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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. 76-4-310

ACF Industries  
Amcar Division  
Milton, PA.

July, 1976

I. TOXICITY DETERMINATION

The National Institute For Occupational Safety and Health (NIOSH) on January 23, 1976, conducted an investigation into an alleged dermatitis problem in conjunction with rail tank car fabrication operations.

The initial investigation confirmed the alleged problem which appeared to be related to the use of an asbestos blanket during the welding of the tank car under-carriage. Prior to conducting the medical portion of this investigation, however, the asbestos blanket in question was substituted with a non-asbestos containing blanket. A subsequent visit to the plant was made on March 2-3, 1976, to conduct environmental sampling for asbestos. During this visit no indication of further or continuing dermatitis was reported.

II. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this Hazard Evaluation Determination Report are available upon request from the National Institute For Occupational Safety and Health, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. Copies have been sent to:

- A. ACF Industries, Amcar Division
- B. U.S. Dept. of Labor, Region III
- C. United Steelworkers, Local 1928
- D. NIOSH, Region III

For the purpose of informing approximately 58 "affected employees" the employer will 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. Code 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. NIOSH received such a request from the United Steelworkers, Local 1928 of ACF Industries, Amcar Division to evaluate alleged dermatitis associated with a welding blanket.

#### IV. HEALTH HAZARD EVALUATION

##### A. Plant Process/Conditions of Use

ACF Industries, Amcar Division is engaged in the production of railroad tank cars and pressure vessels. Operations include cutting, forming, and welding various parts along a production line.

Two areas appeared to present a potential asbestos exposure problem during the initial survey. The first area involved cutting three to four inch wide strips of asbestos paper board on a band saw. The strips were cut to length by hand and placed over a layer of fibrous glass insulation in place on the inner shell of a double wall tank. The asbestos strip protects the fibrous glass when the outer shell of the tank car is welded in place. No control measures were being used at this time and considerable dust was noted around the band saw.

The second area involved the welding of the rail car under-carriage to the tank body, during which time a five-by-eight foot protective blanket is placed over the wheel and axle of the under-carriage. The blanket is used to protect the wheel and axle from any stray or accidental arc during welding that might occur, damaging the point of contact. In all cases, the working space is limited and the worker must come in close contact with the blanket to perform weld. With time, the blankets become worn resulting in some sloughing-off. Samples of the blanket were sent to the manufacturer of the cloth to confirm its composition which was 80 to 85% chrysotile asbestos(1) and 15 to 20% cellulose fiber.

##### B. Evaluation Design and Progress

On January 23, 1976, an initial visit was made to ACF Industries, Amcar Division to review manufacturing conditions associated with the reported dermatitis problem. During the initial visit it was learned that the employee representative was also concerned about employee exposure to asbestos containing dust in the fibrous glass insulation department (109). A walk through survey and employee interviews in the areas of interest were then conducted. Seven employees were interviewed regarding complaints using a non-direct technique.

A replacement for the blanket in use was subsequently found which appeared to eliminate the associated problem. To ensure that workers were not continuing to be exposed to background levels of asbestos, environmental sampling was conducted on March 2-3, 1976 at the insulation and welding areas

of the plant. At the request of management and the employee representative, samples for toluene diisocyanate (TDI) also were collected during cover plate welding to close foaming openings.

### C. Evaluation Methods

Employees exposure to airborne asbestos containing dust was evaluated using Mine Safety Appliances Company personal air sampling equipment. Samples were collected on mixed cellulose ester filters at 1.5 liters per minute. Samples were subsequently counted using a phase contrast microscope technique<sup>(2)</sup>. TDI samples were collected using an absorption solution of Acetic and Hydrochloric Acids<sup>(3)</sup>. Samples were collected in glass midjet impingers at one (1) liter per minute. Samples were subsequently analyzed colorimetrically, and the limit of sensitivity of this method in a 30 liter air volume is 0.0047 parts per million parts of air.

### D. Evaluation Criteria

The primary source of environmental criteria considered in this report are:

- 1) NIOSH Criteria Documents Recommending Occupational Health Standards and
- 2) U.S. Department of Labor/OSHA proposed occupational health standards.

<u>Substance</u>	<u>8 Hour Time Weighted Average Exposure Standard</u>
Asbestos <sup>(a)</sup>	0.5 fibers per cubic centimeter greater than 5 microns in length
Toluene 2-4 Diisocyanate <sup>(b)</sup>	0.005 parts per million parts of air

It should be noted that the latency period for asbestos may well extend between 20 and 40 years. This means that the disease may undergo a long development before a tumor is actually detected. At this point, a tumor will have reached a stage where removal of the worker from the work place may be of no avail and where treatment may be extremely difficult, if not futile. Prudent policy would therefore seem to indicate that every reasonable measure should be taken to limit exposures and provide early detection of developing medical problems.

- a) OSHA in its proposed Occupational Exposure Standard (Federal Register, October 9, 1975, Vol. 40, No. 197)
- b) NIOSH in its Criteria for a Recommended Standard - Occupational Exposure to Toluene 2-4 Diisocyanate.(1973)

### E. Results and Discussion

During the initial survey, seven employees were interviewed regarding alleged dermatitis. Information gathered at this time appeared to indicate a causal relation between the asbestos blanket and the reported dermatitis. Areas affected on the bodies of the workers appeared to correlate with those areas coming directly in contact with the asbestos blanket. Five employees who had regular contact with the blanket reported irritation on the back, waist,

legs (below the welding apron) and wrists. Workers normally wore leather aprons covering the front of the trunk, upper legs and shoulder areas. In addition, full length gloves open at the top but tight at the wrists were used. Two employees interviewed had no contact with the blankets and reported no dermatitis problems. The decision was made to request medical support to characterize the reported dermatitis.

Prior to completing the initial survey, a discussion was held with management regarding OSHA's asbestos medical and environmental monitoring requirements. The company indicated at this time that an effort would be made to replace the asbestos blankets (department 107) used during welding and reduce exposures at the paper board cutting (department 109) through engineering controls.

Subsequently, NIOSH was informed that an alternate material had been found, and was now in use replacing the asbestos blanket. Further, this change appeared to have eliminated the reported dermatitis problem. Changes were also made at the insulation area (department 109) to almost eliminate exposure i.e. the practice of purchasing pre-cut strips and requiring wetting of strips before work up on the tanks.

General air samples in department 107 and personal samples in department 109 collected on March 2, 1976 to evaluate asbestos exposure showed no detectable fiber concentrations. Personal samples collected in department 107 could not be counted for asbestos because of loading of welding fumes, thus, exposure determination was based on general air samples alone.

Samples collected for toluene diisocyanate were partially lost in shipment while the remaining samples contained suspended solids which imparted a coloration to the liquid collection phase. This coloration interfered with the analytical technique making analysis impossible. Samples collected at the plate welding operation in department 109 in the future should be sampled with a pre-filter to remove particulate matter to avoid interferences.

#### V. CONCLUSIONS

No final determination could be made regarding the reported dermatitis. Prior to the NIOSH medical evaluation, the problem appeared to have been corrected by substitution for the asbestos blankets. Patch testing performed by the company's consulting dermatologist did not give a positive reaction to the asbestos blankets. Thus, although there appears to be a causal relation between the reported dermatitis and the asbestos blanket, this could not be confirmed.

Asbestos dust was not detectable in department 107 or 109 during the environmental portion of this survey and should not present a continuing source of exposure provided present operation procedures of pre-cut and wetting of asbestos strips is continued. No environmental recommendations are considered necessary at this time. Medical examinations for workers previously exposed to asbestos should be performed along the lines contained in the OSHA Regulations on asbestos [1910.03a(j)].

No determination could be made regarding the toxicity of toluene diisocyanate at the insulated tank car and foaming operations due to sampling problems. Should additional work in this area be desired, it is recommended that an additional Health Hazard Evaluation Request, specifically for this operation, be completed by either management or the employee representative.

VI. REFERENCES

- 1) Personal Correspondence Raybestos Manhattan Industrial Products Company, North Charleston, S.C.
- 2) NIOSH Sampling Data Sheet #201, March 12, 1974.
- 3) NIOSH Manual of Analytical Methods, HEW Publication No. NIOSH 75-121-P & CAM 141.

II. AUTHORSHIP AND ACKNOWLEDGMENT

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Fiber Concentration  
 ACF Industries  
 Amcar Division  
 Milton, PA  
 Report No. 76-4

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Location	Asbestos Fibers/cc <sup>(a)</sup>	Remarks
Department 107	*(b)	Workers exposure welding under carriage non-asbestos blanket
	*	Worker's exposure 2364 welder
	*	Worker's exposure "fitter"
	<0.01 <sup>(c)</sup>	General Air Track 4
	<0.01	General Air Track 4
Department 109	<0.01	Worker's exposure insulation installation
	<0.01	Worker's exposure insulation installation

- a) denotes Asbestos fibers greater than 5 microns in length per cubic centimeter of air.
- b) denotes samples that could not be counted due to loading of welding fumes.
- c) denotes less than 0.01 fibers per cubic centimeter.