

**BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE**

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	Sonoco Protective Solutions, Inc.
Address	29 Park Road, Putnam, CT 06260
Equipment Location	29 Park Road, Putnam, CT 06260
Equipment Description	Custom Shape Expandable Polystyrene (EPS) Foam Molding Facility & Regenerative Thermal Oxidizer
Town-Permit Numbers	152-0017
Premises Number	8
Stack Number	4
Modification Issue Date	June 16, 2025
Prior Permit Issue Date(s)	December 6, 2023 August 2, 2011 November 22, 1993
Expiration Date	None

Katherine S. Dykes
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Commissioner

June 16, 2025
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

The expandable polystyrene (EPS) foam molding operation consists of EPS beads containing liquefied pentane. Heat is introduced to the EPS beads and pentane property becomes gaseous exerting pressure onto the surfaces of the beads to expand. VOC emissions are from the use of the blowing agent pentane as the raw material is pre-expanded, aged, molded, and stored as finished product. Pentane functions as an expansion agent for the beads. Finished goods retain a small amount of residual VOC indefinitely.

The foam molding operation at the Putnam Plant has been established since 1966. The operation molds EPS and similar polystyrene-based polymers, ARCEL (a high impact polystyrene/polyethylene copolymer), and R-MER (a copolymer similar to ARCEL, but with a lower volatile content) into custom shaped products for packaging, materials handling, and structural component uses.

The EPS foam molding operation comprises of four phases: 1. Pre-Expansion (PE), where the EPS beads are partially expanded in preparation for molding; 2. Pre-Puff Storage (SB), where aging and storage of the pre-expanded beads is done prior to molding; 3. Molding (MP), where fusing of beads into various shapes is done; and 4. Finished Goods Storage (FGS), the warehousing of molded product.

A regenerative thermal oxidizer is used to control VOC emissions from two pre-expanders.

Emission loss rate at each phase of the operation varies depending on bead size and volatile content, density of the expanded bead, and shape and size of the molded product.

B. Equipment Design Specifications

1. Two Pre-Expansion Units: EPS beads are partially expanded in preparation for molding
2. Pre-Puff Storage Bags (60 bags or less): Aging and storage of pre-expanded beads in mesh bags prior to molding
3. Molding Presses: Fusing of beads into various shapes (some of the presses will be used primarily for molding on non-VOC materials)
4. Finished Goods Storage: Storage of EPS molded products in warehouses or on outdoor concrete pads
5. Curing Room
6. Drying Tunnel

C. Control Equipment Design Specifications

1. Control Type: Regenerative Thermal Oxidizer (RTO)
2. Process Controlled: Pre-Expansion Process
3. Pollutant(s) Controlled: VOC

4. Make and Model: The CMM Group-RTO-3000-M-95-2C
5. Fuel Type: Natural Gas
6. Maximum Design Fuel Firing Rate (ft³/hr): 800
7. Maximum Design Heat Capacity (MMBtu/hr): 0.8
8. Operating Temperature Range (°F): 1,450 – 1,800
9. Minimum Residence Time (sec): 0.5
10. Minimum Destruction Efficiency (%): 98

D. Stack Parameters

Process Phase	Emission Point No.	Direct or Room Exhaust	Type Code ^a	Height (feet)	Diameter (inches)	Actual Flow Rate (acfm)	Temperature (°F)
PE (1&2)	S42	Direct	A	35	15.6	500-4,550	150-300
MP Area	S10	Room	D	32	28	24,100	Ambient + 10
MP Area	S11	Room	D	32	28	24,100	Ambient + 10
MP Area	S12	Room	D	32	28	24,100	Ambient + 10
MP Area	S13	Room	D	32	28	24,100	Ambient + 10
MP Area	S36	Room	D	28	53	46,400	Ambient + 10
MP Area	S37	Room	D	28	53	46,400	Ambient + 10
MP Area	S38	Room	D	28	53	46,400	Ambient + 10
MP Drain Vents	DV01-DV10	Direct	A	36	8	1,000 ^b	160-220
PP	S7	Room	D	35	28	17,100	Ambient + 10
Storage Area	S5	Room	C	35	24	10	Ambient + 10
Storage Area	S6	Room	A	35	28	17,200	Ambient + 10
FGS Area	S8	Room	A	32	28	24,100	Ambient + 10
FGS Area	S9	Room	A	32	28	24,100	Ambient + 10
FGS Area	S-FGS1	Room	B	25	24	9,900	Ambient + 10
FGS Area	S-FGS2	Inoperative	-	-	-	-	-
FGS Area	S-FGS3	Room	B	25	45	9,900	Ambient + 10
FGS Area	S-FGS4	Room	C	27	45	9,900	Ambient + 10

Emission Point No. S42 is associated with the RTO to capture emissions from the pre-expanders (PE). The minimum distance from stack S42 to nearest property line is 240 ft.

^aType Codes: A = vertical stack (unobstructed)
 B = horizontal/downward stack
 C = vertical stack (obstructed)
 D = fugitive process emissions

^bIndicated flows for points DV01-DV09 are maximum.

PART II. OPERATIONAL CONDITIONS

A. The weighted average VOC content of the beads in each calendar month shall not exceed:

1. EPS: 4.2%

2. ARCEL: 8.5%

B. Annual throughput is based on the following equation:

$$\sum_x (U_x)(V_x)(L_E) + \sum_y (U_y)(V_y)(L_A) \leq 131,600 \text{ lb VOC/yr}$$

where:

U_x = Pounds of EPS beads from lot x used during the 12-month period

V_x = VOC content of EPS beads from lot x, in percent by weight expressed as a decimal

L_E = Overall emission loss rate for EPS beads, in percent by weight expressed as a decimal

U_y = Pounds of ARCEL beads from lot y used during the 12-month period

V_y = VOC content of ARCEL beads from lot y, in percent by weight expressed as a decimal

L_A = Overall emission loss rate for ARCEL beads, in percent by weight expressed as a decimal

C. Control Equipment: Regenerative Thermal Oxidizer

1. Maximum Annual Fuel Consumption over any consecutive 12 month period (MMft³/yr): 6.87

2. Operating Temperature Range (°F): 1,450 – 1,800

3. Minimum Overall Control Efficiency (%): 98

PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

A. Criteria Pollutants

Foam Molding Operation Emissions

Pollutant	tons/month	tpy
VOC	12	65.8

Regenerative Thermal Oxidizer (RTO) Emissions

Pollutant	lb/hr	tpy
PM/PM ₁₀	0.006	0.026
PM _{2.5}	0.006	0.026
SO _x	0.0004	0.002
NO _x	0.078	0.344
CO	0.066	0.289

VOC	0.004	0.019
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Overall Emissions

Pollutant	tpy
PM/PM ₁₀	0.026
PM _{2.5}	0.026
SO _x	0.002
NO _x	0.344
CO	0.289
VOC	65.8

B. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSCA Section 22a-174-29. [STATE ONLY REQUIREMENT]

For EPS and ARCEL materials, the Actual Stack Concentration (ASC) shall be derived using the HAPs content in each material (ppmw), the HAPs loss rate (% by weight), and the maximum material processing rate (lb/hr) as a worst case, and any applicable controls. This gives the actual stack emissions in lb/hr which can be converted to a concentration in $\mu\text{g}/\text{m}^3$ or ppmv.

C. Opacity

This equipment shall not exceed 10% opacity during any six minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

D. Demonstration of compliance with the above emission limits may be met by calculating the emission rates using emission factors from the following sources:

- VOC from Foam Molding: Material Balance; Stack Test Results
- Pollutants from RTO: Compilation of Air Pollutant Emission Factors, AP-42, fifth edition, Section 1.4 Natural Gas Combustion, July 1998

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall monitor VOC content of the beads (% of VOC) to achieve compliance with the limit in this permit.
2. The Permittee shall monitor fuel consumption by the RTO using non-resettable totalizing fuel meter.

3. The Permittee shall continuously monitor and continuously record the RTO's combustion chamber temperature using a thermocouple. The Permittee shall maintain this parameter within the range recommended by the manufacturer to achieve compliance with the emission limits in this permit.
4. The Permittee shall perform inspections of the RTO as recommended by the manufacturer.
5. The Permittee shall equip the RTO with a monitoring device capable of detecting and logging each time the RTO is started up and shut down.

B. Record Keeping

1. The Permittee shall maintain records of each bead shipment. Such records shall include: a shipping receipt and a certification from a bead supplier certifying the percentage of VOC in the bead shipment. The shipping receipt and/or certification shall include the date of delivery, the name of the bead supplier, the percentage of VOC, by weight, in the beads and the lot number or identifier.
2. Within 15 days of the end of the calendar month, the Permittee shall record the monthly throughput in lb/month of EPS and ARCEL beads by type and lot identifier for the prior month.
3. Within 15 days of the end of the calendar month, the Permittee shall make and keep records of the 12-month aggregate throughput of EPS and ARCEL beads in lb/yr for EPS beads and lb/yr for ARCEL beads. The 12-month aggregate for each type of bead (EPS and ARCEL) shall be calculated by adding the monthly throughput for each of the most recent 12-consecutive months as determined in accordance with Part IV.B.2.
4. Within 15 days of the end of the calendar month, the Permittee shall calculate and record the monthly weighted average VOC content of EPS bead throughput and ARCEL bead throughput in % by weight for the prior month. Such records shall include a sample calculation for each bead type and all supporting documentation, including lot numbers, bead weights by lot, and bead VOC content by lot for the calculation.
5. Within 15 days of the end of the calendar month, the Permittee shall calculate and record the monthly and consecutive 12-month VOC emissions in units of tons. The consecutive 12-month emissions shall be determined by adding the current month's VOC emissions to that of the previous 11 months. Such records shall include a sample calculation.
6. The Permittee shall keep material safety data sheets (MSDS), technical data sheets (TDS) or Safety Data Sheets (SDS) for the beads used. Such information shall include the quantity and type of each hazardous air pollutant contained in the beads. For paperwork reduction, these sheets may be kept in electronic form; access to above paperwork requirement may also be allowed via internet on-demand.
7. Within 30 days of the end of each calendar month, the Permittee shall make and keep records of actual stack concentrations and maximum allowable stack concentrations for each pollutant listed in RCSA Section 22a-174-29 of the RCSA and emitted from a discharge point listed in Part I.D Stack Parameters of this Permit during the prior

month. Such records shall include a sample calculation including all assumptions and data used in the calculation.

8. The Permittee shall keep records of the monthly and consecutive 12 month fuel consumption for the RTO. The consecutive 12 month fuel consumption shall be determined by adding the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of each month.
9. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM₁₀, PM_{2.5}, SO_x, NO_x, VOC, and CO emissions in units of tons. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.
10. The Permittee shall make and maintain records of the RTO's operations and any service, maintenance or repairs performed on the RTO. Such records shall include the date and time of each start-up and shutdown, the reason for such start-up or shutdown, the duration of time the RTO is not operating and whether or not the pre-expanders are operated during such shutdown; the date and time of each service, maintenance or repair performed and the corrective action taken.
11. The Permittee shall maintain records of the RTO combustion temperature.
12. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

1. The Permittee shall notify the commissioner in writing, of any exceedance of an emissions limitation or operational condition of this permit, and shall identify the cause or likely cause of such violation, all corrective actions and preventive measures taken with respect thereto, and the dates of such actions and measures, as follows:
 - a. For any hazardous air pollutant, no later than twenty-four (24) hours after such violation commenced; and
 - b. For any other regulated air pollutant, no later than ten (10) days after such violation commenced.
2. The Permittee shall notify the commissioner by electronic mail at DEEP.CACU@ct.gov of any breakdown, failure or deliberate shutdown of the RTO that is expected to continue for more than 24 hours during which the pre-expanders will continue to operate. Such notification shall be submitted within two (2) business days of the commencement of the breakdown, failure or deliberate shutdown.

PART V. STACK EMISSION TEST REQUIREMENTS

Stack emission testing shall be performed in accordance with the Emission Test Guidelines available on the DEEP website at www.ct.gov/deep/stacktesting.

Initial stack testing shall be required for the following pollutant(s):

☐ PM ☐ PM₁₀ ☐ PM_{2.5} ☐ SO₂ ☐ NO_x ☐ CO
☐ VOC ☐ Opacity ☒ RTO's Overall Control Efficiency (%)

The Permittee shall conduct initial stack testing within 180 days of the issuance of this modified permit. The Permittee shall submit test results within 60 days after completion of testing.

The Permittee shall conduct recurrent stack testing for the above parameter within five years of the date of the previous stack test.

Stack test results shall be reported as follows: Overall Control Efficiency in %.

PART VI. OPERATION AND MAINTENANCE REQUIREMENTS

- A.** The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations. The Permittee shall maintain a full, legible copy of the manufacturer's specifications and written operations manual on-site at all times. The Permittee shall provide a copy of the manufacturer's specifications and written operations manual upon request of the Commissioner or his/her agent
- B.** The Permittee shall properly operate the control equipment at all times.
- C.** The Permittee shall only allow personnel who have been trained in the proper operation of the control equipment to operate such equipment.

PART VII. SPECIAL REQUIREMENTS

A. Premises Emissions Summary

- 1. On January 1st of each calendar year, if the potential emissions of NO_x or VOC from the premises are equal to or greater than 25 tons per year per pollutant, then for such pollutant(s), the Permittee shall:
 - a. Monitor NO_x and/or VOC emissions, as applicable, from the premises for such calendar year.
 - b. Calculate and record annual NO_x and/or VOC emissions, as applicable, from the premises for such calendar year, in units of tons. The Permittee shall make these calculations on or before February 1st of the following year with respect to the previous calendar year. Such records shall include a sample calculation(s).
 - c. If actual NO_x and/or VOC emissions, as applicable, from the premises are equal to or greater than 25 tons for such calendar year, the Permittee shall submit to the commissioner, on or before March 1st of the following year, an annual emissions summary with respect to the premises for the previous calendar year. Such summary shall be submitted on forms prescribed or provided by the commissioner.
- 2. A Permittee is exempt from Part VII.A.1 requirements of this permit if, on January 1st of the subject year, the premises was operating in accordance with any of the following:
 - a. A valid Title V permit issued pursuant to RCSA section 22a-174-33;
 - b. RCSA section 22a-174-33a; or

c. RCSA section 22a-174-33b

- B.** The Permittee shall not cause or permit the emission of any substance or combination of substances which creates or contributes to an odor beyond the property boundary of the premises that constitutes a nuisance as set forth in RCSA Section 22a-174-23.
[STATE ONLY REQUIREMENT]

PART VIII. ADDITIONAL TERMS AND CONDITIONS

- A.** This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.
- B.** Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.
- C.** This permit may be revoked, suspended, modified or transferred in accordance with applicable law.
- D.** This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons of municipalities who are not parties to this permit.
- E.** Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under Section 22a-175 of the Connecticut General Statutes, under Section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."
- F.** Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.
- G.** Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

- H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.
- I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.