

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

N728959346

FACILITY: Sonoco Protective Solutions, Inc.	SRN / ID: N7289
LOCATION: 123 NORTH CHIPMAN ST., OWOSSO	DISTRICT: Lansing
CITY: OWOSSO	COUNTY: SHIAWASSEE
CONTACT: Phillip E. Abney , Maintenance Supervisor	ACTIVITY DATE: 07/07/2021
STAFF: Julie Brunner	COMPLIANCE STATUS: Compliance
SUBJECT: Scheduled inspection (PCE) as part of a Full Compliance Evaluation (FCE)	SOURCE CLASS: SM OPT OUT
RESOLVED COMPLAINTS:	

On July 7, 2021, I conducted a scheduled inspection of Sonoco Protective Solutions, Inc. located at 123 N. Chipman St, Owosso, Michigan 48867. The last compliance inspection of the facility was on March 20, 2018.

Arrived: 9:05 am

Weather: 75°F, W 5 MPH, UV Index 2

Departed: 11:00 am

No visible emissions (VEs) were observed from any of the facility exhaust stacks upon arrival. No odors were identified surrounding the facility.

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Facility Contacts:

Mr. Phillip Abney, Maintenance Supervisor, 989-729-2780 x 103, phillip.abney@sonoco.com

Mr. Tom Mims, Plant Manager, 989-729-2780 x 106, tom.mims@sonoco.com

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Facility Description:

This facility produces expanded foam products. They started production of custom-shape molding of polymeric materials in 2003 as Tuscarora Incorporated. They have operated under the names SCA Packing North America, Inc., Tegrant Diversified Brands, and for the last 15 years as Sonoco Protective Solutions, Inc. (SPS). They mold both pre-expanded polypropylene, and expand and mold polystyrene. SPS is a second tier supplier to the auto industry. They make forms for trunks, doors, headrests, and other parts of vehicles. Many of these components are impact absorbers, which are designed to protect vehicle occupants. They also make foam parts for child safety seats, coolers for catering, and some packaging materials for shipping various products in boxes. About 20% of the business is non-automotive.

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Plastics Used

EPS beads are expandable polystyrene beads. These are white in color, and arrive at the plant in raw, unexpanded form, looking somewhat like salt. ARCEL® beads are a type of expandable polystyrene bead composed of a copolymer of styrene and ethylene, and marketed under the ARCEL® brand name. EPP beads are pre-expanded polypropylene. They are black in color, and arrive at the plant already having been pre-expanded.

The facility is permitted as a synthetic minor source with enforceable restrictions on volatile organic compounds (VOC) and four (4) hazardous air pollutants (HAPs) to less than major source thresholds to opt-out of the Title V – Renewable Operating Permit (ROP) program.

Plant Capacity: Expanded products are up to 80% capacity or greater, and general production (pre-expanded products) is up to 90%.

Staff #: 145 to 150 Shifts/Day: 3 Days of Operation/Week: 5 days/week

List of Active Air Use Permits and Exempt Equipment:

Permit to Install (PTI) No. 278-02E was issued June 18, 2019 adding a new expander for plastic expansion and molding, and includes the VOC opt-out from the ROP Program and restrictions on HAPs and toxic air contaminants (TACs).

The following emission units are at the facility including exempt equipment:

Emission Unit (EU)	Description	PTI & Applicable Regs
EUEPSPROCESSES	The expandable polystyrene foam processes include finished goods storage and all the steps taken to create finished goods from expandable polystyrene beads. Major steps include partially expanding polystyrene beads with steam in the two Hirsch 6000 pre-expanders, pre-puff storage, and molding the pre-puff into finished goods.	PTI 278-02E
EUBOILER1	Natural gas-fired Johnston boiler, 600 horsepower (hp), 24.354 MMBtu/hr, Manuf. Date 1997	Rule 282(2)(b) (i); 40 CFR Part 60, Subpart Dc
EUBOILER2	Natural gas-fired Johnston boiler, 300 hp steam, 12.560 MMBtu/hr, Manuf. Date 1989 (Not in use)	Rule 282(2)(b) (i); 40 CFR Part 60, Subpart Dc

Emission Unit (EU)	Description	PTI & Applicable Regs
EUBOILER3	Natural gas-fired Cleaver Brooks 700 hp process steam boiler rated at 29.291 MMBtu/hr, Manuf. Date 1/22/1993	Rule 282(2)(b) (i); 40 CFR Part 60, Subpart Dc
Drying Rooms/Ovens	Series of steam heated drying rooms used to dry any remaining water from the finished product	Rule 281(2)(e)
Recycle grinder	Grinds rejected plastic parts for recycle in the process.	Rule 285(2)(l)(vi) (B)

The three (3) natural gas-fired boilers are subject to New Source Performance Standard (NSPS), 40 CFR 60, Subpart Dc which applies to each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 100 MMBtu/hr or less, but greater than or equal to 10 MMBtu/hr.

The natural gas-fired boilers are not subject to 40 CFR 63, Subpart JJJJJJ—National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources because they meet the definition of a gas-fired boiler.

Michigan Air Emissions Reporting System (MAERS):

The facility reports to MAERS as an SM Opt-Out, Category E fee subject. Below is a summary of the 2020 year emissions reported.

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EUEPSPROCESSES

VOC - 74139.20 LB (37.1 tons)

ACETOPHENONE - 122.70 LB

BENZENE - 3.60 LB

ETHYLBENZENE - 29.50 LB

PHENOL - 1.20 LB

STYRENE - 374.20 LB

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Inspection:

A pre-inspection meeting was conducted with Mr. Phillip Abney (Maintenance Supervisor). The purpose of my inspection and then facility operations were discussed. There are no emergency generators or parts washers at the facility. The facility has an HVAC system on the roof for heating and air conditioning.

The general manufacturing process starts with expanding the EPS and ARCEL beads. The EPP black beads arrive pre-expanded, are loaded into the feed hoppers that go to the mold presses.

PTI 278-02E for plastic expansion and molding –

EUEPSPROCESS includes the pre-expansion of the EPS and ARCEL white beads and the molding of the pre-expanded polystyrene and polypropylene (EPP, black beads). The EPS and ARCEL polystyrene beads are pre-expanded in one (1) expander and go to storage hoppers that feed the molding presses. The second expander pre-expands ARCEL black beads. The expanders use steam to pre-expand the beads. Expanding the polystyrene beads result in emissions of VOCs, TACs, and HAPs. The VOC content and the amount of EPS and ARCEL processed is limited in PTI 278-02E. Pre-expansion has two stack IDs: SVPE1 and SVPE2.

The permit requires that SPS monitor the daily throughput of EPS and ARCEL beads that are pre-expanded. The “Daily Report of Expanded Bead” log sheet for 7-6-2021 and 7-7-2021 was in the area. The written record includes the type of beads processed, VOC contents (per lot number), VOC content determinations (e.g., Certification of Analysis) and additional information. The daily ARCEL and EPS bead throughput and all information is entered into the electronic program (FIT program) for generation of the monthly reports. SPS is in compliance with PTI No. 278-02E, Special Condition (SC) VI.2, SC VI.3, SC VI.4, and SC VI.5.

The EPP black beads arrive pre-expanded and are stored in hoppers on the opposite end of the line of molding presses from the pre-expander area. Any emissions of VOC, TACs, and HAPs are negligible because the beads are pre-expanded by the supplier. There are no permit limits on the amount of EPP black beads that can be processed.

SPS has a total of 27 presses that are used to mold the pre-expanded beads. (There were 26 mold presses at the time of the last inspection.) The mold presses use steam (produced from the onsite boilers) to melt and adhere the beads together. No mold release agents are used in the presses. Six (6) of the presses are used for molding two (2) different types of beads, and the remaining presses are used for EPP beads only. But, this is subject to change depending on product requirements. The beads are blown with steam heat to the molding units from the storage hoppers. The steam and press emissions are vented to eighteen (18) press drain vents that are connected by a common drainage pipe in the floor. The drainage pipe conveys the condensate from the process to the wet well outside. The eighteen (18) press drain vents are represented by stack ID SVDVENTS1-18. A common drainage pipe is a 24 in. diameter pipe in the floor, and the wet well outside has two (2) doors in the lid in which steam escapes and is about two (2) foot above ground. This is not a stack, but a condensate drain that has some steam emissions from the wet well outside.

The list of mold presses, what type of plastic is processed, and drain vents in the order they sit in the floor of the facility is listed below:

Molding Press	Material and Pressure
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		Press Drain Stack Vents
Press #1 (1014-HP)	EPS, low pressure (50 lb steam)	shared #1 & #4
Press #4 (1014-HP)	EPS, low pressure (50 lb steam)	shared #1 & #4
Press #26 (1014-HP)	EPS, low pressure (50 lb steam)	#26
Press #3 (68-HP)	EPS, low pressure (50 lb steam)	#3
Press #8 (1014-HP)	EPS and EPP, high pressure (100 lb steam)	shared #8 & #25
Press #25 (68-HP)	EPS and EPP, high pressure (100 lb steam)	shared #8 & #25
Press #24 (68-HP)	EPS and EPP, high pressure (100 lb steam)	shared #24 & #6
Press #6 (813-HP)	EPS and EPP, high pressure (100 lb steam)	shared #24 & #6
Press #7 (1318-HP)	EPP, high pressure (100 lb steam)	#7
Press #7A (1014-HP)	EPS and EPP, high pressure (100 lb steam)	#7A
Press #7B (1318-HP)	ARCEL and EPP, high pressure (100 lb steam)	#7B
Press #8A (813-HP)	EPS, high pressure (100 lb steam)	shared #8A & #19
Press #19 (68-HP)	EPP, high pressure (100 lb steam)	shared #8A & #19
Press #10 (68-HP)	EPP, high pressure (100 lb steam)	shared #10 & #11
Press #11 (1014-HP)	EPP, high pressure (100 lb steam)	shared #10 & #11

Press #12 (813-HP)	EPP, high pressure (100 lb steam)	shared #12 & #7C
Press #7C (1318-HP)	EPS and EPP, high pressure (100 lb steam)	shared #12 & #7C
Press #13 (1318-HP)	EPP, high pressure (100 lb steam)	#13
Press #14 (1014-HP)	EPP, high pressure (100 lb steam)	shared #14 & #22
Press #22 (1014-HP)	EPP, high pressure (100 lb steam)	shared #14 & #22
Press #15 (1014-HP)	EPP, high pressure (100 lb steam)	#15
Press #16 (1014-HP)	EPP, high pressure (100 lb steam)	#16
Press #17 (1014-HP)	EPP, high pressure (100 lb steam)	#17
Press #21 (1014-HP)	EPP, high pressure (100 lb steam)	#21
Press #18 (1014-HP)	EPP, high pressure (100 lb steam)	shared #18 & #20
Press #20 (1014-HP)	EPP, high pressure (100 lb steam)	shared #18 & #20
Press #9A (68-HP)	EPP, high pressure (100 lb steam)	?
Press #9	Moved down and not in service yet	?

Exempt Equipment -

SPS also has three (3) drying rooms/ovens that are used to dry off any remaining water from the finished product. They are used to mainly dry EPP parts. A very small percentage (<10%) of EPS and ARCEL parts are dried. The ovens are heated via steam generated from the boilers with a temperature setting of 180°F but can vary between 160°F to 180°F. Oven #1 was operating at 174°F. Oven #2 was operating at 170°F. Oven #3 was operating at 165°F. The drying ovens are exempt per Rule 281(2)(e).

Parts that are rejects are recycled. A grinder with dust collection is located by the expander. It vents internally, and collected dust is disposed of properly. The grinder is exempt per Rule 285(2)(l)(vi)(B).

SPS has three (3) natural gas-fired boilers that provide process steam. The boilers are exempt per Rule 282(2)(b)(i), and subject to NSPS 40 CFR Part 60, Subpart Dc. Consumers Energy provides the natural gas and specifications of the pipeline quality gas are maintained by Consumers Energy.

Records of natural gas use in each boiler for 2017 was provided in a previous inspection. In 2017, a total of 240.5 MM cubic feet of natural gas was combusted for the 12-month time period. Pipeline quality gas and recordkeeping are the only NSPS requirements. The NSPS does not contain usage restrictions for these boilers.

Records Review:

SPS has a material limit on PTI 278-02E, SC II.1 for total throughput at pre-expansion that requires they never exceed 177,000 pounds of VOC (88.5 tons) per 12-month rolling time period. The 12-month rolling VOC emission reports for 2019, 2020, and until June 2021 were provided. For 2019, 2020, and until June 2021, the total pounds VOC for the 12-month rolling time period is 71,427 lbs (35.7 tons), 74,130 lbs (37.1 tons), and 91,506 lbs (45.8 tons), respectively. SPS is in compliance with the emission limits in SC I.3 and the material limits in SC II.1 for EUEPSPROCESS, and the facility-wide VOC limit of 89.5 tpy.

Weighted averages of VOC content for EPS and ARCEL beads are required to be calculated for each month. Based on VOC emission reports for 2019, 2020, and until June 2021, SPS calculates their weighted average VOC content for EPS and ARCEL beads consistent with the Appendix A formulas. The highest monthly VOC average for the EPS beads from the records provided is 4.06 lbs VOC/100 lbs in September 2019. SPS is in compliance with the 4.5 lbs VOC/100 lbs EPS beads processed emission limit in SC I.1.

SPS is limited to 10.25 lbs of VOC/100 lbs of ARCEL beads processed on a 12-month rolling time period. The 12-month rolling average VOC content based on the reports for 2019, 2020, and until June 2021 was 9.53 lbs/100 lbs, 9.47 lbs/100 lbs, and 9.47 lbs/100 lbs of ARCEL beads processed, respectively. SPS is in compliance with SC I.2 for EUEPSPROCESS.

SPS also keeps facility-wide 12-month rolling records of specific TAC/HAP emissions (benzene, cumene, ethyl benzene, styrene, benzaldehyde) as determined at the end of each calendar month.

The summary of 12-month rolling TAC/HAP emissions are in the following table:

Pollutant	2019 Mass Emissions (lb)	2020 Mass Emissions (lb)	July 2020 – Emission June 2021 Limit Mass Emissions (lb)
Acetophenone	202.71	122.7	156.9

Pollutant	2019 Mass Emissions (lb)	2020 Mass Emissions (lb)	July 2020 – Emission June 2021 Mass Emissions (lb)	Limit
Benzaldehyde*	71.39	16.0	28.1	1920 lb/yr
Benzene	3.44	3.5	5.2	480 lb/yr
Cumene	0	0	0	480 lb/yr
Ethylbenzene	16.58	29.5	47.8	1.0 tpy
Phenol		1.2	1.6	
Styrene	319.84	374.1	450.9	4.0 tpy
Toluene	0	0	0	
Xylenes	0	0	0	
Total HAPs	542.6	531.0	662.4	

* Not a HAP.

Summary:

The facility appeared to be in compliance with PTI 278-02E, and all applicable rules and regulations.



Image 1(OMG 0203) : Newest pre-expander



Image 2(IMG 0204) : Pre-expander 1

NAME Julie L. Brunner

DATE 8/27/2021

SUPERVISOR B.M.