



Textile Services Division

1415 PARK AVENUE • HOBOKEN, NEW JERSEY 07030 • 201-792-2400

REPORT OF TEST

December 14, 1972

NUMBER

78992

CLIENT: Eaton-Dikeman
Div. of Knowlton Bros.
Mt. Holly Springs, Pennsylvania 17065

SUBJECT: Duplicate specimens of three (3) samples of filter paper sampled and identified by Client as listed below, several grams of asbestos and Anthraquinone Blue 3G dyestuff. Client's letter of authorization dated December 4, 1972.

Removal of Asbestos Fibers from Aqueous Suspension by Cellulose Filter Paper

Procedure:

Three (3) grams of asbestos fibers were added to 900 milliliters of distilled water in a blender and agitated for one minute. Three (3) grams of Anthraquinone blue 3G dye were dissolved in 600 milliliters distilled water and filtered through a 0.8 micron cellulosic membrane filter at medium speed to remove any undissolved dye.

The asbestos slurry was added to the filtered dye solution and mixed briefly.

The dyed asbestos slurry was filtered through a membrane filter 0.45 microns, and washed until the filtrate was colorless.

The dyed asbestos fibers were dispersed in 3 liters of distilled water and screened through a fine stainless steel screen (openings about 125 microns). During the screening process, as the longer fibers were collected on the screen they were occasionally discarded. This procedure provided some milligrams of dyed, short asbestos fiber pieces in 3 liters of distilled water. To demonstrate that these dyed asbestos fibers are observable, 50 milliliters of the fiber suspension were filtered through a white cellulose membrane (0.45 microns) filter. The membrane was dried for 15 minutes at 105°C. A convenient size section from the membrane was cut and placed on a microscope slide, saturated with immersion oil (Nr 1.515) to render it transparent and covered immediately with a slide coverglass. The slide was examined under a microscope provided with a 10x eye piece, a square measuring/counting reticle and 43x objective lens. Counting procedure used was similar to that specified by OSHA for Asbestos contamination.

SIGNED FOR THE COMPANY

BY

R. Robison

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United States Testing Company, Inc.

CLIENT: Eaton-Dikeman

Number
78992

For the actual test filtration, 500 milliliters of the fiber suspension were passed through each one of the filters provided. Blue asbestos was very evident on the surface of each one of the filters. Next the filtrate was then passed through a white membrane filter (0.45u) and dyed, transparentized and viewed under the microscope as above.

Results:

<u>Sample/Specimen:</u>	<u>909-22/A</u>	<u>909-22/B</u>	<u>915/A</u>	<u>915/B</u>	<u>955/A</u>	<u>955/B</u>	<u>Demonstration</u>
Reticle Areas Examined:	20	20	20	20	20	20	8 **
Asbestos Particles Counted:							
Under 5 microns	65	74	282	213	29	21	113
Over 5 microns	18	17	63	58	3	5	106
Total	83	91	345	271	32	26	219
Calculated Asbestos Particles Present on Total Membrane Filter:							
Under 5 Microns	96298	109631	417783	315560	42963	31111	418845*
Over 5 Microns	26667	25186	93335	85927	4445	7408	392900*
Total	122965	134817	511118	401487	47408	38519	811745*
Effectiveness of Filter, % (Total Calculated Particles on Each Membrane, Filter Compared with Total calculated Particles on Demonstration Membrane Filter (X10*))							
	98.5	98.3	93.7	95.1	99.4	99.5	---

*To compare with the other results these figures were multiplied by ten as the volume of suspension tested was only 50 ml, while all other tests are based on 500 ml of suspension.

Conclusion:

The above results indicate that filter paper 955 is the most effective collector of asbestos particles in aqueous suspension of the filters tested.

** data x $\frac{20}{8} \times 10$ for comparison
 $113 \times 25 = 2820$
 $106 = 2650$
 $219 = 5470$



Textile Services Division

1415 PARK AVENUE • HOBOKEN, NEW JERSEY 07030 • 201-792-2400

REPORT OF TEST

January 3, 1973

NUMBER

80060

CLIENT: Eaton-Dikeman
Div. of Knowlton Bros.
Mt. Holly Springs, Pennsylvania 17065

SUBJECT: Duplicate specimens of two (2) samples of filter paper sampled and identified by Client as listed below, several grams of asbestos and Anthraquinone Blue 3G dyestuff. Client's letter of authorization dated December 20, 1972.

Removal of Asbestos Fibers from Aqueous Suspension by Cellulose Filter Paper

Procedure:

Two (2) grams of asbestos fibers were added to 600 milliliters of distilled water in a blender and agitated for one minute. Two (2) grams of Anthraquinone blue 3G dye were dissolved in 400 milliliters distilled water and filtered through a 0.8 micron cellulosic membrane filter at medium speed to remove any undissolved dye.

The asbestos slurry was added to the filtered dye solution and mixed briefly.

The dyed asbestos slurry was filtered through a membrane filter 0.45 microns, and washed until the filtrate was colorless.

The dyed asbestos fibers were dispersed in 2 liters of distilled water and screened through a fine stainless steel screen (openings about 125 microns). During the screening process, as the longer fibers were collected on the screen they were occasionally discarded. This procedure provided some milligrams of dyed, short asbestos fiber pieces in 2 liters of distilled water. To demonstrate that these dyed asbestos fibers are observable, 50 milliliters of the fiber suspension were filtered through a white cellulose membrane (0.45 microns) filter. The membrane was dried for 15 minutes at 105°C. A convenient size section from the membrane was cut and placed on a microscope slide, saturated with immersion oil (Nr. 1.515) to render it transparent and covered immediately with a slide coverglass. The slide was examined under a microscope provided with a 10x eye piece, a square measuring/ counting reticle and 43x objective lens. Counting procedure used was similar to that specified by OSHA for Asbestos contamination.

SIGNED FOR THE COMPANY

BY

R. Robinson

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United States Testing Company, Inc.

CLIENT: Eaton-Dikeman

Number

~~70002~~
80060

For the actual test filtration, 250 milliliters of the fiber suspension were passed through each one of the filters provided. Blue asbestos was very evident on the surface of each one of the filters. Next the filtrate was then passed through a white membrane filter (0.45u) and dried, transparentized and viewed under the microscope as above.

Results:

<u>Sample/Specimen:</u>	<u>610/A</u>	<u>610/B</u>	<u>1342/A</u>	<u>1342/B</u>	<u>Demonstration</u>
Reticle Areas Examined:	20	20	20	20	8
Asbestos Particles Counted:					
Under 5 microns	0	0	0	0	162
Over 5 microns	0	0	0	0	120
Total	0	0	0	0	282
Calculated Asbestos Particles Present on Total Membrane Filter:					
Under 5 Microns	0	0	0	0	600,469
Over 5 Microns	0	0	0	0	444,792
Total	0*	0*	0*	0*	1,045,261

Effectiveness of Filter, % (Total Calculated Particles on Each Membrane, Filter Compared with Total calculated particles on Demonstration Membrane Filter x5**).

100.0 100.0 100.0 100.0 ---

*Scanning of the entire filter after observation of the number of reticle areas required by OSHA revealed that each filter had one or two large asbestos fibers. It is our opinion that these are laboratory contamination.

**To compare with the other results these figures were multiplied by five as the volume of suspension tested was only 50 ml, while all other tests are based on 250 ml. of suspension.

Conclusion:

The above results indicate that either filter paper is a very effective collector of asbestos particles in aqueous suspension. However, paper 1342 had a much higher flow rate under vacuum conditions.