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POLYSTYRENE  
AP-42  
Section 5.13.3  
Reference Number

## COSDEN OIL & CHEMICAL COMPANY

15

P. O. BOX 1311  
BIG SPRING, TEXAS 79720

March 30, 1983

Mr. Jack Farmer, Director  
Emission Standards and Engineering Division  
U.S. Environmental Protection Agency  
Office of Air Quality Planning and Standards  
Research Triangle Park, North Carolina 27711

Dear Mr. Farmer:

Subject: Section 114 Request for Information - Polymer  
Resin Processing

Enclosed is our response to Mr. Don Goodwin's letter dated, December 16, 1982. The confidential data has been separated from the balance of the data and is marked "Confidential, —" Cosden Oil & Chemical Company".

You may also want to refer to Cosden's responses to the following questionnaires:

- 1) "Air Pollution Control Engineering and Cost Study of the Petrochemical Industry"

Letter submitted to Mr. Leslie B. Evans, Applied Technology Division, Office of Air Programs, dated October 6, 1972.

Subject: Polystyrene

- 2) "Organic Chemicals or Plastics & Synthetics Questionnaire"

Letter submitted to Mr. Robert B. Schaffer, Effluent Guidelines Division, dated December 22, 1976.

Subject: Organic Chemicals & Plastics

Mr. Goodwin's letter indicated that Pacific Environmental Services, Inc. (PES) has been designated by EPA as an authorized representative of your agency. Please be advised that any visit to Cosden facilities to gather additional information would be conditioned by the following:

- 1) PES and its employees will execute a secrecy agreement and hold harmless agreement.
- 2) Employees of EPA and PES would at the end of any visit allow their notes to be reviewed for confidential information.

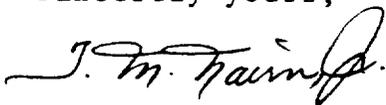


Mr. Farmer  
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Section 114 Request for Information - Polymer and Resin  
Processing - continued

Should you have any questions, please address them to  
Cosden Oil & Chemical Company, P.O. Box 1311, Big Spring, Texas  
79721.

Sincerely yours,



Ted M. Nairn, Jr.  
Manager, Environmental Activities

TMN:VLD

Enc.

CC: Mr. W.L. Whittington  
Mr. R. Fuller  
Mr. J. Morris

A) GENERAL INFORMATION

- 1) Polymer Name: Expandable Polystyrene (EPS)  
Types: a) Regular - Food Grade  
b) Modified- Flame Retardant
- 2) Company Name: Cosden Oil & Chemical Company
- 3) Location: Four miles east of Howard County  
Court House at Big Spring, Texas  
City Limits on North side of  
Interstate - 20 at Refinery Road  
within the Refinery and Petrochemical  
complex.
- 4) Contact Person: T.M. Nairn, Jr.  
Mailing Address: P.O. Box 1311  
Big Spring, Texas 79720  
Telephone Number: (915) 263-7661, extension 357
- 5) Date Completed: March 28, 1983

B) OVERALL PROCESS INFORMATION

1) Process Capacity: 50 Million Pounds/Year

Seasonal Variation: None

Relative Capacity: a) EPS - 100%

b) Crystal Polystyrene (PS) - None

c) High Impact Polystyrene (HIPS)-None

2) Process Name: EPS Unit

Type: Batch Suspension

3) Overall Process Block Diagram:

Attached are two Process Block Flow Diagrams

a) "Polystyrene Process Flow" (Polymerization Process)

b) "EPS Process" (Impregnation Process)

Description of Process:

The process consists of two parts:

1) The production of polystyrene particles by the batch suspension process, and

2) the addition of a blowing agent and subsequent process steps. The blowing agent, pentane, is added to a reactor containing polystyrene, process water, product modifying chemicals and suspension chemicals. The reactor temperature and pressure are utilized to impregnate the polystyrene particles with the blowing agent. Upon completion of the impregnation stage the reactor contents are transferred to a hold tank.

From the hold tank the product is fed to a drying system utilizing centrifugal dryers for water removal, followed by contact with low temperature pre-heated air to remove any surface moisture.

The product is then segregated according to size and transferred pneumatically to product storage silos.

From the storage silos the product goes to the product blending/boxing area where external surface coatings are added and the finished product is boxed for shipment.

4) Number of pumps and valves which handle Volatile Organic Compounds (VOC):

Compound: Pentane ( $C_5H_{12}$ )

Pumps: (3) Railcar Unloading, Storage Tank and Addition Tank

Valves: (1) Control Valve

(12) Block Valves (Gate design)

(2) Pressure Relief Valves located on Storage Tank and Addition Tank. These valves vent into the Refinery Flare Header System.

This equipment is used only for the production of EPS.

POLYSTYRENE PROCESS FLOW

CONFIDENTIAL

EPS PROCESS

CONFIDENTIAL

C) POLYMERIZATION PROCESS and IMPREGNATION PROCESS

- 1) Process Flow Sheets (2) are attached with emission points shown for the following:
  - a) Polymerization Process
  - b) Impregnation Process, showing introduction of the expanding (blowing) agent (pentane).

POLYMERIZATION PROCESS

CONFIDENTIAL

IMPREGNATION PROCESS

CONFIDENTIAL

C) continued

2) Emissions:

Source No. 1 (EPS Process): Pentane Storage Tank  
Relief Valves

Flow: Intermittent

Composition: Pentane, Nitrogen

Rate/Quantity: Unknown (relieves into Refinery  
Flare Header System)

Temperature: Unknown

Pressure: Unknown

Describe composition variation, if any: Not Applicable

Method used to determine composition and flow: Never Sampled

Ease of Sampling: Very difficult

C) Continued

Source No. 2: Reactor Emergency Vents utilizing rupture disc safety pressure relief system set below maximum reactor design pressure.

Flow: Intermittent, emergency relief. No background information available. Pressure has never exceeded rupture disc design pressure during EPS production.

Composition: Steam, Pentane, Nitrogen; dependent on the stage of process and reason for emergency.

Rate/Quantity: Mixture of the above in unknown quantities.

Temperature: Confidential Data

Pressure: Unknown

Method used to determine composition and flow: Never Sampled

Ease of Sampling: Very difficult.

C) continued

Source No. 3: Vents on Hold Tanks

Flow: Intermittent, when reactor contents are transferred into hold tank. At maximum production; three times in 24 hours for approximately 30 minutes duration each.

Composition: Air, Nitrogen, Water Vapor and Pentane

Rate/Quantity: 45 ft.<sup>3</sup>/minute (based on volume displaced)  
Exact quantity of above mixture is unknown.

Temperature: Confidential Data

Pressure: Ambient

Method used to determine composition and flow: Never Sampled

Ease of Sampling: Relatively easy

D) MATERIALS RECOVERY/SEPARATION PROCESS

- 1) Process Flow Sheet for the "Materials Recovery/Separation Process" section attached with emission points shown.

MATERIALS RECOVERY/SEPARATION PROCESS

CONFIDENTIAL

D) continued

2) Emissions:

Source No. 4: Product Dryer Vents

Flow: Continuous

Composition: Air, particulate dust, pentane and water vapor.

Rate/Quantity: Air - 7,000 SCFM  
Particulate - Quantity unknown  
Water Vapor - 125 Lbs./Hr. (Basis: Maximum Capacity)  
Pentane - 8.5 Lbs./Hr (Basis: maximum capacity)

Temperature: Confidential Data

Pressure: 0 - 1 psig

Method used to determine composition and flow: Blower specifications and material balance.

Ease of Sampling: Relatively easy

D) continued

Source No. 5: Pneumatic Product Transfer System Air Vents

Flow: Continuous

Composition: Air and pentane

Rate/Quantity: Air - 4,100 SCFM  
Pentane - 2.8 Lbs/Hr. (Basis: Maximum  
capacity)

Temperature: Ambient

Pressure: 0 - 5 psig

Method used to determine composition and flow: Blower  
specifications and material balance.

Sample Procedure: Devolatilizing Oven Test Run on Product

Ease of Sampling: Easy

D) continued

Source No. 6: Product Blending/Boxing Vents

Flow: Intermittent - approximately 18 hours  
per day at maximum capacity.

Composition: Air and pentane

Rate/Quantity: Unknown

Temperature: Ambient

Pressure: 0 psig

Sampling: Never Sampled

Ease of Sampling: Difficult

E) ENGINEERING DESCRIPTION OF CONTROL DEVICES SPECIFIED IN B.3

Enclosed is a detailed sketch of the pentane storage system. These tanks operate under a nitrogen blanket with the main storage (1,000 bbls.) and the addition tank (800 gal.) set at 26 psig. Both tanks are equipped with pressure relief valves; the main storage tank set at 35 psig and the addition tank set at 80 psig. The relief valves vent into the Refinery Flare Header System. No data is available on the capital cost of this system or the EPS unit portion of the operating costs.

PENTANE STORAGE SYSTEM

CONFIDENTIAL

DOCKET NO. A-82-19

Category II-D-96

The following information is located in the confidential files of the Director, Emission Standards and Engineering Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina. This information is confidential, pending final determination by the Administrator, and is not available for public inspection.

Various process flow diagrams. From letter dated March 30, 1983, from T.M. Hain, Cosden Oil and Chemical Co., to J. Farmer, U.S. EPA.