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

HAZARD EVALUATION AND TECHNICAL ASSISTANCE
REPORT NO. TA 77-41

VIMASCO CORPORATION
NITRO, WEST VIRGINIA

SEPTEMBER 1977

Study Requested By:
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Study Dates:
April 28-29, 1977

I. SUMMARY OF REPORT

The Hazard Evaluation and Technical Assistance Branch of the National Institute for Occupational Safety and Health conducted an asbestos study for the Vimasco Corporation of Nitro, West Virginia, and the Cincinnati Gas & Electric Company of Cincinnati, Ohio. The study was conducted on April 28-29, 1977.

A total of 38 samples for asbestos were taken during the survey of which 28 were personal and 10 were general area samples. The concentration of asbestos on all samples was below the analytical limits of detection of 0.05 fibers per cubic centimeter of air (fibers/cc). Based on these data and recent NIOSH recommended environmental criteria, it can be concluded that no health hazard exists during application of the Vimasco cable coating operation (Tables I and II).

II. INTRODUCTION

On April 28-29, 1977, the Hazard Evaluation and Technical Assistance Branch of the National Institute for Occupational Safety and Health conducted an asbestos survey of the Vimasco cable coating operation at the Cincinnati Gas and Electric's Oakley Substation located in Cincinnati, Ohio.

The Vimasco cable coating is a fire protection material consisting of polyvinyl acetate and asbestos. It is used to prevent the spread of fire in electrical cables having combustible insulation when grouped together in continuous rigid cable supports, junction boxes, cable trays and similar locations.

The material is received in five gallon containers and is ready for use when opened. An airless spray pump, operating at 80 cubic feet per minute (cfm) is used to apply the coating. The piston type pump is submerged into the container of material and during the "up" stroke, the material is deposited into a reservoir and on the "down" stroke it is forced through the line and spray pump. The air was supplied by a large portable air compressor located on the outside of the building.

III. EVALUATION METHODS, CRITERIA AND TOXICOLOGY

A. Evaluation Methods

Personal and area samples for airborne asbestos were collected on Millipore* type AA cellulose membrane filters with an 0.8u pore size. The filters were encased in a 37 mm three-piece plastic field monitoring cassette with the face cap removed to expose the entire surface of the filter.

*Mention of commercial products does not constitute endorsement by NIOSH.

Personal samples were collected at the employees' breathing zone using portable, battery-powered, Mine Safety Appliance* gravimetric pumps (Model G). The pumps and filters were worn by the employees during spraying. General air samples were also taken using the same type of pumps and filters used in personal sampling. The area samples were taken at various locations in the building.

All samples for asbestos were collected at a flow rate of 1.0 liters per minute (lpm) and were analyzed at the Utah Biomedical Test Laboratory, Salt Lake City, Utah, using phase contrast microscopy.[1]

B. Evaluation Criteria

1. Environmental

The primary criteria used for the evaluation of airborne asbestos was the NIOSH recommended standard limiting worker exposure to an airborne concentration of 0.1 fibers over 5 millimicrons in length per cubic centimeter (fibers/cc) of air on an 8-hour time-weighted average (TWA) and a peak concentration of 5 fibers/cc based on 15 minute sampling period.[2]

2. Evaluation Toxicology

Asbestos is a generic term which applies to a number of naturally occurring silicates of variable composition, but basically is of a form of hydrous magnesium silicate. Their chief characteristic is a structure composed subdivision of long, parallel, flexible fibers, capable of repeated longitudinal subdivision. The most widely used form in the United States is chrysotile, a fibrous form of serpentine. Other types include amosite, crocidolite, tremolite, anthophyllite and actinolite.

One of the potential health hazards associated with exposure to asbestos is that of inhalation of airborne fibers, resulting in a type of pneumoconiosis referred to as asbestosis. Asbestos fibers are capable of passing through the upper respiratory tract and depositing in ther terminal bronchioles of the lungs. The fibers, upon deposition in the terminal bronchioles, initiate a tissue response which results in a coating of the fiber with the ultimate production of what is known as the asbestos "body". If large quantities of the fibers are inhaled over a prolonged period, the tissue reaction progresses until a generalized, diffuse fibrosis becomes evident. This fibrosis is first seen in the lower lobes of the lungs, but eventually if exposure continues, appears in the other lobes as well. The fibrosis can impair the transfer of oxygen across the alveolar membrane and result in respiratory insufficiency, or cardiac failure.

*Mention of commercial products does not constitute endorsement by NIOSH.

Along with asbestosis, studies have provided conclusive evidence that exposure to asbestos fibers causes cancer in man. The frequency of bronchiogenic cancer is greater in occupationally exposed persons, as well as an increased occurrence in development of mesotheliomas of the pleura and peritoneum. These asbestos-associated neoplasms may occur without radiological evidence of asbestosis.

C. Results of Sampling

A total of 38 samples for airborne asbestos were taken during the survey, of which 28 were personal and 10 were general area samples. The concentration of asbestos fibers on all samples were below the NIOSH analytical limits of detection of 0.05 fibers/cc (Table I and II).

Since these samples are below the current OSHA standard of 2.0 fibers/cc and the recent NIOSH recommended standard, it is believed that no health hazard will exist during the application of the Vimasco cable coating if the manufacture recommendations for application are followed.

IV. REFERENCES

1. Manual of Analytical Methods, HEW Publication No. 75-121.

2. Memorandum from Director,NIOSH to Assistant Secretary of Health, December 15, 1976.

V. AUTHORSHIP AND ACKNOWLEDGMENTS

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TABLE I

PERSONAL AIR SAMPLES FOR ASBESTOS
VIMASCO CORPORATION
April 28, 29, 1977

Sample No.	Sample Time ON	OFF	Sample Vol/liters	Job Title	Concentration fibers/cc
C.G. 2	0930	1150	140	Sprayer	<0.05
5	0930	1150	140	Sprayer	<0.05
3	0930	1152	142	Sprayer	<0.05
4	0930	1145	135	Helper	<0.05
1	0930	1145	135	Supervisor	<0.05
6	0930	1430	360	Station Oper.	<0.05
7	1330	1405	35	Sprayer	<0.05
8	1330	1405	35	Sprayer	<0.05
9	1327	1430	57	Sprayer	<0.05
10	1328	1430	58	Helper	<0.05
11	1328	1430	58	Supervisor	<0.05
12	1328	1430	58	Operator	<0.05
13	1413	1430	17	Sprayer	<0.1
14	1413	1430	17	Sprayer	<0.1
15	1430	1532	62	Sprayer	<0.05
16	1430	1530	60	Sprayer	<0.05
17	1430	1530	60	Sprayer	<0.05
18	1430	1530	60	Helper	<0.05
19	1430	1530	60	Supervisor	<0.05
20	1430	1530	60	Helper	<0.05
21	0820	1122	182	Sprayer	<0.05
22	0820	1110	170	Operator	<0.05
23	0821	0920	61	Supervisor	<0.05
24	0820	1120	180	Sprayer	<0.05
25	0823	1123	180	Helper	<0.05
26	0820	0920	60	Supervisor	<0.05
27	1005	1110	65	Supervisor	<0.05
28	1005	1110	65	Supervisor	<0.05

TABLE II

GENERAL AREA SAMPLES FOR ASBESTOS
VIMASCO CORPORATION
April 28, 29, 1977

Sample No.	Sample Time ON	Sample Time OFF	Sample Vol/liters	Location	Concentration fibers/cc
C.G. A-1	0858	1430	332	Lunch Table	<0.05
A-2	0858	1430	332	Mid Room	<0.05
A-3	0900	1430	330	First Aid Bos	<0.05
A-4	1325	1430	65	Mid Room	<0.05
A-5	1413	1430	17	Cutting Insulat.	<0.05
A-6	1345	1405	20	Cutting Insulat.	<0.05
A-7	1435	1530	55	Mid Room	<0.05
A-8	0823	1115	172	First Aid Box	<0.05
A-9	0825	1115	175	Mid Room	<0.05
A-10					

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15. Supplementary Notes

16. Abstracts:

A Hazard Evaluation and Technical Assistance survey was conducted by NIOSH on April 28-29, 1977 at the Vimasco Cable coating facility operating at the Cincinnati Gas and Electric Company of Cincinnati, Ohio. The Vimasco cable coating is a fire protection material consisting of polyvinyl acetate and asbestos. The concentration of asbestos in all 30 samples (28 personal and 10 general area samples) taken during the survey was below the analytical limits of detection of 0.05 fibers per cubic centimeter of air. Based on these data and recent NIOSH recommended environmental criteria, it is concluded that no health hazard exists during application of the Vimasco cable coating operation.

17. Key Words and Document Analysis. 17a. Descriptors

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Industrial atmospheres
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Atmosphere contamination control
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Electrical industry
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