

**REGULATION 8
ORGANIC COMPOUNDS
RULE 52
POLYSTYRENE, POLYPROPYLENE AND POLYETHYLENE FOAM
PRODUCT MANUFACTURING OPERATIONS**

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(Adopted July 7, 1999)

8-52-100 GENERAL

- 8-52-101 Description:** The purpose of this Rule is to limit the emissions of volatile organic compounds (VOC) from the manufacture of foam products composed of polystyrene, polyethylene or polypropylene.
- 8-52-110 Exemption, Polymer or Resin Manufacturing:** The requirements of this Rule shall not apply to operations performed to manufacture polymers or resins. Such manufacturing operations are subject to the applicable provisions of District Regulation 2, Regulation 10, and Regulation 8, Rule 36.
- 8-52-111 Exemption, Use of Non-VOC Blowing Agent:** The requirements of this Rule shall not apply to any polystyrene, polyethylene or polypropylene foam product manufacturing operation where a VOC blowing agent is not used, provided the person claiming this exemption satisfies the requirements of Section 8-52-504.
- 8-52-112 Exemption, Solid Product Manufacturing:** The requirements of this Rule shall not apply to operations performed to manufacture non-foam solid polystyrene, polyethylene or polypropylene products, provided the person claiming this exemption satisfies the requirements of Section 8-52-504. Such operations are subject to the applicable provisions of District Regulation 2 and Regulation 8, Rule 2.
- 8-52-113 Limited Exemption, Recycled Polystyrene Foam Processes:** The requirements of Section 8-52-302 shall not apply to equipment or operations performed to process expanded polystyrene foam waste into recycled polystyrene pellets, which are subsequently used to manufacture recycled polystyrene loose fill. Such operations are subject to the applicable provisions of District Regulation 2 and Regulation 8, Rule 2.
- 8-52-114 Limited Exemption, Loose Fill Research and Development:** The requirements of Section 8-52-302 shall not apply to equipment used exclusively to research and/or develop recycled polystyrene loose fill production processes. Such equipment is subject to the applicable provisions of District Regulation 2 and Regulation 8, Rule 2.
- 8-52-115 Limited Exemption, Shape and Block Molding, Low Throughput:** The requirements of subsection 8-52-301.2 shall not apply to expandable polystyrene shape and block molding product manufacturing operations that process less than 1,000,000 pounds of expandable polystyrene beads in any consecutive 12-month period, provided all VOC emissions from expandable bead storage, expansion and intermediate pre-puff storage/aging are controlled by an approved emission control system that satisfies the requirements of Section 8-52-304 and achieves a capture and control efficiency of at least 85 percent by weight.

8-52-200 DEFINITIONS

- 8-52-201 Approved Emission Control System:** A system for reducing emissions of volatile organic compounds to the atmosphere, consisting of an abatement device and a collection system that meets the requirements of Regulation 2, Rule 1, and achieves the control efficiency specified in the applicable standards section at all times for the operation being controlled.
- 8-52-202 Blowing Agent:** Any liquid, gaseous or solid substance that alone or in conjunction with other substances is capable of producing a cellular (foam) structure in a polymeric material.
- 8-52-203 Expandable Polystyrene Molding:** A series of processes where expandable polystyrene beads, which are polystyrene resin particles impregnated with blowing

agent, undergo expansion, aging and then cup, shape or block molding to form a low-density foam product. During expansion, the beads are expanded to the appropriate desired density by exposure to steam or hot air in a pre-expander. During aging, the expanded beads (or pre-puff) are transferred to storage silos or mesh bags to stabilize and dry. During molding, the aged pre-puff is exposed to heat in a closed mold that causes the beads to soften, re-expand, and fuse together to form the shaped product. For the purposes of this Rule, cup molding refers to the molding of cups and containers such as bowls.

- 8-52-204 Extrusion:** The process in which a plastic resin is melted in an extruder and continuously forced through a die opening shaped like the finished product. As it leaves the die opening, the extruded plastic melt partially expands and is then drawn by a puller through forming equipment that sizes, cools, and cuts the product to length or winds it into a roll. With extruded foam products, expandable beads are used as the raw material or blowing agent is injected under pressure directly into the extruder where it mixes with the plastic melt.
- 8-52-205 Foam:** A solid material in a lightweight cellular form (having internal voids or cavities called cells that contain air or a gas) resulting from the introduction or generation of gas bubbles throughout its mass during processing.
- 8-52-206 Foam Board:** A form of expanded thermoplastic foam that is manufactured by an extrusion process that injects blowing agent into the extruder and uses a slit aperture die that forms a slab, or by a block molding process using expandable beads. For the purposes of this Rule, a foam board product includes foam board and those products made from foam board.
- 8-52-207 Foam Sheet:** A form of thermoplastic foam that is manufactured by a tubular extrusion process using expandable beads or by extrusion with blowing agent injected into the extruder. For the purposes of this Rule, a foam sheet product includes foam sheet and those products made from foam sheet.
- 8-52-208 Loose Fill:** A form of expanded polystyrene foam, which is used as a protective packaging material because of its low density (less than 0.5 lbs/ft³), resiliency, and cushioning characteristics. This material is primarily manufactured with a series of steam expansion and aging (or curing) processes using expandable polystyrene beads as the raw material. When recycled polystyrene is used as the raw material, extrusion (with blowing agent injected directly into an extruder) and forming processes partially expand, shape, and cut the plastic material prior to the expansion and aging processes.
- 8-52-209 Polyethylene:** Any grade, class, or type of thermoplastic polymer, copolymer, interpolymer, alloy, or blend, or of cross-linked thermoset polymer, composed primarily of polymerized ethylene.
- 8-52-210 Polymer:** A high molecular weight organic compound that is formed by the polymerization of small molecules or monomers and that has a chemical structure represented by repeating units. When two or more different monomers polymerize, a copolymer is formed.
- 8-52-211 Polypropylene:** Any grade, class, or type of thermoplastic polymer, copolymer, interpolymer, alloy, or blend, or of cross-linked thermoset polymer, composed primarily of polymerized propylene.
- 8-52-212 Polystyrene:** Any grade, class, or type of thermoplastic polymer, copolymer, interpolymer, alloy, or blend composed primarily of polymerized styrene.
- 8-52-213 Product Manufacturing Operation:** A production line or lines consisting of all steps in the processing of a polymer or resin, from the receipt of raw polymeric material by the manufacturing facility through the final step prior to shipment of the finished foam product that results in a change in the form, chemical composition, or any chemical or physical property of the material, and that results in VOC emissions to the atmosphere. Individual steps include, but are not limited to, expandable bead storage, finished product storage/aging, extrusion, expansion, softening or annealing, intermediate (pre-puff) storage/aging, decomposition, molding, grinding, and forming. For the purposes of this rule, polyethylene and polypropylene foam product

manufacturing operations shall include all processes from and including expandable bead storage through and including 24 hours of finished product storage/aging.

8-52-214 Raw Material: All polystyrene, polyethylene and polypropylene, and blowing agent used in the manufacture of foam products, including virgin and recycled polymeric materials.

8-52-215 Resin: Any of a class of solid or semisolid products of natural or synthetic origin, generally of high molecular weight with no definite melting point. Most resins are polymers or copolymers.

8-52-216 Solid: A state of matter that has a crystalline or amorphous structure, a rigidity of form and tendency to maintain a definite shape, and whose uniformly compact interior results from the close proximity of the component atoms, ions, or molecules and the strength of the forces between them.

8-52-217 Volatile Organic Compound (VOC): Any organic compound (excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate) which would be emitted from a foam product manufacturing operation subject to this Rule.

217.1 For the purposes of determining emissions, the following organic compounds:

- pentafluoroethane (HFC-125)
- 1,1,2,2-tetrafluoroethane (HFC-134)
- 1,1,1,2-tetrafluoroethane (HFC-134a)
- 1,1-difluoroethane (HFC-152a)
- acetone
- ethane

shall not be considered a VOC subject to this Rule.

8-52-300 STANDARDS

8-52-301 Polystyrene Foam Product Manufacturing Operations: Effective June 1, 2000, except as provided in Sections 8-52-111, 115 and 302, a person shall not manufacture polystyrene foam products within the District unless, for each 100 pounds of raw material processed, VOC emissions, which include emissions from the product manufacturing operation and residual blowing agent in the finished foam product, do not at any time exceed:

- 301.1 2.8 pounds for expandable polystyrene cup molding product manufacturing operations; or
- 301.2 2.7 pounds for expandable polystyrene shape and block molding product manufacturing operations; or
- 301.3 2.4 pounds for loose fill product manufacturing operations; or
- 301.4 2.4 pounds for extruded polystyrene foam board and sheet product manufacturing operations.

8-52-302 Recycled Polystyrene Loose Fill Product Manufacturing Operations: Effective June 1, 2000, a person manufacturing loose fill from recycled polystyrene shall capture at least 50% by weight of the total VOCs added to the product manufacturing operation. The captured emissions shall be vented to an abatement device with a control efficiency of at least 98% by weight at all times.

8-52-303 Polyethylene and Polypropylene Foam Product Manufacturing Operations: Effective June 1, 2000, except as provided in Section 8-52-111, a person shall not manufacture polyethylene or polypropylene foam products within the District unless at least 85% by weight of the VOC emissions from the product manufacturing operation are captured and vented to an abatement device with a control efficiency of at least 98% by weight at all times.

8-52-304 Approved Emission Control System: A person subject to the limits in Sections 8-52-301, 302 or 303 may comply by using an approved emission control system. Where incineration is used to control emissions, at least 98 percent by weight of the organic carbon shall be oxidized to carbon dioxide.

8-52-400 ADMINISTRATIVE REQUIREMENTS

8-52-401 Compliance Schedule: A person subject to this Rule shall comply with the following increments of progress:

- 401.1 By November 15, 1999, submit to the APCO an application for an Authority to Construct and a Permit to Operate new or modified equipment to achieve compliance with this Rule.
- 401.2 By June 1, 2000, be in full compliance with this Rule.

8-52-500 MONITORING AND RECORDS

8-52-501 Records: Effective June 1, 2000, a person subject to this Rule shall comply with the following requirements, as applicable:

- 501.1 Maintain current data that provides the following information:
 - a. The type of resin(s) and blowing agent(s) used in product manufacturing operations; and
 - b. The amount of polymerized styrene, ethylene, propylene, and blowing agent in each resin formulation used in percent by weight as indicated by the specifications of the foam product manufacturer, and the manufacturer or supplier of the raw polymeric material.
- 501.2 Maintain monthly records of the amount of each raw polymeric material processed, the amount of each finished foam product manufactured, the amount of each VOC blowing agent used, and the hours of operation.
- 501.3 Such records shall be retained for the previous 24-month period and shall be made available for inspection by the APCO upon request.

8-52-502 Polyethylene and Polypropylene VOC Loss Data: A person manufacturing polyethylene and polypropylene foam using a VOC blowing agent shall maintain data showing the VOC loss from the product manufacturing operation for each type of resin used, expressed as a weight percent of the initial VOC blowing agent concentration. This VOC loss data shall be established at the time of source testing for a Permit to Operate. All supporting documentation related to this information shall also be maintained.

8-52-503 Approved Emission Control System, Recordkeeping Requirements: A person operating an approved emission control system to comply with Section 8-52-301, 302 or 303 shall record key system operating parameters such as temperature, flow rate, and pressure on a daily basis.

8-52-504 Extruder Blowing Agent Injection Rate, Monitoring: A person operating an extruder into which VOC blowing agent is injected shall install and maintain in good working order a device which continuously records the blowing agent injection rate(s) at all times during extrusion. Such monitoring devices, which include but are not limited to mass flow meters and recorders, shall be calibrated according to the procedures recommended by the instrumentation manufacturer or at least twice in any consecutive 12-month period, and meet manufacturer's specifications for accuracy and precision. Records and calibration dates shall be maintained for the previous 24-month period and shall be made available for inspection by the APCO upon request.

8-52-505 Burden of Proof: A person claiming any exemption in this Rule must have the information available, such as raw material used, laboratory analyses, technical data sheets or source test results, that would allow the APCO to verify eligibility for the exemption.

8-52-600 MANUAL OF PROCEDURES

8-52-601 Analysis of Samples: The VOC content and exempt compound content of raw polymerized materials subject to this Rule shall be analyzed using BAAQMD Manual of Procedures, Volume III, Method 22, and South Coast Air Quality Management District (SCAQMD) Test Method 306-91.

8-52-602 Determination of Emissions: The capture and control efficiency of an approved emission control system as referenced in Sections 8-52-301, 302 and 303 shall be measured by any of the following methods: 1) BAAQMD Manual of Procedures, Volume IV, ST-7, or 2) EPA Method 25 or 25A. When either EPA Method 25 or 25A is used, capture efficiency shall be determined as prescribed in EPA's "Guidelines for Determining Capture Efficiency" dated January 9, 1995, or EPA Methods 204 and 204A through 204F. For the purpose of determining control device efficiency, any compound listed in Section 8-52-217 shall be included as volatile organic compounds. A source shall be in violation if the VOC emissions measured by any of the referenced test methods exceed the standards of this Rule. For polyethylene and polypropylene foam product manufacturing operations, the VOC loss from the operation as established at the time of source testing for a Permit to Operate shall be applicable for subsequent emissions determinations.