

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45226

HEALTH HAZARD EVALUATION DETERMINATION
REPORT NO. 78-29-478

U.S. STEEL CORPORATION
CUYAHOGA HEIGHTS, OHIO

APRIL, 1978

I. TOXICITY DETERMINATION

A health hazard evaluation was conducted by the National Institute for Occupational Safety and Health (NIOSH) on January 31 and February 1, 1978, at the U.S. Steel Corporation in Cuyahoga Heights, Ohio. At the time of this evaluation, breathing zone and general area samples were taken for mineral spirits and benzene. Results of the environmental sampling indicate that employees were not exposed to airborne contaminants at toxic concentrations during the investigation.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this determination report are currently available upon request from NIOSH, Division of Technical Services, Information resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia. Information regarding its availability through NTIS can be obtained from NIOSH, Publications Office, at the Cincinnati address.

Copies of this report have been sent to:

- a) U.S. Steel Corporation
- b) Authorized Representative for Employees, United Steelworkers of America - Local 1298
- c) United Steelworkers of America International, Pittsburgh, Pennsylvania
- d) U.S. Department of Labor - Region V
- e) NIOSH - Region V

For the purpose of informing the six affected employees, copies of the report shall be posted in a prominent place accessible to the employees 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 received a request from an authorized representative of employees regarding exposure to Samoclene® No. 128-M at the die shop in the wire mill at U.S. Steel Corporation, Cuyahoga Heights, Ohio.

IV. HEALTH HAZARD EVALUATION

A. Process Evaluated

U.S. Steel Corporation, Cuyahoga Heights, Ohio, is in the business of producing steel wire and rods. A die shop, located within the wire mill, produces the various kinds of dies used in the production of steel wire. Various types of abrasives and lubricants are used in making the dies. A rinsing solution, Samoclene® No. 128-M, is used to remove the abrasives and lubricants from the dies. The dies are rinsed by placing them in a spray washer or agitator washer, both which are enclosed and exhaust ventilated, or by placing the dies in a safety can filled with Samoclene® No. 128-M. The dies are then removed and blown dry with air hoses.

B. Evaluation Design

An initial and environmental survey was conducted on January 31 and February 1, 1978. A NIOSH Regional Consultant and Regional Hygienist made a walk through the die shop, accompanied by management and union representatives.

Six employees were given nondirected interviews to determine if they had experienced health problems as a result of their work place exposure. Those interviewed made complaints such as, "eye irritation," "granulation under both eyelids," "sinus irritation," "sore throat," "nausea," "labored and painful breathing," "dizziness," "drowsiness," etc. On February 1, 1978 both personal breathing zone and general area atmospheric samples were collected during normal operations in the die shop for mineral spirits and benzene.

C. Evaluation Methods

Breathing zone and general area atmospheric samples for mineral spirits and benzene were collected on organic vapor charcoal sampling tubes using portable battery powered sampling pumps operating at approximately 200 cubic centimeters (cc) per minute. Samples were analyzed by gas chromatography.

D. Evaluation Criteria

In order that workers may better understand the potential health hazards associated with the chemical substances evaluated during this study, the following discussion is provided.

Benzene -- there is strong evidence that benzene can cause progressive malignant disease of the blood-forming organs. Benzene can also result in central nervous system depression and skin irritation. NIOSH recommends a ceiling value of 1 part per million (ppm) for benzene. A ceiling value is a concentration that should never be exceeded.¹ The OSHA standard for an 8-hour time weighted average exposure is 1 ppm.

Mineral Spirits -- overexposure may cause vertigo, headache, and anesthetic stupor. In extreme cases of acute exposure rapid central nervous system depression may occur resulting in deep coma and death. Prolonged skin exposure may cause drying and cracking of the skin. NIOSH recommends an exposure limit of 350 milligrams per cubic meter (TWA).⁵ There is no OSHA standard for mineral spirits.

E. Evaluation Results

Results from the personal breathing zone and area samples collected are shown in Table 1. All samples are well below the NIOSH evaluation criteria. However, it should be noted that the complaints reported in the nondirected interviews appear to be those which mineral spirits can produce.

F. Recommendations

- 1) Management and employees should meet and discuss complaints and problems involving health hazards that employees feel might exist.
- 2) An educational program should be instituted in which the employees are informed of the hazardous nature of the toxic substances used.

V. REFERENCES

- 1) NIOSH Revised Recommended Standard for Occupational Exposure to Benzene, NIOSH, Cincinnati, Ohio (1976)
- 2) DOL/OSHA Permanent Standard for Occupational Exposure to Benzene: Title 29, Section 1910:1028, effective March 13, 1978.
- 3) NIOSH Recommended Standard for Occupational Exposure to Refined Petroleum Solvents, NIOSH, Cincinnati, Ohio (1977)

VI. AUTHORSHIP AND ACKNOWLEDGMENTS

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TABLE 1
ATMOSPHERIC CONCENTRATIONS OF MINERAL SPIRITS AND BENZENE

U. S. STEEL CORPORATION
DIE SHOP
February 1, 1978

<u>SAMPLE NUMBER</u>	<u>JOB CLASSIFICATION</u>	<u>TYPE OF SAMPLE</u>	<u>TIME OF SAMPLE</u>	<u>MINERAL SPIRITS Mg/M³</u>	<u>BENZENE PPM</u>	<u>COMMENTS</u>
C-1	Die Rougher	BZ	7:24-14:14	93.0	*	
C-2	Die Inspector	BZ	7:25-14:14	14.0	*	
C-3	Die Maker	BZ	7:26-14:13	44.0	*	
C-4	Die Maker	BZ	7:27-14:12	78.6	*	
C-5	--	Area	7:36-14:15	37.0	*	Agitator Washer
C-6	--	Area	7:37-14:15	138.7	*	Spray Washer

Evaluation Criteria 350 1
NIOSH Limit of Detection 0.01 mg/sample 0.01 mg/sample

ppm = parts of vapor or gas per million parts of contaminated air

mg/M³ = milligrams of substance per cubic meter of air

BZ = breathing zone

* = below the NIOSH limit of detection