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. HHE 79-77-605

TOWN CENTER ASSOCIATES BUILDING
ROCKVILLE, MARYLAND

JULY, 1979

I. TOXICITY DETERMINATION

NIOSH conducted a health hazard evaluation on the 2nd floor of the Town Center Associates Building on May 23, 1979. The purpose of the evaluation was to determine whether exposure to a "gray fuzz" was causing a health hazard to the employees of this area.

During the administration of the non-directed questionnaire, the requestor stated she suffered severe skin irritation when her work location was under an air duct. This problem abated when her work location was changed to an area where no air ducts were in the vicinity. Environmental sampling results showed that a potentially hazardous exposure to fibrous glass did not exist.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this report are available 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 can be obtained from the NIOSH Publications Office at the Cincinnati address. Copies have been sent to:

(a) Building Manager, Town Center Associates Building
(b) Central File Supervisor, Equitable Trust Company
(c) Vice President, Equitable Trust Company
(d) U.S. Department of Labor, Region III
(e) NIOSH, Region III

For the purpose of informing the approximately 35 "affected employees," the employer shall promptly "post" for a period of 30 calendar days the Determination Report in a prominent place(s) near where exposed employees work.

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 an 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 of Town Center Associates Building, alleging an allergy as a result of exposure to a "gray fuzz" from the heating and cooling vents.

IV. HEALTH HAZARD EVALUATION

A. Area Process - Conditions of Use

The Equitable Trust Bank leases approximately 5000 square feet of the second floor of the 19 story Town Center Associates Building for the Consumer Credit Department. The primary responsibilities of the employees are clerical and checking the creditability of the loan applicants. Basically, this is typical of office work in any business office.

This building is five years old and was sprayed with a fireproofing, sound control thermal insulation, non-asbestos type material.

There are ten intake and ten exhaust, slot-type openings in the ceiling. The amount of outside air introduced can vary from 0 to 100 percent. During the intake some of the loose insulation may be introduced into the work atmosphere.

B. Evaluation Design

On May 23, 1979, Walter Chrostek, NIOSH Industrial Hygienist, visited the Town Center Associates Building. A walk-through and evaluation of the work atmosphere was conducted. Of the 30 employees who were present only one had a medical problem, and a non-directed medical interview was conducted with her.

C. Evaluation Methods

Three types of environmental samples were collected, viz., total dust, respirable dust and samples for fiber count. The samples collected were from the general air in the vicinity of the desk (central file) where the employee experience the discomfort.

Total and respirable dust samples were collected on tared 37 millimeter, 0.8 micron pore size polyvinyl chloride filters. Atmospheric samples for fibrous glass count were collected on cellulose ester membrane filters.

The air sampling rate was approximately 1.75 liters per minute.

A bulk sample was taken from the ceiling rafter in the storage room to determine the composition of the insulation material.

D. Evaluation Criteria

Airborne exposure limits for the protection of the health of workers have been recommended or promulgated by several sources. These limits are established at levels designed to protect workers occupationally exposed to a substance on an 8-hour day, 40-hour per week basis over a normal lifetime. For this investigation, the criteria used to assess the degree of health hazards to workers were selected from three sources:

1) NIOSH: Criteria for a Recommended Standard....Occupational Exposure to Fibrous Glass

2) Threshold Limit Values (TLV): Guidelines for Airborne Exposures Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) for 1978.

3) OSHA Standard: The air contaminant standards enforced by the U.S. Department of Labor - Occupational Safety and Health Administration - as found in the Federal Register - 20 CFR 1910.1000 (Table Z-3).

	Source		
Substance	NIOSH[a]	TLV[a]	OSHA[a]
Fibrous Glass			
Total Dust	5	10	15
Respirable Dust			5
Fiber Count	3,000,000[b]		

(a) - denotes milligrams of substance per cubic meter of air sampled (mg/M^3).

(b) - denotes fibers per cubic meter (fibers < 3.5 microns diameter and > 10 microns in length).

Fibrous glass[1] is of two categories. The delineation between categories is by fiber diameter, with 3.5 micrometers (µm) being the dividing line. The primary health effects associated with the larger diameter fibers involve skin, eye, and upper respiratory tract irritation, a relatively low incidence of fibrotic (lung) changes, and preliminary indications of a slight excess mortality risk due to nonmalignant respiratory diseases. In this regard, NIOSH considers the hazard potential of fibrous glass to be greater than that of nuisance dust, but less than that of coal dust or quartz. On the basis of currently available information, NIOSH does not consider fibrous glass to be a substance that produces cancers as a result of occupational exposure. However, these smaller fibers can penetrate more deeply into the lungs than larger fibers and until more definitive information is available, the possibility of potentially hazardous effects warrant special consideration.

E. Environmental Results

A bulk sample of the material from a steel rafter was collected. The analytical laboratory reported that a visual estimation, using phase contrast, polarizing and dispersion techniques was composed of between 60-70 percent fibrous glass.

The environmental samples for total and respirable dust were analyzed gravimetrically. Both samples were below their permissable limits (Table II).

The environmental samples for fiber count were analyzed according to NIOSH method P&CAM 239[2] using phase contrast microscopy. Fibrous glass fibers with a minimum length greater than 10 microns and a minimum width of 3.5 microns were counted. All samples were below the analytical limit of detection (4500 fibers/filter or 0.01 fibers/cc) (Table I).

F. Discussion

Different dimensions of fibrous glass will produce different biologic effects. Large diameter (greater than 3.5 (μ)m) glass fibers have been found to cause skin, eye, and upper respiratory tract irritation; a relatively low frequency of fibrotic changes; and a very slight indication of an excess mortality due to nonmalignant respiratory disease. Smaller diameter (less than 3.5 (μ)m) fibrous glass has not been conclusively related to health effects in humans but glass fibers of this dimension have only been regularly produced since the 1960's. Smaller diameter fibers (3.5 (μ)m) have the ability to penetrate to the alveoli, and this potential is cause for concern.

A study on fibrous glass dermatology[3] found skin irritation occurs in most new workers. Fibers of large diameters are more likely to cause irritation. The worker usually describes a burning, itching, or pricking sensation. Common locations are arms, face, or neck. For most workers this will pass within a week or two. Nevertheless, approximately 5% of all new workers leave within the first two weeks because of the skin irritation or discomfort. Other workers who stay may have intermittent itching and dermatitis. Temperature and humidity are important because the severity of the dermatitis increases in warm and humid weather. However, cases were still observed in the winter.

V. REFERENCES

1. NIOSH Criteria for a Recommended Standard....Occupational Exposure to Fibrous Glass, DHEW (NIOSH) Publication No. 77-152, April 1977.

2. P&CA Method 239, NIOSH Manual of Analytical Methods, 2nd Edition, HEW (NIOSH) Publication No. 77-152A, April 1977.

3. Paul A. Possick, M.D., Gerald A. Gellin, M.D., and Marcus M. Key, M.D., Fibrous Glass Dermatitis, American Industrial Hygiene Association Journal, Volume 31, Number 1, Pages 12 to 15, January-February, 1970.

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Table I
Town Center Associates Building
Rockville, Maryland
HHE 79-77
May 23, 1979
Results of Area Sampling for Fibrous Glass Dust

Sample Number	Sample Time (Minutes)	Location	Fiber Glass Concentrations* (Fibers/Filter)
1	236	Top of File	<4500
2	180	Top of File	<4500
3	405	Top of Desk	<4500

*All samples were below the analytical limit of detection (4500 fibers/filter or 0.01 fibers/cc).

Table II
Town Center Associates Building
Rockville, Maryland
HHE 79-77
May 23, 1979
Results of Area Sampling for Fibrous Glass Dust

Sample Number	Sample Time (Minutes)	Location	Dust Type	Concentration, mg/M^3**
D8-1000	420	Top of Desk (Central File)	Total	.05
D8-996	420	Top of Desk (Central File)	Respirable	.03

**mg/M^3 - milligrams of dust per cubic meter of air.