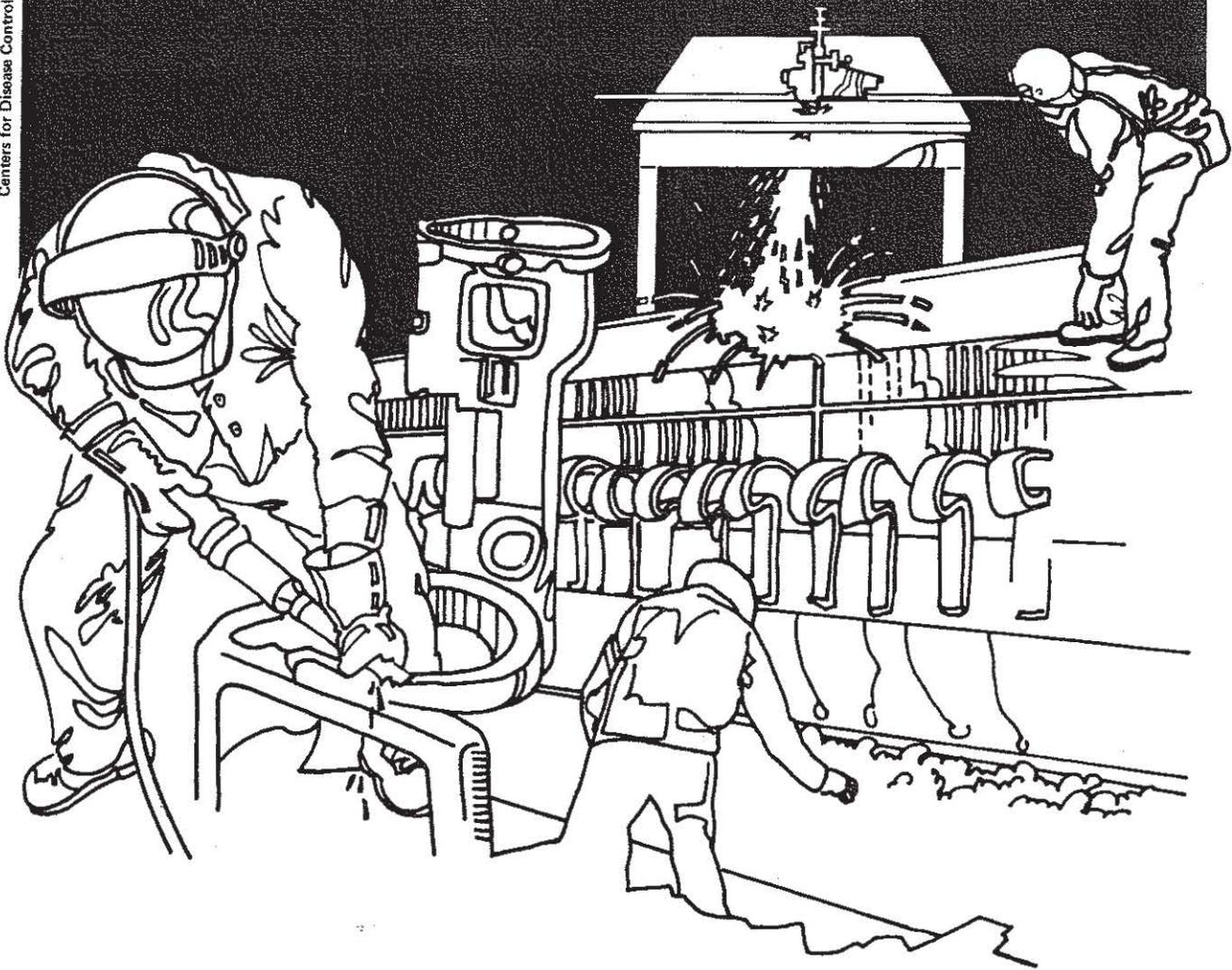


# NIOSH



## Health Hazard Evaluation Report

HETA 81-407-993  
GRUNDY INDUSTRIES, INC.  
DENVER, COLORADO

## PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from 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 Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

HETA 81-407-993  
NOVEMBER 1981  
GRUNDY INDUSTRIES, INC.  
DENVER, COLORADO

NIOSH INVESTIGATOR:  
Bobby J. Gunter, Ph.D., IH

I. SUMMARY

In July 1981 the National Institute for Occupational Safety and Health (NIOSH) received a request from the owner and manager of Grundy Industries, Inc., Denver, Colorado, to evaluate a potential health hazard to asbestos during the manufacture of a roofing compound made from asphalt and asbestos. There was concern over possible asbestos exposure during the addition of asbestos to the asphalt.

All workers who were in the building were monitored for asbestos exposure during an environmental survey conducted on August 19, 1981.

Five breathing zone air samples and five general area air samples were taken for asbestos. Values ranged from below detection limits to 0.15 fibers per cubic centimeter greater than 5 microns in length. The average exposure was 0.07 fibers per cubic centimeter. None of the samples exceeded the Occupational Safety and Health Administration (OSHA) standard of 2 fibers per cubic centimeter. None of the personal breathing zone air samples exceeded the NIOSH 8 hour Time-Weighted Average (TWA) recommended level of 0.10 fibers per cubic centimeter greater than 5 microns in length.

On the basis of the environmental data, a health hazard from exposure to asbestos did not exist at the time of this survey. Recommendations on maintaining a clean work site are included in this report.

KEYWORDS: SIC 2952 (Paving and Roofing Materials/Asphalt Felts and Coatings), asbestos, roofing compounds.

## II. INTRODUCTION

NIOSH received a request in July 1981 from the owner and manager of Grundy Industries, Inc. Denver, Colorado, to determine if there was a health hazard from asbestos during the manufacturing of an asphalt/asbestos roofing compound. An environmental survey was conducted on August 19, 1981, to evaluate potential exposures to asbestos.

## III. BACKGROUND

This company produces an asbestos roofing compound. Approximately 1.3 pounds of asbestos is added to each gallon of asphalt. The asphalt is in an underground reservoir. Bags of asbestos are opened and fed directly into the asphalt reservoir which is a closed system. After mixing has occurred, the asphalt and asbestos mixture is poured into five gallon and one gallon containers and labeled. They are then ready for transport to consumers.

Workers have very little contact with either asphalt or asbestos. All asbestos bags are disposed of properly according to OSHA regulations.

## IV. ENVIRONMENTAL METHODS AND MATERIALS

All asbestos workers were interviewed and monitored for asbestos exposure. Environmental breathing zone and general area air samples for asbestos were collected on AA filters and counted on a phase contrast microscope.

## V. EVALUATION CRITERIA

### A. Environmental

The three sources of criteria used to assess the workroom concentration of asbestos were the (1) Occupational Safety and Health Administration (OSHA) standard (29 CFR 1910.1001); (2) the NIOSH criteria for a recommended standard; and (3) the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances in the Workroom Environment (TLV).

NIOSH recommends that occupational exposure to asbestos be controlled so that workers are not exposed to a workroom air concentration for an 8-hour time-weighted average (TWA) exposure of 0.10 fibers per cubic centimeter greater than 5 microns in length and 0.5 fibers per cubic centimeter greater than 5 microns in length for a 15-minute Ceiling. The U.S. Department of Labor/Occupational Safety and Health Administration (OSHA) standard for asbestos for a 8-hour (TWA) exposure is 2 fibers per cubic centimeter greater than 5 microns in length, and a Ceiling concentration of 10 fibers per cubic centimeter greater than 5 microns in length. The TLV is 0.10 fibers per cubic centimeter greater than 5 microns in length

## B. Toxicological

Asbestos is a generic term applied to a number of hydrated mineral silicates, including chrysotile, amosite, crocidolite, tremolite, and anthophyllite. Asbestos consists of fibers of varying size, color, and texture. The uses of asbestos are numerous and include thermal and electrical insulation, fire blankets, safety garmets, filler for plastics, and roofing materials. The most toxic route of entry is inhalation.

The most widely recognized disease caused by asbestos is asbestosis, followed by cancer of the lungs and digestive tract, and mesothelioma.

Asbestosis is a lung disorder characterized by a diffuse interstitial fibrosis, including pleural changes of fibrosis and calcification. Asbestos bodies may be found in the sputum, and the worker exhibits restrictive pulmonary function. Along with the clinical changes a worker may have fine rales, finger clubbing, dyspnea, dry cough, and cyanosis.

Bronchogenic carcinoma and mesothelioma of the pleura and peritoneum are also caused by asbestos exposure. Excesses of cancer of the stomach, colon, and rectum have been found among asbestos workers.

The NIOSH recommendation and the TLV of 0.10 fibers per cubic centimeter greater than 5 microns in length were established to protect against asbestosis and reduce to an acceptably low risk the development of neoplasms.

Medical monitoring of asbestos workers should include preplacement and annual physical examinations with emphasis on the pulmonary system.

## VI. RESULTS AND DISCUSSION

Five breathing zone air samples and five general area air samples were taken for asbestos. Values ranged from below detection limits to 0.15 fibers per cubic centimeter greater than 5 microns in length. The average exposure was 0.07 fibers per cubic centimeter. None of the samples exceeded the Occupational Safety and Health Administration (OSHA) standard of 2 fibers per cubic centimeter. None of the personal breathing zone air samples exceeded the NIOSH 8 hour Time-Weighted Average recommended level of 0.10 fibers per cubic centimeter greater than 5 microns in length. Refer to Table 1 for the environmental results.

Employee interviews did not reveal any worker who had medical problems.

## VII. CONCLUSIONS

Based on the environmental sampling, a hazardous situation did not exist from exposure to asbestos during this evaluation.

VIII. RECOMMENDATIONS

1. Eating, drinking, and smoking should be prohibited in rooms where processing or handling of asbestos is taking place.
2. Workers should be trained on the potential dangers from overexposure to asbestos.
3. Employees should not carry their cigarettes on the work site when working with asbestos.

IX. REFERENCES

1. Proctor, N.H. and Hughes, J.P., Chemical Hazards of the Workplace, J.P. Lippincott Company, Philadelphia, 1978, pp. 112-113.

X. AUTHORSHIP AND ACKNOWLEDGMENTS

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XI. DISTRIBUTION AND AVAILABILITY

Copies of this report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, 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:

1. Grundy Industries, Inc.
2. NIOSH - Region VIII.
3. Colorado State Department of Health.
4. State Designated Agency.

For the purpose of informing affected employees, a copy of this report shall be posted in a prominent place accessible to the employees for a period of 30 calendar days.

TABLE 1

Breathing Zone and General Area Air Concentrations of Asbestos Fibers

Grundy Industries, Inc.  
Denver, Colorado

August 19, 1981

<u>Job Classification/Location</u>	<u>Sampling Time</u>	<u>Fibers/cc*</u>
Asbestos Mixer	7:15 AM - 3:10 PM	0.06
Labels	7:16 AM - 3:06 PM	0.06
Superintendent	7:20 AM - 2:56 PM	0.06
Forklift Driver	7:21 AM - 3:02 PM	0.08
Chemist	7:23 AM - 3:00 PM	0.10
General Room (mix area)	7:25 AM - 2:50 PM	**
General Room (hopper)	7:28 AM - 2:45 PM	0.15
General Room (labeler)	7:30 AM - 2:50 PM	**
General Room (asbestos mixer)	7:30 AM - 2:45 PM	0.12
General Room (asphalt mixer)	7:31 AM - 2:55 PM	0.04

\* = fibers per cubic centimeter greater than 5 microns in length

\*\* = below laboratory limit of detection

EVALUATION CRITERIA: OSHA = 2.0 fibers/cc greater than 5 microns in length  
 NIOSH = 0.10 fibers/cc greater than 5 microns in length  
 ACGIH TLV = 0.10 fibers/cc greater than 5 microns in length

LABORATORY LIMIT OF DETECTION: 0.03 fibers per field or 4500 fibers per filter

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