

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45202

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 74-146-222

AMERICAN CAN COMPANY
LEMOYNE, PENNSYLVANIA

SEPTEMBER 1975

I. TOXICITY DETERMINATION

Based on the results of an observational and environmental evaluation conducted by the National Institute for Occupational Safety and Health (NIOSH) on March 18 and 19, 1975, it has been determined that atmospheric concentrations of methyl ethyl ketone, toluene, xylene, carbon monoxide, and carbon dioxide exposures were not present in concentrations hazardous to employees. However, the use of solvents for cleaning rolls without proper skin protection can cause dermatitis, and thus, constitutes a potential health hazard. The use of impermeable gloves should alleviate this problem at the coating department area of the American Can Company, Lemoyne, Pennsylvania.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Hazard Evaluation Determination are available upon request from the Hazard Evaluation Services Branch, NIOSH, U.S. Post Office Building, Room 508, 8th and Walnut Streets, Cincinnati, Ohio 45202. Copies have been sent to:

- a) American Can Company, Lemoyne, Pennsylvania
- b) Authorized Representative of Employees
- c) U.S. Department of Labor - Region III
- d) NIOSH - Region III, Philadelphia, Pennsylvania

For the purpose of informing approximately 8 exposed employees, this report shall be posted in a prominent place readily accessible to workers for a period of at least 30 calendar days.

III. INTRODUCTION

Section 20 (a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669 (2)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health received such a request from an authorized representative of employees regarding smoke and fumes in the coating department at the American Can Company, Lemoyne, Pennsylvania.

IV. HEALTH HAZARD EVALUATION

A. Description of Process - Condition of Use

An initial survey was conducted at the American Can Company in Lemoyne, Pennsylvania on March 18 and 19, 1975. The American Can Company manufactures fiber and metal containers. The company employs a total of 260 employees, two shifts a day, five days a week. Of the 260 employees, eight employees work in the coating department where the potential health hazard exists. Four employees work on the first shift (7:00 A.M. to 3:30 P.M.) and four employees work on the second shift (3:30 to 12:00 midnight).

The process involves the application of a coating onto metal sheets, approximately 35" x 38", to preserve the metal from rusting and meet the Food and Drug Administration's specifications. The sheets are fed into a bath containing the coating by a Dexter feeder at a rate of 112 sheets per minute and then dried by passing them through a gas heated oven 126' long. The temperatures range from 400° F. at the baking stage to 40° F. at the cooling stage. The solvent vapors are driven off the coating when the sheets enter the oven and the air containing solvent vapor is transferred through ductwork to one of two recovery tanks where the solvent is trapped on charcoal to remove it from the air stream. Normally, there are four operators in the coating department per shift - the coater operator, stacker operator, paint room operator, and the mechanic.

The coating mixture used during the initial survey was X-21 topcoat which contains toluene, xylene, methyl ethyl ketone and di methyl formamide

The coating machine together with the oven was well ventilated; the average face velocity at the oven was 300 FPM.

B. Evaluation Design

It was decided that employee exposures to organic vapors would be determined by obtaining personal samples during a normal work shift. Carbon monoxide and carbon dioxide readings would be taken by direct reading instrument during the sampling period. It was also decided to conduct medical interviews with all available workers from the coating department and to include a few workers who work in the coating department from time to time.

C. Evaluation Methods

1. Environmental

(a) Organic Vapor Sampling

X-21 topcoat coating was used during the day of the evaluation. Employees exposures to toluene, xylene and methyl ethyl ketone were monitored using personal air sampling equipment. Breathing zone and general air samples

were obtained using Sipes personal pumps and charcoal air sampling tubes. Sample rates were approximately 50 cc/minute. The charcoal tubes were sealed and mailed immediately to the NIOSH laboratory in Salt Lake City and analyzed by the gas chromatographic techniques reported by White, et. al.¹

(b) Carbon monoxide and carbon dioxide samples were collected with a Dräger pump and detector tubes.

(c) Two general area samples were collected in the Millwright shop and the Electric shop for total nuisance dust on pre-weighed AA filters, using a MSA Model G vacuum pump operated at an air flow of 1.5 liters per minute.

(d) Medical Interviews

Histories were collected from workers on the first shift by asking non-directed and directed questions by a NIOSH industrial hygienist to elicit health complaints and general information regarding working conditions.

D. Environmental Criteria

Environmental standards of substances investigated

Environmental standards intended to protect the health of workers have been required or recommended by several sources. These standards are established at levels designed to protect workers occupationally exposed to a substance on an 8-hour per day, 40 hours per week basis over a normal working lifetime. In this study the environmental criteria from five sources were considered:

- a) Federal Standards - The standard enforced by the Department of Labor as described in the Federal Register, Vol. 37, Section 1910.93, June 27, 1974.
- b) Threshold Limit Values (1974 TLVs) - Developed by the TLV Committee of the American Conference of Governmental Industrial Hygienists.
- c) Criteria for a recommended standard - Occupational exposure to toluene HSM 73-11023 USDHEW, Public Health Service, NIOSH, Rockville, Maryland, 1973.
- d) Criteria for a recommended standard - Occupational exposure to xylene HEW-75-168 USDHEW, Public Health Service, NIOSH, Rockville, Maryland, 1975
- e) Criteria for a recommended standard - Occupational exposure to carbon monoxide HSM 73-11000 USDHEW, Public Health Service, NIOSH, Rockville, Maryland, 1972.

The environmental exposure criteria selected for this study were the Federal Standards for methyl ethyl ketone, carbon dioxide, and total nuisance dust, and the NIOSH criteria document recommendation for toluene, xylene, and carbon monoxide.

Substance	8-hour Time, Weighted Average Concentration - ppm *
methyl ethyl ketone	200
carbon dioxide	5,000
toluene	100
xylene	100
carbon monoxide	35
total nuisance dust	15 mg/m ³ **

* parts per million of vapor per million parts of contaminated air by volume at 25° C. and 760 mm Hg pressure.

** mg/m³ - milligrams of contaminant per cubic meter of air

E. Evaluation Results and Discussions

Environmental

Results of environmental charcoal tube sampling are contained in Table I. All levels were below the detectable limit of 1 ppm. None of the employees monitored for MEK, toluene and xylene were found to have significant airborne exposure to the mixture of solvent vapors.

The two filter samples collected for total nuisance dust did not exceed 0.4 mg/M³ and assuming the dust to be inert, both samples were well below the current Federal Standard for nuisance dust. The air dust samples are listed in Table I. The levels of carbon monoxide were less than 10 ppm and of carbon dioxide well below the Federal Standard.

Medical

Six of the eight employees were interviewed during the first shift for alleged health problems associated with their work environment. The medical interviews indicated that one of the six employees had a rash on his hands which the worker believes was caused by the solvent (alcohol, isophorone and xylene) used at the roll cleaning operation. The only personal protective equipment worn was cotton gloves which were not adequate for their intended purpose. No other symptomatology or health problems were reported.

F. Conclusion

Based on the absence of significant medical symptomatology and the low levels of airborne contaminants measured during this evaluation it has been determined that a health hazard does not exist for exposed employees from substances investigated. However, skin exposures to the solvent may cause dermatologic problems.

V. RECOMMENDATIONS

- 1) Impermeable gloves should be worn by the operator when cleaning the rolls to prevent skin problems.

VI. REFERENCE

- 1) White, W. D., Taylor, D. B., Mauer, P. H. and Kupel, R. E., "A Convenient Optimized Method for the Analysis of Selected Solvent Vapors in the Industrial Atmosphere", American Industrial Hygienists Association Journal, Volume 31, March-April 1970.

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TABLE I

SUMMARY OF ENVIRONMENTAL RESULTS AT AMERICAN CAN COMPANY
LEMOYNE, PENNSYLVANIA
On March 19, 1975

3-19-75 Field Number	Job and/or Location	Type	Sample Period	MEK ppm*	Toluene ppm	Xylene ppm
1	Feeder Operator	BZ	8:39 - 11:04	<1	<1	<1
2	Paint Room Attendance	BZ	8:21 - 10:15	<1	<1	<1
3	Stacker	BZ	12:15 - 3:05	<1	<1	<1
4	Bulk Air Sample	GA	8:23 - 3:05	<1	<1	<1
5	Loader Area	GA	8:26 - 12:45	<1	<1	<1
6	Paint Room Attendance	BZ	10:50 - 3:02	<1	<1	<1
7	Feeder Operator Washing Rolls	BZ	11:05 - 11:24	<1	<1	<1
8	Feeder Operator	BZ	11:58 - 3:07	<1	<1	<1
9	Loader Area	GA	12:45 - 3:00	<1	<1	<1

FILTER SAMPLES

				Total Nuisance ** Dust mg/m ³
AA-120	Milwright Shop	GA	8:32 - 3:12	0.2
AA-124	Electric Shop	GA	8:32 - 3:09	0.4

*ppm - Parts of vapor or gas per million parts of contaminated air by volume at 25° C. and 760 mm Hg pressure.

**mg/m³ - Milligrams of contaminant per cubic meter of air.

BZ - Personal breathing zone air samples.

GA - General area.