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DOCUMENT DESCRIPTION: Memo RE FDA Optical Methods for Counts of Asbestos Minerals Meeting OSHA Definition in 4 RTV Talc Samples

Johns-Manville

Internal Correspondence

To: R. S. Lamar - R&D

Date: October 9, 1974

From: V. E. Wolkodoff - R&D

Copies: Distribution at End of Memo

Subject: FDA OPTICAL METHODS FOR COUNTS OF ASBESTOS MINERALS MEETING
OSHA DEFINITION IN FOUR TALC SAMPLES PRODUCED BY R. T.
VANDERBILT COMPANY

1. Through J. P. Leineweber, R. P. Carter has requested that this memorandum listing asbestos fiber counts on four samples of talc from R. T. Vanderbilt Company (submitted by Charles Wagner Company) be on his desk on Friday, October 11, 1974.
2. The R. T. Vanderbilt Company talc samples are identified as follows:

1. Lab. No. RC-74255-1	Nytal 200
2. Lab. No. RC-74255-2	Nytal 400
3. Lab. No. RC-74255-3	Asbestine 3X
4. Lab. No. RC-74255-4	Asbestine 325
3. Since the samples are extremely complex due to types of asbestos being present, the J-M modified optical method could not be used for each determination but rather we had to use the FDA Microscopical Detection of Asbestos in Talc by Arnold E. Schulze and William V. Eisenberg issued on August 20, 1973. The J-M modified optical technique, however, was used on each samples (clarified Millipore membrane) in conjunction with Zernecke phase contrast microscopy as a check on the total number of fibers in each sample. In all tests only fibers meeting OSHA definition were counted; that is, at least a 3:1 aspect ratio and fiber lengths have to be at least 5 microns or longer.
4. Total number of asbestos fibers per mg in each sample:

a. Nytal 200	1,055,000 fibers/mg
b. Nytal 400	2,146,000 fibers/mg
c. Asbestine 3X	1,460,000 fibers/mg
d. Asbestine 325	1,526,000 fibers/mg
5. Fibers per mg of each asbestos component for the four

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EXHIBIT

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samples studied are as follows:

SAMPLES	TREMOLITE	CHRYSOTILE	ANTHOPHYLLITE
Nyral 200	604,000/mg	300,000/mg	151,000/mg
Nyral 400	1,931,000/mg	86,000/mg	129,000/mg
Asbestine 3X	876,000/mg	561,000/mg	23,000/mg
Asbestine 325	992,000/mg	503,000/mg	31,000/mg

The predominant fiber in each sample is Tremolite which can be somewhat blocky, with clipped ends, is very harsh, but most are narrow and rigid fibers. The Chrysotile ranges from silky (very small percentage), bundles of few fibrils, and bundles containing numerous fibrils. In general, the Chrysotile is considered medium-harsh to harsh. The Anthophyllite is characterized by having very narrow diameters, being extremely rigid, being almost spear-like since individual fibers can show one end as acicular (needle-like) and others show a double termination of acicularity.

6. By transmission electron microscopy (TEM), six plates were taken of each sample. One print of each sample to show at least a few Chrysotile fibers are attached and the magnification is 11,000X. At this magnification 1.1 cm equals one micron.

The TEM plates on file are as follows:

- | | |
|------------------|-------------------------|
| a. Nyral 200 | TEM Plate Nos. 2301 A-F |
| b. Nyral 400 | TEM Plate Nos. 2302 A-F |
| c. Asbestine 3X | TEM Plate Nos. 2303 A-F |
| d. Asbestine 325 | TEM Plate Nos. 2304 A-F |

All plates were taken at 4400X, and after enlargement for prints, the magnification would be 11,000X.

All TEM plates were taken on our RCA EMU-3B electron microscope. We had planned to use a better model, Philips 200, at The Denver Research Institute for greater

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clarity, better resolution, obtain plates at higher magnification and do selected area electron diffraction to prove the identity of the asbestos minerals (which cannot be done on our RCA model), but the instrument at DRI was not available for our use at the time; and in all probability even if available, the work could not have been finished by October 11, 1974, since the optical work took a great deal of time.

7. If better TEM micrographs are needed with selected area electron diffraction patterns for your FDA presentation, and if you somehow can get additional time before the presentation, I will make arrangements for our use of the Philips 200 electron microscope at DRI.

V. E. Wolkodoff

V. E. Wolkodoff
Applied Research Section

jc

Distribution:

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1 TEM NYCAL 200, PC 74255-1

LM-2.011

11,000X

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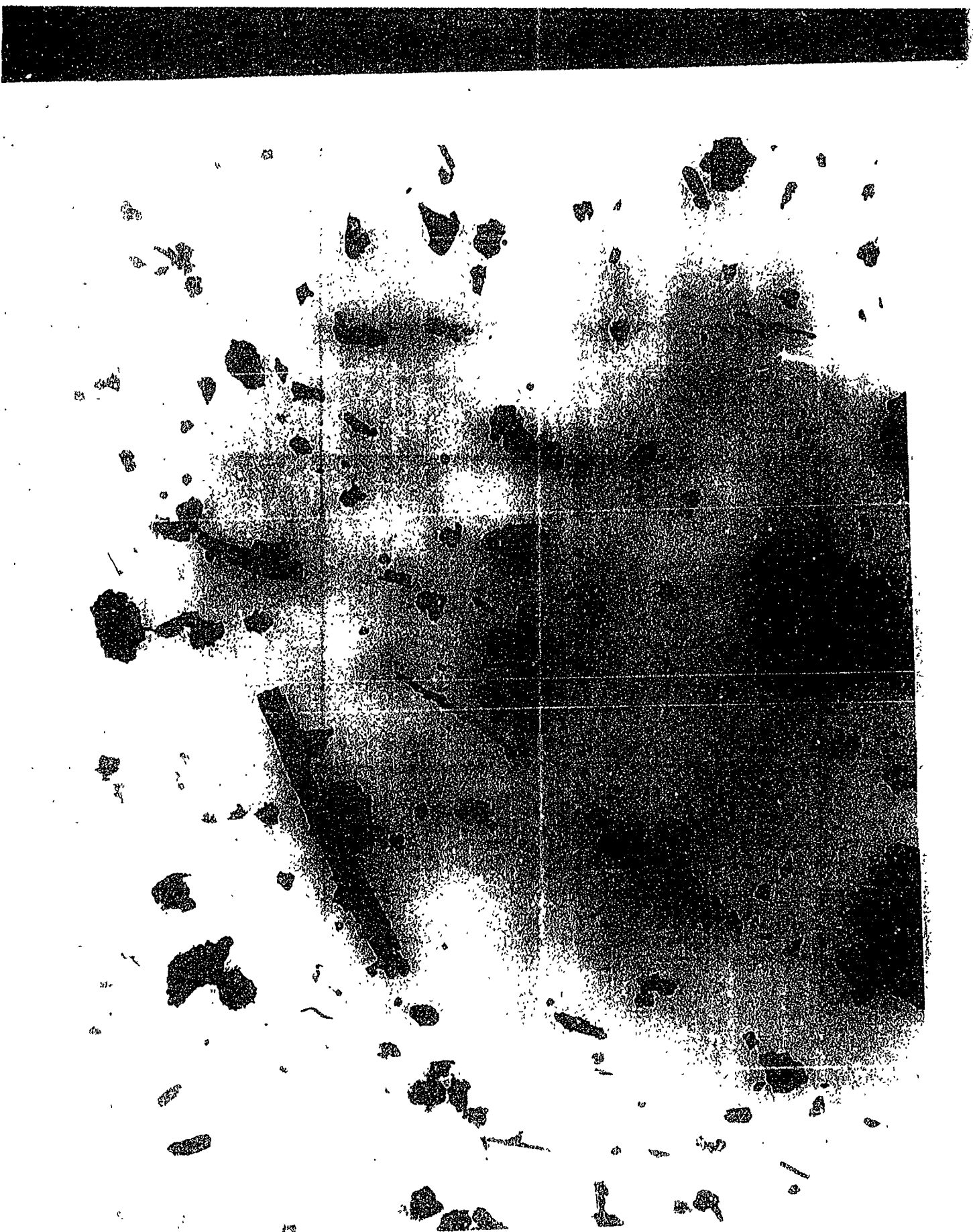


2. GDM Nylal 400, PC 74255-1

012 1020

11,000

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3 TEM Asbestine 3X, RC 74255-3

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EN-2303D

11,000X

