United States
Environmental Protection
Agency

Air and Energy Engineering
Research Laboratory
Research Triangle Park NC 27711

Research and Development

EPA/600/S2-89/043 Sept. 1989

EPA

Project Summary

Source Characterization and Control Technology Assessment of Methylene Chloride Emissions from Eastman Kodak Company, Rochester, NY

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This report gives results of an assessment of the application of potential control technologies for methylene chloride(also known as dichloromethane or DCM) emissions sources at Eastman Kodak Company's Kodak Park facility in Rochester, NY. DCM is a solvent used by Kodak in the manufacture of cellulose triacetate film support.

This work involved: (1) a plant visit where the major DCM emission sources were inspected, and (2) identification and evaluation of potential control technologies that might be applied to the emission sources. Included are emission estimates determined by Kodak of all emission points greater than 8,000 lb*/yr DCM, as well as a description of each point observed during the visit. A cost analysis of different add-on control devices is provided for four of the uncontrolled emission points.

This report characterizes emissions and control technologies for reducing emissions of methylene chloride (DCM) at Eastman Kodak Company's Kodak Park facility in Rochester, NY.

This Project Summary was developed by EPA's Air and Energy Engineering Research Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

The assessment of Control technologies for DCM emission sources at Kodak Park was initiated by New York State's Department of Environmental Conservation (DEC) in order to bring the facility into compliance with title 6, chapter III, Part 212 of New York State's air pollution regulations. This was due in part to New York's reducing the acceptable ambient level for methylene chloride from 1167 to 0.37 $\mu g/m^3$, and Kodak's plans to increase cellulose triacetate film production. DEC requested assistance from EPA's Control Technology Center (CTC) to independently evaluate control technologies which might be applied to DCM emissions at Kodak Park. Data provided by Kodak indicate that DCM emissions from the Kodak Park facility total 9.2 million lb/yr, the largest of any source in the U.S.

Emissions Inventory

Work on this project focused on the evaluation of category 1 and 2 emission points. According to Kodak, category 1 sources emit more than 100,000 lb/yr

*1lb = 0 454 kg

DCM, while category 2 sources emit between 8,000 and 100,000 lb/yr. Of the 181 registered emission points at Kodak Park, 26 (15%) are category 1 or 2. These sources, however, emit approximately 8.4 million lb DCM, or greater than 90% of all DCM emissions. During the control technology assessment, it was determined that a substantial number of emission sources had emission estimates with a low confidence level. Of the 26 existing category 1 or 2 sources, emissions from 11 points were estimated by best engineering judgment. The accuracy of such estimates can be held suspect. Before serious consideration is given to applying a control device to any of the emission points which were estimated using best engineering judgment, better emission estimates need to be obtained.

By far, the largest source of DCM emissions at Kodak Park is the production of cellulose triacetate film. In this process, triacetate pellets are dissolved in methylene chloride and other solvents to form "dope." The dope is then extruded onto a polished surface to forma thin sheet or web. The web is than dried at elevated temperatures, driving off the methylene chloride and other solvents. This process happens within roll coating machines which are enclosed. While Kodak recycles greater than 95% of the DCM used in this process, 7.38 million lb, or over 80% of total DCM emissions to the atmosphere, occur from this process. Other sources of DCM emissions include: the Dope Department, where triacetate pellets are dissolved in DCM; the Distilling Department, where DCM is distilled and recovered; fugitive emissions from pumps, valves, seals, flanges, etc., within Kodak Park; and secondary losses from wastewater.

The assessment also indicated that the greatest potential for emission reduction is controlling leaks from the roll coating machines. Kodak has proposed to remedy this situation by changing latching devices and gasket seals, covering bearing casings, and installing solid pipe bulkhead fittings on the machine casing. These changes were projected by Kodak to reduce DCM emissions by 3 million lb/yr. This assessment found no reason that this projection cannot be met. Kodak projects that work in this area will be completed in 1992.

The remaining category 1 and 2 sources at Kodak Park can be divided into two groups. The first group consis of emission points which are alreac controlled, while the second group co sists of uncontrolled sources. "Emissi controls used by Kodak include carb adsorbers, dual water/methanol scru bers, and condensers. A review of ava able data indicates that the scrubbe and condensers are not being operat efficiently, and significant emission r duction can be achieved by more ef cient operations.

Most of the uncontrolled emissic points have high flow rates and low DC concentrations, making control diffic and expensive. Several points in th group, however, present situations whe Kodak could recover DCM. These inclu combining emission sources and addi a scrubber or carbon adsorber. In ad tion, emissions can also be reduced b controlling solvent loss from ultrason cleaning operations, and instituting a le detection and repair program for valve flanges, pumps, seals, etc., in DC services.

Table 1 summarizes potential emi sions reduction of emission sources e amined by this report.

Table 1. *Expected Emissions Reduction from Possible Control Technologies*

Emission Point(s)	*Description*	*Current Emissions, lb/yr*	*Emissions After Control, lb/yr*	*Percent Reduction*	*Reasonable Control Technology*
53-85, 53-38, and 20-68	*Machine Room Exhaust*	*7,380,000*	*4,380,000*	*40.6*	*Improving Seals on Roll Casting Machines*
53-22	*C.A. for Machine Air Draw-off*	*78,500*	*45,700*	*41.7*	*Improved Operations*
142-1	*Solvent Recovery System Vent Scrubber*	*14,000*	*Cannot Determine*		*Improved Operations*
120-7	*Still System Vent Scrubber*	*8,700*	*Cannot Determine*		*Improved Operations*
54-15	*Building 54 Vent System*	*23,350*	*2,350*	*89.9*	*Improved Operations*
52-37 and 54-29	*Batch Mixers Felt Wash Process*	*237,835*	*23,784*	*90*	*Carbon Adsorber or Scrubber*
53-32 and 53-96	*Hopper Cleaning, Storage Vessel Vents*	*41,900*	*2,095*	*95*	*Inclusion with Flows for the 18,000 cfm* Carbon Adsorber*
49-53	*Ultrasonic Cleaner*	*10,000*	*4,000*	*60*	*Proper Freeboard Ratio, Freeboard Chiller C.A.*
Fugitives	*Equipment Leaks*	*650,000*	*390,000*	*40*	*Leak Detection and Repair Program*

** 1 cfm = 0.00047 m^3/s*

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The complete report, entitled "Source Characterization and Control Technology Assessment of Methylene Chloride Emissions from Eastman Kodak Company, Rochester, NY," (Order No. PB 89-224 471/AS; Cost: $21.95, subject to change) will be available only from:
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EPA/600/S2-89/043