FILE NAME: Railroads (RR)

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DOCUMENT DESCRIPTION: Letter, Memo & Report RE Anchor Brake Shoes Asbestos Emissions

March 15, 1978

Mr. W. E. Mims
Engineer, Car Construction
Mechanical Department
Seaboard Coast Line Railroad Co.
500 Water Street
Jacksonville, Florida 32202

Dear Mr. Mims:

This letter and the attachments are in response to your request for information regarding lead and asbestos in our ANCHOR Composition Brake Shoes. The contents of the attachments are as follows:

1. A report entitled " ANCHOR Brake Shoes, Asbestos Emissons". This report dated August 8, 1977, by our Mr. R. D. Fleck, Director of Research and Development, contains numerous conclusions from studies by industrial concerns and governmental agencies regarding the use of asbestos in brake linings.

2. A letter dated January 30, 1978 from Mr. Fleck outlining the findings of Ryckman, Edgerley, Tomlinson and Associates, regarding lead and asbestos emissions on the dynamometer when testing ANCHOR Brake Shoes.

3. Another letter dated February 9, 1978 from Mr. Fleck covering the volume content of asbestos and lead in ANCHOR Brake Shoes, the make-up of the bond and the recommended handling of our brake shoes.

Please review the enclosed and let me know if additional information is required.

(cont.)

cc: F. P. Kostka
Chief Patent Attorney
AMSTED Industries

SCP, RDF, DBW, FILE, BOOK

As we discussed by telephone, I would appreciate a copy of the letter from Mr. G. W. Gerhart of the Safety Steering Committee of the AAR.

We thank you for your cooperation and again, if you have any additional questions or comments on the enclosed, feel free to call on us.

Very truly yours,

R. H. Alber

R. H. Alber
Sales Manager
ANCHOR Brake Shoes

RHA/ljm

ATT.

cc: F. P. Kostka
Chief Patent Attorney
AMSTED Industries

SCP, RDF, DBW, FILE, BOOK

CSXT 416864

ANCHOR BRAKE SHOES

ASBESTOS EMISSIONS

ANCHOR BRAKE SHOES--ASBESTOS EMISSIONS WEST CHICAGO

August 08, 1977

R. H. Alber
Sales Manager
ANCHOR Brake Shoes

Many of our customers have asked us about the dangers of asbestos in our brake shoes during use. This concern resulted from widespread publicity in the press concerning asbestos and its effect on the general health.

We have answered the questions by quoting conclusions from studies conducted by industrial concerns and government agencies. These all conclude that the dust emitted from brake linings is not a significant source of asbestos in the environment. Brake linings in autos contain up to 55% asbestos but the fiber is locked into the linings with various resins and polymers. When brakes are applied high temperatures generated from friction change the chemical nature of asbestos into a non-fibrous material known as "forsterite". Studies have shown that brake lining dust contains only traces of free asbestos fiber. Since railroad brake shoes contain only 1/5 as much asbestos, the danger is even less.

Asbestos fiber health hazards are confined mainly to industrial workers. The risk comes from inhalation of excessive amounts of asbestos dust over a period of many years. Some long time employees have developed cancer. With today's improved dust control technology, there is every reason to believe that asbestos related disease will cease to be an occupational problem. (O.S.H.A. Standards now prohibit asbestos fiber levels above 2 5+ micron fibers per cm^3 of air in a plant.)

The basis of the above opinions came from the following sources: (articles attached)

1. "Asbestos and Health" Johns-Manville Co.
   A good general discussion of asbestos and health with good references to much of the work done in this field. This article states that "there is no evidence either from experience or scientific study that anyone in the general public has ever contracted any disease from exposure to the wearing or weathering of brake linings."

2. "Asbestos and Brake Linings" Asbestos Information Association
   This small pamphlet concentrates on asbestos in auto,truck, and bus brake linings. It's important message: "The contribution of asbestos from brake lining wear to ambient air pollution is infinitesimal, even in urban areas and is an inconsequential health factor in urban air pollution."

It also states that asbestos exists naturally in serpentine rock formations throughout the world and is constantly being released into the atmosphere through erosion by wind and water.

3. "Brake Lining Decomposition Products" Jeremiah R. Lynch National Center for Urban and Industrial Health, U.S. Public Health Service, Journal of the Air Pollution Control Association, Vol. 18, No. 12, PP 824-826, 1968.

Brake testing laboratory methods were used to test fiber emissions from a variety of friction products. Mr. Lynch concludes that only a very small proportion of the asbestos worn from brake linings is released as free fiber; the remainder is converted into some other mineral as a result of the extreme temperatures generated at small spots on the lining surface.

4. "Brake and Clutch Emissions Generated During Vehicle Operation" Jacko, DuCharme, & Somers. S.A.E. Meeting, May 14-18, 1973; paper No. 730548. (A more completed detailed report is E.P.A. 68-04-0020 5/71 - 3/73)

An actual automobile was equipped with a unique collection system to accumulate all brake lining emissions. Particulate matter was analyzed using optical and electron microscope methods.

On the average, more than 99.7% of the asbestos is converted. (to other harmless dust particles)

5. "Asbestos Emissions from Brake Dynamometer Tests" Anderson, Gealer, McCune, and Sprys. Ford Motor Co. S.A.E. Meeting May 14-18, 1973 Paper No. 730549.

These Ford engineers conducted their studies on a brake lining dynamometer, using automobile disc brakes. Analysis was made using a transmission electron microscope.

Less than 0.02% of the lining wear was released as asbestos fibers. The concentration of asbestos fibers in the urban atomosphere, due to brake usage was estimated at $0.07 \times 10 - 9\ g/m^3$. Based on this figure, the use of brakes was judged to be not significant as a source of atmospheric asbestos.

Summary:

1. Health hazards from asbestos are confined mainly to industrial workers.

2. Improved dust control technology has drastically reduced exposure to asbestos fibers.

3. The dust emitted from auto brake linings is not a significant source of asbestos in the environment.

4. Railroad composition brake shoes contain only 1/5 as much asbestos as the auto brake linings so are even safer.

R. D. Fleck
Director
Research and Development

RDF:meo

P.S. The Product Loss Control Committee recommended that the AMSTED legal department approve any letter concerning safety prior to sending out to our salesmen.

COMPOSITION BRAKE SHOES
LEAD & ASBESTOS EMISSIONS INTO
THE ATMOSPHERE DURING BRAKING

WEST CHICAGO

January 30, 1978

R. H. Alber
Sales Manager
ANCHOR Brake Shoes

Ryckman Edgerley Tomlinson and Associates, Environmental Engineers, conducted a study of lead and asbestos emissions from ANCHOR Brake Shoes on 09/02/76.

Mine Safety Appliance's gravimetric samplers were placed at three locations around the American Steel Foundries railroad wheel dynamometer in Granite City, Illinois. Appropriate filters were used and analyses were performed according to procedures recommended by the National Institute of Occupational Safety and Health (Phase contrast microscopy for asbestos and atomic absorption spectroscopy for lead)

Testing conditions were designed to give the greatest possible exposure situation. A series of 90 MPH stops were made using a wheel load of 21000 pounds and a 6000 pound brake shoe load. The total material loss during these tests were 382 grams. These were exaggerated conditions since the normal AAR Official dynamometer test results in losses of about 60 grams of brake shoe materials.

Locations monitored included:

1. The operators console
2. 15 feet downwind from the shoe
3. 30 feet downwind from the shoe

(The wind is generated by a pedestal fan cooling the shoe/wheel contact area)

Results of the analysis of test samples collected were:

Location	No. of Tests	Lead mg/m^3 Result	Lead mg/m^3 OSHA Max.	Asbestos Fibers/ml Result	Asbestos Fibers/ml OSHA Max.
1	9	0.044	0.200	0.052	2.0
2	4	0.100	0.200	0.080	2.0
3	8	0.036	0.200	0.036	2.0

CONCLUSIONS:

The critical locations monitored indicated airborne concentrations well below the permissible O.S.H.A. standards.

Since these tests were much more severe than normal braking conditions, the expected lead and asbestos emissions into the atmosphere should be even less than these safe amounts.

R. D. Fleck
Director
Research and Development

RDF:meo

P.S. O.S.H.A. Material Safety Data Sheet to follow.

cc: DBW
JDP
FILE
BOOK

COMPOSITION BRAKE SHOES
LEAD/LEAD COMPOUNDS & ASBESTOS

WEST CHICAGO

February 09, 1978

R. H. Alber
Sales Manager
ANCHOR Brake Shoes

ANCHOR high friction composition brake shoes, produced by Griffin Wheel Company, contain approximately 5% lead/lead compounds and 9% asbestos fibers by volume.

These ingredients are encapsulated in a rubber-phenolic binder and molded into shape under high temperature and pressure conditions.

These shoes can be handled without personal danger using gloves and normal sanitary practices.

There are no known O.S.H.A. health hazard threshold limit values (T. L.V.'s) for this type of molded composition.

It is recommended that scrap shoes be disposed of by approved land-fill methods.

R. D. Fleck
Director
Research and Development

RDF:meo

cc: RDF, DBW
FILE
BOOK