



ASBESTOS TEM LABORATORIES, INC.

**EPA Quantitative Bulk Test Method
Transmission Electron Microscopy
Analytical Report**

Laboratory Report # 35432

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ASBESTOS TEM LABORATORIES, INC

Accredited by
U.S. Dept. of Commerce
NVLAP
CA DOHS ELAP

Feb/20/2003

Mr. Jack Anderson
ABC Consultants
5499 West "A" Street
Burlingame, CA 94111

RE: LABORATORY REPORT #35432

Transmission electron microscopy analytical results for 3 bulk material sample(s).

Job Site: Bay Meadows Apartments

Job No.: 435-278

Please find below the results for the TEM analysis of one or more bulk material samples. The analytical procedures were performed according to the EPA Test Method For the Determination of Asbestos in Bulk Building Materials - TEM method modified for quantitative bulk sample analysis. Prior to analysis, each sample was logged-in and all pertinent data was recorded. Each sample was checked for damage and disruption of any chain-of-custody seals. A unique laboratory number was assigned to each sample. A hard copy Log-In sheet was generated. This, and all other relevant paper work was kept with the sample throughout the analytical procedures to assure proper analysis.

Sample preparation began with the homogenization of a representative portion of the submitted bulk material. A subsample was separated, weighed, placed into a ceramic crucible and ashed in a muffle furnace at 480 Deg. C for at least 4 hours. The ashed samples were treated with dilute HCl if suspected to contain carbonate or sulfate minerals, suspended in distilled water, and ultrasonicated to disperse any fibrous matter. A known volume of the liquid suspension was filtered onto a 0.1 micron pore size Millipore mixed cellulose ester filter. The filter was then dried in HEPA filtered, Class 100 air on a clean bench. The filter was placed onto a glass microscope slide, sectioned, and collapsed in acetone. The collapsed filter was plasma-etched to remove 10% of the filter surface and then carbon coated. The carbon coated filter was sectioned and the sections placed onto 200-mesh copper TEM sample grids in dimethyl sulfoxide and acetone wick washers. After sufficient time to dissolve the filter material, the TEM sample grids were removed from the baths and placed into labeled sample containers.

TEM analysis was performed on a Philips EM-300 transmission electron microscope operating at 100kV. The sample was placed into the microscope where it was first scanned at low magnification to confirm that the distribution of material was reasonably homogeneous. High magnification analysis (18,000X) was performed using a two tier approach: 1) A relatively large area of several TEM grid openings for asbestos fiber bundles, and 2) a relatively small area of a number of fields of view for individual asbestos fibers (fibrous particles exhibiting an aspect ratio greater than or equal to 3 to 1, and a length greater than or equal to .5 um). Detected asbestiform structures were subjected to detailed morphological and/or selected area diffraction analysis. If necessary, energy dispersive X-ray analysis was also performed. The length and width of each asbestos fiber was measured. From this data, a total volume and mass of asbestos observed in the scanned area is calculated, and extrapolated to a total weight percent asbestos for each sample.

Sincerely Yours,

Laboratory Manager

--- These results relate only to the samples tested and must not be reproduced, except in full, with the approval of the laboratory. This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. ---

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Contact: Mr. Jack Anderson	REPORT NO. 35432
Address: ABC Consultants 5499 West "A" Street Burlingame, CA 94111	Date: <u>Jan-21-03</u>
Job Site / No. Bay Meadows Apartments 435-278	Date Received: <u>Jan-20-03</u>
	Total Samples Analyzed: 3

SAMPLE DESCRIPTION	
Client Sample # NV-5275-1.	#93 - Upstairs by sky light. White spray acoustic.
Laboratory Sample # 491-018-001	

SAMPLE PREPARATION PARAMETERS			
Weight of Material Suspended (mg): <u>53.6</u>	Filter Type & Pore Size <u>MCE 0.1um</u>		
Volume of Suspension Water (ml): <u>500</u>	Effective Filter Area (sq.mm) <u>201</u>		
Volume of Suspension Filtered (ml): <u>0.5</u>			

ASBESTOS DETECTED IN SCAN AREA				CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)		
CHRYSOTILE		AMPHIBOLE		CHRYSOTILE	AMPHIBOLE	TOTAL
FIBERS	BUNDLES	FIBERS	BUNDLES			
6	NSD	NSD	NSD	.006	0	.006
COMMENTS						
Chrysotile Asbestos Detected				Filter Loading: Moderate SAED Photo ID Nos.		

TEM / ANALYTICAL PARAMETERS					
Grid # Scanned For Bundles <u>4</u>	Grid Area (sq.mm) <u>0.0097</u>	Bundle Scan Area (sq.mm) <u>0.0388</u>			
Grid # Scanned For Fibers <u>4</u>	Grid Area (sq.mm) <u>0.0097</u>	Fiber Scan Area (sq.mm) <u>0.0388</u>			
Magnification: <u>18,000X</u>					

NOTATION KEY	
Chrys. - Chrysotile Asbestos	1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos	1 mm = 1 millimeter
NSD - No Structures Detected	1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos	1 cc = 1 cubic centimeter
<hr style="width: 100%;"/> Analyst Signature	
<hr style="width: 100%;"/> Lab Manager Signature	

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SAMPLE DESCRIPTION	
Client Sample # NV-5275-2.	#93 - N.E. upstairs room. Wall texture.
Laboratory Sample # 491-018-002	

SAMPLE PREPARATION PARAMETERS			
Weight of Material Suspended (mg): <u>49.6</u>	Filter Type & Pore Size <u>MCE 0.1um</u>		
Volume of Suspension Water (ml): <u>500</u>	Effective Filter Area (sq.mm) <u>201</u>		
Volume of Suspension Filtered (ml): <u>0.5</u>			

ASBESTOS DETECTED IN SCAN AREA				CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)		
CHRYSOTILE		AMPHIBOLE		CHRYSOTILE	AMPHIBOLE	TOTAL
FIBERS	BUNDLES	FIBERS	BUNDLES			
59	7	NSD	NSD	0.17	0	0.17
COMMENTS						
Chrysotile Asbestos Detected				Filter Loading: Moderate SAED Photo ID Nos.		

TEM / ANALYTICAL PARAMETERS					
Grid # Scanned For Bundles <u>1</u>	Grid Area (sq.mm) <u>0.0097</u>	Bundle Scan Area (sq.mm) <u>0.0097</u>			
Grid # Scanned For Fibers <u>1</u>	Grid Area (sq.mm) <u>0.0097</u>	Fiber Scan Area (sq.mm) <u>0.0097</u>			
Magnification: <u>18,000X</u>					

NOTATION KEY	
Chrys. - Chrysotile Asbestos	1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos	1 mm = 1 millimeter
NSD - No Structures Detected	1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos	1 cc = 1 cubic centimeter
	_____ Analyst Signature
	_____ Lab Manager Signature

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SAMPLE DESCRIPTION	
Client Sample # NV-5275-3.	#93 - S.E. upstairs room. Joint compound.
Laboratory Sample # 491-018-003	

SAMPLE PREPARATION PARAMETERS			
Weight of Material Suspended (mg): <u>59.8</u>	Filter Type & Pore Size <u>MCE 0.22um</u>		
Volume of Suspension Water (ml): <u>500</u>	Effective Filter Area (sq.mm) <u>201</u>		
Volume of Suspension Filtered (ml): <u>0.5</u>			

ASBESTOS DETECTED IN SCAN AREA				CALCULATED ASBESTOS CONCENTRATION (WEIGHT %)		
CHRYSOTILE		AMPHIBOLE		CHRYSOTILE	AMPHIBOLE	TOTAL
FIBERS	BUNDLES	FIBERS	BUNDLES			
20	21	NSD	NSD	0.28	0	0.28
COMMENTS						
Chrysotile Asbestos Detected				Filter Loading: Moderate SAED Photo ID Nos.		

TEM / ANALYTICAL PARAMETERS					
Grid # Scanned For Bundles <u>1</u>	Grid Area (sq.mm) <u>0.0097</u>	Bundle Scan Area (sq.mm) <u>0.0097</u>			
Screen # Scanned For Fibers <u>30</u>	Screen Area (sq.mm) <u>0.0000196</u>	Fiber Scan Area (sq.mm) <u>0.000588</u>			
Magnification: <u>18,000X</u>					

NOTATION KEY	
Chrys. - Chrysotile Asbestos	1 um = 1 micron = 0.001 mm
Amph. - Amphibole Asbestos	1 mm = 1 millimeter
NSD - No Structures Detected	1 sq.mm = 1 square millimeter
Non-Asb. - Non-Asbestos	1 cc = 1 cubic centimeter
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