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DOCUMENT DESCRIPTION: Letter from Consultant to RTV RE Analysis of
Samples of Talc

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The Materials Characterization Specialists

November 22, 2000

Mr. John W. Kelse
R. T. Vanderbilt Company, Inc.
30 Winfield Street
Norwalk, CT 06856-5150

RE: PLM Evaluation of Talc Samples
RJ Lee Group Job No.: LSH006444

Dear Mr. Kelse:

RJ Lee Group has completed the analysis of several samples of talc. The procedure used for these analyses is based on a procedure developed by Dr. Ann Wylie. Basically, a known mass of sample is placed on a clean glass slide to which is added several drops of 1.598 refractive index oil. Twenty percent of the slide is examined in a polarizing light microscope; the dimensions of every particle with an aspect ratio of at least 3:1 (length to width) are recorded. The minerals were identified as talc, tremolite, anthophyllite, or "transitional" according to the following system:

Mineral	α , RI	γ , RI
Talc	< 1.598	≤ 1.598
Transitional	< 1.598	> 1.598
Amphibole	≥ 1.598	> 1.598

In addition, the particles were classified as "fiber" or "cleavage" using a consensus definition. Particles classified as "fiber" are asbestiform and show evidence of high aspect ratio, bundles, splayed ends, and curvature. Splayed ends are generally indicative of bundles of asbestiform fibers. There were several high aspect ratio transitional particles which did not meet the consensus definition of asbestiform (generally not displaying evidence of curvature or splayed ends).

Seven samples were submitted for analysis (NYTAL 100, NYTAL 200, NYTAL 300, NYTAL 400, NYTAL 3300, NYTAL 7700, and IT-3X). This preliminary report discusses the data generated on the NYTAL 100 and NYTAL 300 samples, with partial analyses of the other samples. Analyses of the remaining samples are progressing and will be reported as they become available.

Table 1 shows the concentration of the particles with aspect ratios of at least 3:1. The table shows two measures of concentrations, particles/mg of sample and weight percent. In the samples, the particle type with the largest concentration is tremolite. Very few anthophyllite particles were observed in any sample.

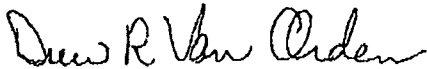
Table 2 shows the concentration of all asbestiform fibers observed in these samples. In the samples, only talc fibers were observed to be asbestiform; all other particles are cleavage fragments. Very few asbestiform fibers were observed with an aspect ratios less than 5:1.

Figure 1 compares the average lengths for the principal mineral components of the Nylal products. Figures 2 and 3 show the average width and aspect ratios for the sample products. Figure 4 shows the particle number concentration and particle weight percent for each analyzed product.

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If you have any questions, please feel free to call me.

Sincerely,



Drew R. Van Orden, PE
Senior Scientist

Table 1. Concentration of All Mineral Particles With An Aspect Ratio of At Least 3:1

Product	Slide	Mineral	particle/mg			Particle Wt, %		
			3:1 - 5:1	≥ 5:1	≥ 3:1	3:1 - 5:1	≥ 5:1	≥ 3:1
Nytal 100	1	Tremolite	353	839	1,193	4.39	2.02	6.41
		Anthophyllite		12	12		< 0.01	< 0.01
		Transitional	18	265	281	0.19	3.09	3.28
		Talc	16	189	205	0.21	0.31	0.52
	2	Tremolite	289	1,042	1,331	4.09	2.69	6.77
		Anthophyllite		6	6		0.01	0.01
		Transitional		66	66		0.37	0.37
		Talc	15	114	129	0.03	0.08	0.11
	3	Tremolite	375	1,288	1,663	6.78	3.58	10.35
		Anthophyllite		4	4		< 0.01	< 0.01
		Transitional	6	101	107	0.06	1.03	1.09
		Talc	2	230	233	< 0.01	0.14	0.15
Nytal 300	1	Tremolite	843	3,638	4,481	1.04	1.29	2.33
		Anthophyllite		12	12		0.01	0.01
		Transitional	12	341	353	0.07	0.57	0.64
		Talc		1,056	1,056		0.37	0.37
	2	Tremolite	18	3,395	3,412	< 0.01	0.63	0.64
		Anthophyllite						
		Transitional		272	272		0.31	0.31
		Talc		727	727		0.08	0.08
	3	Tremolite	361	3,453	3,814	0.44	1.24	1.68
		Anthophyllite		4	4		< 0.01	< 0.01
		Transitional	8	261	269	0.01	0.35	0.36
		Talc	16	1,044	1,060	0.03	0.17	0.20

Table 1. Concentration of All Mineral Particles With An Aspect Ratio of At Least 3:1
(continued)

Product	Slide	Mineral	particle/mg			Particle Wt, %		
			3:1 - 5:1	≥ 5:1	≥ 3:1	3:1 - 5:1	≥ 5:1	≥ 3:1
Nytal 3300	1	Tremolite	337	4,376	4,713	0.28	0.89	1.17
		Anthophyllite		18	18		0.01	0.01
		Transitional	18	285	302	0.24	0.55	0.79
		Talc		1,318	1,318		0.35	0.35
Nytal 7700	1	Tremolite	123	4,486	4,609	0.04	0.27	0.31
		Anthophyllite		11	11		< 0.01	< 0.01
		Transitional		277	277		0.33	0.33
		Talc	5	2,050	2,050	< 0.01	0.15	0.15
Nytal 200	1	Tremolite	166	1,748	1,914	0.49	1.80	2.30
		Anthophyllite						
		Transitional	13	145	158	0.08	0.72	0.79
		Talc	26	950	977	0.11	0.63	0.74
Nytal IT-3X	1	Tremolite	206	1,310	1,516	1.20	1.52	2.73
		Anthophyllite	4	101	105	0.06	0.02	0.09
		Transitional	110	1,117	1,226	0.84	3.45	4.29
		Talc	35	4,844	4,880	0.48	2.20	2.68

Table 2. Concentration of All Asbestiform Mineral Fibers With An Aspect Ratio of At Least 3:1

Product	Slide	Mineral	Fiber/mg			Fiber Wt, %		
			3:1 - 5:1	≥ 5:1	≥ 3:1	3:1 - 5:1	≥ 5:1	≥ 3:1
Nytal 100	1	Talc		104	104		0.02	0.02
	2	Talc		60	60		0.05	0.05
	3	Talc		128	128		0.06	0.06
Nytal 300	1	Talc		707	707		0.29	0.29
	2	Talc		477	477		0.05	0.05
	3	Talc		879	879		0.11	0.11
Nytal 3300	1	Talc		1,099	1,099		0.32	0.32
Nytal 7700	1	Talc		1,895	1,895		0.13	0.13
Nytal 200	1	Talc	4	381	385	< 0.01	0.30	0.31
Nytal IT-3X	1	Talc	13	2,961	2,974	0.02	1.76	1.78

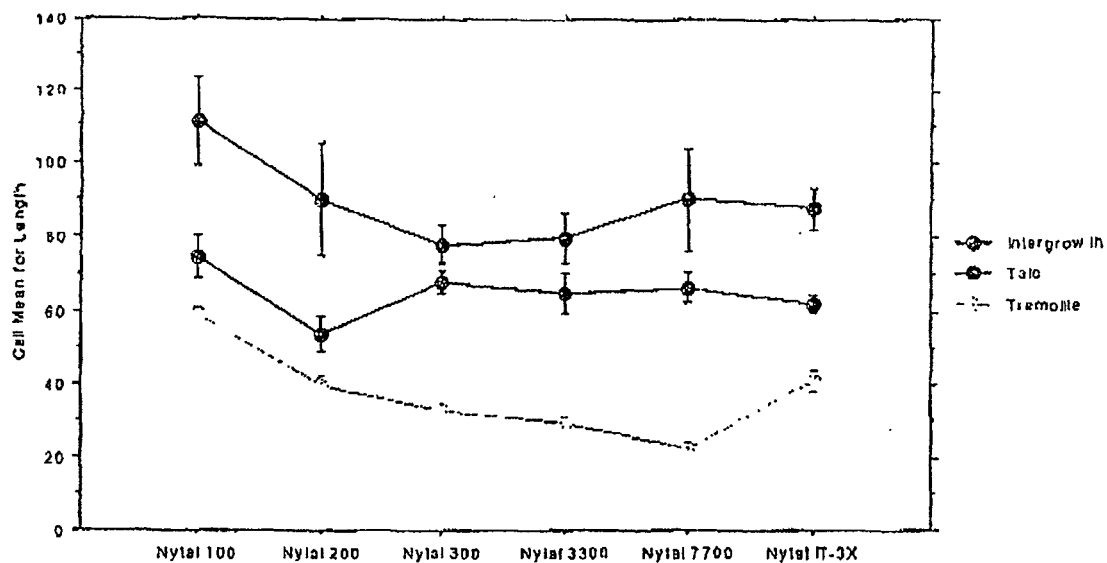


Figure 1. Comparison of particle length (μm) for Nylal products; all particles $\geq 3:1$.

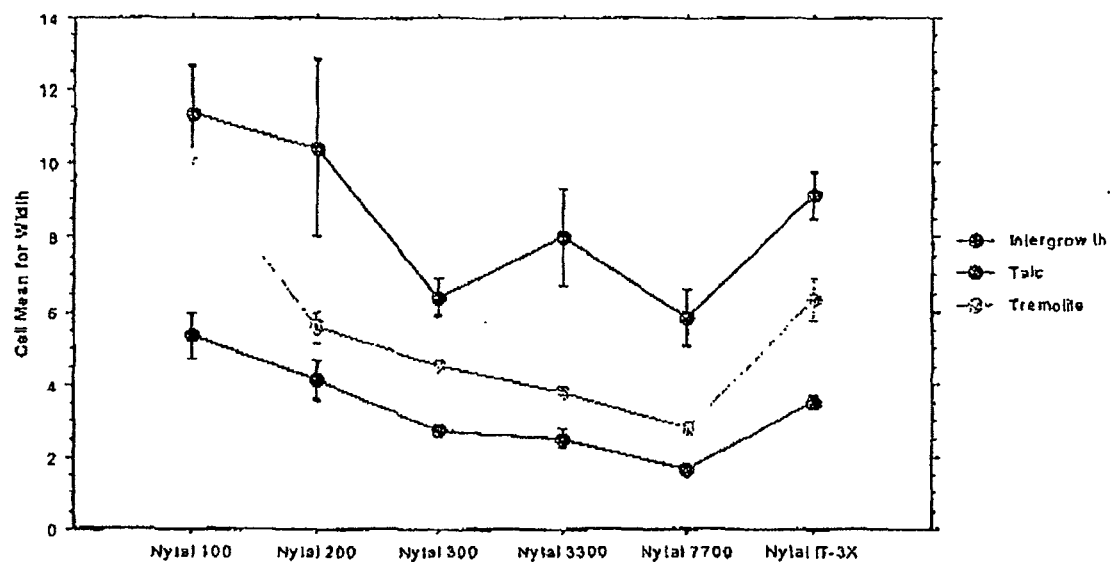


Figure 2. Comparison of particle width (μm) for Nylal products; all particles $\geq 3:1$.

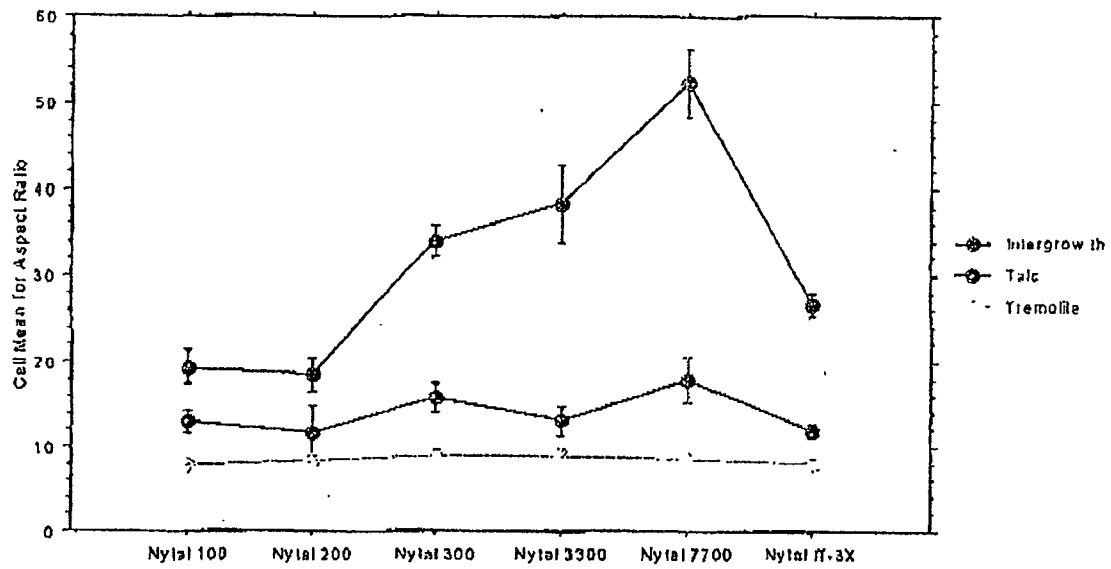


Figure 3. Comparison of Aspect Ratio for all particles $\geq 3:1$ for Nytal products.

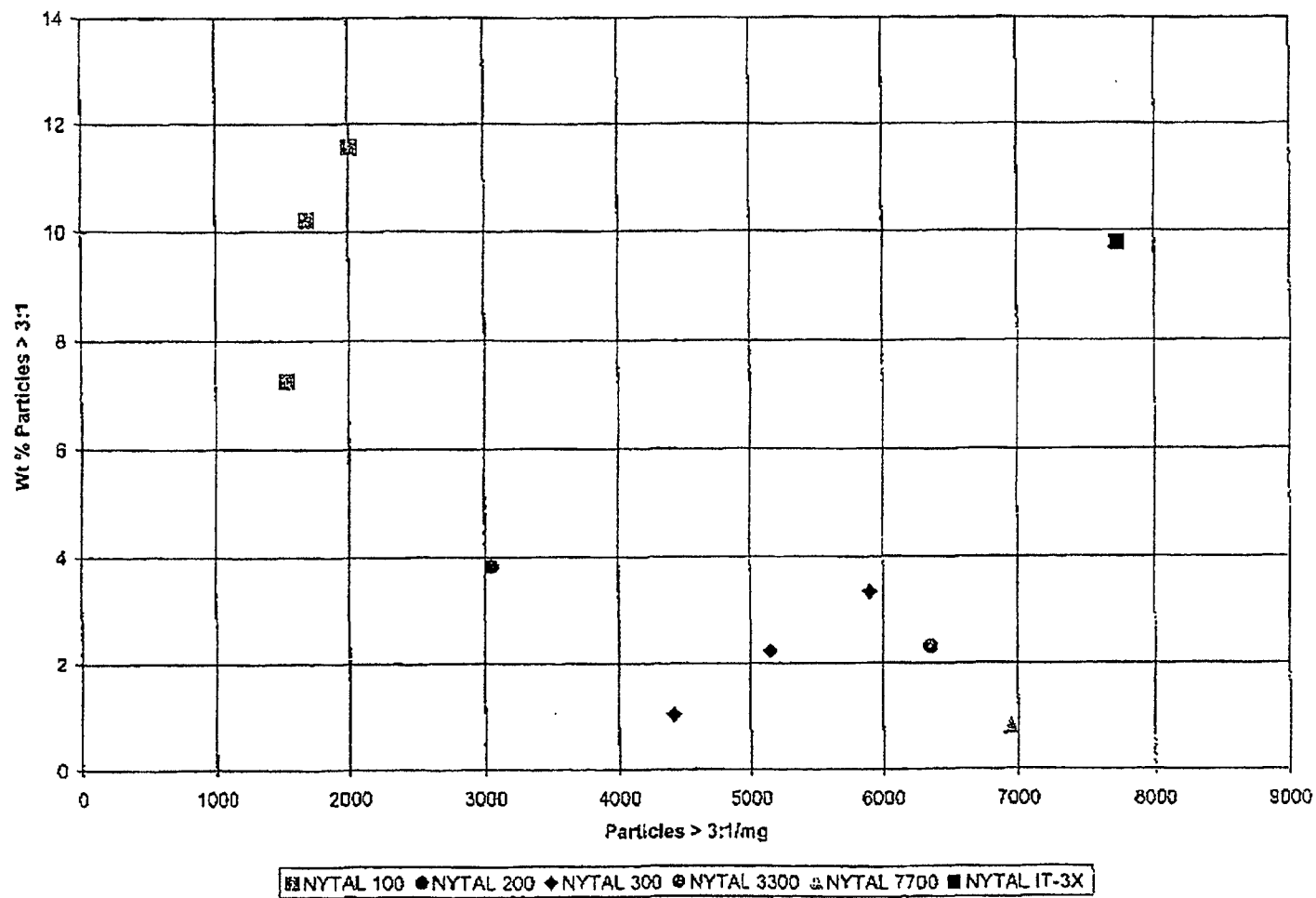


Figure 4. Comparison of particle number concentration and particle weight percent for NYTAL products.