

**AIR POLLUTION CONTROL DISTRICT
SAN DIEGO COUNTY**

1ST WORKSHOP REPORT

**RULE 67.22 - EXPANDABLE POLYSTYRENE FOAM PRODUCTS
MANUFACTURING OPERATIONS**

A workshop notice was mailed to all permitted facilities manufacturing foam products in San Diego County, the US. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties. Four people attended the workshop held on October 29, 1992. The comments received and District responses are as follows:

1. WORKSHOP COMMENT

Why do we need to develop a separate rule for just one manufacturing facility?

DISTRICT RESPONSE

The one affected facility emits more than 25 tons per year (tpy) of volatile organic compounds (VOC's), and thus is a major source as defined by the Federal Clean Air Act Amendments (FCAA) of 1990. As mandated by the FCAA, the District must adopt a specific rule for each source category to require existing major VOC source(s) to implement Reasonably Available Control Technology (RACT).

2. WORKSHOP COMMENT

The 25 tpy emission threshold above which a VOC source is classified as a major source corresponds to a federal ozone nonattainment area which is classified as 'Severe'. Since the Air Resources Board (ARB) has reclassified San Diego County as a 'Serious' state ozone nonattainment area, why must the 25 tpy threshold be used in Rule 67.22?

DISTRICT RESPONSE

The 25 tpy threshold is based on the Federal Clean Air Act definition of a major emission source in Severe nonattainment areas for the federal ozone air quality standard. San Diego County is currently classified as a Severe nonattainment area. Since Rule 67.22 is being developed to satisfy the requirements of the FCAA, the 25 tpy emission threshold must be used.

3. WORKSHOP COMMENT

A facility may emit less than 25 tpy of VOC from expandable polystyrene foam products manufacturing operations. However, the total VOC emissions from such a facility, including VOC emissions from other operations, may exceed 25 tpy. Would such a facility be exempt

from the emission control requirements of Rule 67.22, under the exemption provided in Subsection (b)(1)?

DISTRICT RESPONSE

Yes, such a facility would be exempt from Section (d) of Rule 67.22.

4. WORKSHOP COMMENT

How does Rule 67.22 differ from South Coast Air Quality Management District's Rule 1175?

DISTRICT RESPONSE

Rule 67.22 addresses only polystyrene foam molding operations, while Rule 1175 also applies to other foam products manufacturing processes such as polystyrene foam extrusion, polyurethane, isocyanurate and phenolic foam operations. Other foam products manufacturing operations were not included in Rule 67.22 because either such operations do not exist in San Diego County or the operations use only exempt compounds such as chlorofluorocarbons as blowing agents.

The South Coast air district has recently revised Rule 1175 to require polystyrene molding operations to comply with a production-based emissions standard of 2.4 pounds of VOC emissions per 100 pounds of production. This standard provides more flexibility achieving emission reductions, and in most cases can be met without requiring an air pollution control system that collects emissions from the entire plant floor.

An analysis of Rule 67.22 conducted by the District showed that capital and operational costs of add-on air pollution control equipment may be very significant for the one affected facility in San Diego County. In addition, the affected facility was already considering a process modification to use a raw polymeric material with a lower pentane content. Proposed Rule 67.22 has therefore been revised to now require the affected facility to comply with a production-based emissions standard of 3.0 pounds of VOC emissions per 100 pounds of production, which will provide an estimated 40 percent overall emission reduction.

5. WORKSHOP COMMENT

It does not seem fair that, under the compliance schedule of Section (h), an existing facility has up to 36 months after the date of adoption to comply with the requirements of Rule 67.22, whereas a new facility has to comply with these requirements upon adoption of the rule.

DISTRICT RESPONSE

The 36-month period is necessary to allow an existing facility adequate time to implement the required controls without having to shut down its operations. An existing facility will have to apply for modifications of the existing permit(s), perform the necessary engineering design,

purchase and install the control equipment, and conduct performance tests in order to demonstrate compliance with Rule 67.22. A new facility, on the other hand, will have to go through the permitting process in order to comply with other District rules, including New Source Review, and should be in compliance with all District rules upon startup. This requirement is consistent with other District rules regulating VOC emission sources.

6. WORKSHOP COMMENT

Does the 25 tpy exemption level apply to VOC emissions per facility?

DISTRICT RESPONSE

Yes. Eligibility for exemption from emission control requirements of Rule 67.22 under Subsection (b)(1) is determined based on VOC emissions from polystyrene foam products manufacturing operations at a single stationary source.

7. WORKSHOP COMMENT

If an existing major VOC source which emitted more than 25 tpy in 1990 reduces its VOC emissions to less than the 25 tpy exemption threshold, it should be exempt from the emission control requirements of Rule 67.22.

DISTRICT RESPONSE

The 1990 Federal Clean Air Act Amendments require the District to adopt rules reflecting RACT for major stationary sources. For San Diego County, currently identified as a Severe federal ozone nonattainment area, a major source is a facility which emits or has the potential to emit 25 tons per year or more of VOC's. EPA has clarified this requirement to exclude certain major sources from the RACT requirements as follows: (1) the source must have an approved federally enforceable permit that permanently restricts the source's emissions to less than 25 tons per year, and (2) the actual emissions at the source since the enactment of the 1990 FCAA have never exceeded 25 tons per year, and (3) the emissions allowed under the permit are not greater than the emissions assumed in the latest EPA approved attainment demonstration. A source which emitted more than 25 tons per year in any year since 1990 does not meet condition (2), and therefore cannot be excluded from RACT requirements.

8. EPA COMMENT

The referenced test method for measurement of the blowing agent content of raw polymeric materials and/or expandable polystyrene foam products, SCAQMD Test Method 306-91, "Analysis of Pentanes in Expandable Styrene Polymers", has not been approved by EPA. This test method is being reviewed by EPA headquarters and the District will be informed of the results. Please be advised that if SCAQMD Test Method 306-91 is found inappropriate for its intended use, Rule 67.22 cannot be approved without an appropriate test method.

DISTRICT RESPONSE

The District anticipates that EPA will approve SCAQMD Method 306-91 with some minor modifications.

9. ARB COMMENT

The term ‘emission reduction efficiency’ is used in Subsection (e)(1)(iii), while Subsection (g)(3) uses the term ‘control efficiency’ for the same concept. To improve clarity, only one term should be used for a single concept.

DISTRICT RESPONSE

Subsections (e)(1)(iii) and (g)(3) have been revised, and no longer include either of these terms.

10. ARB COMMENT

Subsection (g)(2) specifies a test method for measuring the pentane content of expandable styrene polymers. This assumes that the determination of pentane content is equivalent to the determination of blowing agent content. Although pentane is the only blowing agent commonly used, there is no restriction in the rule against using other blowing agents to expand the foam. If the possibility exists that other blowing agents may be used in the District, provisions should be made for quantifying them.

DISTRICT RESPONSE

The rule has been revised expanding the definition of a blowing agent to include any liquid or gaseous volatile organic compound. In addition, Subsection (g)(2) has been revised to specify the use of SCAQMD Test Method 306-91 for determination of pentane, or the use of an alternative test method for other VOC containing blowing agents provided that it has been approved in writing by the Air Pollution Control Officer, the ARB and EPA.

11. ARB COMMENT

In several places, Rule 67.22 refers to ‘blowing agent content’. Since a blowing agent is defined in the rule as a liquid or gas which ‘contains’ VOC’s, ‘blowing agent content’ would not necessarily exclude exempt compounds. If there is a possibility that exempt compounds alone, or mixed with non-exempt compounds, may be used as blowing agents, we suggest that the rule explicitly state whether or not exempt compounds are included or excluded from ‘blowing agent content’. A test method for quantifying exempt compounds will be necessary if such compounds are used and not to be included in ‘blowing agent content’.

DISTRICT RESPONSE

The definition of ‘blowing agent’ has been revised to apply specifically to VOC’s.

12. ARB COMMENT

Subsection (g)(3) specifies methods for determining control device efficiency and overall capture and control efficiency. The portion of the section devoted to capture efficiency is ambiguous because the second sentence specifies a test method for determining VOC evaporation from raw material usage and blowing agent content, and the third sentence specifies methodology for determining how much VOC is captured. The fourth sentence contradicts these two sentences by indicating that capture efficiency will be determined by a protocol approved by the Air Pollution Control Officer. Evaporative losses and captured VOC are the principal parameters of capture efficiency, although EPA protocols call for determining captured VOC indirectly by subtracting fugitive losses (measured using a temporary or permanent enclosure around the process) from evaporated VOC. It is suggested that either the fourth sentence in this section be deleted or, alternatively, the mention of capture efficiency and VOC capture in the section's second and third sentences be deleted.

DISTRICT RESPONSE

Subsection (g)(3) has been revised to correspond to other revisions in the rule. The results of the revisions include the removal of the second and third sentences and some modification to the fourth sentence. This will address this comment.

3/1/94

**AIR POLLUTION CONTROL DISTRICT
SAN DIEGO COUNTY**

**RULE 67.22 - EXPANDABLE POLYSTYRENE FOAM PRODUCTS
MANUFACTURING OPERATIONS**

2ND WORKSHOP REPORT

A workshop notice was mailed to all facilities involved in manufacturing foam products in San Diego County. Notices were also mailed to all Chambers of Commerce in San Diego County, all Economic Development Corporations, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The proposed rule and Socioeconomic Impact Assessment (SIA) were presented for public comment. The workshop was held on March 14, 1994, and was attended by three people. The workshop comments and District responses are as follows:

1. WORKSHOP COMMENT

How were annual uncontrolled pentane emissions calculated for the affected facility?

DISTRICT RESPONSE

Annual emissions were calculated by multiplying the annual raw material usage by the difference in weight percentage of pentane in the raw material and the molded products. The annual raw material usage was included in the facility's annual Emissions Inventory reports, and the difference in weight percentage of pentane was determined by laboratory analysis of the raw material, and of the final molded product after 24 hours of storage.

2. WORKSHOP COMMENT:

If San Diego County's classification as a federal ozone nonattainment area is changed from 'severe' to 'serious', the federal major source threshold will change from 25 tons to 50 tons per year. Would the exemption level for emission control requirements in Section (b) be changed accordingly?

DISTRICT RESPONSE:

No. In addition to federal requirements, the District must also meet California Clean Air Act requirements and implement all technically and economically feasible emission control measures. Such measures included in proposed Rule 67.22 are expected to be cost effective for foam manufacturing facilities emitting 25 tons of VOC's per year or more. Therefore, an increased exemption level in Section (b) would not meet state requirements, nor would it meet the commitments made by the District in its Regional Air Quality Strategy.

3. WORKSHOP COMMENT

Polystyrene foam molding facilities using low-pentane raw beads (3.6 percent of initial weight) are encountering operational difficulties. Manufacturers may need to reformulate the raw beads to contain 3.8 percent pentane. Will Rule 67.22 provide for the use of such reformulated raw beads?

DISTRICT RESPONSE

The District has revised the compliance schedule to provide two years for a process modification. This will allow the affected facility and the raw bead manufacturers additional time to implement the new technology. In the event that compliance with the proposed emissions standard cannot be realized solely by use of low-pentane raw beads, the affected facility may need to pursue compliance options which include add-on pollution control equipment, such as a catalytic oxidizer, or use of an existing boiler.

4. WORKSHOP COMMENT

Rule 67.22 provides a three year compliance schedule for the implementation of add-on air pollution control, but only one year for a process modification. More than one year may be needed to implement a new technology such as switching to low-pentane raw beads.

DISTRICT RESPONSE

The District has revised the compliance schedule to provide an additional year for a process modification.

5. WORKSHOP COMMENT

What might be addressed in a typical compliance determination for the use of low-pentane raw beads at the affected facility? Who will be responsible if a test analysis shows the raw beads to be out of compliance?

DISTRICT RESPONSE

As provided in Subsection (d)(2), the district would determine compliance according to the manufacturer's specification of the pentane content of the raw beads. However, compliance determinations is ultimately subject to verification according to the analytical methods in Subsection (g)(2). Occasionally, such verification is employed by the District, or ARB or EPA.

Ultimately the affected facility is responsible for compliance with the rule. If a violation of the standard specified in Subsection (d)(2) were determined, the facility would receive a District

Notice of Violation. In order to address this concern, an affected facility may take precautions, such as entering into contractual agreements with the supplier and/or manufacturer concerning possible violations due to exceedance of Rule 67.22 standards (e.g., certification of the VOC content of raw materials).

6. WORKSHOP COMMENT

Is a facility which conducts operations such as polyurethane foam expanding subject to Rule 67.22?

DISTRICT RESPONSE

No. Only polystyrene foam products manufacturing operations are subject to Rule 67.22.

**AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO**

PROPOSED NEW RULE 67.22

**RULE 67.22. EXPANDABLE POLYSTYRENE FOAM PRODUCTS
MANUFACTURING OPERATIONS**

(a) APPLICABILITY

Except as otherwise provided in Section (b), this rule is applicable to any person who manufactures expandable polystyrene (EPS) foam products using volatile organic compounds (VOC's) as blowing agents. EPS foam products manufacturing operations subject to this rule shall not be subject to Rule 66.

(b) EXEMPTIONS

~~(1)~~ The requirements of Section (d) of this rule shall not apply to any stationary source emitting with uncontrolled VOC emissions of less than 25 tons per calendar year of VOC's from EPS foam products manufacturing operations.

~~(2) The requirements of Subsection (d)(2) of this rule shall not apply to any EPS foam products manufacturing operation where the highest concentration of blowing agent in the EPS foam products is less than or equal to 1.8 percent by weight, as determined within 15 minutes of completion of the molding process.~~

(c) DEFINITIONS

For the purposes of this rule, the following definitions shall apply:

(1) **"Blowing Agent"** means a liquid or gaseous ~~material containing volatile organic compound (VOC's)~~ material containing volatile organic compound (VOC's) that facilitates the formation of an EPS foam product from polymeric raw materials.

(2) **"Exempt Compound"** means any of the following compounds or classes of compounds: 1,1,1-trichloroethane, methylene chloride, trichlorofluoromethane (CFC-11), dichlorodifluoromethane (CFC-12), chlorodifluoromethane (HCFC-22), trifluoromethane (HFC-23), trichlorotrifluoroethane (CFC-113), dichlorotetrafluoroethane (CFC-114), chloropentafluoroethane (CFC-115), dichlorotrifluoroethane (HCFC-123), dichlorofluoroethane (HCFC-141b), tetrafluoroethane (HFC-134 and HFC-134a, both isomers), chlorodifluoroethane (HCFC-142b), 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), pentafluoroethane (HFC-125), 1,1,1-trifluoroethane (HFC-143a), 1,1-difluoroethane (HFC-152a); and the following four classes of perfluorocarbon (PFC) compounds:

- (i) cyclic, branched, or linear, completely fluorinated alkanes;
- (ii) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
- (iii) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
- (iv) sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

(3) **"Existing Equipment"** means any EPS foam products manufacturing equipment for which an Authority to Construct or Permit to Operate was issued before (*date of adoption*).

(4) **"EPS Foam Products"** means low-density foam products which are manufactured from a series of processes where raw polymeric materials such as polystyrene beads containing a blowing agent are expanded by exposure to steam or any other expansion agent and subsequently molded into the final products. EPS foam products include, but are not limited to, drinking cups, insulation boards, packaging materials, and ice chests.

(5) **"Manufacturing Emissions"** means VOC emissions ~~of VOC's which occur during the manufacturing of EPS foam products, from the delivery of the raw polymeric materials to the manufacturing site through to 24 hours after the molding of pre-expanded materials to form the final EPS foam products. Manufacturing emissions do not include emissions of VOC's which occur during the first 24 hours of storage of the final EPS foam products.~~

(6) **"New Equipment"** means any EPS foam products manufacturing equipment for which an Authority to Construct was issued after (*date of adoption*).

(7) **"Stationary Source"** means the same as defined in Rule 20.1.

~~an emission unit or aggregation of emission units located on the same or contiguous properties. Emission units which are on the same or contiguous property but which are not under the same ownership or entitlement to use and which are not related shall not be considered a single stationary source. Contiguous property means two or more parcels of land with a common boundary or separated solely by a public or private roadway or other public or private right of way.~~

(8) **"Storage Emissions"** ~~means emissions of VOC's which occur during the first 24 hours of storage of the final EPS foam products.~~

(8) **"Uncontrolled VOC Emissions"** means VOC emissions from an EPS foam products manufacturing operation, calculated according to Subsection (g)(1), before application of add-on air pollution control equipment or process modification.

(9) **"Volatile Organic Compound"** means any volatile compound containing at least one atom of carbon excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonates, and exempt compounds which may be emitted to the atmosphere from EPS foam products manufacturing operations subject to this rule.

(d) **STANDARDS**

A person shall not manufacture EPS foam products unless:

(1) ~~Actual~~ VOC emissions from such manufacture do not exceed 3.0 pounds per 100 pounds of ~~final~~ EPS raw polymeric materials used ~~foam products~~; or

(2) The raw polymeric materials used for such manufacture contain no more than 3.6 percent by weight of blowing agent, as indicated in product specifications from the manufacturer of the raw polymeric material.

~~(4) A person shall not manufacture EPS foam products unless all manufacturing emissions are vented to an air pollution control system which meets the requirements of Sections (e) and (h).~~

~~(2) A person shall not manufacture EPS foam products unless the final EPS foam products are stored on site for a period of at least 24 hours and all storage emissions are vented to an air pollution control system which meets the requirements of Sections (e) and (h).~~

(e) **CONTROL EQUIPMENT**

(1) A person subject to the provisions of Subsections (d)(1) ~~and/or (d)(2)~~ shall may comply by using an air pollution control system which:

(i) Has been installed in accordance with an Authority to Construct; and

(ii) Includes an emission collection system which captures manufacturing emissions ~~and/or storage emissions, as applicable~~, and transports the captured emissions to an air pollution control device; and

(iii) Has a combined emissions capture and ~~emission reduction~~ control device efficiency such that ~~actual~~ VOC emissions from manufacturing

operations do not exceed 3.0 pounds per 100 pounds of final EPS raw polymeric materials used. ~~foam products. of at least 85 percent by weight.~~

(2) A person subject to the provisions of Subsection (e)(1) of this rule shall submit an Operation and Maintenance Plan for the air pollution control device and emission collection system to the Air Pollution Control Officer for approval and receive such approval prior to operation of the air pollution control equipment. Thereafter, the plan can be modified, with the Air Pollution Control Officer approval, as necessary to ensure compliance. Such plan shall:

(i) Identify all key system operating parameters. Key system operating parameters are those necessary to ensure compliance with Subsection (e)(1) such as temperatures, pressures and flow rates; and

(ii) Include proposed inspection schedules, anticipated ongoing maintenance, and proposed recordkeeping practices regarding the key system operating parameters necessary to maintain continuous compliance with the provisions of Subsection (e)(1)(iii).

(3) A person subject to the requirements of ~~this~~ Subsection (e)(2) shall implement the plan upon approval of the Air Pollution Control Officer, and shall comply with the provisions of the approved plan thereafter.

(f) **RECORDKEEPING**

Any person who manufactures EPS foam products shall maintain records in accordance with the following requirements:

(1) Maintain current records of manufacturer data for the blowing agent content of EPS raw materials used.

~~(1)~~ (2) Maintain monthly records of the amount of EPS raw materials used.

~~(2) Maintain records showing the amount of time the final EPS foam products were stored on site.~~

(3) For control equipment, maintain ~~records sufficient to document continuous compliance, such as~~ daily records of key system operating parameters specified in Subsection (e)(2)(i), which will demonstrate continuous operation and compliance of the emission control device during periods of emission producing activities.

These records shall be retained on-site for at least three years and shall be made available to the District upon request.

(g) **TEST METHODS**

(1) Calculations of VOC emissions ~~of VOC's~~ pursuant to ~~Subsections~~ Sections (b)(1) ~~and (d) and Subsection (c)(8)~~ of this rule shall be ~~based on~~ by multiplying the quantity of EPS foam products produced ~~and by~~ the difference between the blowing agent content of the raw polymeric materials and that of the final EPS foam products, as determined after 24 hours of storage.

(2) Measurement of the blowing agent content of raw polymeric materials and/or EPS foam products pursuant to ~~Subsections (b)(2) and (g)(1)~~ of this rule shall be conducted in accordance with South Coast Air Quality Management District (SCAQMD) Test Method 306-91, "Analysis of Pentanes in Expandable Styrene Polymers". Test procedures shall be performed in accordance with a protocol approved by the Air Pollution Control Officer. An alternative test method may be used provided such method has been approved, in advance, by the Air Pollution Control Officer, California Air Resources Board (ARB) and federal Environmental Protection Agency (EPA).

(3) Measurement of VOC emission control device efficiency pursuant to Section (e) of this rule shall be conducted using EPA Methods 18, 25, and/or 25A (40 CFR 60, Appendix A), as they exist on (date of adoption). Test procedures shall be performed in accordance with a protocol approved by the Air Pollution Control Officer.

~~(3) (4) The overall control efficiency pursuant to Subsection (e)(1)(iii) shall be determined by multiplying the capture efficiency of the emission collection system by the control efficiency of the air pollution control device. To determine the capture efficiency of the emission collection system, total potential VOC emissions shall be calculated from the amount of raw polymeric materials used and the blowing agent content as determined using SCAQMD Test Method 306-91, "Analysis of Pentanes in Expandable Styrene Polymers". The amount of emissions carried into the control device and the efficiency of the air pollution control device shall be determined using EPA Method 25A (40 CFR 60, Appendix A), as it exists on (date of adoption). Measurements of organic gaseous emissions and determination of capture efficiency pursuant to Subsection Section (e)(1) of this rule shall be conducted using test methods as provided in Subsections (g)(1), (g)(2) and (g)(3). Test procedures shall be performed in accordance with using a protocol approved by the Air Pollution Control Officer. Subsequent to the initial compliance demonstration period, appropriate key system operating parameters as determined by the Air Pollution Control Officer may be used as indicators of the performance of the emission collection system.~~

(h) COMPLIANCE SCHEDULE

(1) Any person operating existing equipment who is subject to the provisions of ~~Subsections Section (d)(1) and/or (d)(2) and electing to comply with this rule by~~ installing an air pollution control system pursuant to Section (e) shall meet the following increments of progress:

(i) By *(twelve months after date of adoption)*, submit to the Air Pollution Control Officer an application for Authority to Construct and Permit to Operate an air pollution control system meeting the requirements of Section (e).

(ii) By *(twenty-one months after date of adoption)*, issue purchase orders for the control device and other long delivery time components necessary to comply with Section (e).

(iii) By *(thirty-six months after date of adoption)*, demonstrate compliance with Section (e).

(2) Any person operating existing equipment who is subject to the provisions of Section (d) and electing to comply with process modification shall meet the following increments of progress: ~~by (twelve months after date of adoption), comply with Section (d).~~

(i) By *(twelve months after date of adoption)*, submit to the Air Pollution Control Officer an application for Authority to Construct and Permit to Operate new or modified equipment necessary to comply with Section (d).

(ii) By *(twenty-four months after date of adoption)*, demonstrate compliance with Section (d).

~~(2)~~ (3) Any person installing new equipment who is subject to the provisions of ~~Subsections~~ Section (d)(1) and/or (d)(2) shall comply with the provisions of Section (d) ~~(e)~~ upon startup.