

MAR-177

February 17, 1977

Messrs. J. Fournier, D/626
P. S. Parisi, D/700-8

You may be interested in the attached report which covers asbestos dust testing conducted in the Manuet, NY automotive center on January 27, 1977.

As indicated on page 6, we are well within the allowable limits when hang-on shoes are used in conjunction with proper installation procedures.

Please advise if you have questions.

LX:ian

Att.

Les E. Smith
Department 701

Home Depot
for 171 over
info - J

7-36 A

REPORT
of
INDUSTRIAL HYGIENE TESTS

for
ASBESTOS FIBERS

conducted at

SEARS AUTOMOTIVE CENTER

HANUET, N.Y.

on

January 27, 1977

TEST REPORT #2025

Prepared by:

RC

ROSSNAGEL & ASSOCIATES

Engineering & Testing Consultants

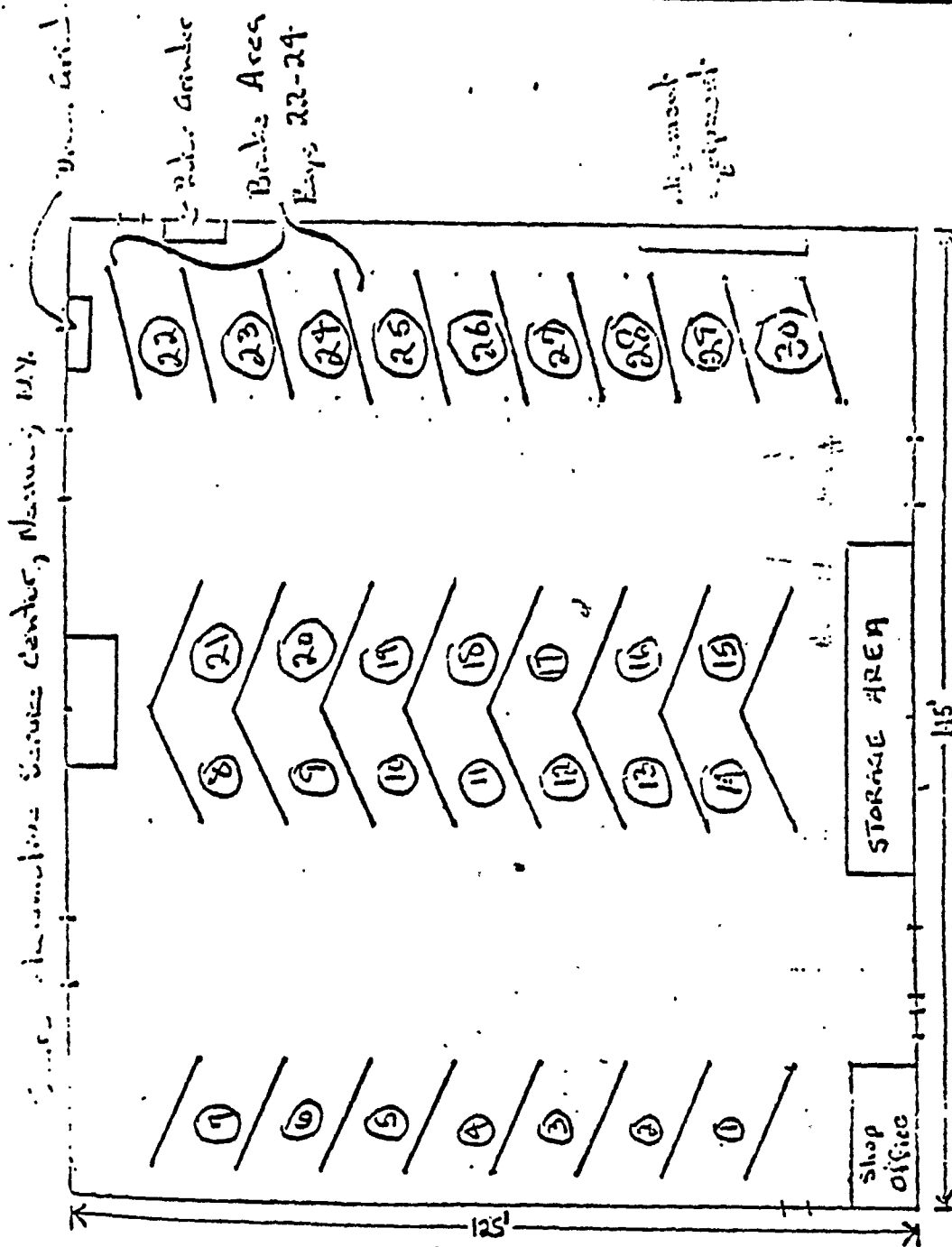
1777 21st St. • Cherry Hill, N.J. 08003
(609) 424-4440

Distribution:

Mr. Lex K. Smuts
Dept. 731
Sears, Chicago
(3 copies)

36-B

Report Issued: February 11, 1977



2-9-77 5R

II

FIBERS & CONCENTRATION

RESULTS

The results of the Asbestos Fiber Counting Test are shown in Table I below:

ASBESTOS FIBER COUNTING RESULTS

Personal Sampler No.	Location	Filter	Time Sampled, mins.	FIBERS Greater than 5 μ and <100 μ with an aspect ratio of at least 3:1			Allowable Limit Fibers/ ml (2)	Allowable Ceiling Limit Fibers/ ml (3)	Operator
				Total Fiber Count	Avg. Fiber Count /min	Concentration Fibers/ml, TWA (1)			
23-7	Ref.	100	140	6	.05	.0411	2	10	Paul Marrone
23-9	to	100	408	2	.02	.0477			Edworch Sinden
23-1	Page	100	430	5	.05	.0110			Charles Spagna
23-7	3	100	15	0	0	0			Paul Marrone
23-7		100	263	3	.03	.0100			Paul Marrone

TABLE I

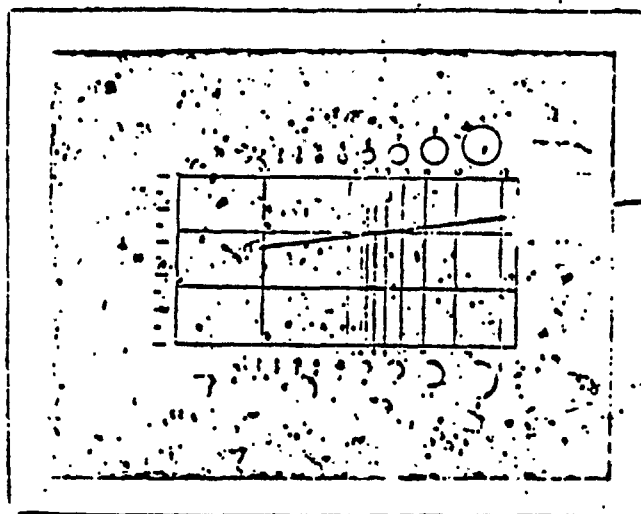
- Notes: 1) Concentration of fibers/ml is calculated on basis of sample volume and area of membrane filter and microscope field of view. TWA is Time Weighted Average.
- 2) Allowable Limit as of 7/1/76 for 1 1/2 to 8-hour exposure.
- 3) Allowable Limit as of 7/1/76 for 15-minute exposure.

CUSTOMER: Sears Roebuck

Location Automotive Center

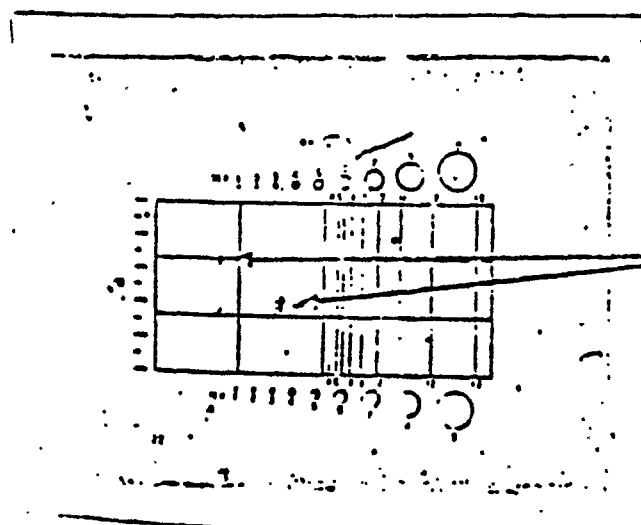
Date 1/21/77

Photomicrographs showing fibers, dust or lint in microns
(millionths of an inch).



Sample or
Filter S/N 185

This is an asbestos
fiber of about 7
microns.



Sample or
Filter S/N 185

This view shows
only dust particles.
There are no
asbestos fibers
present.

All photomicrographs are taken at 520X
magnification using phase contrast optics.

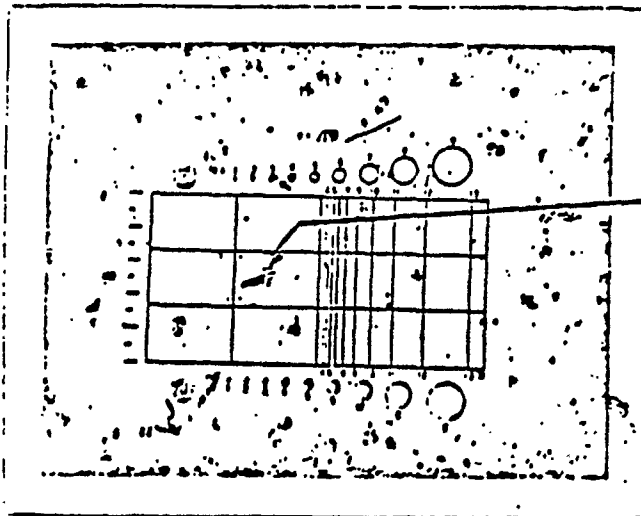
A micron is $1/1,000,000$ of a meter. In
other words, 27 microns equal .0001 inches.

CUSTOMER: Seacrest Manufacturing

Location Automotive / C-30-12

Date 1/31/77

Photomicrographs showing fibers, dust or lint in microns
(millionths of an inch):



Sample or
Filter # 187

This is an asbestos
fiber of about 12
microns.

Sample or
Filter #

All photomicrographs are taken at 520X
magnification using phase contrast optics.

A micron is 1/1,000,000 of a meter. In
other words, 25 microns equal .0001 inches.

7RA-213A

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MAR 000834

CONCLUSIONS

Table I shows that Samples #1, #2, #3, #4 and #5 for the day sampled, January 27, 1977, are within the allowable exposure limit for asbestos. The Backup Time Weighted Average calculations are shown in Section IV for each run and for the total sampling time for Mr. Harrons. The Time Weighted Average calculation for Mr. Harrons for the day was .0207 fibers/ml. The 15 minute ceiling limit severe test also showed no asbestos fibers counted on 100 random fields of the filter used. Since this result was unexpected our lab made a count of a second 100 fields on the filter. When the second 100 random fields of the same filter were examined again, the results (zero fibers) were confirmed. In the detailed DESCRIPTION OF TEST on Page 11 there are additional words as to why this "ceiling limit test" may have shown such good results. These calculations are based on asbestos exposure during the time sampled.

The previous national emission standard (effective June 7, 1972) for asbestos, published in FEDERAL REGISTER, Vol. 36, No. 233, Pages 11313-11322 by the E.P.A., and in FEDERAL REGISTER, Vol. 37, No. 123, Pages 11313-11322 by O.S.H.A., states: "The proposed standard would limit occupational exposure to 3-hour Time Weighted Average (TWA) airborne concentrations of asbestos dust not exceeding five fibers longer than five micrometers per milliliter. Concentrations above five fibers, but not to exceed ten fibers (ceiling concentration), would be permitted up to 15 minutes in an hour, but not for more than 5 hours in any one 3-hour day."

The new national emission standards (effective July 1, 1975) for asbestos, published in FEDERAL REGISTER, Vol. 40, No. 127, Pages 27552-27553 by O.S.H.A., lowers the permissible exposure to two fibers per cc in 3-hour Time Weighted Average exposure. These standards are now in effect.

Under the existing O.S.H.A. limits, no areas exceeded the TWA limit of 2 or 10 fibers/ml. It is the belief of ROSSNAGE & ASSOCIATES that there exists little possibility of exposure above the limits on another day (since the TWA are so far below the limit) if the same working procedures are followed.

O.S.H.A. presently requires periodic monitoring at intervals no longer than six months (membrane filter method). Medical surveillance is required for all workers who are exposed to asbestos as part of their work environment. Required components of a medical surveillance program include periodic measurement of pulmonary function (forced vital capacity (FVC)), forced expiratory volume for 1 second (FEV₁), and periodic chest roentgenograms (posterior-anterior 14" x 17").

DESCRIPTION OF TEST

J. P. Waltz, Chemist, arrived at the store at 8:10 A.M. to conduct the sampling. The sampling was completed at 5:00 P.M. After a brief discussion with Mr. Fleming, Mr. Waltz left the plant at 5:30 P.M.

Five Millipore Membrane Filter Cassettes were utilized with four Bendix Personal Samplers to obtain the integrated samples. Four of the filters were used on extended tests during general work day and one filter was used in a fifteen-minute ceiling limit test on what was believed to be the worst case situation.

Mr. Lex Smuts and Jim Waltz present and watching the flow of work during the entire morning and were particularly attentive during the 15-minute ceiling limit test. The standard work practices were generally followed during the entire day but the regulation requiring the backing plate to be wetted before being brushed (not blown) off may have been more diligently followed during the 15-minute ceiling test than if Mr. Smuts and Jim Waltz had not been present.

The membrane filter cassettes were carefully kept in an upright position and returned to the lab for analysis. A representative section of the filter was cut, properly mounted on a glass microscope slide using a 1:1 mixture of dimethyl phthalate and diethyl oxalate and examined at a magnification of 400X using phase contrast optics. The number and length range of the fibers observed in a given area under the microscope was recorded and this figure was used to calculate the number of fibers per cubic centimeter (or milliliter) of air sampled.

Photomicrographs of asbestos fibers found were made to illustrate the concentration of asbestos is visually counted. Fibers having

in aspect ratio of 3:1 and which were larger than 5 microns and up to 100 microns were counted. A minimum of 100 fields was examined and then the fiber count totaled.

This is an exceedingly skilled and painstaking operation requiring 2-3 hours for each filter under microscopic examination. See the additional words in Procedure #113 included in the "O.S.H.A. Fiber & Mineral Dust Tests" paper which can be found in the Appendix.

CALCULATIONS

Sample Volume Calculation

Fiber Summary & Calculation Sheet

100-5-105

Engineering & Technical Services

Made by C-44

Checked by

Description Calculation of Time Weighted Average

TIME WEIGHTED AVERAGE CONCENTRATION IN THE AIR

S/N	SAMPLE NO.	PUMP #	TIME (MINUTES)	SAMPLE FLOW (LITERS/MIN)	TOTAL SAMPLE VOLUME (LITERS)
133	1	PS-2	8:44-9:55 = 71	1.3	92.3
		PS-7	9:55-10:05 = 10	1.3	13.0
			10:05-11:05 = 60	1.3	78.0
134	2	PS-9	8:55-11:45 = 150	1.3	195.0
			11:45-5:15 = 250	1.3	325.0
135	3	PS-19	8:55-12:05 = 130	1.3	169.0
			1:15-4:15 = 180	1.3	234.0
			4:30-5:15 = 45	1.3	58.5
136	4	PS-7	11:45-11:23 = 15	1.3	19.5
137	5	PS-7	11:31-12:13 = 42	1.3	54.6
			11:42-5:23 = 221	1.3	287.3

1,4,5 142+15+23=420 (750/420)=1.786 750

CALCULATION OF TIME WEIGHTED AVERAGE

$$\frac{\sum (\text{CONCENTRATION} \times \text{MINUTES})}{\text{TOTAL TIME}} = \text{TWA}$$

$$\frac{(0.011)142 + 0(15) + (0.008)23}{420} = 0.00207 \frac{\text{fibers}}{\text{ML}}$$

for Mr. Marrone

Southeastern Division
250 ARIZONA AVE., N.E.
ATLANTA, GA. 30307

Engineering & Testing Consultants

1221 W. 79th Street, W., N.J. 07093

533 ARDEN AVE., N.E.
ATLANTA, GA. 30307
(404) 877-4244

FIBER SUMMARY & CALCULATED RESULTS

Lab Report # 782

Test Report # 2005

Customer Name Sears

Address _____

Personal Sampler # P5-247

Filter S/N 183

Operation _____

Type of Fiber Asbestos

If more than one Form 150 is used for a given filter, then the total counts are tabulated below:

	CATEGORIES OF LENGTHS					
	$\leq 5 \mu$	$>5-10 \mu$	$>10-20 \mu$	$>20-50 \mu$	$>50-100 \mu$	$>100 \mu$
Totals	0	5	1	0	0	0
Percent	0	83.3	16.7	0	0	0

Total Fibers Counted 5

Average Net Fiber Count = $\frac{\text{Totals}}{\text{No. Filters Counted}} = \frac{5}{1} = 5$ Based on 10 fields counted

Sampling Rate: 1.753 liters/min.

Sampling Time: 14.2 minutes

Sampling Volume = Rate $\times$ Time = 1.753 $\times$ 14.2 $\times$ 1000 = 249.656 milliliters

Fiber Concentration = $\frac{\text{Avg. Net Fiber Count} \times 100,000}{\text{Vol. Sampled, ml}} = \frac{5 \times 100,000}{249.656} = 2003.6$ fibers/ml

REMARKS: The filter was highly colored and there was a large amount of dust present.

* Do not count as fibers
Form 150-2113

14.1

Engineering & Testing Consultants

1999 21. 70 • Cherry Hill, N.J. 08003

Name Stans

Address 13

City 13

State 13

Zip 13

Personal Sampler # 13

Date 1/1/77

Made by 13

Filter Type 13

Checked by 13

FIBER MICRON SIZE DISTRIBUTION BY COUNT

Magnification 400 X

Classification 13

Test Article PORTON

Operation 13

Field Sampling Method 13 Field Sample Time 13 minutes

Field No.	L a t.	L o n g.	CATEGORIES OF LENGTHS						Remarks
			$\leq 5 \mu$	$>5-10 \mu$	$>10-20 \mu$	$>20-50 \mu$	$>50-100 \mu$	$>100 \mu$	
1									13
2									13
3									13
4									13
5									13
6									13
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Fibers

1. Must count at least 100 fibers or a minimum of 20 random fields.
2. Count only fibers having an aspect ratio of at least 3:1 and a length of greater than 5 microns.
3. Longitude is left-to-right on filter. Latitude is in-and-out on filter.
4. Fibers counted under phase contrast optics.
5. This distribution IS NOT on a wgt. basis.

MAR

000842

Industrial Hygiene Division

300 N. 7th St., Suite 100, St. Paul, MN 55102

Report # 100

Customer Name GenCorp

Date 11/15/83

Address _____

Checked by CL

Personal Sampler # 100

Filter S/N 100

Operation _____

Type of Fiber Asbestos 2302

If more than one form 100 is used, the total counts are tabulated below:

	CATEGORIES OF LENGTHS					
	≤ 5 μ	> 5-10 μ	> 10-20 μ	> 20-50 μ	> 50-100 μ	> 100 μ
Totals		4	1	1		
Percent		50%	20%			

Total Fibers Counted 5

Average Net Fiber Count = $\frac{\text{Total Count}}{\text{Vol. Sampled, ml}}$ = $\frac{5}{172.000}$ = 2.91×10^{-5} fibers/ml

Sampling Rate: 1.3 liters/min.

Sampling Time: 430 minutes

Sampling Volume = Rate x Time = 1.3 x 430 x 1000 = 559,000 ml

Avg. Net Fiber Concentration = $\frac{\text{Count} \times 1000}{\text{Vol. Sampled, ml}}$ = $\frac{5 \times 1000}{559,000}$ = 8.94×10^{-5} fibers/ml

Remarks:

Do not count as fibers

Form 100-1113

11/15

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המחלקה הכלכלית / 155 / 155 / 155

1967 _____ Division _____ Chapter by _____

Consistency

Page Article 002991 .. Generation

Field Sampling Method microbial Field Sample Time minutes

[illegible]

Fibera

1. Must count at least 100 fibers or a minimum of 20 random fields.
 2. Count only fibers having an aspect ratio of at least 3:1 and a length of greater than 5 microns.
 3. Longitude is left-to-right on filter. Latitude is in-and-out on filter.
 4. Fibers counted under phase contrast optics.
 5. This distribution IS NOT on a wgt. basis.
- 100-100-4

Page 10/10

Total Fields Counted 20

Total Fibers Counted 100

Engineering & Testing Consultants

1929 N. 70 - Cherry Hill, N.J. 08003

ATLANTA, GA. 30107
(404) 377-6244

FIBER SUMMARY & CALCULATION SHEET

Lab Report # 793

Date 1/31/77

Test Report # 2025

Made by JD

Customer Name Sears

Checked by CAM

Address _____

Personal Sampler # PS-7

Filter S/N 136

Operation _____

Type of Fiber Asbestos

If more than one Form 130 is used for a given filter, then the total counts are tabulated below:

	CATEGORIES OF LENGTHS					
	$\leq 5 \mu$	$> 5-10 \mu$	$> 10-20 \mu$	$> 20-50 \mu$	$> 50-100 \mu$	$> 100 \mu$
Totals	0	0	0	0	0	0
Percent	0	0	0	0	0	0

←————— Fibers —————→

Total Fibers Counted 0

Average Net Fiber Count = $\frac{\text{Fibers}}{\text{Vol. Sampled, ml}} = \frac{0}{27,000} = 0$ based on 100 fields counted

Sampling Rate: 1.8 liters/min.

Sampling Time: 15 minutes

Sampling Volume = Rate x Time = 1.8 x 15 x 1000 = 27,000 milliliters

Fiber Concentration = $\frac{\text{Avg. Net Fiber Count} \times 171,000}{\text{Vol. Sampled, ml}} = \frac{0 \times 171,000}{27,000} = 0$ fiber/ml

REMARKS:

* Do not count as fibers
Form #RA-211B

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1977 11-70 • Cherry Hill, N.J. 08003

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1. The first group of people who are interested in the study of the history of the United States are the people who are interested in the history of the United States.

.. multiplication 405 :

Umsatzsteuern: 1.000,00 €

Type Article 00370N

Conclusion

Field Sampling Method Number

Field Sample Time _____ minutes

[illegible]

7: vera

1. Must count at least 100 fibers or a minimum of 20 random fields.
2. Count only fibers having an aspect ratio of at least 3:1 and length of greater than 5 microns.
3. Longitude is left-to-right on filter. Latitude is in-and-out on filter.
4. Fibers counted under phase contrast optics.
5. This distribution is NOT on a wgt. basis.

Engineering & Testing Consultants

Job Name SEARS AUTOMOTIVE 1979 Rt. 70 • Cherry Hill, N.J. 08003

Job # 773

Job # 3025

Filter S/N 1125

Personal Sampler #

Date 2/2/77

Name by

Location

Filter Type Millipore

Checked by

FIBER MICRON SIZE DISTRIBUTION FROM AIR

Amplification 40x

Or. Magnification 1000x

Type Reticle Dotton

Operation

Field Sampling Method Phase Contrast Filter Field Sample Time minutes

Field No.	L t.	L o. p.	CATEGORIES OF LENGTHS						Remarks
			$\leq 5 \mu$	$>5-10 \mu$	$>10-20 \mu$	$>20-50 \mu$	$>50-100 \mu$	$>100 \mu$	
1			There were no visible fibers in this section of sample of machined field.						
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← Fibers →

1. Must count at least 100 fibers or a minimum of 20 random fields.
2. Count only fibers having an aspect ratio of at least 3:1 and a length of greater than 5 microns.
3. Longitude is left-to-right on filter. Latitude is in-and-out on filter.
4. Fibers counted under phase contrast optics.
5. This distribution IS NOT on a wgt. basis.

FRA-130-4

Page 149

Total Fields Counted
Total Fibers Counted

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1299 St. 70 • Cherry Hill, N.J. 08003

250 ARIZONA AVE., N.E.
ATLANTA, GA. 30307
(404) 377-4545

FIBER SUMMARY & CALCULATION SHEET

Lab Report # 783 Date 1/31/77
Test Report # 2075 Made by W
Customer Name Sargis Checked by CAM
Address _____

Personal Sampler # P5-7 Filter S/N 187

Operation _____

Type of Fiber Asbestos

If more than one Form 130 is used for a given filter, then the total counts are tabulated below:

	CATEGORIES OF LENGTHS					
	$\leq 5 \mu$	$> 5-10 \mu$	$> 10-20 \mu$	$> 20-50 \mu$	$> 50-100 \mu$	$> 100 \mu$
Totals		2	1			
Percent		66.6	33.3			

Total Fibers Counted 3

Average Net Fiber Count = $\frac{\text{Fiber Count}}{\text{No. Fields Counted}} = \frac{3}{23} = 0.13$ based on 23 fields counted

Sampling Rate: 1.8 liters/min.

Sampling Time: 253 minutes

Sampling Volume = Rate x Time = $1.8 \times 253 = 455.4$ liters

Avg. Net Fiber Count = $0.13 \times 455.4 = 59.2$
Fiber Concentration = $\frac{\text{Count}}{\text{Vol. Sampled}} = \frac{59.2}{455.4} = 0.13$ fibers/ml

REMARKS:

Do not count as fibers

Form #RA-211B

August 11, 77

LOCATION

DATE 1-27-77

EVENTS LOG

TIME	EVENT
8:10 AM	Arrived at Sears Service Center
8:20	Met Mr. Smuts and discussed testing
8:30	Started in work area
8:46	Set up PS-2 filter 183 on Paul Marrone 1.5 lpm
8:50	Set up PS-9 filter 184 on Dilworth Shadden 1.5 lpm
8:55	Set up PS-1 filter 185 on Charles Spigner 1.5 lpm
9:15	checked PS-2 OK 1.5 lpm
9:17	checked PS-9 OK 1.5 lpm
9:21	checked PS-1 OK 1.5 lpm
9:30	PS-2 slowing down, stopped to switch to PS-7
10:05	Started PS-7 on Paul M. 1.5 lpm
10:06	PS-9 and PS-1 OK 1.5 lpm
11:10	Stopped PS-7 on Paul M. from 1.5 lpm (1.1 lb)
11:13	started PS-7 on Paul M. for 15 min ceiling Filter 186
11:18	checked PS-9 and PS-1 OK 1.5 lpm (Removing shoes and brushing cleanup plate)
11:28	Stopped PS-7 from 1.5 lpm
11:31	Started PS-7 filter 187 1.5 lpm
11:45	Stopped PS-9 from 1.5 lpm for lunch
12:05	Stopped PS-1 from 1.5 lpm for lunch
12:13	Stopped PS-7 from 1.5 lpm for lunch
1:15	started PS-9 after lunch with 1.5 lpm on Charles
1:23	started PS-1 with 184 on Dilworth 1.5
1:42	Started PS-7 with 187 on Paul

VISITORS LOG

Ler. Smuts
 Eric Flynn
 Tom O'Reilly
 Mr. Richardson
 Bob Fleming

ROSSNAGEL & ASSOCIATE

Southeastern Division
 250 ARIZONA AVE., N.E.
 ATLANTA, GA. 30307
 (404) 377-4248

Engineering & Testing Consultants
 1999 RT. 70

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000849

Name

LOCATION

DATE 1-27-77

EVENTS LOG

TIME	EVENT
1:50	Checked all three samplers 1:50 pm OK
2:15	Mr. Smiths left for the day
2:25	Checked all three samplers 1:50 pm OK
3:05	checked all three samplers 1:50 pm OK
3:30	checked all three samplers 1:50 pm OK
4:00	checked all three samplers 1:50 pm OK
4:35	checked all three samplers 1:50 pm OK
4:47	PS 9 stopped on its way to PS 2
4:50	PS 2 started 2:15 pm
5:10	PS-1 with filter #84 stopped from 1:50 pm - Silworth leaving to wash up
5:15	PS-2 with filter #183 stopped from 1:50 pm - Shirley leaving to wash up
5:23	PS-7 with filter #187 stopped from 1:50 pm - Paul leaving to wash up
5:30	Everything packed up - checked in at office to report and left for home

VISITORS LOG

Southeastern Division
250 ARIZONA AVE., N.E.
ATLANTA, GA. 30307
(404) 377-4248

ROSSNAGEL & ASSOCIATE

Engineering & Testing Consultants
1977 27. 70
CHERRY HILL, N. J. 08003

#2A-28A

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MAR

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APPENDIX

Paper entitled, "O.S.H.A. Fiber & Mineral Dust Tests"