

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

FILE COPY

HEALTH HAZARD EVALUATION DETERMINATION  
REPORT NO. 73-134-98

ARTCRAFT COMPANY  
LOS ANGELES, CALIFORNIA 90063  
DECEMBER 1973

I. TOXICITY DETERMINATION

It has been determined that methyl ethyl ketone, toluene, n-butyl acetate, isopropyl alcohol, and xylene vapors are not toxic at the concentrations measured at the Artcraft Company plant during normal operating conditions. This determination is based upon environmental measurements in the workplace, concurrent employee interviews by a physician, analysis of the conditions where these solvents are used, and on available literature regarding their toxicities. During the day of the evaluation (August 30, 1973), no significant symptoms were reported by employees and levels of methyl ethyl ketone, toluene, n-butyl acetate, isopropyl alcohol, and xylene were found to be far below levels believed to be toxic to employees.

It is recommended that only approved organic vapor respirators be used in the plant and a respirator maintenance program be established.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Determination Report are available upon request from the Hazard Evaluation Services Branch, NIOSH, U.S. Post Office Building, Room 508, 5th and Walnut Streets, Cincinnati, Ohio 45202. Copies have been sent to:

- a) Artcraft Company, Los Angeles, California
- b) Authorized Representative of Employees
- c) U.S. Department of Labor - Region IX
- d) NIOSH - Region IX

For the purposes of informing the approximately 40 "affected employees" the employer will promptly "post" the Determination Report in a prominent place(s) near where exposed employees work for a period of 30 calendar days.

III. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(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 (NIOSH) received such a request from an authorized representative of employees regarding exposure to paint thinner vapors in use at the Artcraft Company plant, Los Angeles, California.

#### IV. HEALTH HAZARD EVALUATION

Artcraft is in the business of mass producing paintings for consumers. The company employs about 15 artists in the Art Department who do the original work on a large number of paintings. These artists generally work only with standard acrylics and oils. A few of the artists will paint on silk screens which must be cleaned after use with a paint thinner. The cleaning operation takes about 5 minutes and an artist may clean 5 screens per day. The screens are cleaned in a sink and local exhaust ventilation is provided above the sink. Although the ventilation system may not be of optimum design, the sporadic nature of the silk cleaning operation does not warrant any changes in the operation except to substitute an approved organic vapor respirator for the present unapproved one in the area.

Three spray booths are located in the Art Department, and these booths are used for lacquering completed paintings. Additionally, three paint booths are located in an adjoining room where frames for paintings are stained. Each spray or paint booth is operated by one employee.

##### B. Worksite Evaluation

On August 30, 1973, Dr. Bodner and Mr. Okawa conducted a survey of the Art Department. Environmental samples for solvent vapors were collected in the breathing zones of workers operating the paint and spray booths. In conjunction with environmental sampling, Dr. Bodner interviewed a representative number of employees in the work area.

##### C. Evaluation Methods

###### 1. Solvent Vapor Air Sampling

Employee exposures to solvent vapors were measured via personal air sampling equipment. Breathing zone air samples were obtained using charcoal air sampling tubes. The charcoal tubes were sent to NIOSH laboratories in Salt Lake City and were analyzed by the gas chromatographic method reported by White et al.<sup>1</sup> Bulk samples of the lacquers were also sent to Salt Lake City for analysis.

###### 2. Employee Interviews

Fourteen employees were interviewed by a physician regarding work related and non-work related health problems.

### 3. Ventilation Measurements

Spot ventilation measurements were taken in the paint and spray booths with an Alnor velometer, jr. The capture velocity capabilities of the booths were noted in linear feet per minute (lfpm).

#### D. Evaluation Criteria

After completing the initial observational survey of the Art Department, it was decided to concentrate the environmental sampling on the paint and spray booth operators who have the greatest and most constant exposure to the compounds being used. It was determined with assistance from the manufacturer that the potentially toxic constituents found in the lacquers were methyl ethyl ketone, toluene, n-butyl acetate, isopropyl alcohol, and xylene. Presently, the established Federal Standards for these compounds are respectively 200, 200, 400, 150, and 100 ppm (parts of vapor or gas per million parts of contaminated air by volume) as promulgated by the U.S. Department of Labor.<sup>2</sup> Additionally, an analysis for benzene (standard 10 ppm) in the environmental samples was requested. All the standards are based on eight-hour time-weighted averages.

#### E. Evaluation Results

##### 1. Solvent Vapor Air Sampling

Four spray or paint booths were in operation during our survey. Two breathing zone samples were collected on each of the workers. The laboratory results for the 8 samples were reported in parts per million.

The average concentration of toluene was found to be 6.5 ppm with a range of 1 - 20 ppm. The average level for n-butyl acetate was 10.5 ppm with a range of 3 - 32 ppm. The average level for methyl ethyl ketone was 2.2 ppm with a range of 0 - 7 ppm. Benzene, isopropyl alcohol, and xylene were not detected in any of the samples. Since there is no variation in the lacquers and the operation is fairly constant, it is felt that these samples are indicative of normal working conditions.

##### 2. Ventilation Measurements

The booth capture velocities in the paint and spray booths where workers were standing was measured. The air movement in all the booths ranged from 100 - 150 lfpm which is considered adequate for a large paint or spray booth.

##### 3. Employee Interviews

Fourteen workers (8 women and 6 men) were interviewed by a physician.

Nine of the workers reported no health problems. One worker had a history of "bronchitis" but had worked at this plant for 20 years with no other problems except this one acute episode. Two workers reported occasional headaches and two employees reported occasional nausea. One employee reported one instance of nausea in 20 years at the plant when paint thinner was splashed in her face. In view of the paucity of symptoms reported and the long employment of some of the workers, there appeared to be no health hazard at the time of the survey.

V. REFERENCES

1. White, W.D., D.B. Taylor, P.A. Mauer and R.E. Kupel, "A Convenient Optimized Method for the Analysis of Selected Solvent Vapors in the Industrial Atmosphere," Am. Ind. Hyg. Assoc. J., Vol. 31, March-April, 1970.
2. Federal Register, Vol. 37, No. 202, Part II, Section 1910.93, October 18, 1972.

VI. AUTHORSHIP AND ACKNOWLEDGMENTS

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