



ASBESTOS TEM LABORATORIES, INC.

**EPA Yamate Level II
Transmission Electron Microscopy
Analytical Report**

Laboratory Job # 628-002

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ASBESTOS TEM LABORATORIES, INC

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NVLAP
CA DOHS ELAP

Feb/20/2003

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

RE: LABORATORY JOB # 628-002
Transmission electron microscopy analytical results for 2 air sample(s).
Job Site: 1223 Fourth Street, Sacramento, CA
Job No.: 10/12-1245

Enclosed please find results for the TEM analysis of one or more air samples. The analytical procedures were performed according to a modified Yamate Level II method.

Prior to analysis, samples are checked for damage and disruption of the chain-of-custody seal. Samples are then logged-in, each given a unique laboratory number, and a hard copy containing all pertinent information is generated. This, and all other relevant paper work are kept with each sample throughout the analytical procedures to assure proper analysis.

Preparation of air filter cassettes is performed within a HEPA filtered, Class 100 air, laminar flow clean bench environment. Cassettes are wet-wiped to remove any external contamination prior to placement into the clean bench area. Sections of the filters are removed, placed onto glass microscope slides, and collapsed in acetone vapor. The collapsed filters are plasma etched, removing the surface of the filter to a depth of ten percent of its original thickness, then carbon coated. The filters are further sectioned and placed carbon side up onto 200-mesh copper TEM sample grids in an acetone wick washer to remove filter material. The grids are placed into labeled containers and loaded into the microscope for analysis.

TEM analysis is performed on a Philips EM-300 transmission electron microscope operating at 80 or 100 kV, with a magnification of 18,000X. A known area of the specimen surface is scanned for fibrous structures. All structures exhibiting an aspect ratio greater than or equal to 5 to 1, and a length greater than or equal to 0.5 um are subjected to detailed morphological and selected area diffraction (SAED) analysis. Structures indicated as asbestos, or potentially asbestos, are further analyzed by energy dispersive X-ray (EDX) analysis as needed. Analysis continues until either 50 asbestiform structures are found, an analytical sensitivity of less than 0.005 structures per cubic centimeter of air is obtained, or 7 grid openings have been analyzed. Data is compiled into a standard AHERA report format and subjected to a thorough quality assurance check before the information is released to the client.

Sincerely Yours,

Laboratory Manager
ASBESTOS TEM LABORATORIES, INC.

--- 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

Modified Yamate Level II Analysis Method

Contact:	Mr. Jack Anderson	Report No.:	<u>32079</u>
Address:	ABC Consultants	Date:	<u>Jun-07-02</u>
	5499 West "A" Street	Date Received:	<u>Jun-04-02</u>
	Burlingame, CA 94111		
Job Site / No.:	1223 Fourth Street, Sacramento, CA	Total Samples Analyzed:	<u>2</u>
	10/12-1245		

CLIENT SAMPLE #	P-182.	SAMPLE LOCATION
Laboratory Sample #	628-002-001	Personal: Jack Jones; tile & mastic

AIR FILTER DATA		AIR PUMP DATA	
Type	<u>MCE0.8um</u>	Time (min)	<u>93</u>
Diameter (mm)	<u>25</u>	Flow Rate (lpm)	<u>2.0</u>
Area (sq mm)	<u>385</u>	Volume (liters)	<u>186</u>

IDENTIFIED STRUCTURES				CALCULATED ASBESTOS STRUCTURE CONCENTRATION			
ASBESTOS		OTHER		Per CC Air			Per sq mm
CHRY.S.	AMPH.	AMBIG.	NON-ASB.	< 5um	> 5um	TOTAL	Filter
4	ND	ND	ND	0.086	< 0.022	0.086	41.7

COMMENTS

Chrysotile Asbestos Detected	FILTER LOADING: MODERATE SAED PHOTO ID #s.
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TEM / ANALYTICAL PARAMETERS			
Magnification:	<u>18,000X</u>	<u>ANALYTICAL SENSITIVITY</u>	
Grid Openings Scanned	<u>10</u>	Structures/sq mm	<u>10.4</u>
Grid Opening Area (sq.mm.)	<u>0.0096</u>	Structures/cc	<u>0.022</u>
Scan Area (sq.mm.)	<u>0</u>		

NOTATION KEY

Chrys. - Chrysotile Asbestos	ND - None Detected	
Amph. - Amphibole Asbestos	1 um = 1 micron = 0.001 mm	ANALYST SIGNATURE
Ambig. - Ambiguos ID	1 mm = 1 millimeter	
Non-Asb. - Non-Asbestos	1 cc = 1 cubic centimeter	LAB MANAGER SIGNATURE
	1 sq.mm = 1 square millimeter	

TRANSMISSION ELECTRON MICROSCOPY ANALYTICAL REPORT

Modified Yamate Level II Analysis Method

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Address:	ABC Consultants	Date:	<u>Jun-07-02</u>
	5499 West "A" Street	Date Received:	<u>Jun-04-02</u>
Burlingame, CA 94111	Total Samples Analyzed:		<u>2</u>
Job Site / No.	1223 Fourth Street, Sacramento, CA 10/12-1245		

CLIENT SAMPLE #	EM-182.	SAMPLE LOCATION
Laboratory Sample #	628-002-002	EM; tile & mastic

AIR FILTER DATA		AIR PUMP DATA	
Type	<u>MCE0.8um</u>	Time (min)	<u>90</u>
Diameter (mm)	<u>25</u>	Flow Rate (lpm)	<u>10</u>
Area (sq mm)	<u>385</u>	Volume (liters)	<u>900</u>

IDENTIFIED STRUCTURES				CALCULATED ASBESTOS STRUCTURE CONCENTRATION			
ASBESTOS		OTHER		Per CC Air			Per sq mm
CHRYS.	AMPH.	AMBIG.	NON-ASB.	< 5um	> 5um	TOTAL	Filter
12	ND	ND	ND	0.031	0.022	0.053	125
COMMENTS							
Chrysotile Asbestos Detected				FILTER LOADING: HEAVY SAED PHOTO ID #s.			

TEM / ANALYTICAL PARAMETERS			
Magnification:	<u>18,000X</u>	<u>ANALYTICAL SENSITIVITY</u>	
Grid Openings Scanned	<u>10</u>	Structures/sq mm	<u>10.4</u>
Grid Opening Area (sq.mm.)	<u>0.0096</u>	Structures/cc	<u>0.004</u>
Scan Area (sq.mm.)	<u>0.1</u>		

NOTATION KEY

Chrys. - Chrysotile Asbestos	ND - None Detected	
Amph. - Amphibole Asbestos	1 um = 1 micron = 0.001 mm	<u>ANALYST SIGNATURE</u>
Ambig. - Ambiguos ID	1 mm = 1 millimeter	
Non-Asb. - Non-Asbestos	1 cc = 1 cubic centimeter	<u>LAB MANAGER SIGNATURE</u>
1 sq.mm = 1 square millimeter		