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Department of Community Medicine

February 26, 1970

Dr William R Pierson
Chemistry Department, Scientific Research Staff
Ford Motor Company
P O. Box 2053
Dearborn, Michigan 48121

Dear Dr Pierson.

I am sure you are aware of the most recent issue of the Annals of Occupational Health (Great Britain) which is devoted to problems of asbestos exposure associated with brake drum repair I think there is a fair amount of useful material in it, although some additional perspectives and approaches might have been included

Concerning your letter of January 28, 1970, the following comments might be useful First, we now have a fair amount of experience in evaluating the asbestos content of ambient air under varying circumstances It is apparent that unless electron microscopy is undertaken at at least 31,000X direct magnification most of the fibers (fibrils) will not be seen This is especially true when, as is usually the case, the mounting technique tends to separate the fibers into their unit fibrils (chrysotile) We are currently studying whether higher magnification would be preferable, from the same point of view

Second, insofar as change in the nature of the fibers is concerned, your remark is perceptive There is an addendum to a paper of Juraj Jacatic, M E Rubnitz, M. C Godwin and Robert W. Weiskopf "Tissue Response to Intraperitoneal Asbestos with Preliminary Report of Acute Toxicity of Heat-Treated Asbestos in Mice" in ENVIRONMENTAL RESEARCH in which it was noted that fibers heated well beyond 700° C seemed particularly toxic [illegible] are not tolerated) on intraperitoneal injection in [illegible] experimental animal We have no knowledge about this in [illegible]

It might be useful to repeat the brake dust studies Johns-Manville has undertaken some studies on this problem and found that almost all of the chrysotile could no longer be detected by "light microscopy or x-ray diffraction". However, light microscopy would be inadequate; they did, also, get approximately the same results by electron microscopy. a. [illegible]

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not aware of the magnification they used They felt that this was consistent with the theoretical calculations which showed that the point temperature at the true area of particle contact could reach 2,000° C under the test conditions, well beyond the temperature at which chrysotile decomposes thermally.

Surely the matter could be settled by an appropriate test design This should be undertaken

Insofar as the quantity of asbestos used for brake linings is concerned, the following estimates are based upon several sources and are, I think, accurate I have obtained them from two sources, and the two closely conform For 1965, the following amounts were used in the United States (in tons)

Material	Tons	%
Friction materials	33,000	5
Asbestos cement	180,800	25
Flooring	137,500	19
Paper	140 000	19
All other	228,400	32
TOTAL	719,700	100

There has been some increase since 1965, but I think a relative percentage usage by the industry has not changed very much.

With the advent of disc brakes, the asbestos industry anticipates a decrease in the total tonnages used in the future, in brake linings.

To repeat, while it is my informed guess that brake linings contribute less than is commonly assumed to asbestos contamination of the ambient air, I think this should be documented, precisely because of common assumptions Should you think this would be useful, we would be happy to explore with you such assistance as we might be able to offer in an appropriate investigation

Sincerely yours,

I. J. Selikoff

Irving J. Selikoff, M D
Professor

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P S To judge the comparitive contribution of another asbestos use, for example, one could consider the sprayed insulation industry Here, an average New York high-rise office building would use approximately 200 tons of sprayed

mineral fiber for fireproofing the steel structure Of this, anywhere from 3 to 30% becomes waste, more often at the higher end of the spectrum The fireproofing material contains 15-25% asbestos (the remainder being extruded glass, bentonite, etc). Where adequate precautions are not taken, much of the waste material may become airborne Even if only 10% does, a ton of asbestos or more may enter the city air.