of paragraph (h)(4) (iii) or (iv) of this section, respectively.

(iii) Any owner or operator of a printing line subject to the limitations of paragraph (h)(1) of this section and complying by means of paragraph (h)(1)(ii) of this section shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing subject printing line from paragraph (h)(1) (i) or (iii) of this section to paragraph (h)(1)(ii) of this section, the owner or operator of the subject printing line shall certify to the Administrator that the printing line will be in compliance with paragraph (h)(1)(ii) of this section on and after July 1, 1991, or on and after the initial start-up date. Such certification shall include:

(*1*) The name and identification number of each printing line which will comply by means of paragraph (h)(1)(ii) of this section.

(*2*) The name and identification number of each coating and ink available for use on each printing line.

(*3*) The VOM content of each coating and ink as applied each day on each printing line.

(*4*) 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.

(*5*) The method by which the owner or operator will create and maintain records each day as required in paragraph (h)(4)(iii)(B) of this section.

(*6*) An example of the format in which the records required in paragraph (h)(4)(iii)(B) of this section will be kept.

(B) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of paragraph (h)(1) of this section and complying by means of paragraph (h)(1)(ii) of this section shall collecting line and maintain the information at the facility for a period of three years:

(*1*) The name and identification number of each coating and ink as applied on each printing line.

(*2*) The VOM content and the volume of each coating and ink as applied each day on each printing line.

(*3*) The daily-weighted average VOM content of all coatings and inks as applied on each printing line.

(C) On and after July 1, 1991, the owner or operator of a subject printing line shall notify the Administrator in the following instances:

(*1*) Any record showing violation of paragraph (h)(1)(ii) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*2*) At least 30 calendar days before changing the method of compliance with paragraph (h)(1) of this section from paragraph (h)(1)(ii) to paragraph (h)(1)(i) or (iii) of this section, the owner or operator shall comply with all requirements of paragraph (h)(4)(ii)(A) or (iv)(A), respectively. Upon changing the method of compliance with paragraph (h)(1) from paragraph (h)(1)(ii) to paragraph (h)(1)(i) or (iii), the owner or operator shall comply with all requirements of paragraph (h)(4)(ii) or (iv) of this section, respectively.

(iv) Any owner or operator of a printing line subject to the limitations of paragraph (h)(1) of this section and complying by means of paragraph (h)(1)(iii) of this section shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing printing line from paragraph (h)(1)(i) or (ii) of this section to paragraph (h)(1)(iii) of this section, the owner or operator of the subject printing line shall perform all tests and submit to the Administrator the results of all tests and calculations necessary to demonstrate that the subject printing line will be in compliance with paragraph (h)(1)(iii) of this section on and after July 1, 1991, or on and after the initial start-up date.

(B) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of paragraph (h)(1) of this section and complying by means of paragraph (h)(1)(iii) of this section 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:

(*1*) Control device monitoring data.

(*2*) A log of operating time for the capture system, control device, monitoring equipment and the associated printing line.

(*3*) 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.

(C) On and after July 1, 1991, the owner or operator of a subject printing line shall notify the Administration in the following instances:

(*1*) Any record showing violation of paragraph (h)(1)(iii) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*2*) At least 30 calendar days before changing the method of compliance with paragraph (h)(1) from paragraph (h)(1)(iii) to paragraph (h)(1) (i) or (ii), the owner or operator shall comply with all requirements of paragraph (h)(4) (ii)(A) or (iii)(A) of this section, respectively. Upon changing the method of compliance with paragraph (h)(1) from paragraph (h)(1)(iii) to paragraph (h)(1) (i) or (ii) of this section, the owner or operator shall comply with all requirements of paragraph (h)(4) (ii) or (iii) of this section, respectively.

(5) *Heatset-web-offset lithographic printing*—(i) *Applicability.* (A) The limitations of paragraph (h)(5)(ii) of this section 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:

(*1*) 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

(*2*) A federally enforceable construction permit or SIP or FIP revision for all heatset-web-offset lithographic 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 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

(B) Any owner or operator of any heatset-web-offset lithographic printing line that is exempt from the limitations in paragraph (h)(5)(ii) of this section because of the criteria in paragraph (h)(5)(i)(A) of this section shall be subject to the recordkeeping and reporting requirements in paragraph (h)(5)(iii)(A) of this section.

(ii) *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 paragraph (h)(5)(ii) (A) or (B) of this section and the requirements in paragraphs (h)(5)(ii) (C) and (D) of this section.

(A) An afterburner system is installed and operated that reduces 90 percent of the VOM emissions from the dryer exhaust, or

(B) 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

(C) The control device is equipped with the applicable monitoring equipment specified in paragraph (a)(4)(iv)(B) of this section and the monitoring equipment is installed, calibrated, operated and maintained according to vendor specifications at all times the control device is in use, and

(D) The control device is operated at all times when the subject printing line is in operation. The owner or operator shall demonstrate compliance with paragraph (h)(5) of this section by using the applicable test methods and procedures specified in paragraphs (a)(4) (i), (iv), and (vi) of this section and by complying with the recordkeeping and reporting requirements specified in paragraph (h)(5)(iii) of this section.

(iii) *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 paragraph (a)(4) of this section to establish the records required under paragraph (h)(5)(iii) of this section.

(A) Any owner or operator of a printing line which is exempted from the limitations of paragraph (h)(5)(ii) of this section because of the criteria in paragraph (h)(5)(i) of this section shall comply with the following:

(*1*) By July 1, 1991, the owner or operator of a facility to which paragraph (h)(5)(iii)(A) of this section is applicable shall certify to the Administrator that the facility is exempt under the provisions of paragraph (h)(5)(i) of this section. Such certification shall include:

(*i*) A declaration that the facility is exempt from the limitations of paragraph (h)(5)(ii) of this section because of the criteria in paragraph (h)(5)(i) of this section, 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 Administrator.

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 Administrator.

(*2*) On and after July 1, 1991, the owner or operator of a facility to which paragraph (h)(5)(iii)(A) of this section 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.

(*3*) On and after July 1, 1991, the owner or operator of a facility exempted from the limitations of paragraph (h)(5)(ii) of this section because of the criteria in paragraph (h)(5)(i) of this section shall notify the Administrator 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 shall be reported by sending a copy of such record to the Administrator within 30 days after the exceedance occurs.

(B) Any owner or operator of a printing line subject to the limitations of paragraph (h)(5)(ii) of this section and complying by means of paragraph (h)(5)(ii)(A) of this section shall comply with the following:

(*1*) By July 1, 1991, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing printing line from paragraph (h)(5) (ii)(B) to (ii)(A) of this section, the owner or operator of the subject printing line shall perform all tests and submit to the Administrator the results of all tests and calculations necessary to demonstrate that the subject printing line will be in compliance with paragraph (h)(5)(ii)(A) of this section on and after July 1, 1991, or on and after the initial start-up date.

(*2*) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of paragraph (h)(5)(ii) of this section and complying by means of paragraph (h)(5)(ii)(A) of this section 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.

(*3*) On and after July 1, 1991, the owner or operator of a subject printing line shall notify the Administrator in the following instances:

(*i*) Any record showing violation of paragraph (h)(5)(ii)(A) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*ii*) At least 30 calendar days before changing the method of compliance with paragraph (h)(5)(ii) of this section from paragraph (h)(5) (ii)(A) to (ii)(B), the owner or operator shall comply with all requirements of paragraph (h)(5)(iii)(C)(*1*) of this section. Upon changing the method of compliance with paragraph (h)(5)(ii) from paragraph (h)(5) (ii)(A) to (ii)(B) of this section the owner or operator shall comply with all requirements of paragraph (h)(5)(iii)(C) of this section.

(C) Any owner or operator of a printing line subject to the limitations of paragraph (h)(5)(ii) of this section and complying by means of paragraph (h)(5)(ii)(B) of this section shall comply with the following:

(*1*) By July 1, 1991, or upon initial start-up of a new printing line, or upon changing the method of compliance for an existing printing line from paragraph (h)(5) (ii)(A) to (ii)(B) of this section, the owner or operator of the subject printing line shall perform all tests and submit to the Administrator the results of all tests and calculations necessary to demonstrate that the subject printing line will be in compliance with paragraph (h)(5)(ii)(B) of this section on and after July 1, 1991, or on and after the initial start-up date.

(*2*) On and after July 1, 1991, or on and after the initial start-up date, the owner or operator of a printing line subject to the limitations of paragraph (h)(5)(ii) of this section and complying by means of paragraph (h)(5)(ii)(B) of this section 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.

(*3*) On and after July 1, 1991, the owner or operator of a subject printing line shall notify the Administrator in the following instances:

(*i*) Any record showing violation of paragraph (h)(5)(ii)(B) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*ii*) At least 30 calendar days before changing the method of compliance with paragraph (h)(5)(ii) of this section from paragraph (h)(5)(ii)(B) to (h)(5)(ii)(A) of this section, the owner or operator shall comply with all requirements of paragraph (h)(5)(iii)(B)(*1*) of this section. Upon changing the method of compliance with paragraph (h)(5)(ii) of this section from paragraph (h)(5)(ii)(B) to (h)(5)(ii)(A) of this section, the owner or operator shall comply with all requirements of paragraph (h)(5)(iii)(B) of this section.

(iv) *Compliance schedule.* Every owner or operator of a heatset-web-offset lithographic printing line shall comply with the applicable requirements of paragraphs (h)(5) (ii) and (iii) of this section in accordance with the applicable compliance schedule specified in paragraph (h)(5)(iv) (A), (B) or (C) of this section.

(A) No owner or operator of a heatset-web-offset lithographic printing line which is exempt from the limitations of paragraph (h)(5)(ii) of this section because of the criteria in paragraph (h)(5)(i) of this section shall operate said printing line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (h)(5)(iii)(A) and (h)(5)(ii)(A) of this section.

(B) No owner or operator of a heatset-web-offset lithographic printing line complying by means of paragraph (h)(5)(ii)(A) of this section shall operate said printing line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraphs (h)(5)(iii)(B) and (h)(5)(ii)(B) of this section.

(C) No owner or operator of a heatset-web-offset lithographic printing line complying by means of paragraph (h)(5)(ii)(B) of this section shall operate said printing line on or after July 1, 1991, unless the owner or operator has complied with, and continues to comply with, paragraph (h)(5)(iii)(C) of this section.

(6) The control and recordkeeping and reporting requirements, as well as the test methods in this paragraph, apply to the rotogravure and flexographic presses at General Packaging Products, Inc.'s (GPP) plant in Chicago, Illinois, instead of the requirements in 40 CFR 52.741(h)(1) through 40 CFR 52.741(h)(5).

(i) After July 1, 1992, no inks or other volatile organic material (VOM) containing materials shall at any time be applied or used which have a higher percent VOM by weight than the following:

(A) 8 percent VOM by weight for waterbased inks as applied on GPP's presses.

(B) 82 percent VOM by weight for solvent based inks as applied on GPP's presses.

(C) 100 percent VOM by weight for all other VOM containing materials (besides inks) as used on GPP's presses.

(ii) After July 1, 1992, the weight of ink and other VOM containing materials used shall not exceed the following:

(A) 200,000 pounds per year total for all waterbased inks, as applied (including dilution material). The yearly weight of waterbased inks used is to be calculated according to the procedure in paragraph (h)(6)(iii) of this section.

(B) 100,008 pounds per year total for all solvent based inks, as applied (including dilution material). The yearly weight of solvent based inks used is to be calculated according to the procedure in paragraph (h)(6)(iii) of this section.

(C) 100,000 pounds per year total (based upon the formulation of the material as it is used on the presses) for all other VOM containing materials (besides inks). The yearly weight of other VOM containing materials is to be calculated according to the procedure in paragraph (h)(6)(iii) of this section.

(iii) The yearly weight of ink/material used is to be calculated as follows:

(A) Compute the weight of ink/material used each month by the 15th of the following month.

(B) By the 15th of each month, add the monthly ink/material usage for the 12 previous months (to obtain the yearly weight of ink/material used).

(iv) Beginning on July 1, 1992, the owner and operator of GPP's plant in Chicago, Illinois, shall keep the following records for each month. All records shall be retained at GPP for 3 years and shall be made available to the Administrator on request:

(A) The name and identification number of each waterbased ink, each solvent based ink, and each other VOM containing material as applied or used on any press.

(B) The pounds of waterbased ink as applied on all presses for each month and the percent VOM by weight for each waterbased ink as applied on any press for each month.

(C) The pounds of solvent based ink as applied on all presses for each month and the percent VOM by weight for each solvent based ink as applied on any press for each month.

(D) The pounds of other (non-ink) VOM containing material used on all presses for each month and the percent VOM by weight for each (non-ink) VOM containing material as used on any press for each month.

(v) Any record showing a violation of paragraph (h)(6)(i) or (h)(6)(ii) of this section shall be reported by sending a copy of such record to the Administrator within 30 days of the violation.

(vi) To determine compliance with paragraphs (h)(6)(i) and (h)(6)(ii) of this section and to establish the records required under paragraph (h)(6)(iv) of this section the percent VOM by weight of each ink and other VOM containing material shall be determined by the applicable test methods and procedures specified in paragraph (a)(4) of this section.

(i) *Leaks from synthetic organic chemical and polymer manufacturing equipment*—(1) *Inspection program for leaks.* The owner or operator of a synthetic organic chemical or polymer manufacturing plant subject to paragraph (i) and subpart Q (sections 215.430, 215.431, 215.433, 215.434, 215.435, and 215.437) of Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) shall, for the purposes of detecting leaks, conduct a component inspection program using the test methods specified in Method 21, 40 CFR part 60, appendix A, consistent with the following provisions:

(i) 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.

(ii) 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.

(iii) If less than or equal to 2 percent of the valves in light liquid service and in gas service tested pursuant to paragraph (i)(1)(ii) of this section 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.

(iv) Observe visually all pump seals weekly.

(v) Test immediately any pump seal from which liquids are observed dripping.

(vi) Test any relief valve within 24 hours after it has vented to the atmosphere.

(vii) 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.

(viii) Test immediately after repair any component that was found leaking.

(ix) 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.

(x) The following components are exempt from the monitoring requirements in paragraph (i)(1) of this section:

(A) Any component that is in vacuum service, and

(B) Any pressure relief valve that is connected to an operating flare header or vapor recovery device.

(2) *Alternative program for leaks.* The Administrator shall approve an alternative program of monitoring, recordkeeping, or reporting to that prescribed in paragraph (i) and subpart Q (sections 215.430, 215.431, 215.433, 215.434, 215.435, and 215.437) of Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), upon a demonstration by the owner or operator of such plant that the alternative program will provide plant personnel and USEPA personnel with an equivalent ability to identify and repair leaking components. Any alternative program can

only be allowed if approved by the Administrator as a SIP or FIP revision.

(j) *Petroleum refining and related industries: asphalt materials*—(1) *Monitoring program for leaks.* (i) The owner or operator of a petroleum refinery subject to subpart R (section 215.445) of Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) shall, for the purpose of detecting leaks, conduct a component monitoring program consistent with the following provisions:

(A) Test once between March 1 and June 1 of each year, by methods referenced in paragraph (a)(4)(vii) of this section, all pump seals, pipeline valves in liquid service and process drains.

(B) Test once each quarter of each calendar year, by methods referenced in paragraph (a)(4)(vii) of this section, all pressure relief valves in gaseous service, pipeline valves in gaseous service and compressor seals.

(C) Inaccessible valves may be tested once each calendar year instead of once each quarter of each calendar year.

(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, and

(G) Test immediately after repair any component that was found leaking.

(ii) Storage tank valves and pressure relief devices connected to an operating flare header or vapor recovery device are exempt from the monitoring requirements in paragraph (j)(1)(i) of this section.

(iii) The Administrator may require more frequent monitoring than would otherwise be required by paragraph (j)(1)(i) of this section for components which are demonstrated to have a history of leaking.

(2) *Alternative program for leaks.* The Administrator may approve an alternative program of monitoring, recordkeeping or reporting to that prescribed in paragraph (j)(1) of this section and subpart R (sections 215.446, 215.448, and 215.449) of Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), upon a demonstration by the owner or operator of a petroleum refinery that the alternative program will provide refinery and USEPA personnel with an equivalent ability to identify and repair leaking components. Any alternative program can only be allowed if approved by the Administrator as a SIP or FIP revision.

(3) *Compliance schedule for leaks.* The owner or operator of a petroleum refinery shall adhere to the increments of progress contained in the following schedule:

(i) Submit to the Administrator a monitoring program consistent with subpart R (section 215.446) of Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) prior to September 1, 1990.

(ii) Submit to the Administrator the first monitoring report pursuant to subpart R (section 215.449) of Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) prior to October 1, 1990.

(k)–(l) [Reserved]

(m) *Pharmaceutical manufacturing*—(1) *Applicability*. (i) The rules of paragraph (m) of this section, except for paragraphs (m)(4) through (m)(6) of this section, 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 paragraph still apply to the emission source if VOM emissions from the emission source exceed 45.4 kg/day (100 lbs/day).

(ii) Notwithstanding paragraph (m)(1)(i) of this section, 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 paragraph (m) of this section, except for paragraphs (m)(4) through (m)(6) of this section, if emissions of VOM not vented to air pollution control equipment do not exceed the following levels:

(A) For the air suspension coater/dryer: 2,268 kg/year (2.5 tons/year);

(B) For each fluid bed dryer: 4,535 kg/year (5.0 tons/year);

(C) For each tunnel dryer: 6,803 kg/year (7.5 tons/year); and

(D) For each Accelacota: 6,803 kg/year (7.5 tons/year).

(iii) Paragraphs (m)(4) through (m)(6) of this section apply to a plant having one or more emission sources that:

(A) Are used to manufacture pharmaceuticals, and

(B) 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 paragraphs still apply if emissions from one or more sources exceed 45.4 kg/day (100 lbs/day).

(iv) No owner or operator shall violate any condition in a permit when the condition results in exclusion of an emission source from paragraph (m) of this section.

(v) Any pharmaceutical manufacturing source that becomes subject to the provisions of paragraph (m) of this section at any time shall remain subject to the provisions of paragraph (m) of this section at all times.

(vi) Emissions subject to paragraph (m) of this section shall be controlled at all times consistent with the requirements set forth in paragraph (m) of this section.

(vii) Control devices required pursuant to paragraph (m) of this section shall be operated at all times when the source it is controlling is operated.

(viii) Determinations of daily and annual emissions for purposes of paragraph (m)(1) 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 paragraph (m)(8) of this section 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). (This subparagraph shall not affect the Administrator’s authority to require emission tests to be performed pursuant to paragraph (m)(8) of this section.)

(2) *Control of reactors, distillation units, crystallizers, centrifuges and vacuum dryers.* (i) 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 paragraph (m)(2)(i)(B) of this section.

(A) 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 40.0kPa (5.8 psi) at 294.3K (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 adsorption, 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.

(ii) 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.

(3) *Control of air dryers, production equipment exhaust systems and filters.* (i) 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.

(ii) 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.

(4) *Material storage and transfer.* The owner or operator of a pharmaceutical manufacturing plant shall:

(i) 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

(ii) 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).

(5) *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.

(6) *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.

(7) *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 paragraphs (m)(2) through (m)(6) of this section, and used to manufacture pharmaceuticals shall control the emissions of VOM from such emission sources by:

(i) Air pollution control equipment which reduces by 81 percent or more the VOM that would otherwise be emitted to the atmosphere, or

(ii) A surface condenser which captures all the VOM which would otherwise be emitted to the atmosphere and which meets the requirements of paragraph (m)(2)(i) of this section.

(8) *Testing.* (i) Upon request by the Administrator, the owner or operator of any VOM emission source subject to paragraph (m) or exempt from paragraph (m) of this section by virtue of the provisions of paragraph (m)(1) of this section shall, at his own expense, demonstrate compliance to the Administrator by the methods or procedures listed in paragraph (a)(vi)(A) of this section.

(ii) A person planning to conduct a VOM emissions test to demonstrate compliance with paragraph (m) of this section shall notify the Administrator of that intent not less than 30 calendar days before the planned initiation of the test.

(9) *Monitoring and recordkeeping for air pollution control equipment*—(i) *Monitoring.* (A) At a minimum, continuous monitors for the following parameters shall be installed on air pollution control equipment used to control sources subject to paragraph (m) of this section:

(*1*) Destruction device combustion temperature.

(*2*) Temperature rise across a catalytic afterburner bed.

(*3*) VOM concentration on a carbon absorption 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.

(ii) *Recordkeeping.* (A) The owner or operator of a pharmaceutical manufacturing facility shall maintain the following records:

(*1*) Parameters listed in paragraph (m)(9)(i)(A) of this section shall be recorded.

(*2*) For sources subject to paragraph (m)(2) of this section, the vapor pressure of VOM being controlled shall be recorded for every process.

(B) For any leak subject to paragraph (m)(6) of this section 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 paragraph (m)(5) of this section which contain VOL:

(*1*) For maintenance and inspection:

(*i*) The date and time each cover is opened,

(*ii*) The length of time the cover remains open, and

(*iii*) 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 paragraph (m)(1)(i) of this section or paragraph (m)(1)(ii) of this section 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 paragraph (m)(1)(i) or paragraph (m)(1)(ii) of this section, 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 paragraph (m)(1)(i) or paragraph (m)(1)(ii) of this section, as appropriate, are ever exceeded; and

(*3*) Provide written notification to the Administrator within 30 days of a determination that such an emission source has exceeded the applicability cutoffs in paragraph (m)(1)(i) or paragraph (m)(1)(ii) of this section, as appropriate.

(E) Records required under paragraph (m)(9)(ii)(A) of this section 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 Administrator upon verbal or written request.

(n)–(p) [Reserved]

(q) *Gasoline distribution—(*1) *Bulk gasoline plants.* (i) Subject to paragraph (q)(1)(v) of this section, no person may cause or allow the transfer of gasoline from a delivery vessel into a stationary storage tank located at a bulk gasoline unless:

(A) The delivery vessel and the stationary storage tank are each equipped with a vapor collection system that meets the requirements of paragraph (q)(1)(iv)(D) of this section,

(B) Each vapor collection system is operating,

(C) The delivery vessel displays the appropriate sticker pursuant to the requirements of sections 215.584 (b) or (d) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742),

(D) 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

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

(ii) Subject to paragraph (q)(1)(vi) of this section, 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:

(A) The requirements set forth in paragraphs (q) (1)(i)(A) through (1)(i)(D) of this section are met, and

(B) 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.

(iii) Subject to paragraph (q)(1)(v) of this section, each owner of a stationary storage tank located at a bulk gasoline plant shall:

(A) Equip each stationary storage tank with a vapor control system that meets the requirements of paragraph (q) (1)(i) or (1)(ii) of this section, whichever is applicable,

(B) 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, or

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

(iv) Subject to paragraph (q)(1)(v) of this section, each operator of a bulk gasoline plant shall:

(A) Maintain and operate each vapor control system in accordance with the owner's instructions,

(B) Promptly notify the owner of any scheduled maintenance or malfunction requiring replacement or repair of a major component of a vapor control system,

(C) Maintain gauges, meters or other specified testing devices in proper working order, and

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

(*1*) 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,

(*2*) 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 (which is available for purchase from the National Technical Information Services, 5285 Port Royal Road, Springfield, VA 22161), and

(*3*) Avoidable leaks of liquid during loading or unloading operations.

(E) Provide a pressure tap or equivalent on the bulk plant vapor collection system in order to allow the determination of compliance with paragraph (q)(1)(iv)(D)(*1*) of this section, and

(F) Within 15 business days after discovery of any leak by the owner, operator, or the Administrator, repair and retest a vapor collection system which exceeds the limits of paragraph (q)(1)(iv)(D) (*1*) or (*2*) of this section.

(v) The requirements of paragraphs (q) (1)(i), (1)(iii) and (1)(iv) of this section, shall not apply to:

(A) Any stationary storage tank with a capacity of less than 2,177 l (575 gal), or

(B) Any bulk gasoline plant whose daily gasoline throughtput is less than 15,140 l (4,000 gal/day) on a thirty-day rolling average.

(vi) The requirements of paragraph (q)(1)(ii) of this section shall only apply to bulk gasoline plants:

(A) Whose daily gasoline throughput is greater than or equal to 15,140 l (4,000 gal/day) on a thirty-day rolling average, and

(B) That either distribute gasoline to gasoline dispensing facilities subject to the requirements of section 215.583(a)(2) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742) or that are in Cook, DuPage, Kane, Lake, McHenry or Will County.

(vii) Any bulk gasoline plant which is ever subject to paragraph (q)(1) (i), (ii), (iii) or (iv) of this section shall always be subject to these paragraphs.

(2) [Reserved]

(r) [Reserved]

(s) *Paint and ink manufacturing*—(1) *Applicability*. (i) Paragraph (s) shall apply to all paint and ink manufacturing plants which:

(A) Include process emission sources not subject to subparts (B), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or to paragraphs (d), (e) (excluding paragraph (e)(1)(i)(L)), (h) (excluding paragraph (h)(5)), (i), (j), or (q)(1) of this section; and 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 or FIP revision, or

(B) 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.

(ii) For the purposes of paragraph (s) of this section, uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

(2) *Exemption for waterbase material and heatset-offset ink.* The requirements of paragraphs (s)(4) and (s)(5) of this section and paragraph (s)(7)(i) of this section shall not apply to equipment while it is being used to produce either:

(i) Paint or ink formulations which contain 10 percent or more (by weight) water, or

(ii) Inks containing Magie oil and glycol as the primary solvent.

(3) *Permit conditions.* No person shall violate any condition in a federally enforceable permit when the condition results in exclusion of the plant or an emission source from paragraph (s).

(4) *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:

(i) 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.

(ii) The cover remains closed except when production, sampling, maintenance or inspection procedures require access.

(iii) 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.

(5) *Grinding mills.* (i) 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.

(ii) No person shall operate a grinding mill fabricated or modified after the effective date of paragraph (s) which is not equipped with fully enclosed screens.

(iii) 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.

(6) *Storage tanks.* (i) 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 only be allowed if approved by the Administrator as a SIP or FIP revision.

(ii) 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 only be allowed if approved by the Administrator as a SIP or FIP revision.

(7) *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:

(i) 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.

(ii) 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.

(iii) 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.

(iv) 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.

(8) *Clean up.* (i) 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.

(ii) 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.

(9) *Compliance schedule.* Every owner or operator of an emission source subject to the control requirements of paragraph (s) of this section shall comply with the requirements of paragraph (s) of this section on and after July 1, 1991.

(10) *Recordkeeping and reporting.* (i) Upon request by the Administrator, the owner or operator of an emission source which claims to be exempt from the requirements of paragraph (s) of this section shall submit records to the Administrator within 30 calendar days from the date of the request which document that the emission source is in fact exempt from paragraph (s) of this section. 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.

(ii) Every owner or operator of an emission source which is subject to the requirements of paragraph (s) of this section shall maintain all records necessary to demonstrate compliance with those requirements at the facility for three years.

(t) [Reserved]

(u) *Miscellaneous fabricated product manufacturing processes*—(1) *Applicability.* (i) The requirements of paragraph (u) of this section 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), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or specified in paragraph (d), (e), (h), (i), (j), or (q)(1) of this section; if the plant is subject to paragraph (u) of this section. A plant is subject to paragraph (u) of this section if it contains process emission sources, not regulated by subparts (B), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or by paragraph (d), (e) (excluding paragraph (e)(1)(i)(L)), (h) (excluding paragraph (h)(5)), (i), (j), or (q)(1) of this section; 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 or FIP revision.

(ii) If a plant ceases to fulfill the criteria of paragraph (u)(1)(i) of this section, the requirements of paragraph (u) of this section shall continue to apply to a miscellaneous fabricated products manufacturing process emission source which was ever subject to the control requirements of paragraph (u)(3) of this section.

(iii) No limits under paragraph (u) of this section 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 paragraph (u)(3) of this section does not exceed 4.5 Mg (5.0 tons) per calendar year.

(iv) For the purposes of paragraph (u) of this section, an emission source shall be considered regulated by a subpart (of the Illinois rules) or paragraph if it is subject to the limits of that subpart (of the Illinois rules) or paragraph. An emission source is not considered regulated by a subpart (of the Illinois rules) or paragraph if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

(v) For the purposes of paragraph (u) of this section, uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

(2) *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 paragraph (u) of this section.

(3) *Control requirements.* Every owner or operator of an emission source subject to paragraph (u) of this section shall comply with the requirements of paragraph (u)(3) (i), (ii) or (iii) of this section:

(i) Emission capture and control techniques which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

(ii) 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 Code 215 (incorporated by reference as specified in 40 CFR 52.742), or

(iii) An alternative control plan which has been approved by the Administrator as a SIP or FIP revision.

(4) *Compliance schedule.* Every owner or operator of an emission source subject to the control requirements of paragraph (u) of this section shall comply with the requirements of paragraph (u) of this section on and after July 1, 1991.

(5) *Testing.* Any owner or operator of a VOM emission source which is subject to paragraph (u) of this section shall demonstrate compliance with paragraph (u)(3) of this section by using the applicable test methods and procedures specified in paragraph (a)(4) of this section.

(6) The control requirements in this paragraph apply to the adhesive globe coating operations at Replogle's Broadview facility in Cook County, Illinois, instead of the control requirements in paragraph (u)(3) of this section.

(i) After October 6, 1991, no coatings shall at any time be applied which exceed the following emission limitations for the specified coating.

(A) 7.0 lbs VOM per gallon of adhesive coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to coat globes. Such coating consists of #7879446 Methylene Chloride (RGI #01004100). The Administrator shall be notified at least ten (10) days prior to the use of any replacement adhesive for coating globes.

(B) [Reserved]

(ii) After October 6, 1991, the volume of coatings used shall not exceed the following:

(A) 572 gallons per year total for all coatings specified in paragraph (u)(6)(i)(A) of this section. The yearly volume of coatings used are to be calculated as follows:

(*1*) Compute the volume of specified coating used each month by the 15th of the following month.

(*2*) By the 15th of each month, add the monthly coating use for the 12 previous months (to obtain the yearly volume of coatings used).

(B) [Reserved]

(iii) Beginning on October 6, 1991, the owner and operator of the Replogle Globes, Inc. plant in Broadview, Illinois shall keep the following records for each month. All records shall be retained at Replogle Globes, Inc. for three (3) years and shall be made available to the Administrator on request:

(A) The name and identification number of each coating as applied on any adhesive globe 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 month on any adhesive globe coating line.

(7) The control requirements in this paragraph apply to the glass candle container coating line(s) and silk screening machines at the Candle Corporation of America (CCA), Chicago, Illinois facility, instead of the control requirements in paragraph (u)(3) of this section.

(i) After June 1, 1992, no coatings or inks shall at any time be applied, at any coating or ink applicator, which exceed the following emission limitations for the specified coating or ink.

(A) 6.04 pounds (lbs) volatile organic material (VOM) per gallon of clear lacquer/varnish (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to coat glass candle containers. Such clear lacquer/varnish (multicolor) is identified as LP3500. The Administrator must be notified at least 10 days prior to the use of any replacement clear lacquers/varnishes.

(B) 5.23 lbs VOM per gallon of translucent coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to coat glass candle containers. Such translucent coating (multi-color) is identified as LP3603. The Administrator must be notified at least 10 days prior to the use of any replacement translucent coatings.

(C) 5.84 lbs VOM per gallon of white lacquer (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to coat glass candle containers. Such white lacquer is identified as LP3507. The Administrator must be notified at least 10 days prior to the use of any replacement white lacquers.

(D) 3.40 lbs VOM per gallon of fast dry enamel silk screen printing ink (minus water and any compounds which are specifically exempted from the definition of VOM) as applied to print onto glass candle containers.

(ii) After June 1, 1992, the volume of coating and ink used shall not exceed the following:

(A) 2,164 gallons per month total for all coatings specified in paragraph (u)(7)(i)(A) of this section.

(B) 369 gallons per month total for all coatings specified in paragraph (u)(7)(i)(B) of this section.

(C) 49 gallons per month total for all coatings specified in paragraph (u)(7)(i)(C) of this section.

(D) 50 gallons per month total for all inks specified in paragraph (u)(7)(i)(D) of this Section.

(iii) Beginning on June 1, 1992, the owner and operator of CCA's plant in Chicago, Illinois, shall keep the following records for each month. All records shall be retained at CCA for 3 years and shall be made available to the Administrator on request.

(A) The name and identification number of each coating and ink as applied on any glass candle container coating line or silk screening machine.

(B) The weight of VOM per volume and the volume of each coating and ink (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each month on any glass candle container coating line or silk screening machine.

(iv) After June 1, 1992, no more than 100 gallons per month of cleaning solvent is allowed to be used on the glass candle container coating line(s) at CCA. The only cleaning solvents allowed for use are acetone (identified as LP3525) and methyl ethyl ketone (identified as LP3520). Beginning on June 1, 1992, CCA shall keep monthly records of the type and volume of all cleaning solvents used. All such records shall be retained at CCA for 3 years and shall be made available to the Administrator on request.

(v) After June 1, 1992, no more than 50 gallons per month of cleaning solvent is allowed to be used on the glass candle container silk screening machines at CCA. The only cleaning solvent allowed for use is petroleum naphtha (identified as light aromatic naphtha with 7.28 lbs VOM per gallon, minus water and any compounds which are specifically exempted from the definition of VOM). Beginning on June 1, 1992, CCA shall keep monthly records of the type and volume and the weight of VOM per volume (minus water and any compounds which are specifically exempted from the definition of VOM) of all cleaning solvents used on the glass candle container silk screening machines. All such records shall be retained at CCA for 3 years and shall be made available to the Administrator on request.

(8) The control, recordkeeping and reporting requirements in this paragraph apply to the cellulose food casing manufacturing operations at the Viskase Corporation plant in Bedford Park, Illinois (Cook County) instead of the requirements in paragraph (v) of this section, the other parts of paragraph (u) of this section, and the recordkeeping requirements in paragraph (y) of this section. Unless otherwise stated, the following requirements must be met by Viskase on and after November 21, 1995.

(i) VOM emissions shall never exceed 3.30 tons per day.

(ii) VOM emissions shall not exceed 2.22 tons per day, on a monthly average, during June, July, and August.

(iii) VOM emissions shall not exceed 2.44 tons per day during June, July, and August.

(iv) Compliance with the emission limits in paragraphs (u)(8) (i) through (iii) of this section, and the records in paragraph (u)(8)(v) of this section, shall be determined using an emission factor of “0.72 pounds of VOM emissions per pound of carbon disulfide consumed.”

(v) Viskase must keep the following daily records:

(A) The pounds of carbon disulfide per charge for its Fibrous process. If charges with different levels of carbon disulfide per charge are used the same day, a separate record must be kept for each level of carbon disulfide per charge.

(B) The pounds of carbon disulfide per charge for its NOJAX process. If charges with different levels of carbon disulfide per charge are used the same day, a separate record must be kept for each level of carbon disulfide per charge.

(C) The number of charges per day, for each level of carbon disulfide per charge, used in Viskase’s Fibrous process.

(D) The number of charges per day, for each level of carbon disulfide per charge, used in Viskase’s NOJAX process.

(E) The total quantity of carbon disulfide used per day in Viskase’s Fibrous process, the total quantity of carbon disulfide used per day in Viskase’s NOJAX process, and the daily VOM emissions resulting from use of the carbon disulfide.

(F) The monthly use of carbon disulfide, and the monthly VOM emissions resulting from use of the carbon disulfide, during June, July, and August.

(vi) Any violation of the emission limits in paragraphs (u)(8) (i) through (iii) of this section must be reported to USEPA within 30 days of its occurrence.

(vii) In order to determine daily and monthly VOM emissions, the test methods in paragraph (a)(4) of this section may be used in addition to, and take precedence over, the emission factor cited in paragraph (u)(8)(iv) of this section. Method 15 is to be used instead of Methods 18, 25, and 25A when the test methods in paragraph (a)(4) of this section are used to determine VOM emissions from Viskase’s cellulose food casing facility.

(v) *Miscellaneous formulation manufacturing processes*—(1) *Applicability*. (i) The requirements of paragraph (v) of this section shall apply to a plant’s miscellaneous formulation manufacturing process emission sources, which are not included within any of the source categories specified in subpart (B), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452),(S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or specified in paragraph (d), (e), (h), (i), (j), or (q)(1) of this section; if the plant is subject to paragraph (v) of this section. A plant is subject to paragraph (v) of this section if it contains process emission sources, not regulated by subpart (B), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or by paragraph (d), (e) (excluding paragraph (e)(1)(i)(L)), (h) (excluding paragraph (h)(5)), (i), (j), or (q)(1) of this section; 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 or FIP revision.

(ii) If a plant ceases to fulfill the criteria of paragraph (v)(1)(i) of this section, the requirements of paragraph (v) of this section shall continue to apply to a miscellaneous formulation manufacturing process emission source which was ever subject to the control requirements of paragraph (v)(3) of this section.

(iii) No limits under paragraph (v) of this section 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 paragraph (v)(3) of this section does not exceed 4.5 Mg (5.0 tons) per calendar year.

(iv) For the purposes of paragraph (v) of this section, an emission source shall be considered regulated by a subpart (of the Illinois rules) or paragraph if it is subject to the limits of that subpart (of the Illinois rules) or paragraph. An emission source is not considered regulated by a subpart (of the Illinois rules) or paragraph if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

(v) For the purposes of paragraph (v) of this section uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

(2) *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 paragraph (v) of this section.

(3) *Control requirements.* Every owner or operator of an emission source subject to paragraph (v) of this section shall comply with the requirements of paragraph (v)(3) (i) or (ii) of this section.

(i) Emission capture and control techniques which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

(ii) An alternative control plan which has been approved by the Administrator as a SIP or FIP revision.

(4) *Compliance schedule.* Every owner or operator of an emission source subject to the control requirements of paragraph (v) of this section shall comply with the requirements of paragraph (v) of this section on and after July 1, 1991.

(5) *Testing.* Any owner or operator of a VOM emission source which is subject to paragraph (v) of this section shall demonstrate compliance with paragraph (v)(3) of this section by using the applicable test methods and procedures specified in paragraph (a)(4) of this section.

(6) The control requirements in this paragraph apply to the 7 blenders and 3 moguls of the adhesive coating solution formulation (compounding) operations at the Minnesota Mining and Manufacturing Corporation's (3M) Bedford Park facility in Cook County, Illinois, instead of the control requirements in paragraph (v)(3) of this section.

(i) After September 1, 1991, the following operating restrictions shall apply to 3M's Bedford Park, Illinois, compounding operations.

(A) The combined operating hours for all blenders shall not exceed 8,400 hours per quarter (rolled on a monthly basis). The combined quarterly operating hours of all blenders are to be calculated as follows:

(*1*) By the 15th of each month, compute the combined monthly operating hours of all blenders during the previous month.

(*2*) By the 15th of each month, add the monthly operating hours of all blenders for the 3 previous months (to obtain the combined quarterly operating hours of all blenders).

(B) The combined operating hours for all moguls shall not exceed 4,200 hours per quarter (rolled on a monthly basis). The quarterly operating hours of all moguls are to be calculated as follows:

(*1*) By the 15th of each month, compute the combined monthly operating hours of all moguls during the previous month.

(*2*) By the 15th of each month, add the monthly operating hours of all moguls for the 3 previous months (to obtain the combined quarterly operating hours of all moguls).

(ii) Beginning on September 1, 1991, the owner and operator of the 3M Bedford Park Plant in Bedford Park, Illinois, shall keep the following records. These records shall be compiled on a monthly basis, be retained at the 3M facility for a period of 3 years, and be made available to the Administrator upon request.

(A) Separate monthly records for each of the 7 blenders identifying each batch and the length of each batch as well as the total monthly hours of operation for all blenders.

(B) Separate monthly records for each of the 3 moguls identifying each batch and the length of each batch as well as the total monthly hours of operation for all moguls.

(w) *Miscellaneous organic chemical manufacturing processes*—(1) *Applicability*. (i) The requirements of paragraph (w) of this section 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), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or specified in paragraph (d), (e), (h), (i), (j), or (q)(1) of this section; if the plant is subject to paragraph (w) of this section. A plant is subject to paragraph (w) of this section if it contains process emission sources, not regulated by subparts (B), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or by paragraph (d), (e) (excluding paragraph (e)(1)(i)(L)), (h) (excluding paragraph (h)(5)), (i), (j), or (q)(1) of this section; 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 or FIP revision.

(ii) If a plant ceases to fulfill the criteria of paragraph (w)(1)(i) of this section, the requirements of paragraph (w) of this section shall continue to apply to a miscellaneous organic chemical manufacturing process emission source which was ever subject to the control requirements of paragraph (w)(3) of this section.

(iii) No limits under paragraph (w) of this section 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 paragraph (w)(3) of this section does not exceed 4.5 Mg (5.0 tons) per calendar year.

(iv) For the purposes of paragraph (w) of this section, an emission source shall be considered regulated by a subpart (of the Illinois rules) or paragraph if it is subject to the limits of that subpart (of the Illinois rules) or paragraph. An emission source is not considered regulated by a subpart (of the Illinois rules) or paragraph if its emissions are below the applicability cutoff level or if the source is covered by an exemption.

(v) For the purposes of paragraph (w) of this section, uncontrolled VOM emissions are the emissions of VOM which would result if no air pollution control equipment were used.

(2) *Permit conditions.* No person shall violate any condition in a permit when the condition results in exclusions of the plant or an emission source from paragraph (w) of this section.

(3) *Control requirements.* Every owner or operator of an emission source subject to paragraph (w) of this section shall comply with the requirements of

paragraph (w)(3)(i) or (ii) of this section.

(i) Emission capture and control techniques which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

(ii) An alternative control plan which has been approved by the Administrator as a SIP or FIP revision.

(4) *Compliance schedule.* Every owner or operator of an emission source subject to the control requirements of paragraph (w) of this section shall comply with the requirements of paragraph (w) of this section on and after July 1, 1991.

(5) *Testing.* Any owner or operator of a VOM emission source which is subject to paragraph (w) shall demonstrate compliance with paragraph (w)(3) of this section by using the applicable test methods and procedures specified in paragraph (a)(4) of this section.

(x) *Other emission sources*—(1) *Applicability.* (i) The requirements of paragraph (x) of this section shall apply to a plant's VOM emission sources, which are not included within any of the source categories specified in subpart (B), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or specified in paragraph (d), (e), (h), (i), (j), (q)(1), (s), (u), (v) or (w) of this section; if the plant is subject to paragraph (x) of this section. A plant is subject to paragraph (x) of this section if it contains process emission sources, not regulated by subpart (B), (Q) (excluding sections 215.432 and 215.436), (R) (excluding sections 215.447, 215.450, and 215.452), (S), (V), (X), (Y) (sections 215.582, 215.583, and 215.584), or (Z) of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or by paragraph (d), (e) of this section (excluding paragraph (e)(1)(i)(L)), (h) (excluding paragraph (h)(5)), (i), (j), or (q)(1) of this section; 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 of FIP revision.

(ii) If a plant ceases to fulfill the criteria of paragraph (x)(1)(i) of this section, the requirements of paragraph (x) of this section shall continue to apply to an emission source which was ever subject to the control requirements of paragraph (x)(3) of this section.

(iii) No limits under paragraph (x) of this section 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 paragraph (x)(3) of this section does not exceed 4.5 Mg (5.0 tons) per calendar year.

(iv) For the purposes of paragraph (x) of this section, an emission source shall be considered regulated by a subpart (of the Illinois rules) or paragraph if it is subject to the limits of that subpart (of the Illinois rules) or paragraph. An emission source is not considered regulated by a subpart (of the Illinois rules) or paragraph of its emissions are below the applicability cutoff level or if the source is covered by an exemption.

(v) The control requirements in paragraphs (u), (v), (w), and (x) of this section 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.

(2) *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 paragraph (x) of this section.

(3) *Control requirements.* Every owner or operator of an emission source subject to paragraph (x) of this section shall comply with the requirements of paragraph (x)(3) (i), (ii) or (iii) of this section.

(i) Emission capture and control equipment which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent, or

(ii) 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 paragraph are not required to comply with section 215.301 of 35 Ill. Adm. Code 215 (incorporated by reference as specified in 40 CFR 52.742), or

(iii) An alternative control plan which has been approved by the Administrator as a SIP or FIP revision.

(4) *Compliance schedule.* Every owner or operator of an emissions source which is subject to paragraph (x) of this section shall comply with the requirements of paragraph (x) of this section on and after July 1, 1991.

(5) *Testing.* Any owner or operator of a VOM emission source which is subject to paragraph (x) of this section shall demonstrate compliance with paragraph (x)(3) of this section by using the applicable test methods and procedures specified in paragraph (a)(4) of this section.

(6) The control requirements in this paragraph apply to the varnish operations at the General Motors Corporation, Electro-Motive Division Plant (GMC Electro-Motive), LaGrange, Illinois, instead of the control requirements in paragraph (x)(3) of this section.

(i) After July 1, 1991, no coatings shall at any time be applied which exceed the following emission limitations for the specified coating.

(A) 8.0 lbs VOM per gallon of coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied at each coating applicator to coat Nomex rings. Such coating consists of Monsanto Skybond 705 Polyamide Resin (EMD P/N 9088817) and diluents. The Administrator must be notified at least 10 days prior to the use of any replacement coating(s) and/or diluents for coating Nomex rings.

(B) 6.8 lbs VOM per gallon of coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied at each coating applicator for any coatings not specified in paragraph (x)(6)(i)(A) of this section.

(ii) After July 1, 1991, the volume of coatings used shall not exceed the following:

(A) 600 gallons per year total for all coatings specified in paragraph (x)(6)(i)(A) of this section. The yearly volume of coatings used are to be calculated as follows:

(*1*) Compute the volume of specified coating used each month by the 15th of the following month.

(*2*) By the 15th of each month, add the monthly coating use for the 12 previous months (to obtain the yearly volume of coatings used).

(B) 28,500 gallons per year total for all coatings other than those specified in paragraph (x)(6)(i)(A) of this section. The yearly volume of coatings used are to be calculated as specified in paragraphs (x)(6)(ii)(A)(*1*) and (x)(6)(ii)(A)(*2*) of this section.

(iii) Beginning on July 1, 1991, the owner and operator of the General Motors Corporation Electro-Motive Division Plant in LaGrange, Illinois shall keep the following records for each month. All records shall be retained at General Motors for 3 years and shall be made available to the Administrator on request.

(A) The name and identification number of each coating as applied on any coating line within the varnish operation.

(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 month on any coating line within the varnish operation.

(7) The control, recordkeeping, and monitoring requirements in this paragraph apply to the aluminum rolling mills at the Reynolds Metals Company's McCook Sheet & Plate Plant in McCook, Illinois (Cook County) instead

of the control requirements and test methods in the other parts of paragraph (x), and the recordkeeping requirements in paragraph (y) of this section. All of the following requirements must be met by Reynolds on and after July 7, 1995.

(i) Only organic lubricants with initial and final boiling points between 460 degrees F and 635 degrees F, as determined by a distillation range test using ASTM method D86–90, are allowed to be used at Reynolds' aluminum sheet cold rolling mills numbers 1 and 7. All incoming shipments of organic lubricant for the number 1 and 7 mills must be sampled and each sample must undergo a distillation range test to determine the initial and final boiling points using ASTM method D86–90. A grab rolling lubricant sample shall be taken from each operating mill on a monthly basis and each sample must undergo a distillation range test, to determine the initial and final boiling points, using ASTM method D86–90.

(ii) An oil/water emulsion, with no more than 15 percent by weight of petroleum-based oil and additives, shall be the only lubricant used at Reynolds' aluminum sheet and plate hot rolling mills, 120 inch, 96 inch, 80 inch, and 145 inch mills. A grab rolling lubricant sample shall be taken from each operating mill on a monthly basis and each sample shall be tested for the percent by weight of petroleum-based oil and additives by ASTM Method D95–83.

(iii) The temperature of the inlet supply of rolling lubricant for aluminum sheet cold rolling mills numbers 1 and 7 shall not exceed 150 °F, as measured at or after (but prior to the lubricant nozzles) the inlet sump. The temperature of the inlet supply of rolling lubricant for the aluminum sheet and plate hot rolling mills, 120 inch, 96 inch, 80 inch, and 145 inch mills shall not exceed 200 °F, as measured at or after (but prior to the lubricant nozzles) the inlet sump. Coolant temperatures shall be monitored at all the rolling mills by use of thermocouple probes and chart recorders or electronic data recorders.

(iv) All distillation test results for cold mill lubricants, all percent oil test results for hot mill lubricants, all coolant temperature recording charts and/or temperature data obtained from electronic data recorders, and all oil/water emulsion formulation records, shall be kept on file, and be available for inspection by USEPA, for three years.

(8) The control and recordkeeping requirements in this paragraph apply to the silk screen presses and associated ovens, cleaning operations and laminators at Parisian's Novelty Company (Parisian), Chicago, Illinois, facility, instead of the control requirements in paragraphs (x)(8) (u)(3) and (x)(3) of this section and the recordkeeping requirements in paragraph (x)(8)(y) of this section.

(i) After March 1, 1993, no coatings or inks shall at any time be applied, at any coating or ink applicator, which exceed the following emission limitations for the specified coating or ink.

(A) 6.65 pounds (lbs) volatile organic material (VOM) per gallon of ink (minus water and any compounds which are specifically exempted from the definition of VOM) as applied on Parisian's silk screen presses.

(B) 6.4 lbs VOM per gallon of adhesive coating (minus water and any compounds which are specifically exempted from the definition of VOM) as applied on Parisian's laminators. Such adhesive is identified as MIX #963.

(ii) After March 1, 1993, the volume of coating and ink used shall not exceed the following:

(A) 2,556 gallons per year total for all inks. The yearly volume of inks used is to be calculated as follows:

(*1*) Compute the volume of ink used each month by the 15th of the following month.

(*2*) By the 15th of each month, add the monthly ink usage for the 12 previous months (to obtain the yearly volume of ink used).

(B) 780 gallons per year total for all coatings specified in paragraph (x)(8)(i)(B) of this section. The yearly volume of coatings used are to be calculated as specified in paragraphs (x)(8)(ii)(A)(*1*) and (x)(8)(ii)(A)(*2*) of this section.

(iii) Beginning on March 1, 1993, the owner and operator of Parisian's plant in Chicago, Illinois, shall keep the following records for each month. All records shall be retained at Parisian for 3 years and shall be made available to the Administrator on request.

(A) The name and identification number of each coating as applied on any laminator.

(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 month on any laminator.

(C) The weight of VOM per volume and the volume of each type of ink (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each month on any screen press.

(iv) After March 1, 1993, no more than 84 gallons per year of denatured alcohol may be used for cleaning labels at Parisian. The yearly volume of denatured alcohol used is to be calculated as specified in paragraphs (x)(8)(ii)(A)(*1*) and (x)(8)(ii)(A)(*2*) of this section. Beginning on March 1, 1993, Parisian shall keep monthly records of the type, volume, and VOM content of all solvents used for label cleaning. These records shall be retained at Parisian for 3 years and shall be made available to the Administrator on request.

(v) After March 1, 1993, no more than 7,932 gallons per year of screen wash #956 may be used on Parisian's screen cleaner. The yearly volume of screen wash #956 used is to be calculated as specified in paragraphs (x)(8)(ii)(A)(*1*) and (x)(8)(ii)(A)(*2*) of this section. Beginning on March 1, 1993, Parisian shall keep monthly records of the type, volume, and VOM content of all cleaning compounds used on Parisian's screen cleaner. These records shall be retained at Parisian for 3 years and shall be made available to the Administrator on request.

(vi) After March 1, 1993, only those cleaners specifically identified in paragraphs (x)(8)(iv) and (x)(8)(v) of this section may be used at Parisian.

(9) The control requirements in this paragraph apply to the process sources listed in paragraph (x)(9)(i)(A) of this section at the Nalco Chemical Company facility in Bedford Park, Illinois, instead of the control requirements in paragraph (x)(3) of this section.

(i) *Production and Operation Restrictions.*

(A) On and after October 1, 1992, the maximum volatile organic compound (VOC) emissions per batch, the 12-month rolling average number of batches per year, and the peak limit of batches per month shall not exceed the following limits:

Source	Maximum VOC emissions, lb/batch	12-mo. rolling average limit batch/yr	Peak batch limit, batch/month
(*1*) System 1 charge	0.16	280	33
System 1 purge	1.35		
(*2*) 24–T–156, 157	2.60	300	33
(*3*) 28–T–217, 234	0.23	402	45
(*4*) 28–T–214–216	5.70	603	65
(*5*) 20–R–182, 185	0.02	72	8
(*6*) 20–R–130	0.07	340	38
(*7*) 20–R–155	0.21	254	29
(*8*) 20–WT–174	0.21	254	29
(*9*) 12–T–97–99	4.6E–4 lb/hr	8,760 hr/yr	744 hr/mo
(*10*) 12–T–95	4.0E–6 lb/hr	8,760 hr/yr	744 hr/mo
(*11*) 12–T–96	7.7E–5 lb/hr	8,760 hr/yr	744 hr/mo
(*12*) 12–T–67, 73	0.003 lb/hr	8,760 hr/yr	744 hr/mo
(*13*) 20–T–121–122	0.85	312	34
(*14*) 20–T–123–125	5.4	616	68
(*15*) 20–T–140, 142	8.0	600	65
(*16*) 20–T–159	0.31	416	46
(*17*) 20–R–193, 200	9.8	540	59
(*18*) 32–R–300	0.18	365	41
(*19*) 32–T–302	0.21	365	41
(*20*) 32–T–304	0.21	730	81
(*21*) 32–T–314	0.23	365	41
(*22*) 32–T–322	0.21	365	41
(*23*) 32–T–328	0.23	365	41
(*24*) 10–T–61	0.001	365—containing organic	31—containing organic
(*25*) 24–T–441, 166	0.12	730	81
(*26*) 25–T–284, 440, 443–444.	0.28	730	81
(*27*) 25–T–170	4E–6	104	12

Source	Maximum VOC emissions, lb/batch	12-mo. rolling average limit batch/yr	Peak batch limit, batch/month
(*28*) Tank truck loading	0.12 lb/truck	1,600 trucks/yr	134 trucks/mo
(*29*) System 2	0.36	280	33
(*30*) System 4	2.88	280	33
(*31*) 25–R–164	0.10	365	41
(*32*) 25–R–205	0.14	365	41
(*33*) Drum station	3.51	1,005	110
(*34*) V–4SAC	1.56	254	29
(*35*) 20–CT–155	13.90	254	29
(*36*) 12–SE–100	1.10 lb/hr	8,760 hr/yr	744 hr/mo
(*37*) Drum exhaust hood A	1.00	365—involving use of organic material	31—involving use of organic material
(*38*) 24–T–230	0.98	730	81
(*39*) 8–CT–1	0.002 lb/hr	8,760 hr/yr	744 hr/mo
(*40*) 9–CT–1	0.002 lb/hr	8,760 hr/yr	744 hr/mo
(*41*) 10–CT–1	0.005 lb/hr	8,760 hr/yr	744 hr/mo
(*42*) 22–CT–1	0.003 lb/hr	8,760 hr/yr	744 hr/mo
(*43*) 25–CT–1	0.005 lb/hr	8,760 hr/yr	744 hr/mo
(*44*) 25–CT–2	0.002 lb/hr	8,760 hr/yr	744 hr/mo
(*45*) 29–CT–1	0.002 lb/hr	8,760 hr/yr	744 hr/mo
(*46*) 32–CT–1	0.005 lb/hr	8,760 hr/yr	744 hr/mo
(*47*) 36–CT–1	0.002 lb/hr	8,760 hr/yr	744 hr/mo
(*48*) 32–T–325	0[a]	365	41
(*49*) 26–R–195	0.1[a]	365	41
(*50*) Continuous polymer-blending.	0.1 lb/hr[a]	2,000 hr/yr	
(*51*) Portafeed washer booth 1.	0.84 lb/hr[b]	4,160 hr/yr	744 hr/mo
(*52*) Portafeed washer booth 2.	0.84 lb/hr[b]	8,736 hr/yr	744 hr/mo
(*53*) 32–T–392	4.4E–7	104	12

[a] Assumed value.
[b] Based on monitoring data.

(B) The following equation shall be used to calculate maximum VOC emissions per batch for the process sources listed in paragraphs (x)(9)(i)(A)(*1*) (charge only and (*2*) through (*28*) and (*53*) of this section:

$$\mathrm{ER(lb/batch)} = \frac{\mathrm{Q_O(gal/batch)} \times \mathrm{M_V(lb/mole)} \times \mathrm{P(mmHg)}}{\mathrm{constant_1([gal][mmHg]/mole)}}$$

Where:

ER = VOC emission rate;

Q_o = Quantity of organic per batch or charge rate;

M_v = Molecular weight of the volatile component;

P = Partial pressure of the volatile component for mixtures of liquid made up with more than one chemical; or vapor pressure for pure liquids made up of only one organic chemical; and

$Constant_1$ = (7.45 gal/ft^3)x(385 ft^3/mole)x(760 mmHg).

(C) The following equation shall be used to calculate the VOC emissions per batch from the process sources listed in paragraph (x)(9)(i)(A)(*1*) of this section (purge only) and (*29*) through (*32*) of this section:

$$\mathrm{ER(lb/batch)} = \frac{\mathrm{PR(ft^3/batch)} \times \mathrm{M_V(lb/mole)} \times \mathrm{P(mmHg)}}{\mathrm{constant_2([ft^3][mmHg]/mole)}}$$

Where:

PR=Nitrogen purge rate; and
Constant$_2$ = (385 ft^3/mole)x(760 mmHg).

(D) The following equation shall be used to calculate the VOC emissions per batch from the drum station listed at paragraph (x)(9)(i)(A)(*33*) of this section:

$$ER(lb/batch) = \frac{FR_{1mmHg}(lb/batch) \times M_V(lb/mole) \times P_{V2}(mmHg)}{M_a(lb/mole) \times \left(760 - P_{V2}\right)(mmHg)}$$

Where:

FR$_{1mmHg}$ = Maximum air flow rate to maintain 1 mmHg;
M$_a$ = Molecular weight of air; and
P$_{v2}$ = Vapor pressure of organic at 65 °F and 760 mmHg.

ER(1b/batch) = (0.40 × [ER$_{28\text{-}T\text{-}217\text{-}218}$])+(0.60 × [ER$_{28\text{-}T\text{-}214\text{-}216}$])

(E) The following equation shall be used to calculate the VOC emissions per batch from the V–4SAC listed at paragraph (x)(9)(i)(A)(*34*) of this section:

(F) The following equation shall be used to calculate the VOC emissions per batch from 20–CT–155 listed at paragraph (x)(9)(i)(A)(*35*) of this section:

$$ER(lb/batch) = \left[ER_{tot}(lb/hr) - ER_{V-4SAC}(lb/hr)\right] \times hr/batch$$

Where:

ER$_{tot}$ = Total system emission rate calculated using the following equation:

$$ER_{tot}(lb/hr) = \frac{FR_{1mmHg}(lb/hr) \times M_V(lb/mole) \times P_{V1}(mmHg)}{M_a(lb/mole) \times \left(350 - P_{V1}\right)(mmHg)}$$

Where:

P$_{v1}$ = Vapor pressure of organic at 200 °F and 350 mmHg.

(G) The following equation shall be used to calculate the VOC emissions per hour from 12–SE–100 listed at paragraph (x)(9)(i)(A)(*36*) of this section:

ER(lb/hr) = Evap (gm/cm^2 sec) × area (cm^2) × 3600 sec/hr

Where:

Evap = Evaporation rate from a surface 8.93 cm × 8.9 cm (lb/[cm^2] [sec]) calculated using the following equation:

Evap = 10^{-7} $M_v 0.71$ × [0.034 $(P_e - P_d)^{1.25}$ + 156 $(P_e - P_d)$]

Where:

P$_e$ = Partial pressure of the component from the spilled liquid;
P$_d$ = Partial pressure of the component in the incident air stream, assumed to be 0 mmhg; and
Area = Surface area of the liquid.

(H) The following equation shall be used to calculate the VOC emissions per batch from the drum exhaust hood A listed at paragraph (x)(9)(i)(A)(*37*) of this section:

$$ER(lb/batch) = \frac{FR(ft^3/batch) \times M_V(lb/mole) \times P(mmHg)}{constant_2\left([ft^3][mmHg]/mole\right)}$$

Where:

FR = Air flow rate.

(I) The following equation shall be used to calculate the VOC emissions per batch from 24–T–230 listed at paragraph (x)(9)(i)(A)(*38*) of this section:

$$\mathrm{ER(lb/batch)} = \frac{(\mathrm{V_H} - \mathrm{V_A}) \times \mathrm{M_V} \times \mathrm{PP_{135^\circ F}} \times 0.5}{\mathrm{constant_3}}$$

Where:

V_H = Head space volume at heated temperature 135 °F;

V_A = Head space volume at ambient temperature 68 °F;

PP_{135} °F = Partial pressure of volatile component at 135 °F.

Constant$_3$ = (434 ft^3/mole)(7.45 gal/ft^3)x(760 mmHg)

(J) The following equations shall be used to calculate the VOC emissions per batch from the process sources listed in paragraph (x)(9)(i) (*39*) through (*47*) of this section:

$$\mathrm{ER_A(lb/yr)} = \frac{\mathrm{V_R(gal)} \times \mathrm{M_V(lb/mole)} \times \mathrm{P(mmHg)} \times \mathrm{org}}{\mathrm{t(yr)} \times \mathrm{constant_1}\ \mathrm{([gal]\ [mmHg]/mole)}}$$

$$\mathrm{ER_B(lb/yr)} = \mathrm{C_B} \times \mathrm{V_T(gal)} \times \mathrm{d_B(lb/gal)} \times \mathrm{(charges/yr)} \times \mathrm{org}$$

$$\mathrm{ER_C(lb/yr)} = \mathrm{C_C} \times \mathrm{Evap(gal/min)} \times \mathrm{d_C(lb/gal)} \times \mathrm{(min/yr)} \times \mathrm{org}$$

Where:

V_R = Refill volume;

t = Time between refills;

org = Fraction of organic component in product;

C_B = Concentration of chemical B fed 3 times/week;

v_T = Tower volume;

d_B = Density of chemical B;

C_C = Concentration of chemical C fed continuously;

Evap = Evaporation rate; and

d_c = Density of chemical C.

(K) The number of batches for each process source shall be calculated as follows:

(*1*) Compute the monthly number of batches for each process source by the 15th day of the following month.

(*2*) By the 15th day of each month, add the monthly number of batches for each process source for the 12 previous months to obtain the total number of batches per year.

(ii) *Recordingkeeping.* (A) On and after October 1, 1992, the owner and operator of the Nalco Chemical Company facility in Bedford Park, Illinois, shall keep the following records for all process sources listed in paragraphs (x)(9)(i)(A) (*1*) through (*53*) of this section. These records shall be maintained for the units specified in paragraphs (x)(9)(i)(A) through (K) of this section, be compiled on a monthly basis, be retained at the facility for a period of 3 years, and be made available to the Administrator upon request.

(B) [Reserved]

(*1*) Calculations of the pounds per batch or pounds per hour (as appropriate) for each batch for each process source. This includes the information necessary for each calculation.

(*2*) The monthly number of batches for each process source.

(*3*) The total number of batches per year for the 12 previous months for each process source.

(10) The control requirements in this paragraph apply to the storage tanks listed in paragraph (x)(10)(i)(A) of this section at the Nalco Chemical Company facility in Bedford Park, Illinois,

instead of the control requirements in paragraph (x)(3) of this section.

(i) *Production and Operation Restrictions.* (A) On and after October 1, 1992, the product of the molecular weight of vapor in each storage tank (M_v), the true vapor pressure at bulk liquid conditions for each tank (P), and the paint factor (F_p); the storage tank maximum yearly throughput for each tank; and the maximum monthly throughput for each tank shall not exceed the following limits:

Tank No.	$M_V \times P \times F_p$, (lb) (mmhg)/ lb-mole	Yearly throughput, gal/yr	Monthly throughput, gal/month
(*1*) 24–T–147	45.4	56,250	4,688
(*2*) 24–T–150	227	266,450	22,204
(*3*) 24–T–151	227	266,450	22,204
(*4*) 24–T–158N	18.9	173,830	14,486
(*5*) 24–T–158C	18.0	110,190	9,183
(*6*) 24–T–158S	1.17	52,010	4,334
(*7*) 24–T–160	226.8	266,450	22,204
(*8*) 24–T–161	227	182,450	15,204
(*9*) 24–T–162	473	93,900	7,825
(*10*) 20–T–101	3.72	90,290	7,525
(*11*) 20–T–102	1.80	122,900	10,242
(*12*) 20–T–103	420	23,960	1,997
(*13*) 20–T–104	180	475,900	39,659
(*14*) 20–T–105	370	52,360	4,363
(*15*) 20–T–106	1,210	623,100	51,926
(*16*) 20–T–107	294	90,040	7,503
(*17*) 20–T–108	1,360	81,470	6,789
(*18*) 20–T–109	1,390	167,060	13,922
(*19*) 20–T–153	180	35,000	2,917
(*20*) 20–T–131 [a]			
(*21*) 20–T–132 [a]			
(*22*) 20–T–133 [a]			
(*23*) 20–T–134 [a]			
(*24*) 20–T–135 [a]			
(*25*) 20–T–136	29.5	307,710	26,580
(*26*) 20–T–137 [a]			
(*27*) 20–T–138	29.5	307,710	26,580
(*28*) 32–T–305	288	785,550	65,462
(*29*) 32–T–306	66.5	165,350	13,779
(*30*) 32–T–307	66.5	294,750	24,563
(*31*) 32–T–308	66.5	128,470	10,706
(*32*) 32–T–310	66.5	77,290	6,441
(*33*) 32–T–311	66.5	182,130	15,177
(*34*) 32–T–319	50.0	688,950	57,413
(*35*) 32–T–320	50.0	688,950	57,413
(*36*) 32–T–326	70.0	248,440	20,703
(*37*) 32–T–331	70.0	489,540	40,795
(*38*) 32–T–332	70.0	70,380	5,865
(*39*) 32–T–333	70.0	270,850	22,571
(*40*) 32–T–334	70.0	210,610	18,267
(*41*) 32–T–335	70.0	418,200	34,850
(*42*) 32–T–336	70.0	632,460	52,706
(*43*) 32–T–337	798	53,850	4,488
(*44*) 17–T–206	27,000	300,760	25,063
(*45*) 17–T–208	27,000	300,760	25,063
(*46*) 17–T–207	2.48	180,180	15,016
(*47*) 17–T–209	2.48	180,180	15,016
(*48*) 24–T–515	331	216,860	18,072
(*49*) 25–T–282	1.42	1,920,410	160,034
(*50*) 25–T–283	1.42	1,920,410	160,034
(*51*) 24–T–442	18.0	90,990	7,583
(*52*) 17–T–210	47.9	582,990	48,583
(*53*) 17–T–211	47.9	582,990	48,583
(*54*) 17–T–212	508	728,420	60,702
(*55*) 17–T–213	508	728,420	60,702
(*56*) 17–T–401	50.0	131,970	10,998
(*57*) 17–T–402	15.0	120,160	10,014
(*58*) 17–T–403	6.20	127,770	10,648
(*59*) 17–T–404	26.5	1,601,510	133,460
(*60*) 17–T–405	50.0	113,830	9,486
(*61*) 17–T–406	40.0	231,030	19,253
(*62*) 17–T–407	206	135,180	11,265
(*63*) 17–T–409	395	327,410	27,285

Tank No.	$M_V \times P \times F_p$, (lb) (mmhg)/ lb-mole	Yearly throughput, gal/yr	Monthly throughput, gal/month
(*64*) 17–T–410	395	129,290	10,774
(*65*) 17–T–411	50.0	213,870	17,843
(*66*) 17–T–412	50.0	277,840	23,153
(*67*) 17–T–414	50.0	72,920	6,077
(*68*) 17–T–415	50.0	56,140	4,678
(*69*) 17–T–416	395	393,550	32,796
(*70*) 17–T–417	23.4	233,780	19,482
(*71*) 17–T–418	115	873,270	72,773
(*72*) 17–T–419	119	278,460	23,205
(*73*) 17–T–420	112	730,780	60,898
(*74*) 17–T–421	25.2	300,010	25,001
(*75*) 17–T–422	115	873,270	72,773
(*76*) 17–T–423	23.4	215,060	17,922
(*77*) 17–T–424	23.4	209,610	17,468
(*78*) 26–T–218	50.0	64,890	5,408
(*79*) 26–T–219	1.50	197,900	16,492
(*80*) 26–T–220	2,460	160,020	13,336
(*81*) 26–T–221	50.0	74,820	6,235
(*82*) 26–T–222	80.0	66,590	5,550
(*83*) 26–T–224	4.80	225,290	18,774
(*84*) 26–T–225	50.0	36,610	3,051
(*85*) 26–T–226	294	47,390	3,949
(*86*) 26–T–227	50.0	63,040	5,253
(*87*) 26–T–228	500	136,150	11,346
(*88*) 26–T–229	50.0	112,970	9,414
(*89*) 26–T–231	23.4	319,610	26,634
(*90*) 26–T–232	117	564,280	47,024
(*91*) 26–T–233	23.4	539,700	44,975
(*92*) 27–T–245	21.6	361,970	30,165
(*93*) 27–T–246	348	141,820	11,818
(*94*) 27–T–247	23.4	71,670	5,972
(*95*) 27–T–248	198	96,010	8,001
(*96*) 27–T–249	927	51,240	4,270
(*97*) 27–T–250	110	433,030	36,086
(*98*) 27–T–251	396	45,440	3,787
(*99*) 27–T–252	21.6	171,370	14,281
(*100*) 27–T–253	348	237,900	19,825
(*101*) 26–T–192	10.0	117,950	9,829
(*102*) 27–T–278	0.62	74,910	6,243
(*103*) 27–T–279	0.18	583,760	48,647
(*104*) 27–T–285	21.6	459,530	38,294
(*105*) 27–T–286	21.6	459,530	38,294
(*106*) 25–T–201	19.8	143,550	11,963
(*107*) 32–T–388	0.07	499,340	41,612
(*108*) 32–T–389	0.07	499,340	41,612
(*109*) 32–T–390	288	808,310	583,340
(*110*) 32–T–391	1.42	800,00	583,340

[a] Tank not in use.

(B) The throughput shall be calculated as follows:

(*1*) Compute the monthly throughput for each tank by the 15th day of the following month.

(*2*) By the 15th day of each month, add the monthly throughputs for the 12 previous months to obtain the yearly throughput.

(ii) *Recordkeeping.* (A) On and after October 1, 1992, the owner and operator of the Nalco Chemical Company facility in Bedford Park, Illinois, shall keep the following records for all storage tanks. These records shall be compiled on a monthly basis, be retained at the facility for a period of 3 years, and be made available to the Administrator upon request.

(*1*) The molecular weight of vapor in each storage tank (M_v), the true vapor pressure at bulk liquid conditions for each tank (P), the paint factor (F_p), and their product. F_p shall be determined from Table 4.3–1 of "Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources," AP–42, September 1985.

(*2*) The monthly throughput.

(*3*) The total throughput per year for the 12 previous months.

(B) [Reserved]

(iii) *Test Methods.* (A) The true vapor pressure at bulk liquid temperature shall be determined by using the procedures specified in paragraph (a)(8) of this section.

(B) The molecular weight of vapor in the storage tank shall be determined by using Table 4.3–2 "Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources," AP–42, September 1985, or by analysis of vapor samples. Where mixtures of organic liquids are stored in a tank, M_v shall be estimated from the liquid composition using the following equation:

$$M_v = M_a \frac{P_a X_a}{P_t} + M_b \frac{P_b X_b}{P_t}$$

Where:

M_a=Molecular weight of pure component a;
P_a=Vapor pressure of pure component a;
X_a=Mole fraction of pure component a in the liquid;
M_b=Molecular weight of pure component b;
P_b=Vapor pressure of pure component b;
X_b=Mole fraction of pure component b in the liquid; and
P_t=P_a $X_{2=}$ P_b X_b.

(11) The control requirements in this paragraph apply to the fugitive emission sources listed in paragraph (x)(11)(i)(A) of this section at the Nalco Chemical Company facility in Bedfore Park, Illinois, instead of the control requirements in paragraph (x)(3) of this section.

(i) *Production and Operation Restrictions.*

(A) On and after October 1, 1992, all components (e.g., pumps, valves, flanges, pressure relief valves (PRV's), and open end lines) at the specified locations (e.g., Building 32—Tube Reactor System, etc.), and in the specified type of service (e.g., heavy liquid stratified, light liquid stratified, etc.) shall be limited by the maximum monthly hours in the following table:

(ii) *Recordkeeping.*

(A) On and after October 1, 1992, the owner and operator of the Nalco Chemical Company facility in Bedford Park, Illinois, shall keep the following records for all fugitive emission sources. These records shall be compiled on a monthly basis, be retained at the facility for a period of 3 years, and be made available to the Administrator upon request.

(*1*) The total number of hours of organic service for each component at each location specified in paragraphs (x)(11)(i)(A) (*1*) through (*10*) of this section.

(*2*) The vapor pressure of each organic compound in each component at each location specified in paragraphs (x)(11)(i)(A) (*1*) through (*10*) of this section.

(B) [Reserved]

(12) The control and recordkeeping and reporting requirements, as well as the test methods in this paragraph, apply to the gravure and screen press operations at the Meyercord Corporation (Meyercord) in Carol Stream, Illinois, instead of the requirements in paragraphs (x)(1) through (x)(5) of this section.

(i) After July 1, 1991, no materials which contain volatile organic material (VOM), including coatings, inks, and cleaning material, may be used at any gravure or screen press unless the total VOM emissions remain below 100 tons of VOM for every consecutive 365-day period, or fraction thereof, starting on July 1, 1991. A new 365-day period starts on each day. The VOM emissions, which are to be calculated on a daily basis, are to be added to the VOM emissions for the prior 364 days (but not including any day prior to July 1, 1991). VOM emissions are based upon the VOM content of the material and the volume of material used. The effect of add-on control equipment is not considered in calculating VOM emissions; that is, the VOM emissions are to be determined as if the press(es) do(es) not have add-on control equipment. The applicable test methods and procedures specified in paragraph (a)(4) of this section are to be used in determining daily VOM emissions.

(ii) The VOM content of each coating, ink, and cleaning solution shall be determined by the applicable test methods and procedures specified in paragraph (a)(4) of this section to establish the records required under paragraph (x)(12)(ii) of this section. Beginning on July 1, 1991, the owner or operator of the subject presses shall collect and record all of the following information each day and maintain the information at the facility for 3 years:

(A) The name and identification number of each coating, ink, and cleaning solution as applied on any press.

(B) The pounds (lbs) of VOM per gallon of each coating, ink, and cleaning solution (minus water and any compounds which are specifically exempted from the definition of VOM) as applied on any press.

(C) The total gallons of each coating, ink, and cleaning solution (minus water and any compounds which are specifically exempted from the definition of VOM) used per day.

(D) The total lbs of VOM contained in the volume of each coating, ink, and cleaning solution used per day on any press. The lbs of VOM per day is to be calculated by multiplying the lbs of VOM per gallon (minus water and any compounds which are specifically exempted from the definition of VOM) times the gallons (minus water and any compounds which are specifically exempted from the definition of VOM) used per day.

(E) The total lbs of VOM per day from all coatings, inks, and cleaning solutions used on all presses. The total lbs of VOM per day is to be obtained by adding the lbs of VOM per day contained in all coatings, inks, and cleaning solutions.

(F) Within 7 days after each 365-day period, the VOM emissions (as calculated in paragraph (x)(12)(ii)(E)) of this section before add-on control, from the 365-day period, are to be determined.

Starting on July 7, 1992, VOM emissions are to be determined for the 365 days ending 7 days earlier. Each day concludes a new 365-day period. However, no VOM emissions are to be included for any days prior to July 1, 1991. For example, on July 17, 1991, the emissions from July 1, through July 10, 1991, are to be included, whereas on January 7, 1994, the emissions from January 1, 1993, through December 31, 1993, are to be included.

(13) The control and recordkeeping and reporting requirements, as well as the test methods in this paragraph, apply to the sheet fed cold set presses and web heatset presses at the Wallace Computer Services, Inc. (Wallace) printing and binding plant in Hillside, Illinois, instead of the requirements in 40 CFR 52.741(h) and 40 CFR 52.741(x)(1) through 40 CFR 52.741(x)(5).

(i) After July 1, 1991, no inks shall at any time be applied, at the presses indicated below, which exceed the pounds (lbs) volatile organic material (VOM) per gallon of ink (minus water and any compounds which are specifically exempted from the definition of VOM) limit established for each press. After July 1, 1991, the yearly volume of ink used at each press, in gallons of ink (minus water and any compounds which are specifically exempted from the definition of VOM) per year, shall not exceed the gallons per year limit established below for each press. The yearly volume of ink used per press is to be calculated according to the procedure in paragraph (x)(13)(iii) of this section.

Press	Lbs VOM/ gallon ink	Gallons/ year ink
14	1.68	276
16	1.68	1896
22	3.01	2712
23	3.01	13140
25	3.01	12720
26	3.01	4764

(ii) After July 1, 1991, no materials (other than those inks subject to the limits in paragraph (x)(13)(i)) of this section, shall at any time be applied or used, at the presses indicated below, which exceed the lbs VOM per gallon of material (minus water and any compounds which are specifically exempted from the definition of VOM) limit established for each press. After July 1, 1991, the yearly volume of material (excluding ink and water) used at each press, in gallons of material (minus water and any compounds which are specifically exempted from the definition of VOM) per year, shall not exceed the gallons per year limit established for each press. The yearly volume of material (excluding ink and water) used per press is to be calculated according to the procedure in paragraph (x)(13)(iii) of this section.

Press	Lbs VOM/ gallon material	Gallons/ year material
14	6.9	612
16	6.9	8,340
22	7.1	360
23	7.1	480
25	7.1	516
26	7.1	1,848

(iii) The yearly volume of ink/material used is to be calculated as follows:

(A) Compute the volume of ink/material used each month per press by the 15th of the following month.

(B) By the 15th of each month, add the monthly ink/material usage per press for the 12 previous months (to obtain the yearly volume of ink used).

(iv) Beginning on July 1, 1991, the owner and operator of Wallace's plant in Hillside, Illinois, shall keep the following records for each press for each month. All records shall be retained by Wallace for 3 years and shall be made available to the Administrator on request:

(A) The name and identification number of each ink, fountain solution, fountain solution additive, cleaning solvent, and other VOM containing material as applied or used.

(B) The weight of VOM per volume of each ink, fountain solution, fountain solution additive, cleaning solvent, and each other VOM containing material (minus water and any compounds which are specifically exempted from the definition of VOM) as applied or used each month.

(C) The volume of ink (minus water and any compounds which are specifically exempted from the definition of VOM) as applied each month.

(D) The total volume of miscellaneous VOM containing materials (minus water and any compounds which are specifically exempted from the definition of VOM), other than inks, that are used each month.

(v) Any record showing a violation of paragraph (x)(13)(i) or (x)(13)(ii) of this section shall be reported by sending a copy of such record to the Administrator within 30 days of the violation.

(vi) To determine compliance with paragraphs (x)(13)(i) and (x)(13)(ii) of this section and to establish the records required under paragraph (x)(13)(iv) of this section the VOM content of each ink and miscellaneous VOM containing material shall be determined by the applicable test methods and procedures specified in paragraph (a)(4) of this section.

(14) The control and recordkeeping and reporting requirements, as well as the test methods in this paragraph, apply to the power-operated silk screen presses, the hand screen presses, the screen adhesive printing lines, the Andreotti rotogravure press, the Halley Rotogravure press, and the Viking press at the American Decal and Manufacturing Company's plant in Chicago, Illinois, instead of the requirements in paragraphs (h) and (x)(1) through (x)(5) of this section. The emissions from the sources listed above (in paragraph (x)(14) of this section) are to be included in the calculation of "maximum theoretical emissions" for determining applicability for any other sources (for which applicability is based on the quantity of maximum theoretical emissions) at American Decal and Manufacturing Company's Chicago plant not included in paragraph (x)(14) of this section.

(i) After July 24, 1992, no inks, coatings, thinner, clean-up material or other VOC-containing material shall at any time be applied, at the presses/printing lines listed above (in paragraph (x)(14) of this section), which exceed the VOC content (in percent by weight VOC) limit established below. After July 24, 1992, the yearly usage (in weight of material applied) of ink, coating, thinner, clean-up material, and other VOC-containing material, shall not exceed the applicable pounds per year limit established below. The yearly weight of ink, coating, thinner, clean-up material, and other VOC-containing material is to be calculated according to the procedure in paragraph (x)(14)(ii) of this section.

Material	Usage (lbs/yr)	Weight Percent VOC
#6 ink	9,076	56.8
#7 ink	1,278	54.2
#2 ink	2,911	72.7
Blue N.C. lacq.	394	64.3
Black M lacq.	753	61.6
4B9L Clear	2,451	77.1
4B9L H Clear	3,360	75.0
Flow-Out Agent	1,795	97.1
D.S. Stamp lacq.	1,047	62.0

Material	Usage (lbs/yr)	Weight Percent VOC
Dull write-on	86	71.6
AH–16	621	84.5
Thinner (#7,6)	2,350	100.0
Exon 470	1,668	65.4
9L Clear	2,451	77.1
White M lacq	3,467	47.0
Tedlar Gr. Vehicle	1,050	66.7
TH–98	22,047	73.2
TH–57	59	69.5
TH–14M	16,520	0.7
PS 160	10,644	3.0
#1 tint	4,872	69.3
#2 tint	4,256	83.7
Roto Color	13,884	62.0
1st SS White	25,740	51.5
2nd SS White	25,740	51.5
Clean Up	108,742	100.0
Other Materials	400	100.0

(ii) The yearly weight of material used is to be calculated as follows:

(A) Compute the weight of each ink, coating, thinner, clean-up material, and other VOC-containing material used each month by the 15th of the following month.

(B) By the 15th of each month, add the monthly usage (in pounds) for each ink, coating, thinner, clean-up material, and other VOC-containing material for the twelve previous months (to obtain the yearly weight of each ink, coating, thinner, clean-up material used). A comparison of these yearly usage levels (in pounds) with purchase records must be made to ensure the accuracy of the monthly usage levels (in pounds) obtained to satisfy paragraph (x)(14)(ii)(A) of this section.

(iii) Beginning on August 1, 1992, the owner and operator of the American Decal and Manufacturing Company plant in Chicago, Illinois, shall keep the following records for each ink, coating, thinner, clean-up material, and other VOC-containing material for each month. All records shall be kept by the American Decal and Manufacturing Company for 3 years and shall be made available to the Administrator on request:

(A) The name and identification number of each ink, coating, thinner, clean-up material, and other VOC-containing material as applied or used.

(B) The weight percent VOC of each ink, coating, thinner, clean-up material, and each other VOC-containing material as applied or used each month.

(C) The as applied weight of each ink, coating, thinner, clean-up material, and other VOC-containing material used each month.

(iv) Any record showing a violation of paragraph (x)(14)(i) of this section after October 20, 1995 shall be reported by sending a copy of such record to the Administrator within 30 days of the violation.

(v) To determine compliance with paragraph (x)(14)(i) of this section and to establish the records required under paragraph (x)(14)(iii) of this section, the weight percent VOC of each ink, coating, thinner, clean-up material, and other VOC-containing material shall be determined by the applicable test methods and procedures specified in paragraph (a)(4) of this section. Any material reported to be 100 percent VOC does not have to be tested for weight percent VOC.

(y) *Recordkeeping and reporting for non-CTG sources*—(1) *Exempt emission sources.* Upon request by the Administrator, the owner or operator of an emission source which is exempt from the requirements of paragraphs (u), (v), (w), (x), or (e)(3)(ii) of this section shall submit records to the Administrator within 30 calendar days from the date of the request that document that the emission source is exempt from those requirements.

(2) *Subject emission sources.* (i) Any owner or operator of a VOM emission source which is subject to the requirements of paragraph (u), (v), (w) or (x) of this section and complying by the use of emission capture and control equipment shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a new emission source, the owner or operator of the subject VOM emission source shall perform all tests and submit to the Administrator the results of all tests and calculations necessary to demonstrate that the subject emission source will be in compliance on and after July 1, 1991, or on and after the initial start-up date.

(B) On and after July 1, 1991, 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:

(*1*) Control device monitoring data.

(*2*) A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

(*3*) 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.

(C) On and after July 1, 1991, the owner or operator of a subject VOM emission source shall notify the Administrator in the following instances:

(*1*) Any record showing a violation of the requirements of paragraphs (u), (v), (w), or (x) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*2*) At least 30 calendar days before changing the method of compliance with paragraphs (u) or (x) of this section 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 paragraph (y)(2)(ii)(A) of this section. Upon changing the method of compliance with paragraphs (u) or (x) of this section 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 paragraph (y)(2)(ii) of this section.

(ii) Any owner or operator of a coating line which is subject to the requirements of paragraphs (u) or (x) of this section and complying by means of the daily-weighted average VOM content limitation shall comply with the following:

(A) By July 1, 1991, or upon initial start-up of a coating line subject to paragraph (u) or (x) of this section; the owner or operator of the subject coating line shall certify to the Administrator that the coating line will be in compliance on and after July 1, 1991, or on and after the initial start-up date. Such certification shall include:

(*1*) The name and identification number of each coating line which will comply by means of the daily-weighted average VOM content limitation.

(*2*) The name and identification number of each coating as applied on each coating line.

(*3*) 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.

(*4*) 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.

(*5*) The method by which the owner or operator will create and maintain records each day as required in paragraph (y)(2)(ii)(B) of this section.

(*6*) An example of the format in which the records required in paragraph (y)(2)(ii)(B) of this section will be kept.

(B) On and after July 1, 1991, 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:

(*1*) The name and identification number of each coating as applied on each coating line.

(*2*) 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*) The daily-weighted average VOM content of all coatings as applied on each coating line as defined in paragraph (a)(3) of this section.

(C) On and after July 1, 1991, the owner or operator of a subject coating line shall notify the Administrator in the following instances:

(*1*) Any record showing violation of the requirements of paragraph (u) or (x) of this section shall be reported by sending a copy of such record to the Administrator within 30 days following the occurrence of the violation.

(*2*) At least 30 calendar days before changing the method of compliance with paragraph (u) or (x) of this section from the use of complying coatings to the use capture systems and control devices, the owner or operator shall comply with all requirements of paragraph (y)(2)(i)(A) of this section. Upon changing the method of compliance with paragraphs (u) or (x) of this section from the use of complying coatings to the use capture systems and control devices, the owner or operator shall comply with all requirements of paragraph (y)(2)(i) of this section.

(iii) Any owner or operator of a VOM emission source which is subject to the requirements of paragraphs (u), (v), (w) or (x) of this section and complying by means of an alternative control plan which has been approved by the Administrator as a SIP or FIP revision shall comply with the recordkeeping and reporting requirements specified in the altenative control plan.

(z) *Rules stayed.* Not withstanding any other provision of this subpart, the effectiveness of the following rules is stayed as indicated below.

(1) [Reserved]

(2) Compliance with all of 40 CFR 52.741 is stayed for 60 days (July 1, 1991, until August 30, 1991) as it pertains to the following parties: The Illinois Environmental Regulatory Group including its approximately 40 member firms; Allsteel, Incorporated; Riverside Laboratories, Incorporated; the Printing Industry of Illinois/Indiana Association including its member firms, and R.R. Donnelley & Sons Company; the rules applicable to General Motors Corporation; Reynolds Metals Company; Stepan Company; and Duo-Fast Corporation. Final compliance for these parties is extended 60 days from July 1, 1991 until August 30, 1991.

(3) The following rules are stayed from July 23, 1991, until USEPA completes its reconsideration as indicated:

(i) 40 CFR 52.741(e) only as it applies to Duo-Fast Corporation's Franklin Park, Illinois "power-driven metal fastener" manufacturing facility, and

(ii) 40 CFR 52.741 (w) and (y) only as it applies to Stepan Company's miscellaneous organic chemical manufacturing processes at its manufacturing facility located near Millsdale, Illinois.

When USEPA concludes its reconsideration, it will publish its decision and any actions required to effectuate that decision in the FEDERAL REGISTER.

(4)–(5) [Reserved]

APPENDIX A—LIST OF CHEMICALS DEFINING SYNTHETIC ORGANIC CHEMICAL AND POLYMER MANUFACTURING

OCPDB No.[1]	Chemical
20	Acetal.
30	Acetaldehyde.
40	Acetaldol.
50	Acetamide.
65	Acetanilide.
70	Acetic acid.
80	Acetic anhydride.
90	Acetone.
100	Acetone cyanohydrin.
110	Acetonitrile.
120	Acetophenone.
125	Acetyl chloride.
130	Acetylene.
140	Acrolein.
150	Acrylamide.
160	Acrylic acid & esters.
170	Acrylonitrile.
180	Adipic acid.
185	Adiponitrile.
190	Alkyl naphthalenes.
200	Allyl alcohol.
210	Allyl chloride.
220	Aminobenzoic acid.
230	Aminoethylethanolamine.
235	p-aminophenol.
240	Amyl acetates.
250	Amyl alcohols.
260	Amyl amine.
270	Amyl chloride.
280	Amyl mercaptans.
290	Amyl phenol.
300	Aniline.
310	Aniline hydrochloride.
320	Anisidine.
330	Anisole.
340	Anthranilic acid.
350	Anthraquinone.
360	Benzaldehyde.
370	Benzamide.
380	Benzene.
390	Benzenedisulfonic acid.
400	Benzene-sulfonic acid.
410	Benzil.
420	Benzilic acid.
430	Benzoic acid.
440	Benzoin.
450	Bennzonitrile.
460	Benzophenone.
480	Benzotrichloride.
490	Benzoyl chloride.
500	Benzyl chalcohol.
510	Benzyl amine.
520	Benzyl benzoate.
530	Benzyl chloride.
540	Benzyl dichloride.
550	Biphenyl.
560	Bisphenol A.
570	Bromobenzene.
580	Bromonaphthalene.
590	Butadiene.
592	1-butene.
600	n-butyl acetate.
630	n-butyl acrylate.
640	n-butyl alcohol.
650	s-butyl alcohol.
660	t-butyl alcohol.

OCPDB No.[1]	Chemical
670	n-butylamine.
680	s-butylamine.
690	t-butylamine.
700	p-pert-butyl benzoic acid.
750	n-butyraldehyde.
760	Butyric acid.
770	Butyric anhydride.
780	Butyronitrile.
785	Caprolactam.
790	Carbon disulfide.
800	Carbon tetrabromide.
810	Carbon tetrachloride.
820	Cellulose acetate.
840	Chloroacetic acid.
850	m-chloroaniline.
860	o-chloroaniline.
870	p-chloroaniline.
880	Chlorobenzaldehyde.
890	Chlorobenzene.
900	Chlorobenzoic acid.
905	Chlorobenzotrichloride.
910	Chlorobenzoyl chloride.
920	Chlorodifluoroethane.
921	Chlorodifluoromethane.
930	Chloroform
940	Chloronaphthalene.
950	o-chloronitrobenzene.
951	p-chloronitrobenzene.
960	Chlorophenols.
964	Chloroprene.
965	Chlorosulfonic acid.
970	m-chlorotoluene.
980	o-chlorotoluene.
990	p-chlorotoluene.
992	Chlorotrifluoromethane.
1000	m-cresol.
1010	o-cresol.
1020	p-cresol.
1021	Mixed cresols.
1030	Cresylic acid.
1040	Crontonaldehyde.
1050	Crontonic acid.
1060	Cumene.
1070	Cumene hydroperoxide.
1080	Cyanoacetic acid.
1090	Cyanogen chloride.
1100	Cyanuric acid.
1110	Cyanuric chloride.
1120	Cychohexane.
1130	Cyclohexanol.
1140	Cyclohexanone.
1150	Cyclohexene.
1160	Cyclohexylamine.
1170	Cyclooctadiene.
1180	Decanol.
1190	Diacetone alcohol.
1200	Diaminobenzoic acid.
1210	Dichloroaniline.
1215	m-dichlorobenzene.
1216	o-dichlorobenzene.
1220	p-dichlorobenzene.
1221	Dichlorodifluoromethane.
1240	Dichloroethyl ether 1,2-dichloroethane.
1250	Dichlorohydrin
1270	Dichloropropene.
1280	Dicyclohexylamine.
1290	Diethylamine.
1300	Diethylene glycol.
1304	Diethylene glycol diethyl ether.
1305	Diethylene glycol dimethyl ether.
1310	Diethylene glycolmonobutyl ether.
1320	Diethylene glycolmonobutyl ether acetate.
1330	Diethylene glycolmonoethyl ether.
1340	Diethylene glycolmonoethyl ether acetate.
1360	Diethylene glycolmonomethyl ether.
1420	Diethyl sulfate.
1430	Difluoroethane.
1440	Diisobutylene.
1442	Diisodecyl phthalate.
1444	Diisooctyl phthalate.
1450	Diketene.
1460	Dimethylamine.
1470	N,N-dimethylaniline.
1480	N,N-dimethylether.
1490	N,N-dimethylformamide.
1495	Dimethylhydrazine.
1500	Dimethyl sulfate.
1510	Dimethyl sulfide.
1520	Dimethylsulfoxide.
1530	Dimethylterephthalate.
1540	3,5-dinitrobenzoic acid.
1545	Dinitrophenol.
1560	Dioxane.
1570	Dioxolane.
1580	Diphenylamine.
1590	Diphenyl oxide.
1600	Diphenyl thiourea.
1610	Dipropylene glycol.
1620	Dodecene.
1630	Dodecylaniline.
1640	Dodecylphenol.
1650	Epichlorohydrin.
1660	Ethanol.
1661	Ethanolamines.
1670	Ethyl acetate.
1680	Ethyl acetoacetate.
1690	Ethyl acrylate.
1700	Ethylamine.
1710	Ethylbenzene.
1720	Ethyl bromide.
1730	Ethylcellulose.
1740	Ethyl chloride.
1750	Ethyl chloroacetate.
1760	Ethylcyanoacetate.
1770	Ethylene.
1780	Ethylene carbonate.
1790	Ethylene chlorodhydrin.
1800	Ethylenediamine.
1810	Ethylene dibromide.
1830	Ethylene glycol.
1840	Ethylene glycol diacetate.
1870	Ethylene glycol dimethyl ether.
1890	Ethylene glycol monobutyl ether.
1900	Ethylene glycol monobutyl ether acetate.
1910	Ethylene glycol monoethyl ether.
1920	Ethylene glycol monoethyl ether acetate.
1930	Ethylene glycol monoethyl ether.
1940	Ethylene glycol monomethyl ether acetate.
1960	Ethylene glycol monophenyl ether.
1970	Ethylene glycol monopropyl ether.
1980	Ethylene oxide.
1990	Ethyl ether.
2000	2-ethylhexanol.
2010	Ethyl orthoformate.
2020	Ethyl oxalate.
2030	Ethyl sodium oxalacetate.
2040	Formaldehyde.
2050	Formamide.
2060	Formic acid.
2070	Fumaric acid.
2073	Furfural.
2090	Glycerol (Synthetic).
2091	Glycerol dichlorohydrin.
2100	Glycerol triether.
2110	Glycine.
2120	Glyoxal.

OCPDB No.[1]	Chemical
2145	Hexachlorobenzene.
2150	Hexachloroethane.
2160	Hexadecyl alcohol.
2165	Hexamethylenediamine.
2170	Hexamethylene glycol.
2180	Hexamethylentetramine.
2190	Hydrogen cyanide.
2200	Hydroquinone.
2210	p-hydroxy-benzoic acid.
2240	Isoamylene.
2250	Isobutanol.
2260	Isobutyl acetate.
2261	Isobutylene.
2270	Isobutyraldehyde.
2280	Isobutyric acid.
2300	Isodecanol.
2320	Isooctyl alcohol.
2321	Isopentane.
2330	Isophorone.
2340	Isophthalic acid.
2350	Isoprene.
2360	Isopropanol.
2370	Isopropyl acetate.
2380	Isopropylamine.
2390	Isopropyl chloride.
2400	Isopropylphenol.
2410	Ketene.
2414	Linear alkylsulfonate.
2417	Linear alkylbenzene.
2420	Maleic acid.
2430	Maleic anhydride.
2440	Malic acid.
2450	Mesityl oxide.
2455	Metanilic acid.
2460	Methacrylic acid.
2490	Methallyl chloride.
2500	Methanol.
2510	Methyl acetate.
2520	Methyl acetoacetate.
2530	Methylamine.
2540	n-methylaniline.
2545	Methyl bromide.
2550	Methyl butynol.
2560	Methyl chloride.
2570	Methyl cyclohexane.
2590	Methyl cyclohexanone.
2620	Methylene chloride.
2630	Methylene dianiline.
2635	Methylene diphenyl diisocyanate.
2640	Methyl ethyl ketone.
2644	Methyl formate.
2650	Methyl isobutyl carbinol.
2660	Methyl isobutyl ketone.
2665	Methyl methacrylate.
2670	Methyl pentynol.
2690	a-methyl styrene.
2700	Morpholine.
2710	a-napthalene sulfonic acid.
2720	B-napthalene sulfonic acid.
2730	a-naphthol.
2740	B-naphthol.
2750	Neopentanoic acid.
2756	o-nitroaniline.
2757	p-nitroaniline.
2760	o-nitroanisole.
2762	p-nitroanisole.
2770	Nitrobenzene.
2780	Nitrobenzoic acid (o, m & p).
2790	Nitroethane.
2791	Nitromethane.
2792	Nitrophenol.
2795	Nitropropane.
2800	Nitrotoluene.

OCPDB No.[1]	Chemical
2810	Nonene.
2820	Nonyl phenol.
2830	Octyl phenol.
2840	Paraldehyde.
2850	Pentaerythritol.
2851	n-pentane.
2855	l-pentene.
2860	Perchloroethylene.
2882	Perchloromethylmercaptan.
2890	o-phenetidine.
2900	p-phenetidine.
2910	Phenol.
2920	Phenolsulfonic acids.
2930	Phenyl anthranilic acid.
2940	Phenylenediamine.
2960	Phthalic anhydride.
2970	Phthalimide.
2973	b-picoline.
2976	Piperazine.
3000	Polybutenes.
3010	Polyethylene glycol.
3025	Polypropylene glycol.
3063	Propionaldehyde.
3066	Propionic acid.
3070	n-propyl alcohol.
3075	Propylamine.
3080	Propyl chloride.
3090	Propylene.
3100	Propylene chlorohydrin.
3110	Propylene dichloride.
3111	Propylene glycol.
3120	Propylene oxide.
3130	Pyridine.
3140	Quinone.
3150	Resorcinol.
3160	Resorcylic acid.
3170	Salicylic acid.
3180	Sodium acetate.
3181	Sodium benzoate.
3190	Sodium carboxymethylcellulose.
3191	Sodium chloroacetate.
3200	Sodium formate.
3210	Sodium phenate.
3220	Sorbic acid.
3230	Styrene.
3240	Succinic acid.
3250	Succinitrile.
3251	Sulfanilic acid.
3260	Sulfolane.
3270	Tannic acid.
3280	Terephthalic acid.
3290 & 3291.	Tetrachloroethanes.
3300	Tetrachlorophthalic anhydride.
3310	Tetraethyllead.
3320	Tetrahydronaphthalene.
3330	Tetrahydrophthalic anhydride.
3335	Tetramethyllead.
3340	Tetramethylenediamine.
3341	Tetramethylethylenediamine.
3349	Toluene.
3350	Toluene-2,4-diamine.
3354	Toluene-2,4-diisocyanate.
3355	Toluene diisocyanates (mixture).
3360	Toluene sulfonamide.
3370	Toluene sulfonic acids.
3380	Toluene sulfonylchloride.
3381	Toluidines.
3393	Trichlorobenzenes.
3395	1,1,1-trichloroethane.
3400	1,1,2-trichloroethane.
3410	Trichloroethylene.
3411	Trichlorofluoromethane.

OCPDB No.[1]	Chemical
3420	1,2,3-trichloropropane.
3430	1,1,2-trichloro-1,2,2-trifluoroethane.
3450	Triethylamine.
3460	Triethylene glycol.
3470	Triethylene glycoldimethyl ether.
3480	Triisobutylene.
3490	Trimethylamine.
3510	Vinyl acetate.
3520	Vinyl chloride.
3530	Vinylidene chloride.
3540	Vinyl toluene.
3541	Xylene (mixed).
3560	o-xylene.
3570	p-xylene.
3580	Xylenol.
3590	Xylidine, 1,3-butylene glycol, Dinitrotoluene, Methyltertbutyl ether, Phosgene, Polyethylene, Polypropylene, Polystyrene, Urea.

[1] The OCPDB Numbers are reference indices assigned to the various chemicals in the Organic Chemical Producers Data Base developed by the USEPA.

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: $Q_{Gj}=\pm 5.5$ percent and $C_{Gj}=\pm 5.0$ 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 lead-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 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 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. DETERMINATIONS 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. DETERMINATIONS 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 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, 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 5.3.

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 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.

5.4 *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_{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.

G=total VOC content of captured emissions, kg.

$K_1=1.830\times10^{-6}$ 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.*

$$G=\sum_{j=1}^{n}\left(C_{Gj}-C_B\right)Q_{Gj}T_CK_1 \qquad \text{Eq. 1}$$

7.2 *VOC concentration of the captured emissions at point j.*

$$C_{Gj}=\left(C_j-C_{DO}\right)\frac{C_H}{C_{DH}-C_{DO}} \qquad \text{Eq. 2}$$

7.3. *Background VOC concentration at point i.*

$$C_{Bi} = \left(C_i - C_{DO}\right) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 3}$$

7.4 *Average background concentration.*

$$C_B = \frac{\sum_{i=1}^{n} C_{Bi} A_i}{n A_N} \qquad \text{Eq. 4}$$

NOTE: If the concentration at each point is with in 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 emission. 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: O_{Gj}=±5.5 percent and C_{Gj}=±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 contract 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.

2.1.7.8 *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 system, 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 signficantly 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 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.

D_F=dilution factor.

G=total VOC content of captured emissions, kg.

$K_1=1.830\times10^{-6}$ 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 to point j.*

$$C_{Gj} = DF\left(C_j + -C_{DO}\right)\frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

7.3 *Dilution factor.*

$$DF = \frac{C_A}{C_M} \qquad \text{Eq. 3}$$

7.4 *Background VOC concentration at point i.*

$$C_{Bi} = \left(C_i - C_{DO}\right)\frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 4}$$

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.

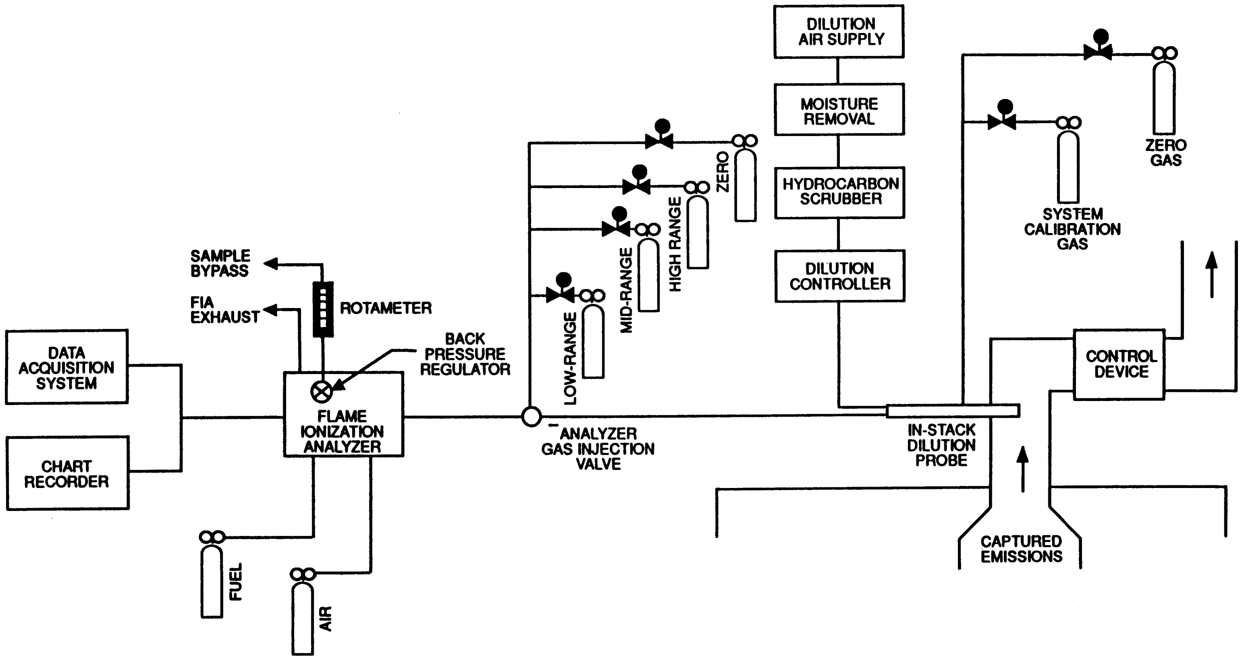

Figure 1. Captured emissions measurement system.

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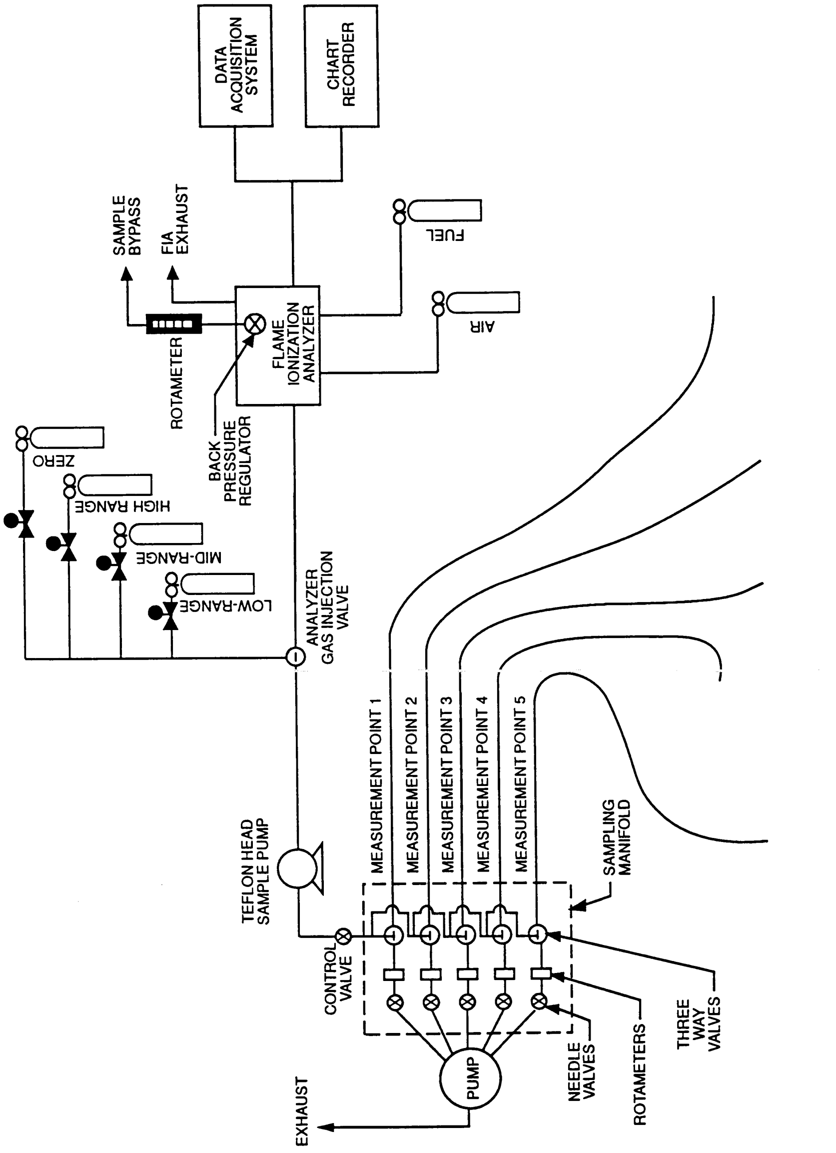

Figure 2. Background measurement system.

VOC 2/90

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 stream shall be constructed of staimust 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 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 totals 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_{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_j=uncorrected average VOC concentration measured at point j, ppm propane.

F_B=total VOC content of fugitive emissions from the building, kg.

$K_1=1.830\times10^{-6}$ 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.*

$$C_{Fj} = \left(C_j - C_{DO}\right) \frac{C_H}{C_{DH} - C_{DO}} \qquad \text{Eq. 2}$$

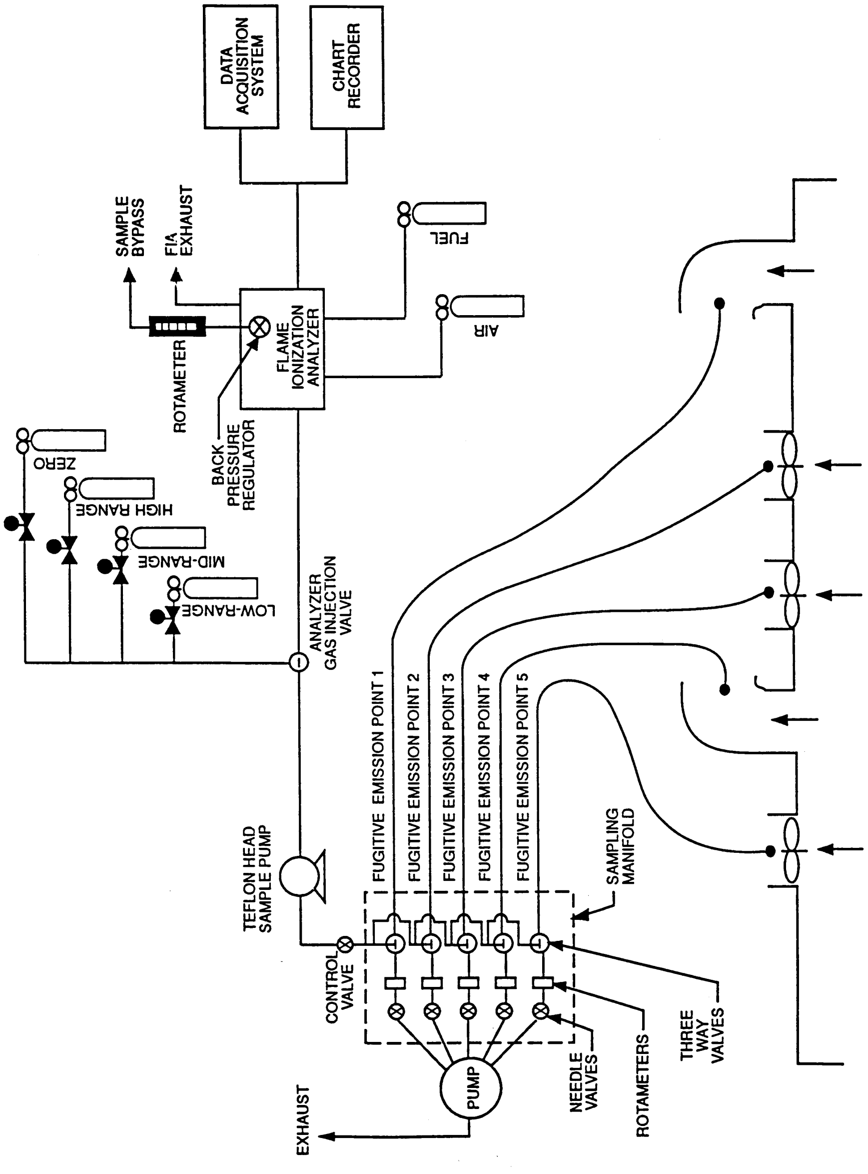

Figure 1. Fugitive emissions measurement system.

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=±5.5 percent and C_{Fj}=±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 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 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 analzyer.* 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 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.*

$$\sum_{j=1}^{F=n}\left(C_{Fj}-C_B\right)Q_{Fj}T_FK_1 \qquad \text{Eq. 1}$$

7.2 *VOC concentration of the fugitive emissions at point j.*

$$C_{Fj}=\left(C_j-C_{DO}\right)\frac{C_H}{C_{DH}-C_{DO}} \qquad \text{Eq. 2}$$

7.3 *Background VOC concentration at point i.*

$$C_{Bi}=\left(C_i-C_{DO}\right)\frac{C_H}{C_{DH}-C_{DO}} \qquad \text{Eq. 3}$$

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.

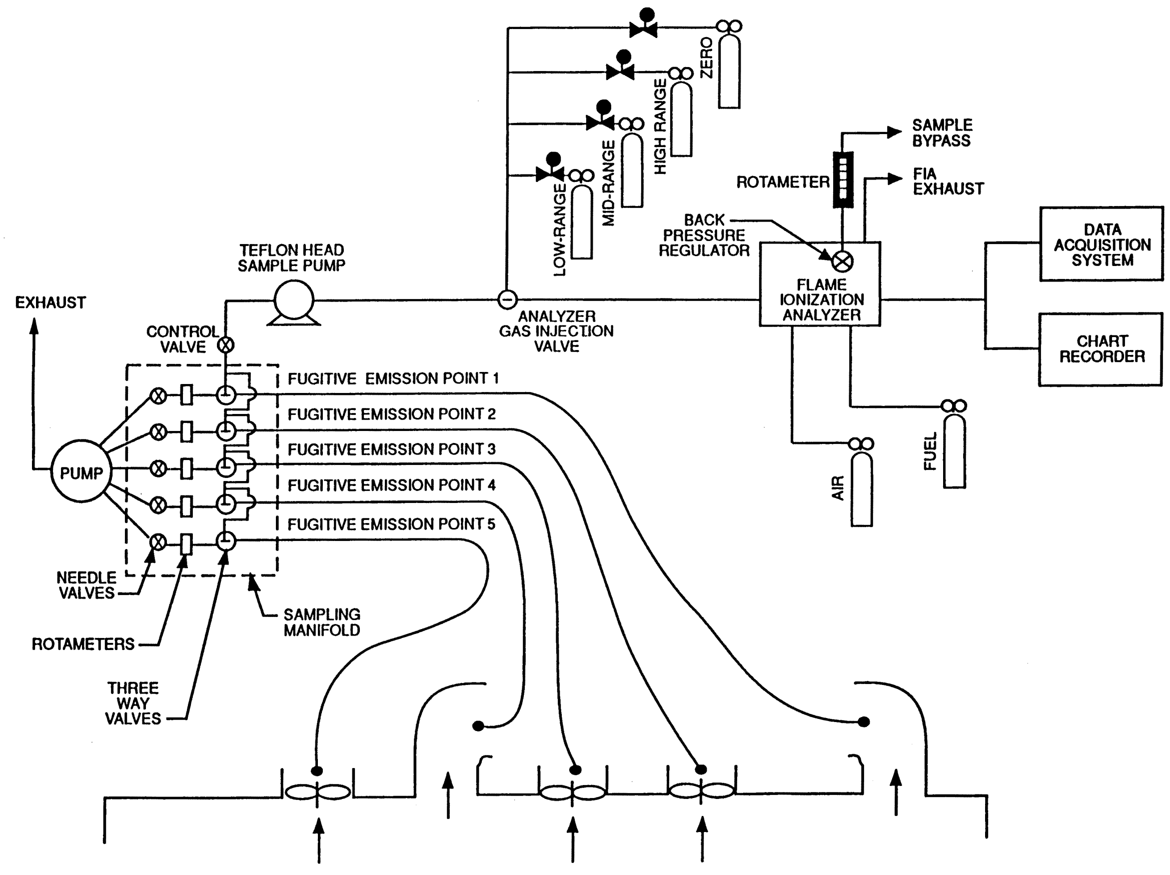

Figure 1. Fugitive emissions measurement system.

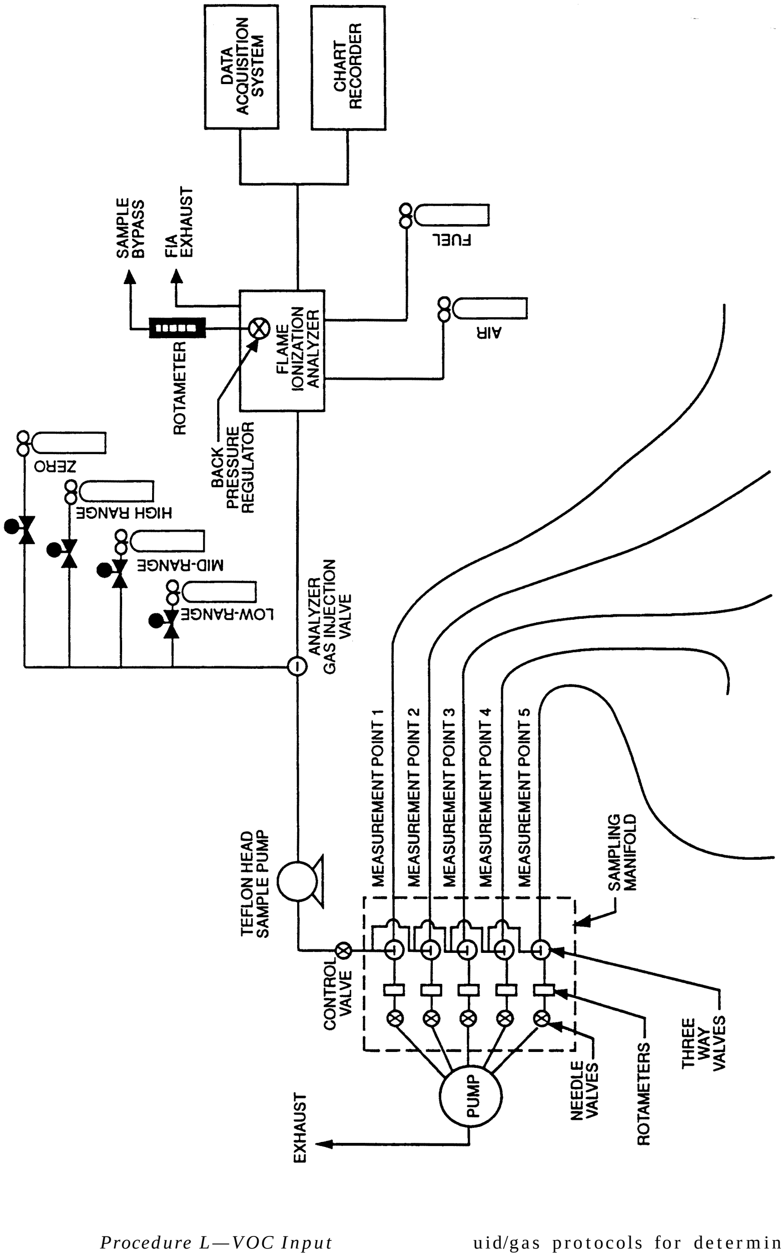

Figure 2. Background measurement system.

VOC 2/90

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=±2.0 percent and V=±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 (⅛-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 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.

2.2.22.2 *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, approximately 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 preweighted empty drum to determine the final weight of the liquid.

3.1.2 If it is not possible to measure a single representative mixture, than 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 fress 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, or determine 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.

$K=1.830\times10^{-9}$ 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.*

$$L = \sum_{j=1}^{n} V_{Ij} W_{Ij} - \sum_{j=1}^{n} V_{Fj} W_{Fj} + \sum_{j=1}^{n} V_{Aj} W_{Aj} \qquad \text{Eq. 1}$$

7.2 *Liquid sample analysis system response factor for systems using intergrators, 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.

$$V = \frac{A_L RF}{M_L} \qquad \text{Eq. 3}$$

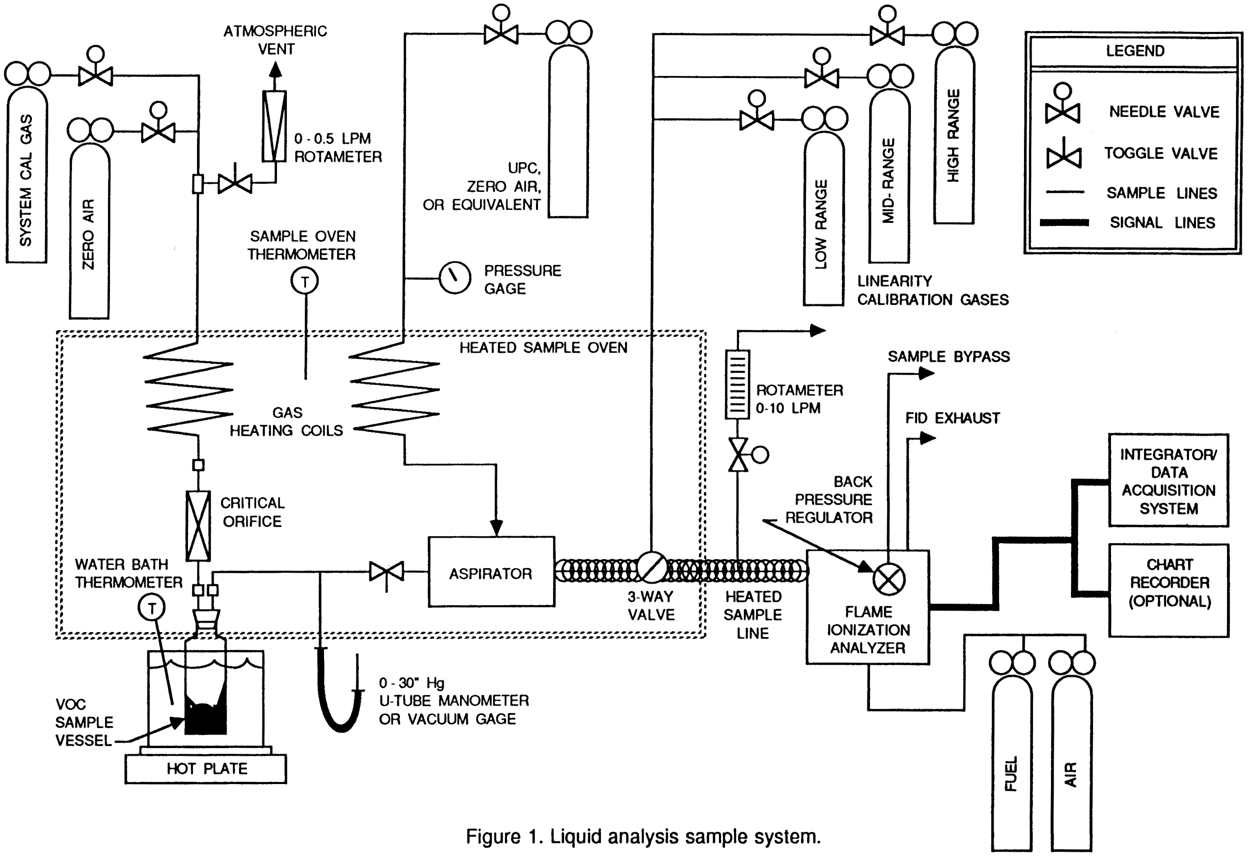

Figure 1. Liquid analysis sample system.

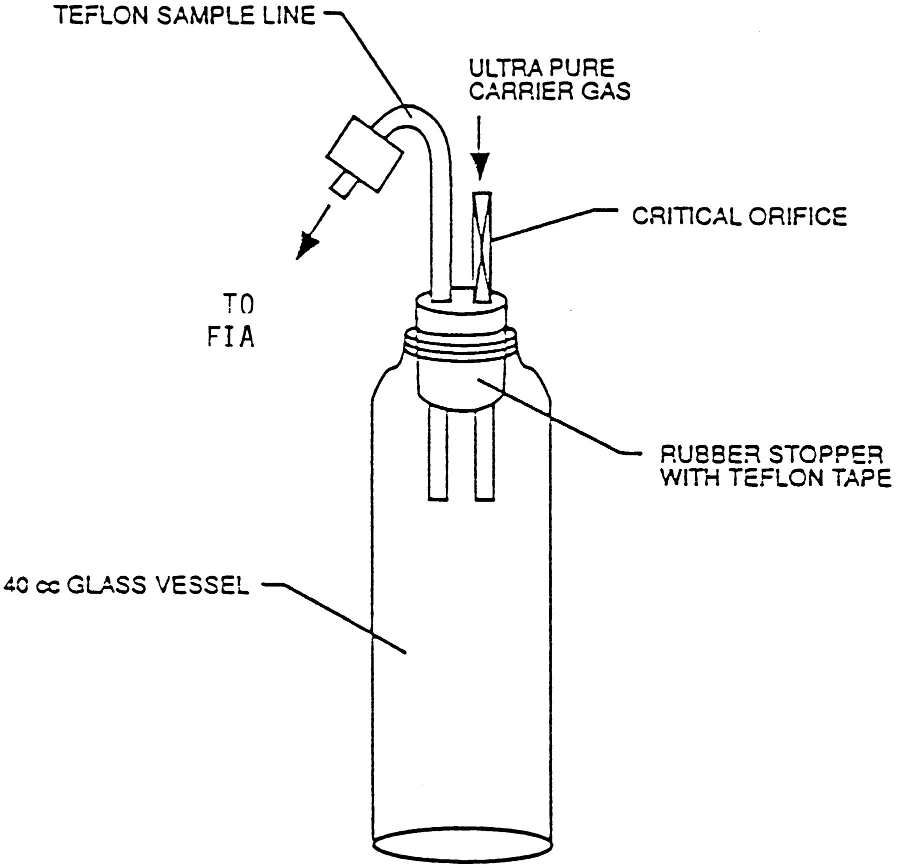

Figure 2. VOC sampling vessel.

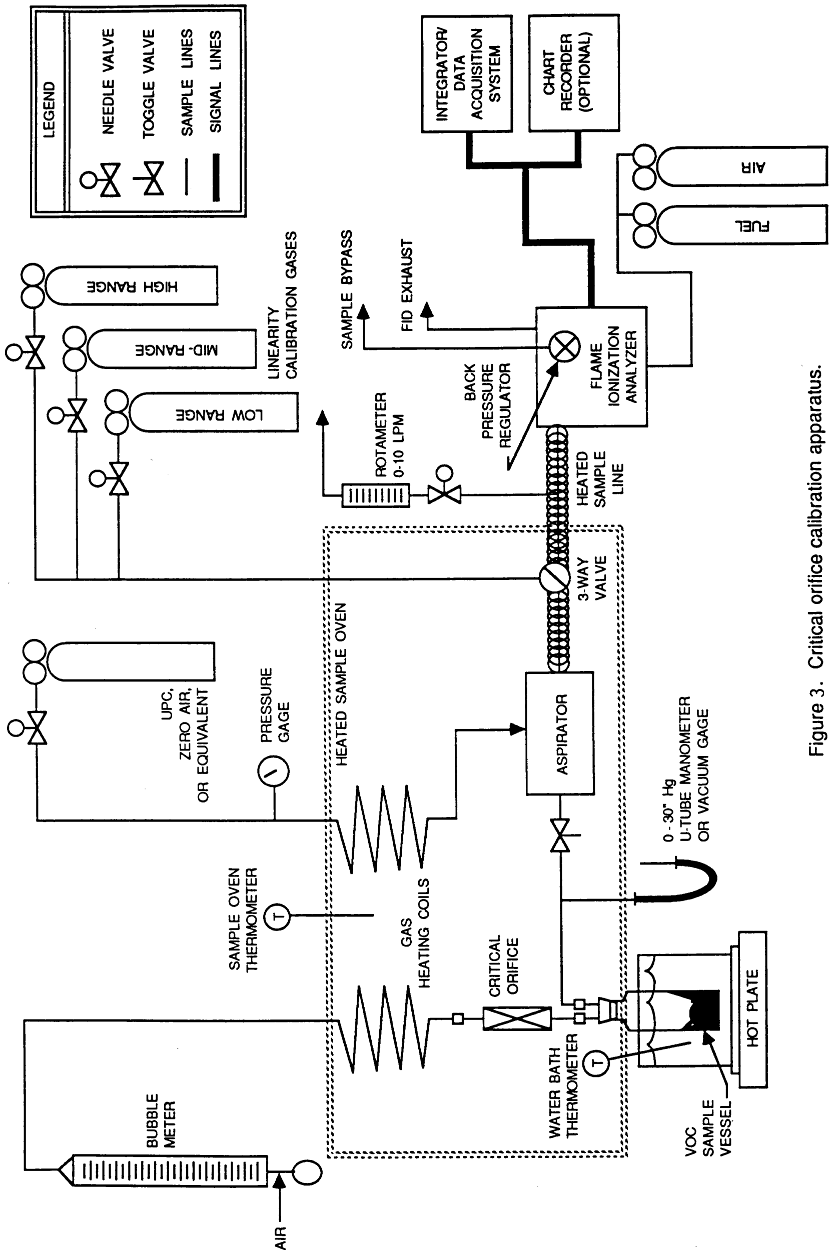

Figure 3. Critical orifice calibration apparatus.

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 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.

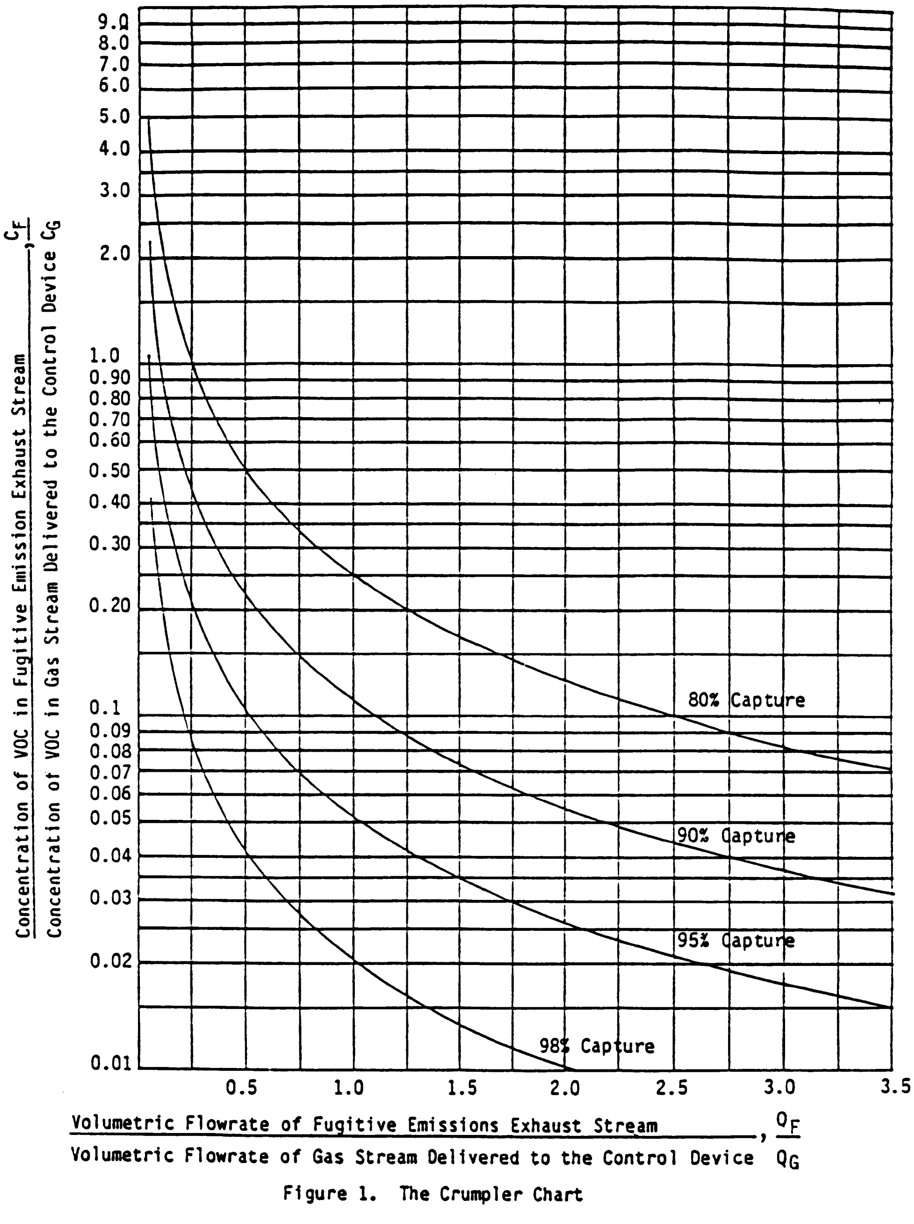

Figure 1. The Crumpler Chart

[55 FR 26856, June 29, 1990; 55 FR 31981, Aug. 6, 1990; 55 FR 39774, 39775, Sept. 28, 1990, as amended at 56 FR 24723, May 31, 1991; 56 FR 33712, July 23, 1991; 57 FR 3946, Feb. 3, 1992; 57 FR 7550, Mar. 3, 1992; 57 FR 27936, June 23, 1992; 58 FR 31653, June 4, 1993; 58 FR 34908, June 30, 1993; 59 FR 14112, Mar. 25, 1994; 59 FR 46569, Sept. 9, 1994; 60 FR 41, Jan. 3, 1995; 60 FR 13045, Mar. 10, 1995; 60 FR 14900, Mar. 21, 1995; 60 FR 43387, 43393, 43395, Aug. 21, 1995; 61 FR 54559, Oct. 21, 1996]