



Air Products and Chemicals
INC.

ESCAMBIA PLANT
INTEROFFICE MEMORANDUM

To: E. A. Primeau

Date: 14 November 1974

From: D. H. Francke

Copies: J. T. Barr
~~R. E. Jones~~
G. J. Mantell
W. C. Wilde

Re: VCl Recovery by Absorption
with Activated Carbon

Attached are some preliminary costs of systems to recover VCl vapors by carbon absorption and steam desorption. These costs are based on the use of Calgon's PCB 4 x 10 activated carbon to remove VCl from an air stream consisting of the blend tank vent, the vent condenser, and the two reactor purge blowers. VCl concentrations were based on material balance data.

This type of system appears to have some promise as a method of VCl removal and recovery to aid in our reduction of VCl emissions. One series of tests made by Calgon for a customer indicated that no loss of adsorptivity was experienced throughout 100 adsorption/desorption cycles. Based on the calculated costs, a breakeven situation between operating costs and VCl savings becomes available at about 200 cycles per carbon bed before recharging the carbon. An actual savings of up to \$14-\$15M/year is possible if the carbon can be used for up to 500 cycles.

To determine the feasibility of such a system along with the actual number of cycles this carbon can be put through we need to run a small carbon bed (about one ft³) through a series of cycles using a small side stream of one of the vents mentioned above. This test could tell us the removal efficiency, the actual adsorption capacity of the carbon, and the actual steam usage for desorption. If run for an adequate time period (about one month), data on the number of cycles would be obtained. This system could be set up at the Escambia PVC Plant using one of the new Bendix Chromatographs to aid in analysis.

D. H. Francke

D. H. Francke

DHF:aw

attachment

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Preliminary Costs of a Carbon
Adsorption System for VCl Recovery

BASIS:

- * 1. Calgon's PCB 4 x 10 Activated Carbon @ \$.905/pound ($\rho=12.63 \text{ lb/ft}^3$)
- 2. Combined air flow of 4300 CFM @ ~600 ppm VCl (data from Mat'l Balance)
- * 3. Capacity of the PCB 4 x 10 = 5% VCl by weight
- * 4. Maximum bed linear velocity = 75 ft/min.
- * 5. Steam required for regeneration = 10 pounds steam/pound VCl recovered
- 6. 3 bed system; 1 bed adsorbing, 1 bed desorbing, 1 bed cooling

*this data provided by Calgon Representative, B. D. Wells

Number of Cycles	Operating Costs (\$/hour)		Operating Cost (\$/year)	
	<u>A</u>	<u>B</u>	<u>A</u>	<u>B</u>
100	3.12626	2.85626	27,386	25,021
200	.15625	.02126	1,369	186
300	(.83374)	(.92374)	(7,304)	(8,092)
500	(1.62574)	(1.67974)	(14,241)	(14,715)

Breakeven Point: A = 211 cycles/bed
 B = 202 cycles/bed

A = 1 hour adsorption, 1 hour desorption, 1 hour cooling

B = 2 hour adsorption, 2 hour desorption, 2 hour cooling

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Vinyl's Troubles Multiplying From Plant to Planning Board

Uniroyal Inc.'s Painesville, Ohio, polyvinyl chloride plant was struck by some 300 members of the United Rubber Workers Union last week, in what is believed to be the first such job action to arise from the discovery of the carcinogenicity of vinyl chloride. The issues in the strike are work practices and a demand for higher pay.

In other developments relating to the troubled resin industry, B.F. Goodrich announced that it would spend \$42 million in the next three years to make its plants safe for workers handling vinyl chloride products, but that this sum still would not enable it to reach compliance with the new permanent Occupational Safety & Health Administration standard. On Tuesday, Society of the Plastics Industry petitioned OSHA to delay the standard.

PAINESVILLE ISSUES

From Painesville, Uniroyal industrial relations manager for the struck plant, Robert Douglas, said that the issues involved union demands for eating facilities separate from the workplace, special cleaning facilities and time off to use them, as well as a wage hike of 75 cents an hour to compensate for the hazards of VCM to the workers.

Mr. Roberts said the eating facility and clean-up issues were both part of the temporary standard on VCM products issued earlier by OSHA. Since OSHA itself dropped the provisions on grounds they had no validity when it wrote the permanent

standards, according to Mr. Douglas, Uniroyal resisted the workers demands - preferring to put its money into the technical changes mandated by the new rule.

The hourly workers went out last Monday. By midweek, according to Uniroyal, there had been at least one meeting between strikers and management; there was no progress and the plant was being picketed.

In Akron, meanwhile, B.F. Goodrich explained that its \$42-million investment in VCM safety measures is keyed to reducing VCM gas levels in six plants and does not cover expansions, including an expansion at Louisville, Ky.

The company claims it is unable to say what the cost of meeting the new standards would be.

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