PLAINTIFF'S EXHIBIT

BOND-135

R. T. VANDERBILT COMPANY, INC.
30 WINFIELD STREET
NORWALK, CONNECTICUT 06855

CABLE ADDRESS
"BILTVAN" NORWALK, CONNECTICUT
TWX 710-468-2940
(203) 853-1400

October 14, 1975

Mr. Julius K. Nemeth
Bondex International
Brunswick, Ohio 44212

Dear Mr. Nemeth:

We are able to certify that NYTAL 200 does not contain asbestos in accordance with Mr. Stender's letter, copy enclosed. NYTAL 200 referred to in your letter of October 3, 1975 does contain about 50% Tremolite, a valuable constituent of all of our talcs. If you care to identify who has been advising you that Tremolite is considered asbestos, we'll try to assist you further.

Sincerely,

Harry W. Howard, Sales Mgr.
Paint/Paper Department

HWH:lad

cc: A. Harvey
J. McCarthy

The recommendations for use of our materials are based upon tests believed to be reliable. However we do not guarantee the results to be obtained

R P M MINA

REARDONCO KIWD

10-16-75 100

ATTN JULIUS NEMETH

RE YOUR LTR RECD TODAY RE TALC

FELL INTO SOME INFORMATION CONCERNING J J VANDERBILT BY ACCIDENT

THE FOLLOWING IS IN FACT TRUTH:

IN RECENT ACTION THE R T VANDERBILT COMPANY HAS ISSUED A LETTER OF CERTIFICATION FOR THEIR TALC PRODUCTS WITH RESPECT TO THE OCCUPATIONAL SFAETY AND HEALTH ADMINISTRATION ASBESTOS REGULATION 1910.93A THIS LETTER OF CERTIFICATION IS BASED ON VANDERBILT'S CLAIM THAT THEIR TALCS DO NOT CONTAIN FIBROUS ASBESTOS

THIS REPORT IS THE RESULT OF THE VANDERBILT-GRANTHAM ACTION PLAN AND CONCERNS THE X-RAY AND MISCROSCOPIC STUDY OF TALC PRODUCTS FROM CYPRUS INDUSTRIAL MINERALS COMPANY AND ITS COMPETITORS, CHECKING FOR THE PRESENCE OF FIBER-FORM ASBESTOS

BASED ON THE RESULTS OF THIS STUDY, THE CLAIM BY VANDERBILT THAT THEIR TALCS CONTAIN NON-FIBROUS TREMOLITE, ACTINOLITE, AND ANTHOPHYLLITE, HAS BEEN PROVEN TOTALLY FALSE

THE TALC PRODUCTS FROM CALIFORNIA CRUDES, MARKETED BY CYPRUS INDUSTRIAL MINERALS AND COMPETITORS, HAVE BEEN SHOWN TO CONTAIN FIBROUS TREMOLITE ASBESTOS THESE RESULTS ARE IN CONTRADICTION TO THE CERTIFICATION OF COMPLIANCE LETTER ISSUED BY CYPRUS INDUSTRIAL MINERALS COMPANY.

IT'S NOT IMPORTANT HOW I CAME BY THE INFORMATION ON TALC

BUT IT IS FACT

DOUG BP

ALSO I AM ALSO AWARE OF TALCS THAT ARE COMPLETELY ASBESTOS FREE WHICH WE ARE EXPERIMENTING WITH AT PRESENT TIME

DOUG

•

R P M MINA

+

R P M MINA

REARDONCO KIWD

10-16-75 150

ATTN JULIUS NEMETH

I DO NOT KNOW WHETHER ANY ACTION HAS BEEN FILED AGAINST VANDERBILT BUT I AM IN POSSESSION OF THE TEST RESULTS WHICH SHOWS NO LESS THAN 56 PERCENT TREMOLIT, SERPENTINE & ANTHPOHYLLITE WITH TREMOLITE LEADING WITH 40-50 PERCENT OF THAT TOTAL WE HAVE THE TEST RESULTS ON ALL NYTALS -- 300, 400 ETC. -- THE WINDSOR MINERAL TALC GRADE CONTAINS 1 PERCENT TREMOLITE WHICH AS I UNDERSTAND IT OSHA CONSIDER "0" THE 40-50 PERCENT TREMOLITE IN THE NYTAL 200 WOULD PRODUCE A READING OF 4 TO 6 PERCENT IN THE METRO SPACKLE AS MADE IN TOMS RIVER

DOUG BP

+

R P M MINA

ABSTRACT

In recent action, the R. T. Vanderbilt Company has issued a letter of certification for their talc products with respect to the Occupational Safety and Health Administration, Asbestos Regulation 1910.93a. This letter of certification is based on Vanderbilt's claim that their talcs do not contain fibrous asbestos.

This report is the result of the Vanderbilt-Grantham Action plan and concerns the X-ray and microscopic study of talc products from Cyprus Industrial Minerals Company and its competitors, checking for the presence of fiber-form asbestos.

Based on the results of this study, the claim by Vanderbilt that their talcs contain non-fibrous tremolite, actinolite, and anthophyllite, has been proven totally false.

The talc products from California crudes, marketed by Cyprus Industrial Minerals and competitors, have been shown to contain fibrous tremolite asbestos. These results are in contradiction to the Certification of Compliance letter issued by Cyprus Industrial Minerals Company.

INTRODUCTION

A major issue, and the reason for this study is the claim by Vanderbilt[1] that their talcs contain non-fiberous asbestos. This claim is apparently the basis for their letter of certification[2], based on OSHA Asbestos Regulation 1910.93a[3].

This project was initiated by the drafting of an Action plan, dated January 18, 1975, concerning Vanderbilt and Grantham talcs[4]. The objectives of this study were to;

1) Establish whether any current CYMIN production talc products contain asbestos.
2) To confirm the presence of asbestos fibers in competitor talcs.

The information resulting from this study is to be used in Sales programs and also as backup material for a letter to be sent to Mr. John Stender, Assistant Secretary of labor.

This project was completed in stages as follows;

1) Analyses of current Cyprus Industrial Minerals products for asbestos fiber.
2) Analyses of competitor talc products for asbestos fiber.
3) Airborne dust monitoring and analyses of samples from plants using competitor talc products.

EXPERIMENTAL

The methods used for the identification of asbestos minerals and fibers were as follow:

Crystal and Chemical Analyses

X-ray Analysis

X-ray diffraction

a) A 1°/min 2θ scan from 3° to 38° 2θ was made of the specimen in a powder holder.

b) A pressed pellet of the sample was prepared and the 2θ region from 10° to 11° was scanned at a 2θ scan speed of 1/8° /min, checking for tremolite presence. (indicated by a peak at 10.4°, 27.2, 30.2 and 35.5° 2θ). Peak intensities on the recorded chart were compared to tremolite standards to estimate percentages.

X-ray fluorescence

A back-up method to "b" above, was $CaCO_3$ to acid treat the powder sample to remove CaO and $CaCO_3$ calculated to correlate to percent tremolite.

This method has been shown to be extremely accurate and has been accepted as the method for tremolite analysis, by the CTFA Talc sub committee.

The instrument used for this work was a combined Norelco X-ray diffractometer-spectrometer with constant potentional power source.

Morphological Analyses

1) Investigation of the Vanderbilt and Grantham talc samples by polarized light microscopy revealed that fibrous tremolite asbestos was present in all samples in which a positive reading was indicated by X-ray analyses. Minimal non-fibrous tremolite forms were noted, as evidenced by refractive indices (α and γ) > n. $\frac{25}{d}$ 1.596 and the majority of tremolite detected was of fiber-form, as defined in the recent OSHA criteria[3].

Both phase-contrast and polarizing microscopy were via a Nikon L-KE microscope.

EXPERIMENTAL

(Continued)

Morphological Analyses (continued)

2) Morphological analyses of the talc samples were performed by secondary electron-SEM. The resultant observations were, that even the blocky, or non-fibrous tremolite forms were seen to exist with parallel striations and partial defibrillation occuring. Fibers were observed in both rigid and flexible forms, with the latter, a more sepentine-form of fiber.

The samples were examined at varying magnifications and angles of tilt using an I.S.I. MS-2 SEM.

3) Transmission Electron Microscopy with Selected Area Electron Diffraction.

The above techniques were used in combination to obtain both morphological and crystal structure analyses. The identification of asbestos fiber by these methods results in positive and conclusive scientific evidence. The Vanderbilt products were studied via these techniques in order to identify the flexible or serpentine-form fibers.

Magnifications used ranged from 6K to 70K times, with electron diffraction analysis being performed on individual fibers.

The samples were prepared for study by applying an aliquot of an ultrasonerated, aqueous dispersion onto a collodion filmed specimen grid and allowing the prep. to air dry. A vacuum evaporated layer of Al and carbon were applied to enhance contrast, and aid in the topographical interpretati by show projection, and also aid as a support film. The thin layer of Al (111 reflection) was used as an internal camera constant for each diffraction pattern indexed. The spacings of the fiber were compared to ASTM X-ray powder data for closest match, and used in conjunction with morpl logical data for fiber identification.

The instrument used for this work was a Hitachi HS-7S wit! a liquid N_2 cooling stage.

ANALYSIS OF CURRENT CYMIN PRODUCTION TALCS
FOR ASBESTOS FIBER

The results of XRD, TEM, and SEM analyses of 10 current production talc products have been previously reported in memos dated January 22,27, and March 7, 1975. Four samples, all from California crude ore, were found to contain tremolite asbestos fibers; These samples were C-400, T076, Furnace Creek, and Supreme 325 products. The asbestos was detectable by XRD in the C-400 and T076 samples and although XRD showed negative results for Furnace Creek and Supreme 325 products, both SEM and TEM revealed a few tenths of a percent of fibrous tremolite present.

Additionally, a trace amount (<0.1%) of possible tremolite was observed in the Yellowstone screenings products, although further work is called for in order to confirm this observation.

The presence of attapulgite fiber has been observed in talcs from both Montana and California crude ores and although attapulgite mineral is not considered or classified as an asbestos mineral, it is likely to be confused with various forms of asbestos.

The results of X-ray diffraction analyses are listed in table No. 1; Scanning electron micrographs, Figures No. 1 through 4; and Transmission electron micrographs, figures No. 5 through 9.

Table No. 1

CYMIN Production Talcs		XRD Analysis
Product	Lot No.	Tremolite%
Glacier 325	457T	0
Glacier 200	469	0
Steawhite 200	466	0
Yellowstone Crude 67% Yellowstone 33% Screening	115	0
Yellowstone Crude Blend	467	0
F.C. (Panamint 100%)	180	0
T706 4 Panamint 1 Samson	687	0.5
C-400 4 Panamint 1 Samson	182	0.5
Supreme 325 (Keeler)	465K	0
White Eagle Screenings	-	0.5
Trinity Super fine	N.A.	0

ANALYSIS OF COMPETITOR TALCS FOR ASBESTOS FIBER

Analyses by XRD/XRS, TEM, SEM, and optical microscopy was undertaken with emphasis on the Vanderbilt and Grantham products. A total of sixteen competitor talc samples were investigated for fibrous asbestos and the majority of work was devoted to identifying and illustrating asbestos fibers present in the Vanderbilt talc products.

TEM with selected area electron diffraction analysis was used for the bulk of this work, with the results of these techniques being positive, undisputable scientific evidence. Through these techniques, the presence of fibrous tremolite asbestos in Vanderbilt talcs was identified and illustrated.

The results are indicated in table No. 2, which reveals that the Vanderbilt products contain substantial fibrous, asbestos minerals. The only sample in which the presence of fibrous asbestos could not be proven, was Pfizer's Montana talc (MP-1252).

Phase contrast optical micrographs are illustrated by figures No. 10-14; the observations by SEM are illustrated in figures No. 15 through 44; TEM and SAED patterns micrographs of the Vanderbilt products are included; figure No. 45 through No. 63.

Each one of these micrographs illustrates the fibrous asbestos evident in the respective talcs, and may serve to disprove any claims that the asbestos is non-fibrous.

TABLE No.2

BON-01077

Asbestos Analyses of Competitor Talcs 3/12/75

Sample	Identification	Date Received	XRD/XRS	SEM	TEM
Pfizer CP-1040		1/31/75	~3% tremolite, fibers	1-2 tremolite	5% tremoli
Windsor Minerals low grade		2/20/75	~1% tremolite	<1% tremolite serpentine fiber forms	<1% tremol serpentine forms
Oregon Talc		2/25/75	~95% serpentine	~95% chrystile, short fibers	~95% Chrys
Pfizer MP 1252		2/24/75	N.D.	fiber form laths	N.D. (fibe form laths
Cyclobrite		2/24/75	~11% tremolite	~30% tremolite, massive and Fiber	20-30% tre
Cyclofil		2/24/75	~9% tremolite	~10% tremolite	~10% tremo fiber & ma
Cyclosorb		2/24/75	~1.5% tremolite	~2% tremolite, traces attapulgite?	~1% tremoli fiber trace attapulgite
Nytal 200		2/24/75	~56% tremolite, serpentine, anthophyllite	40-50% tremolite, massive & fiber form. 5% serpentine-form fiber (anthophyllite).	40-50% fibr tremolite, pentine for fiber = tre ite and/or hophyllite
Nytal 300		2/28/75	~55% tremolite, serpentine, anthohyllite	~30% tremolite massive fiber, serpentive-form fibers (anthophyllite)	Major tremo fiber, serp tine fiber (anthophyll possible an gorite plat
Nytal 300		3/5/75	~55% tremolite, serpentine, anthophyllite	major tremolite massive fibrous minor anthophyllite	*
Nytal 300		3/5/75	~51% tremolite, serpentine, anthophyllite	Major tremolite, minor anthophyllite	

Nytal 300	3/5/75	54% tremolite + serpentine (anthophyllite)	major tremolite minor anthophyllite	*
Nytal 400	3/5/75	52% tremolite + serpentine (anthophyllite)	major tremolite minor anthophyllite	*
Asbestine 3X	3/10/75	49% tremolite, ~15% serpentine, (~2% anthophyllite)	~10% free fiber. anthophyllite, mainly massive tremolite	*
Asbestine 325	3/10/75	49% tremolite, ~25% serpentine (antogorite or lizardite) ~1% anthophyllite	massive and fiberous tremolite; anthophyllite; poorly crystalline talc?	
Talc-No. 1 Fiber	3/10/75	37% tremolite + serpentine ~5% anthophyllite	major fiberous tremolite + substantial serpentine form fibers as anthophyllite	*
Hi-fine 80	4/1/75	14% Tremolite	major fibrous tremolite	

* These samples have not been investigated at this date.

N.D. None detected

AIRBORNE ASBESTOS FIBER MONITORING

Seven different industrial plants were visited during the week of March 24, 1975. The purpose of these visits was to obtain airborne dust samples where Vanderbilt or Grantham talcs were being used, and to analyze these samples for asbestos fiber. By illustrating the presence of airborne fibers resulting from the use of Vanderbilt talcs, the viability of Vanderbilts claim is proven. These results are undeniable testimony to refute or substantiate claims of asbestos containing talcs not being hazardous due to their non-asbestiform tremolite content.

Table No. 3 lists the data obtained from the airborne samples. These samples were of a minimal sampling time, and during analyses many of the filters were observed with an extremely low, particle population density. The accurate method (NIOSH) of accessing the airborne asbestos fiber concentration is to gauge the length of sampling time in order to obtain sufficient material on the filter for satisfactory counting, and then take a few samples with varied sampling times. A minimal sampling time would approximate 30 minutes. This was not possible during the trip due to scheduling and a lack of a sufficient number of sampling pumps to take more than one sample simultaneously.

The results listed in table No. 3, (as fibers/cc) are listed for general information only and not considered to represent a time weighed average or a maximum fiber concentration ("C" limit).

The purpose of obtaining these samples was to illustrate the airborne asbestos fiber which results from the use of the competitor talcs. In all cases, the results listed would represent a minimum value at best, due to the short sampling times.

The majority of plants visited were operating with dust control equipment in operation, some more efficient then others. The workers technique had considerable influence upon the dust levels and observations indicated empty-bag disposal was the major cause of dust liberation.

The plants in which the dust control was not effective, are illustrate by the fibers/cc result listed in table No. 3 and again it is stresse that these results are minimum values.

During the plant visits, at no time were any bags of competitor talc observed with the "Asbestos-Warning" label.

Phase contrast micrographs, figures No. 64 to No. 66, and SEM micrographs, figures No. 67 to No. 82, illustrate the presence of airborne asbestos fibers resulting from the use of the talcs indicated.

TABLE No. 3

AIRBORNE ASBESTOS FIBER MONITORING

Company Code*	Filter No.	Time @ Vol.	(Phase Contrast) fibers/cc	Talc product	Comments
MT	MP-28	6min@2 l/min	0.52 0.50	Asbestine 3X	General area sample, no visible dust.
HBF	MP-29	2min@2 l/min.	1.55	Asbestine 3X	Charging cowles no visable dust
SWC	MP-22	9min@2 l/min.	2.20	Hi-fine 80	Charging cowles #C-15 clean worker
			(SEM) fibers/cc		
SWC	NP-4	7min@2 l/min.	3.56	Hi-fine 80	Charging mix tank #C-15 no visable dust
HBF	NP-1	5min@2 l/min.	3.95	Asbestine 3X	Charging mix tank general area sample
SWC	NP-3	5min@2 l/min.	2.80	Hi-fine 80	Charging mix tank #C-1 general area sample
PD	NP-5	4min@2 l/min.	13.00	Nytal 200	Charging mix tank and compacting bags
PD	NP-6	17min@2 l/min.	9.60	Nytal 200	Charging mix tank and compacting bags
HN	NP-7	2min@2 l/min.	168.00	Nytal 300	**Charging #12 pebble mill, no respirator
HN	NP-8	2min@2 l/min.	98.00	Nytal 300	**Charging #12 pebble mill, no respirator
SWG	NP-12	8min@2 l/min.	5.51	Nytal 300	Charging ball mill, empty bag

Results listed as fibers/cc are only those fibers which conform to the recent OSHA criteria; length to width ratio of 5:1 (or more), maximum diameter 3µm, and maximum length of 30µm

*Company names are listed on a master sheet, we were asked that names be kept confidential.

**Poor dust control

OBSERVATIONS

The main issue, and the reason for this study is the claim by Vanderbilt that their talcs contain non-fibrous tremolite, actinolite, and anthophyllite. Based on this claim, they have requested relief from the OSHA asbestos standard, and issued a letter of certification that their talcs are asbestos free. The scientific evidence incorporated within this report has shown Vanderbilts basis for certification to be completely erroneous in that their products have been shown to contain substantial amounts of asbestos fibers.

Mr. Stenders letter to Mr. H.B. Vanderbilt[1] is contradictory, as he states that; scientific evidence proving that naturally occuring talcs, prior to processing by milling or crushing do not contain fibrous asbestos is the basis for certifying asbestos free talc. He then goes on defining fibrous asbestos as naturally occuring asbestiform minerals which prior to or after crushing and processing, contain fibers made up of fibrils.

The crystal structure of tremolite, actinolite, and anthophyllite are such that natural cleavage planes are in the "C" axis or long dimension. This results in a block form breaking down into smaller particles with an increasing length to width thickness ratio. Normal bagging or handling procedures are sufficient to cause this fiber formation. For as long as the talc is handled, fibers will continue to be generated, until incorporation into the final end application. Sometimes even handling of the end product will generate airborne fibers.

SUMMARY

The results of X-ray and microscopic analyses of various talc samples have revealed that the Vanderbilt products contain substantial (37 to 56%) amounts of fibrous tremolite, with a few percent of anthophyllite asbestos also present.

Industrial plant atmosphere dust samples,have shown that the use of the Vanderbilt or Grantham talc, results in the liberation of airborne asbestos fibers.

The claim by Vanderbilt that their talcs contain non-fibrous tremolite, actinolite and anthophyllite has been proven totally false, based on the scientific evidence incorporated within this report.

The talc products from California ores, marketed by Cyprus Industrial Minerals and its competitors, have been shown to contain fibrous -tremolite asbestos.

It is recommended that the California talc products be deleted from the certification of compliance letter[5] issued by Cyprus Industrial Minerals.