



ASBESTOS INFORMATION ASSOCIATION

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PLAINTIFF'S EXHIBIT

MAR-127

COPY

17 November 1975

Memorandum For: John Marsh, Raybestos-Manhattan
John Riopelle, Bendix Corporation
E. H. Feierabend, Abex Corporation

Subject: Materials of interest concering friction materials

The enclosed material is forwarded as a matter of interest:

1. "Is Brake Lining Dust Harmful?" pamphlet, Nov., 1975
Asbestos Information Committee, U.K.
2. Extracts from two papers presented at International
Conference, Dust and Gases in the Work-Place, June 18-20,
1975, Bonn, Germany

As you are aware the Association proposes to rewrite the pamphlet,
"Asbestos and Brake Linings" (also enclosed). Your recommendations
will be appreciated.

Bob

R. H. Mereness
Executive Director

cc: Stanford Christian, Bendix Corp.
Jim Armstrong, Bendix Corp.
Ike Weaver, Raybestos-Manhattan, Inc.
✓ Ed Drislane, FMSI

Enclosures
RHM:vld

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Is brake lining dust harmful?

Asbestos Information Association
North America
1660 L Street, N. W.
Washington, D. C. 20036



Is brake lining dust harmful ?

The brake linings on which drivers of motor vehicles depend to bring them to a safe stop incorporate asbestos fibre. However, writers on this subject occasionally express the view that the braking of millions of vehicles emits particles of asbestos into the urban atmosphere in such quantities as to create a risk to the health of the general population. What are the facts ?

What happens in braking ?

Any examination of this theory must start with what happens when the brakes of a vehicle are applied. Vehicle brakes operate by converting the energy of the moving vehicle into heat which is then dissipated into the air. In drum brakes a friction lining is applied to a brake drum ; in disc brakes friction pads grip a rotating disc on the wheel hub. Asbestos is an essential ingredient in friction linings and pads primarily because it acts as a reinforcing agent which maintains its strength and stability through a wide range of temperatures and pressures. For technical reasons only chrysotile (white) asbestos is employed in friction materials.

Little dust liberated

The friction between lining and drum or between pad and disc creates wear products, which look like a fine dust.

This dust consists almost entirely of degraded resin, fillers and other brake lining additives, and products of wear from the metal brake drum or disc. Although the asbestos content of conventional brake linings may vary from 25-65 per cent by weight it is almost entirely converted by the considerable heat generated by the action of braking into other materials.

Experiments carried out by various Government and industrial laboratories throughout the world have shown that the free asbestos fibre in the small amount of dust liberated from brake linings rarely exceeds 1 per cent¹ of the total products of wear.

The Environmental Protection Agency of the US Government commissioned the Bendix Corporation to set up a test programme to measure brake and clutch emissions during actual vehicle operation. The asbestos content of the brake emissions ranged in two sets of tests from 1.65 per cent to 0.03 per cent ; only in 3 out of 90 analyses was it over 1 per cent. In a third group of tests the range was from 0.22 per cent to 0.003 per cent².

Experiments with disc brakes have shown that, in their case, the free asbestos fibre is an even lower fraction

of the total products of wear. In tests carried out by research staff of the Ford Motor Company, Detroit, on a production disc brake³, less than 0.02 per cent of the lining wear was released as asbestos fibres.

Amount not harmful

Asbestosis is a disease associated with the inhalation of high concentrations of asbestos fibres over many years. The British Occupational Hygiene Society has published a Hygiene Standard for Chrysotile Asbestos Dust which is designed to virtually eliminate the risk of developing the earliest recognisable clinical signs of asbestosis. This standard is the basis of those which apply under the Asbestos Regulations 1969⁵ to work with asbestos and asbestos products. The minimisation of asbestosis has, at the same time, minimised any associated risk of lung cancer.

Tests made in the urban atmosphere have recorded the presence of asbestos in amounts at least 1,000 times below those regarded as the standard for chrysotile dust in occupational situations. There is no evidence that this trace amount of asbestos in the urban environment can cause damage to the lungs of the general public.⁴

Thus the risk of contracting asbestosis or lung cancer through the application of brakes on motor vehicles is negligible for the general public.

The risk of contracting mesothelioma (a rare tumour which has been mainly associated with crocidolite (blue) asbestos) can be virtually discounted as this type of asbestos is not used in the manufacture of brake linings. It is recognised that chrysotile asbestos is less likely to produce mesothelioma and where it has done so the dust levels to which the cases were exposed were greater than could occur in the urban air as the result of vehicles applying their brakes.

"Asbestos bodies" may be found in the lungs of people in random series of autopsies. The presence of asbestos bodies does not necessarily imply a connection with asbestos-associated disease nor is it an indication of it. Where large numbers of asbestos bodies have been found they have invariably been the result of occupational, not general environmental exposure.

Occupational exposure

The only possibility of a risk to health from brake and clutch linings arises in their manufacture and where regular or continuous machining and maintenance

work is carried out. Such work, however, is controlled by the 1969 Asbestos Regulations to ensure that those employed on such operations are not exposed to excessive amounts of dust likely to impair their health.

The Environmental Control Committee of the Asbestosis Research Council has produced a Control and Safety Guide^a and a simple illustrated leaflet explaining the precautions which may be necessary for workers involved in these activities.

REFERENCES

1. Brake Lining Decomposition Products, by Jeremiah R Lynch, National Centre for Urban and Industrial Health, Journal of the Air Pollution Control Association, Vol. 18, No. 12, pp 824-826. Exposure to Asbestos during Brake Maintenance by D E Hickish and K L Knight, Annals of Occupational Hygiene, Vol. 13, No. 1; January 1970, pp 17-21.
2. Brake and Clutch Emissions generated during Vehicle Operation, M G Jacko, R T DuCharme and J H Somers, Proceedings of Automobile Engineering Meeting of the Society of Automotive Engineers, May 14th to 18th 1973.

3. Asbestos Emissions from Brake Dynamometer Tests by A E Anderson, R L Gealer, R C McCune and J W Sprys, Proceedings of Automobile Engineering Meeting of the Society of Automotive Engineers, May 14th to 18th 1973.
4. Report of the Advisory Committee on Asbestos Cancers to the Director of the International Agency for Research on Cancer (World Health Organisation), Lyon, October 1972.
5. Control & Safety Guide No. 8, Asbestos-based Friction Materials and Asbestos-reinforced Resinous Moulded Materials; Environmental Control Committee, Asbestosis Research Council, P.O. Box 18, Cleckheaton, West Yorkshire. BD19 3UJ.

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Telephone: 01-734 0081
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Stäube und Gase am Arbeitsplatz

International Conference

Dust and Gases in the Work-Place

Colloque International

Poussières et Gaz au Poste de Travail

18. - 20.6.1975

Bonn - Bad Godesberg

Stadthalle

Zusammenfassungen

Abstracts

Résumés

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B o n n

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their Treatment in Garages

ments on dust concentration and of the asbestos

The aim of these technical investigations which were made

Friction linings contain 20 to 60 % of chrysotile asbestos

During blowing out of brake drums a short termed high dust

the transformation into Forsterit has been proved. The transformation, probably, succeeds via an amorphe phase.

Due to these results, besides dust protection, we regard prophylactic examinations in respect to occupational health of all employees in the final manufacturing as necessary. At the brake services all employees occupied with the mechanical treatment of friction linings should be controlled by the occupational physicians in case the weekly exposition time to asbestos dusts exceeds 3 hours. The employees occupied with blowing out do not have to be controlled unless the result of the medical examination does make it necessary.

16. Woitowitz, H.-J. und Valentin, H. Erlangen (BRD)

Occupational Medicine Investigations on Hazards to Health
by Dusts Containing Asbestos

In Germany in 1973 extensive regulations for the protection of asbestos exposed persons became effective (VBG 119). Hereby, the question arose whether workmen exposed to dusts of brake linings containing asbestos can be generally considered as endangered in respect of fibrogenic effects via inhalation.

In regard to this operating method problem there has been performed on a selective universe a casual cross section study with retrospective onset. 210 male and female workers with at least ten years brake lining dust exposition and of three operating methods out of about 50 different plants were involved. The data for each person comprised 200 details - together more than 40.000 - i.e. concerning the anamnesis, under special consideration of profession and working site, and the diagnosis. The thorough examinations were led by occupational physicians and internists who applied physical, in-vitro-clinical, electro-cardiographic, radiological and latest lung functional analysis procedures.

The occupational medical evaluation of diagnoses of an asbestos exposed worker, nowadays has to be multidimensional, principally. The extensive data, therefore, after formation of syndrome groups had to be reduced to 5 types of diagnoses with defined degrees of diagnosed security:

Type I	AIF eventually
Type II	AIF possible
Type III	AIF not presumable
Type IV	AIF competible diagnosis
Type V	AIF normal diagnosis

The judgement of risks is mainly based on diagnoses in respect to eventual AIF (Type I). Suspected diagnoses in respect to a beginning AIF (Type II) were not disregarded. The prevalent diagnoses of type I and II amounted to:

- a) 51 males who produced brake linings or handled unused
brake linings 5,9 % resp. 15,7 %
43 females of the same operating method
0,0 % resp. 7,0 %
- b) 63 males in the truck service who treat unused brake
linings and blow out brake drums
1,5 % resp. 14,5 %
- c) 53 males in the car brake service who blow out or brush
out brake drums 0,0 % resp. 5,6 %

The considerations in respect of occupational health resulting from this will be discussed according to the specific risks of operating methods.