FILE NAME: Asbestos in Hair Dryers (HD)

DATE: 0000

DOC#: HD064

DOCUMENT DESCRIPTION: Test Results - Hairdryers - Asbestos Released & Asbestiform Structure and Data

1/2/2023 3:07:01 PM MTN
CTIO - 11.0 1-22"

HAIRDRYERS - ASBESTOS DISCHARGED

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR SAMPLE FIELDS COUNTED	COLLECTION MEDIA	TIME INTERVAL	STRUCTURES INTRODUCED INTO ENVIRONMENT	MASS INTRODUCED INTO ENVIRONMENT,
25-1 GENERAL ELECTRIC CONTAINS ASBESTOS	OLD	SEM 1500X	0	20	WATER	1 MIN 15 MIN 120 MIN	0.0 0.0 0.0	0.0 0.0 0.0
20 MINUTES 30 on/30 off		TEM BUNDLES 48000X	16	15	WATER	1 MIN 15 MIN 120 MIN	2.75×10^{3} 4.12×10^{4} 3.30×10^{5}	5.58×10^{-2} 8.37×10^{-1} 6.70×10^{0}
		TEM FIBRILS 48000X	30	15	WATER	1 MIN 15 MIN 120 MIN	5.16×10^{3} 7.73×10^{4} 6.19×10^{5}	7.73×10^{-3} 1.16×10^{-1} 9.28×10^{-1}
		TEM CLUMPS 48000X	7	15		1 MIN 15 MIN 120 MIN	1.20×10^{3} 1.80×10^{4} 1.44×10^{5}	2 22.31×10^{-7} g

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA *

AIRDRYER DENTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
#25-1 GENERAL ELECTRIC CONTAINS ASBESTOS	OLD	SEM 2500X	-	-	-	-	-
120 MINUTES 30 on/30 off		TEM BUNDLES 48000X	0.0312-0.1976	0.3536-3.0160	0.0826	1.4885	2.03×10^{-5}
		TEM FIBRILS 48000X	0.0104-0.0437	0.1040-11.6480	0.0238	1.3225	1.50×10^{-6}
		TEM CLUMPS 48000X	0.4166-4.7909		1.9491	2	mean v - 5,964 + [illegible] mean m - 15.51×10^{-12} g

* = All dimensions are in MICROMETERS

Fibrils (um)

0.0156	***
0.2350	***
0.0437	***
11.5450	***
0.0437	***
6.6560	***
0.0437	***
4.1660	***
0.0312	***
0.1456	***
0.0200	***
0.1375	***
0.0200	***
0.1040	***
0.0140	***
0.7250	***
0.0104	***
0.0240	***
0.0156	***
0.0200	***
0.0156	***
0.0200	***
0.0166	***
1.2650	***
0.0200	***
0.1672	***
0.0200	***
0.0320	***
0.0235	***
0.7994	***
0.0250	***
0.7564	***
0.0250	***
1.5640	***
0.0125	***
1.2490	***
0.0200	***
0.7200	***
0.0200	***
0.2200	***
0.0125	***
0.3120	***
0.0187	***
0.3320	***
0.0200	***
0.2564	***
0.0156	***
0.0250	***
0.0416	***
0.5120	***
0.0274	***
0.5230	***
0.0274	***
0.2330	***
0.0336	***
0.5200	***
0.0250	***
0.1672	***
0.0250	***
0.3025	***

30

0.0437	***
0.1640	***
11.6480	***
0.0236	***
1.3225	***
0.0635	***
2.3672	***
1.4973536435e-05	***

1.7650	***
0.0232	***
0.0200	***
0.0320	***
0.0240	***
0.0324	***
0.0250	***
0.0312	***
1.2490	***
0.0416	***
2.4960	***
0.1040	***
0.0744	***
0.0416	***
0.0160	***
0.0720	***
0.0720	***
0.0252	***
2.7040	***
0.0321	***
2.4960	***
0.0232	***
0.7500	***
0.0750	***
2.0160	***
0.1045	***
0.0320	***
0.1456	***
2.4960	***
0.0232	***
1.2500	***
0.0312	***
0.1575	***
0.0235	***
3.9160	***
0.0312	***
1.4992	***
0.0400	***
0.1232	***
2.0314827027e-05	***

16

Clumps (um)

0.7100	***
1.7100	***
2.0020	***
0.1612	***
1.4100	***
2.0312	***
1.4992	***

7

MAIN • M.D. 21401

HAIRDRYERS - ASBESTOS DISCHARGED

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR FIELDS COUNTED	SAMPLE COLLECTION MEDIA	TIME INTERVAL	STRUCTURES INTRODUCED INTO ENVIRONMENT	MASS INTRODUCED INTO ENVIRONMENT
#13 GENERAL ELECTRIC	NEW	SEM 1500X	1	20	WATER	1 MIN 15 MIN 120 MIN	2.12×10^2 3.18×10^3 2.54×10^4	4.08×10^3 6.12×10^4 4.89×10^5
CONTAINS ASBESTOS 120 MINUTES CONTINUOUS		TEM BUNDLES 48000X	21	15	WATER	1 MIN 15 MIN 120 MIN	3.23×10^3 4.84×10^4 3.88×10^5	$7.33 \times 10^-$ 1.10×10 8.80×10
		TEM FIBRILS 48000X	63	15	WATER	1 MIN 15 MIN 120 MIN	9.69×10^3 1.45×10^5 1.16×10^6	$5.43 \times 10^-$ $8.14 \times 10^-$ $6.51 \times 10^-$
		TEM CLUMPS 48000X	29	15		1 MIN 15 MIN 120 MIN	4.46×10^3 6.69×10^4 5.35×10^5	

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA *

AIRDRYER DENTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
#13 GENERAL ELECTRIC CONTAINS ASBESTOS	NEW	SEM 2500X			10.0	94.0	1.92×10^{1}
120 MINUTES CONTINUOUS		TEM BUNDLES 48000X	0.0416-0.4160	0.2496-6.6560	0.0852	1.5590	2.27×10^{-5}
		TEM FIBRILS 48000X	0.0125-0.0416	0.1456-1.6640	0.0240	0.4840	5.60×10^{-7}
		TEM CLUMPS 48000X	0.3749-9.9984		1.5860		

* = All dimensions are in MICROMETERS

Fibrils(um)

0.2289 ***
2.1972 ***
3.2283 ***
1.8322 ***
2.2283 ***
2.1554 ***
0.2374 ***
0.4162 ***
3.2253 ***
1.5642 ***
3.2298 ***
2.8322 ***
0.6312 ***
2.3358 ***
0.9289 ***
3.2253 ***
2.8374 ***
0.3120 ***
2.2238 ***
1.4558 ***
2.2236 ***
2.8240 ***
0.3374 ***
2.2435 ***
2.2155 ***
0.2120 ***
0.2312 ***
2.5288 ***
2.2233 ***
1.2483 ***
2.2166 ***
0.7122 ***
2.2416 ***
0.4152 ***
2.2289 ***
2.4165 ***
2.2238 ***
0.2455 ***
0.2228 ***
1.2483 ***
2.2416 ***
2.5272 ***
2.2416 ***
2.5288 ***
2.2416 ***
2.2240 ***
2.2226 ***
0.2222 ***
2.2165 ***
2.2455 ***
2.0125 ***
2.2455 ***
2.2228 ***
2.2282 ***
2.2146 ***
2.1272 ***
2.6155 ***
2.1664 ***
2.2222 ***
2.8242 ***

63

2.2288 ***
2.2784 ***
2.2223 ***
2.2222 ***
2.2166 ***
1.2212 ***
2.2145 ***
3.2232 ***
2.3222 ***
2.7224 ***
0.2155 ***
0.4158 ***
2.2274 ***
2.2232 ***
2.2274 ***
0.3744 ***
2.2416 ***
2.4158 ***
2.3655 ***
1.4562 ***
2.2155 ***
2.5242 ***
2.2155 ***
2.2228 ***
2.2205 ***
2.2253 ***
2.2288 ***
2.2253 ***
2.2229 ***
2.2455 ***
2.2166 ***
2.7122 ***
2.2205 ***
2.1654 ***
2.2229 ***
2.2228 ***
3.2226 ***
2.2435 ***
2.2416 ***
2.2255 ***
2.2229 ***
0.2253 ***
2.2222 ***
2.7250 ***
2.2272 ***
1.2433 ***
2.2272 ***
2.2128 ***
2.2225 ***
2.1272 ***
2.2256 ***
2.7226 ***
2.2222 ***
1.2442 ***
2.2226 ***
2.4122 ***
0.2252 ***
2.1272 ***
2.2278 ***
2.5228 ***
2.7374 ***
2.2250 ***

0.2125 ***
2.2416 ***
0.1456 ***
1.5542 ***
0.2146 ***
2.4242 ***
9.2033 ***
2.3703 ***
5.00002121E-27 ***

0.1332 ***
3.5760 ***
0.2416 ***
3.5360 ***
0.0024 ***
0.9360 ***
0.3416 ***
0.6112 ***
0.0728 ***
0.6240 ***
0.0416 ***
1.1440 ***
0.2080 ***
1.1440 ***
0.1040 ***
0.8320 ***
0.0416 ***
3.2230 ***
0.0416 ***
2.4960 ***
0.0416 ***
0.3744 ***
0.0416 ***
1.7680 ***
0.1040 ***
0.5200 ***
0.0416 ***
0.2496 ***
0.4160 ***
0.2560 ***
0.0416 ***
1.0400 ***
0.0728 ***
1.3520 ***
0.0416 ***
0.5200 ***
0.1144 ***
0.7280 ***
0.0416 ***
0.4160 ***
0.0416 ***
0.7280 ***

21

0.0416 ***

0.4160 ***

0.2496 ***

5.6560 ***

0.0832 ***

1.5590 ***

0.0832 ***

1.5025 ***

2.[illegible] ***

Clumps (um)

29

0.3332 ***
1.3747 ***
2.4160 ***
0.1456 ***
-0.4160 ***
-0.3745 ***
0.3332 ***
0.3332 ***
0.4160 ***
1.3747 ***
0.6242 ***
-0.3745 ***
1.4561 ***
1.2493 ***
0.4160 ***
0.3745 ***
1.2493 ***
0.5200 ***
0.8332 ***
0.6242 ***
0.5200 ***
0.3332 ***
0.3536 ***
3.3323 ***
2.4160 ***
0.4160 ***
0.4160 ***
0.3324 ***
1.0410 ***

HAIRDRYERS - ASBESTOS DISCHARGED

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR FIELDS COUNTED	SAMPLE COLLECTION MEDIA	TIME INTERVAL	STRUCTURES INTRODUCED INTO ENVIRONMENT	MASS INTRODUCED ENVIRONMENT
#13-1 GENERAL ELECTRIC CONTAINS ASBESTOS	NEW	SEM 1500X	NO SAMPLE TAKEN			1 MIN 15 MIN 120 MIN		
180 MINUTES 30 ON/30 OFF		TEM BUNDLES 48000X	10	15	AIR	1 MIN 15 MIN 120 MIN	1.33×10^4 1.99×10^5 1.49×10^6	2.13×10^1 3.19×10^2 2.55×10^3
		TEM FIBRILS 48000X	11	15	AIR	1 MIN 15 MIN 120 MIN	1.46×10^4 2.19×10^5 1.75×10^6	$1.94 \times 10^-$ $2.92 \times 10^-$ 2.33×10
		TEM CLUMPS 48000X	4	15	AIR	1 MIN 15 MIN 120 MIN	5.32×10^3 7.97×10^4 6.38×10^5	

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA *

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
#13-1 GENERAL ELECTRIC CONTAINS ASBESTOS	NEW	SEM 2500X	NO SAMPLE TAKEN				
100 MINUTES 30 ON/30 OFF		TEM BUNDLES 48000X	0.0416-1.0400	0.3120-26.6240	0.3110	9.1328	1.60×10^{-3}
		TEM FIBRILS 48000X	0.0166-0.0624	0.2080-2.0800	0.0308	0.6977	1.33×10^{-6}
		TEM CLUMPS 48000X	1.5623-4.9992		2.7079		

* = All dimensions are in MICROMETERS

fibrils in μm

15 grid openings

~~#13A~~

B-1

0.0205 ###
0.4150 ###
0.0712 ###
0.0300 ###
0.0416 ###
1.7500 ###
0.0166 ###
0.7120 ###
0.0208 ###
0.2090 ###
0.0550 ###
0.9726 ###
0.3624 ###
0.0750 ###
0.0208 ###
0.2526 ###
0.0208 ###
0.2500 ###
0.0312 ###
0.4166 ###
0.0208 ###
0.2500 ###

11

0.0166 ###

0.0624 ###

0.2090 ###

0.0350 ###

0.0708 ###

0.6977 ###

3.0151 ###

0.5500 ###

1.3275275E-05 m/s

bundles in μm

10

0.1452 ###
0.7226 ###
0.6240 ###
15.6400 ###
0.4158 ###
12.0540 ###
0.1672 ###
15.6240 ###
0.1672 ###
25.0240 ###
0.3120 ###
0.2250 ###
1.0410 ###
0.7240 ###
0.0624 ###
1.0760 ###
0.0416 ###
0.7250 ###
0.0625 ###
0.2100 ###

0.0416 ###

1.0408 ###

0.2166 ###

25.0240 ###

0.3110 ###

0.1330 ###

0.2127 ###

0.1552 ###

0.0916 ###

Clumps in μm

1.2552 ###
2.4220 ###
1.7715 ###
1.5527 ###

#28 SPACE-CTR
HOUSTON, TEXAS

HAIRDRYERS - ASBESTOS DISCHARGED

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR FIELDS COUNTED	SAMPLE COLLECTION MEDIA	TIME INTERVAL	STRUCTURES INTRODUCED INTO ENVIRONMENT	MASS INTRODUCED I ENVIRONMENT,
-28 SEARS, ROEBUCK CONTAINS ASBEST S	OLD	SEM 1500X	NO SAMPLE	TAKEN		1 MIN 15 MIN 120 MIN		
120 MINUTES 30 ON/30 OFF		TEM BUNDLES 48000X	2	15	AIR	1 MIN 15 MIN 120 MIN	4.87×10^{3} 7.30×10^{4} 5.84×10^{5}	8.22×10^{-3} 1.23×10^{-1} 9.87×10^{-1}
		TEM FIBRILS 48000X	11	15	AIR	1 MIN 15 MIN 120 MIN	2.68×10^{4} 4.02×10^{5} 3.22×10^{6}	9.65×10^{-3} 1.45×10^{-1} 1.16×10^{0}
		TEM CLUMPS 48000X	2	15	AIR	1 MIN 15 MIN 120 MIN	4.87×10^{3} 7.30×10^{4} 5.84×10^{5}	

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA *

RDRYER NTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
8 SEARS, ROEBUCK ONTAINS ASBESTOS	OLD	SEM 2500X					
0 MINUTES 0 ON/30 OFF		TEM BUNDLES 48000X	0.0416-0.0624	0.3120-0.3120	0.0520	0.3120	1.69×10^{-6}
		TEM FIBRILS 48000X	0.0125-0.0312	0.1872-1.8720	0.0197	0.5124	3.60×10^{-7}
		TEM CLUMPS 48000X	1.6664-1.6664		1.6664		

* = All dimensions are in MICROMETERS

#28

bundles; um

2 Bundles

0.0415 ***
0.3125 ***
0.0524 ***
0.3125 ***

15 GRIDS

0.0416 ***
0.0524 ***
0.3125 ***
0.3125 ***
0.0520 ***
0.3125 ***
0.0147 ***
0.0709 ***
1.6354229354-05 ***

clumps um

1.5554 ***
1.5554 ***

3.3325 Total

fibrils um

11 FIBRILS

0.0125 ***
0.1672 ***
0.0209 ***
0.7324 ***
0.0145 ***
0.7009 ***
0.0259 ***
0.0720 ***
0.0208 ***
0.3125 ***
0.0155 ***
0.0030 ***
0.0145 ***
0.1672 ***
0.0312 ***
0.0208 ***
0.0125 ***
0.0030 ***
0.0155 ***
0.0160 ***
0.0156 ***
0.0009 ***
0.0125 ***
0.0312 ***
0.1072 ***
0.0720 ***
0.0157 ***
0.5124 ***
0.0054 ***
0.0011 ***
0.5555510472-07 ***

"22-1 SEARS OF
LOMIN-CON-A

HAIRDRYERS - ASBESTOS DISCHARGED

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR FIELDS COUNTED	SAMPLE COLLECTION MEDIA	TIME INTERVAL	STRUCTURES/ CUBIC CENTIMETER IN ENVIRONMENT	
28-1 SEARS, ROEBUCK CONTAINS ASBESTOS	OLD	SEM 1500X	NO SAMPLE	TAKEN		1 MIN 15 MIN 120 MIN		
80 MINUTES CONTINUOUS		TEM BUNDLES 48000X	0	15	AIR	120 MIN	0.0	
		TEM FIBRILS 48000X	5	15	AIR	120 MIN	0.0253	
		TEM CLUMPS 48000X	2	15	AIR	120 MIN	0.0101	

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA *

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
#28-1 SEARS, ROEBUCK CONTAINS ASBESTOS	OLD	SEM 2500X	NO SAMPLE TAKEN				
180 MINUTES CONTINUOUS		TEM BUNDLES 48000X	-	-	-	-	-
		TEM FIBRILS 48000X	0.0166-0.0416	0.6240-2.4960	0.0358	1.2272	3.15×10^{-6}
		TEM CLUMPS 48000X	1.2498-3.3328		2.2928		

* = All dimensions are in MICROMETERS

28-1 15 grids

fibrils (um)

3.0416 ***
0.6240 ***
0.0416 ***
1.0400 ***
0.0166 ***
1.3520 ***
6.0374 ***
0.6240 ***
3.0416 ***
2.4360 ***

0.0166 ***

0.0416 ***

0.6240 ***

2.4360 ***

0.0358 ***

1.2272 ***

0.0105 ***

0.7727 ***

3.145754527-05 ***

No Bundles

Clumps (um)

3.3328 ***
1.2496 ***

AM-01/95 01:00 I
ETC SRETS CCCC

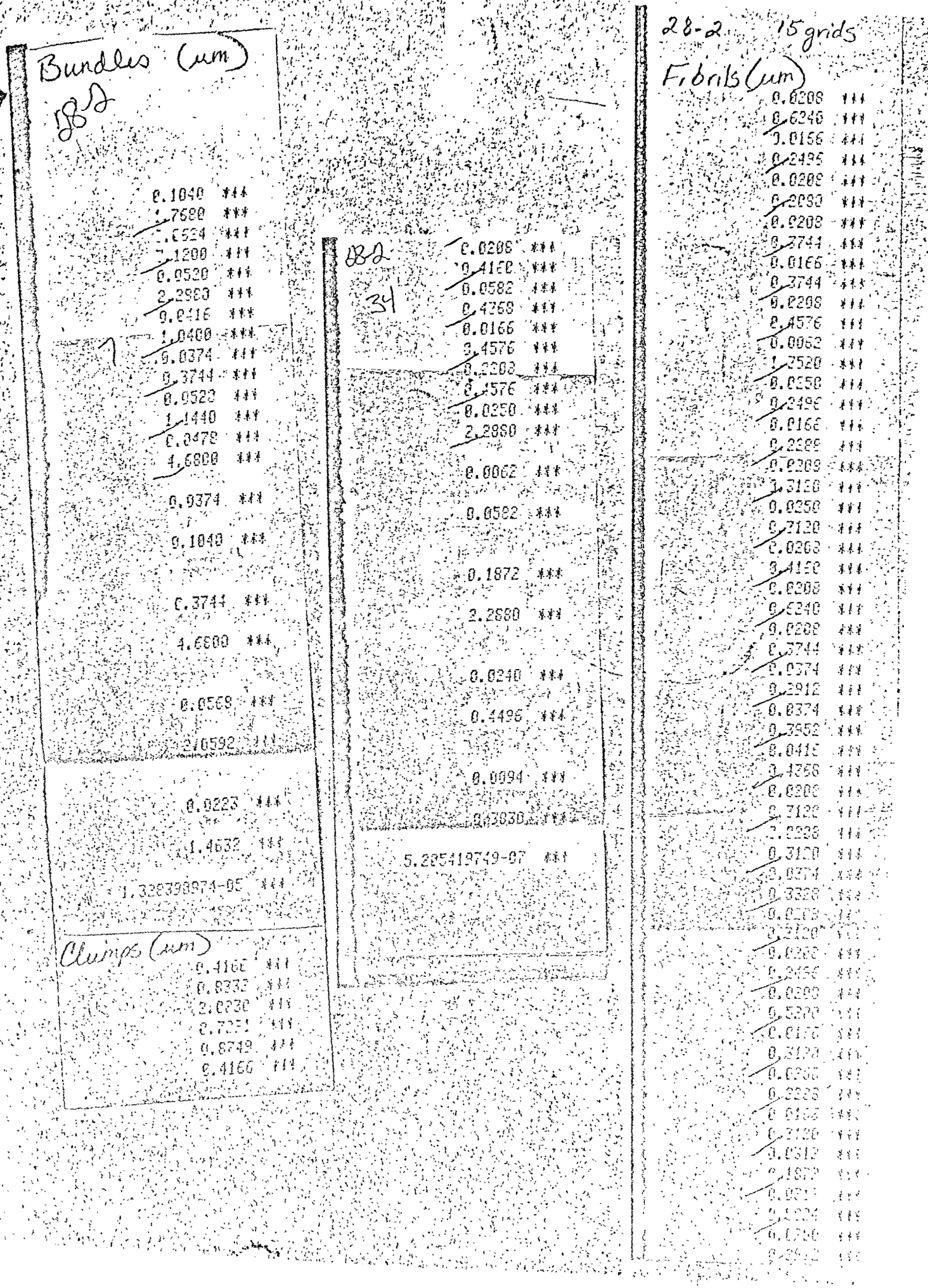
HAIRDRYERS - ASBESTOS DISCHARGED

IRDRYER ENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR FIELDS COUNTED	SAMPLE COLLECTION MEDIA	TIME INTERVAL	STRUCTURES INTRODUCED INTO ENVIRONMENT	MASS INTRODUCED INT ENVIRONMENT, r
8-2 SEARS, ROEBUCK NTAINS SBESTOS	OLD	SEM 1500X	0	20	WATER	1 MIN 15 MIN 120 MIN	0.0 0.0 0.0	0.0 0.0 0.0
0 MINUTES 0 ON/30 OFF		TEM BUNDLES 48000X	7	15	WATER	1 MIN 15 MIN 120 MIN	1.07×10^{3} 1.61×10^{4} 1.28×10^{5}	1.42×10^{-2} 2.14×10^{-1} 1.70×10^{0}
		TEM FIBRILS 48000X	34	15	WATER	1 MIN 15 MIN 120 MIN	5.20×10^{3} 7.80×10^{4} 6.24×10^{5}	2.71×10^{-3} 4.06×10^{-2} 3.25×10^{-1}
		TEM CLUMPS 48000X	6	15	WATER	1 MIN 15 MIN 120 MIN	9.18×10^{2} 1.38×10^{4} 1.10×10^{5}	

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA *

AIRDRYER DENTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
428-2 SEARS, ROEBUCK CONTAINS ASTESTOS	OLD	SEM 2500X	-	-	-	-	-
120 MINUTES 30 ON/30 OFF		TEM BUNDLES 48000X	0.0374 - 0.1040	0.3744- 4.6800	0.0568	2.0592	1.33×10^{-5}
		TEM FIBRILS 48000X	0.0062- 0.0582	0.1872- 2.2880	0.0240	0.4496	5.21×10^{-7}
		TEM CLUMPS 48000X	0.4160- 2.0830		0.8922		

* = All dimensions are in MICROMETERS



Bundles (um)

882

0.1040 ***
.7680 ***
.0624 ***
.1200 ***
0.0520 ***
2.2960 ***
0.0416 ***
1.0400 ***
0.0374 ***
0.3744 ***
0.0520 ***
1.1440 ***
0.0478 ***
4.6800 ***

0.0374 ***

0.1040 ***

0.3744 ***

4.6800 ***

0.0568 ***

2.0592 ***

0.0223 ***

1.4632 ***

1.328398974-05 ***

Clumps (um)

0.4166 ***
0.8332 ***
2.0830 ***
2.7291 ***
0.8749 ***
0.4166 ***

882
34

0.0208 ***
0.4160 ***
0.0582 ***
0.4368 ***
0.0166 ***
3.4576 ***
0.0208 ***
3.4576 ***
0.0250 ***
2.2880 ***

0.0062 ***

0.0582 ***

0.1872 ***

2.2880 ***

0.0240 ***

0.4496 ***

0.0094 ***

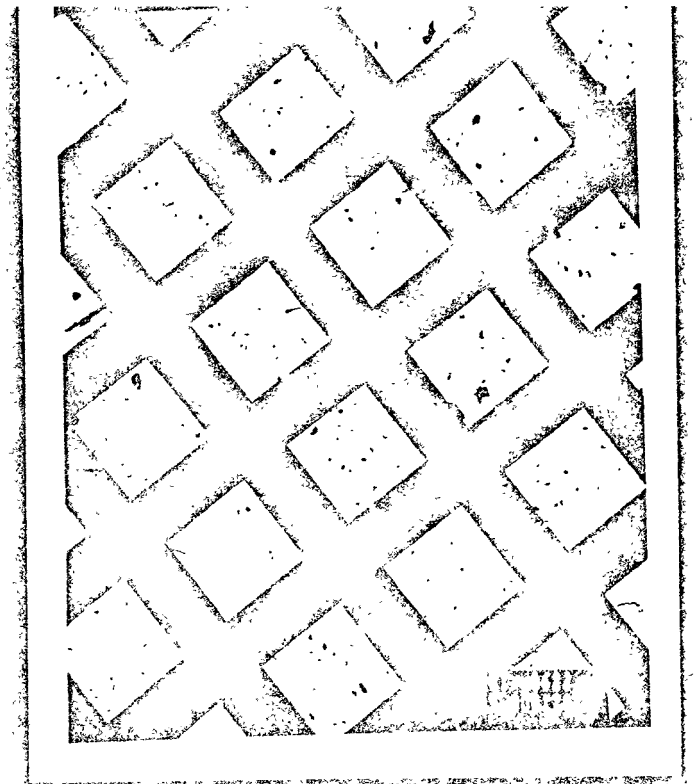
0.003830 ***

5.285419749-07 ***

28-2 15 grids

Fibrils (um)

0.0208 ***
0.6240 ***
0.0166 ***
0.2496 ***
0.0208 ***
0.2080 ***
0.0208 ***
0.3744 ***
0.0166 ***
0.3744 ***
0.0208 ***
0.4576 ***
0.0062 ***
1.2520 ***
0.0250 ***
0.2496 ***
0.0166 ***
0.2288 ***
0.0208 ***
0.3120 ***
0.0250 ***
0.2120 ***
0.0208 ***
0.4160 ***
0.0208 ***
0.0240 ***
0.0208 ***
0.3744 ***
0.0374 ***
0.2912 ***
0.0374 ***
0.3952 ***
0.0416 ***
0.4368 ***
0.0208 ***
0.3120 ***
0.0208 ***
0.3120 ***
0.0374 ***
0.3328 ***
0.0208 ***
0.3120 ***
0.0208 ***
0.2496 ***
0.0208 ***
0.5200 ***
0.0166 ***
0.3120 ***
0.0208 ***
0.3328 ***
0.0166 ***
0.3120 ***
0.0312 ***
0.1872 ***
0.021 ***
0.1248 ***
0.1248 ***
0.2912 ***



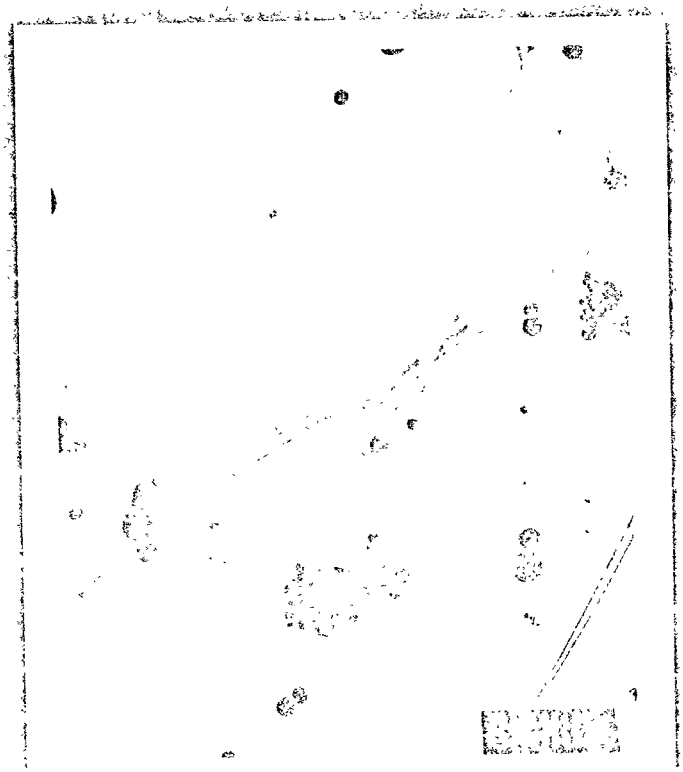
#25 GENERAL ELECTRIC - OLD

TEM 622X TYPICAL GRID PATTERN



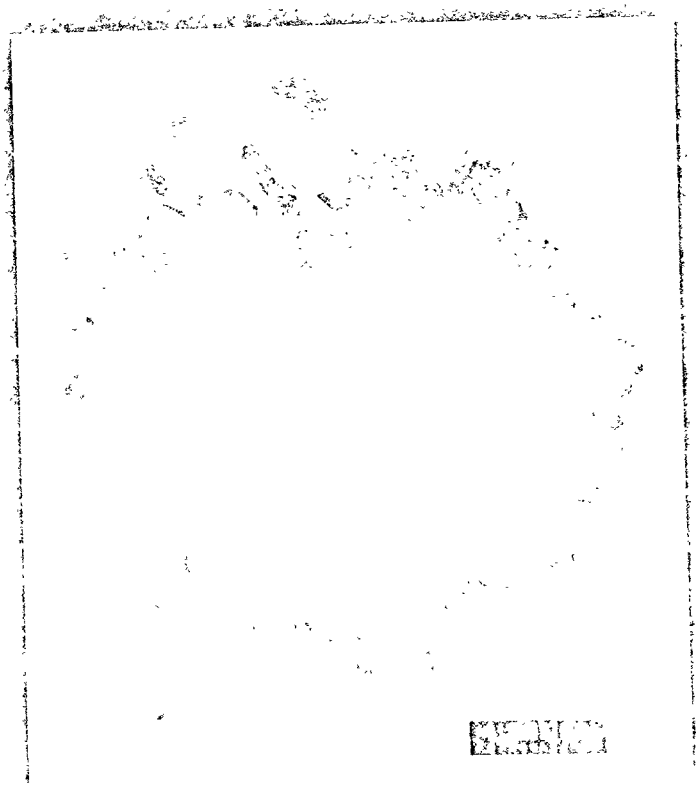
#13 GENERAL ELECTRIC - NEW

TEM 17000X TYPICAL BUNDLE



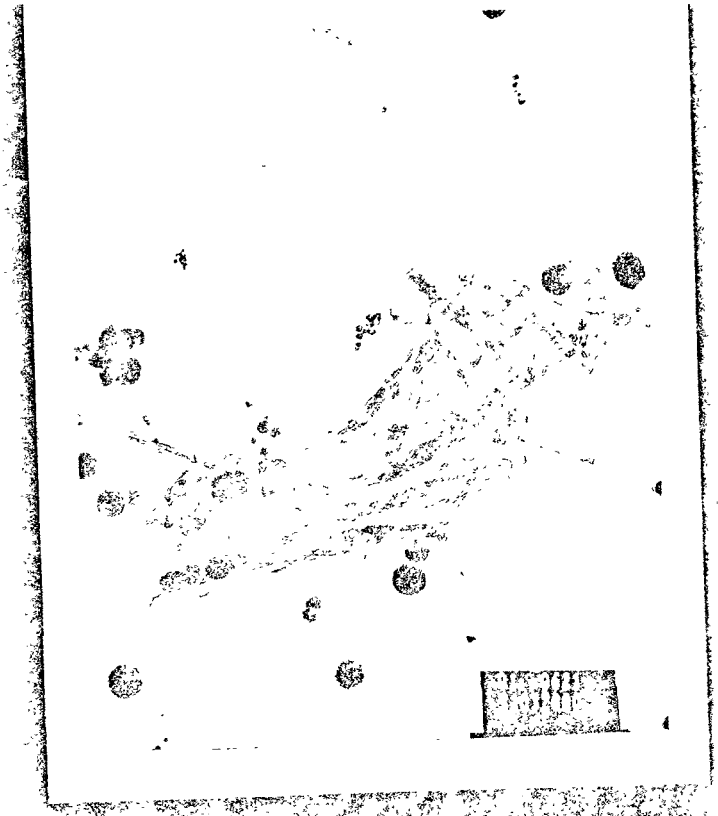
#25 GENERAL ELECTRIC - OLD

TEM 28000X TYPICAL FIBRIL



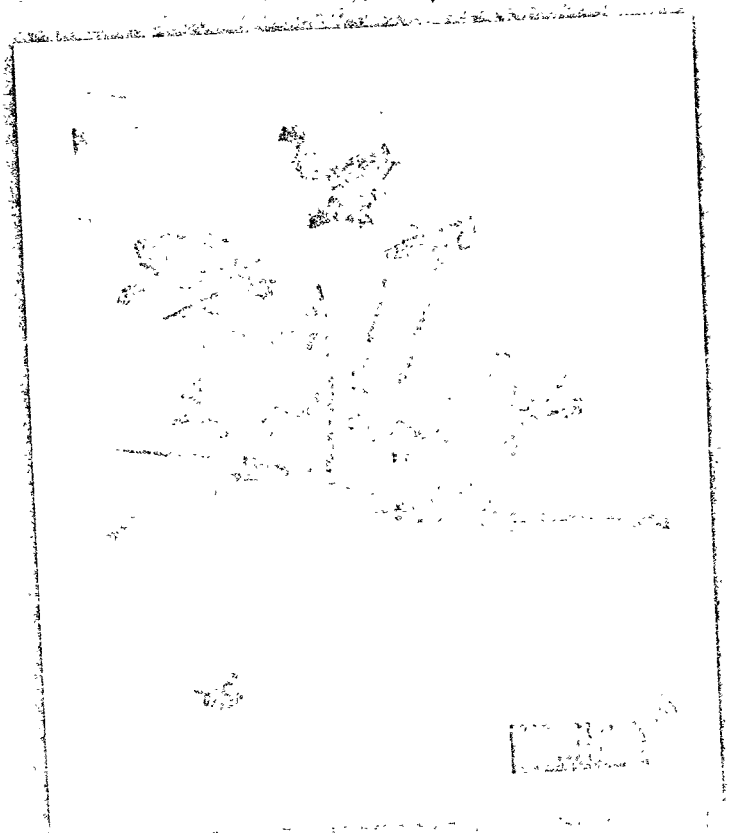
#25 GENERAL ELECTRIC - OLD

TEM 37000X TYPICAL CLUMP FIBRILS PROFILES



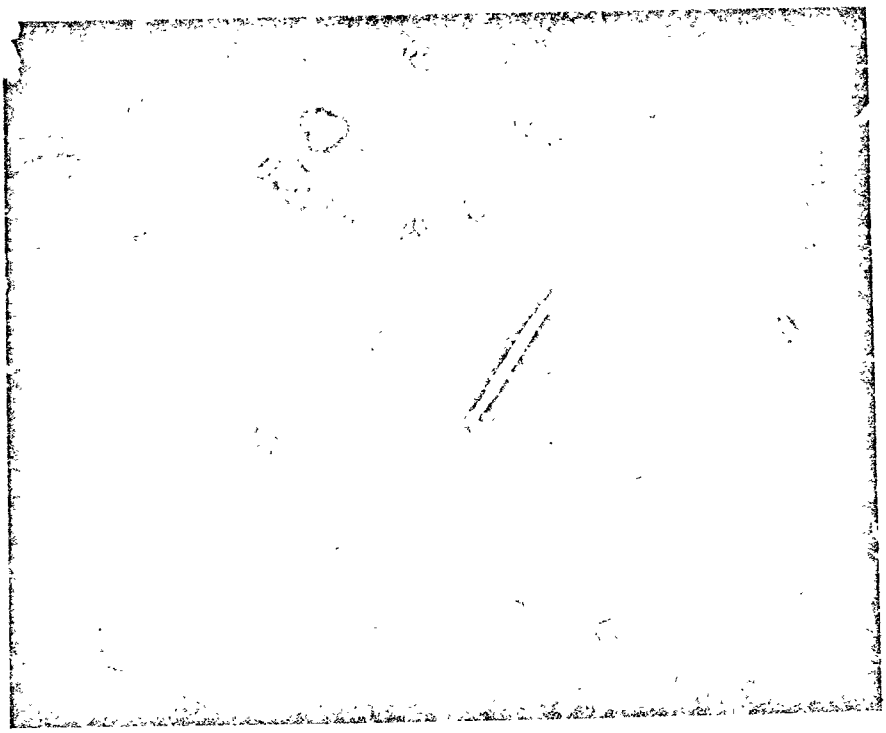
#25 GENERAL ELECTRIC - OLD

TEM 37000X TYPICAL CLUMP



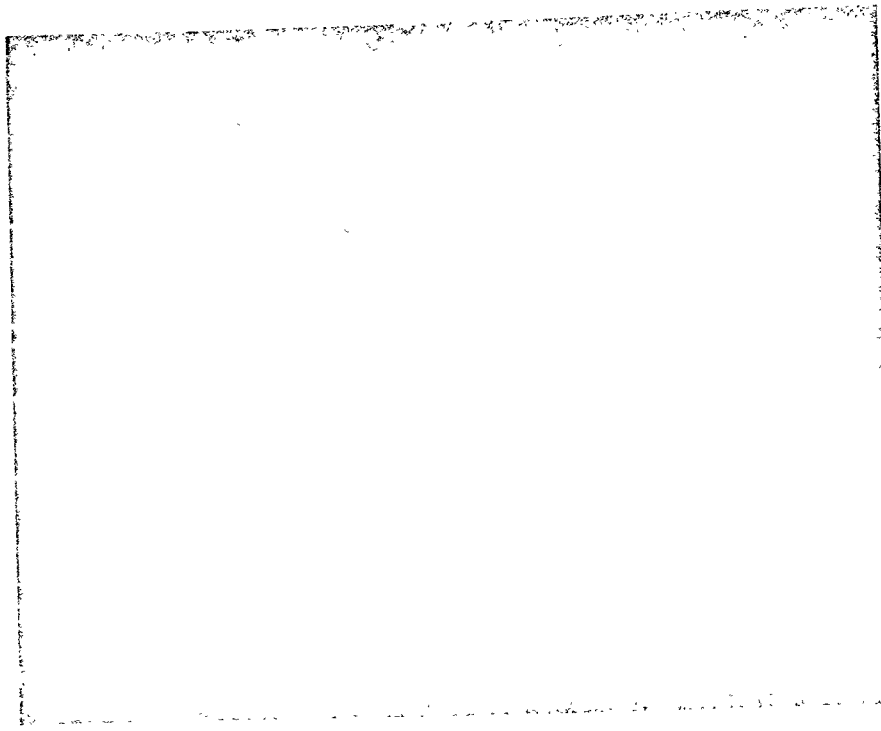
#13 GENERAL ELECTRIC - NEW

TEM 17000X TYPICAL CLUMP



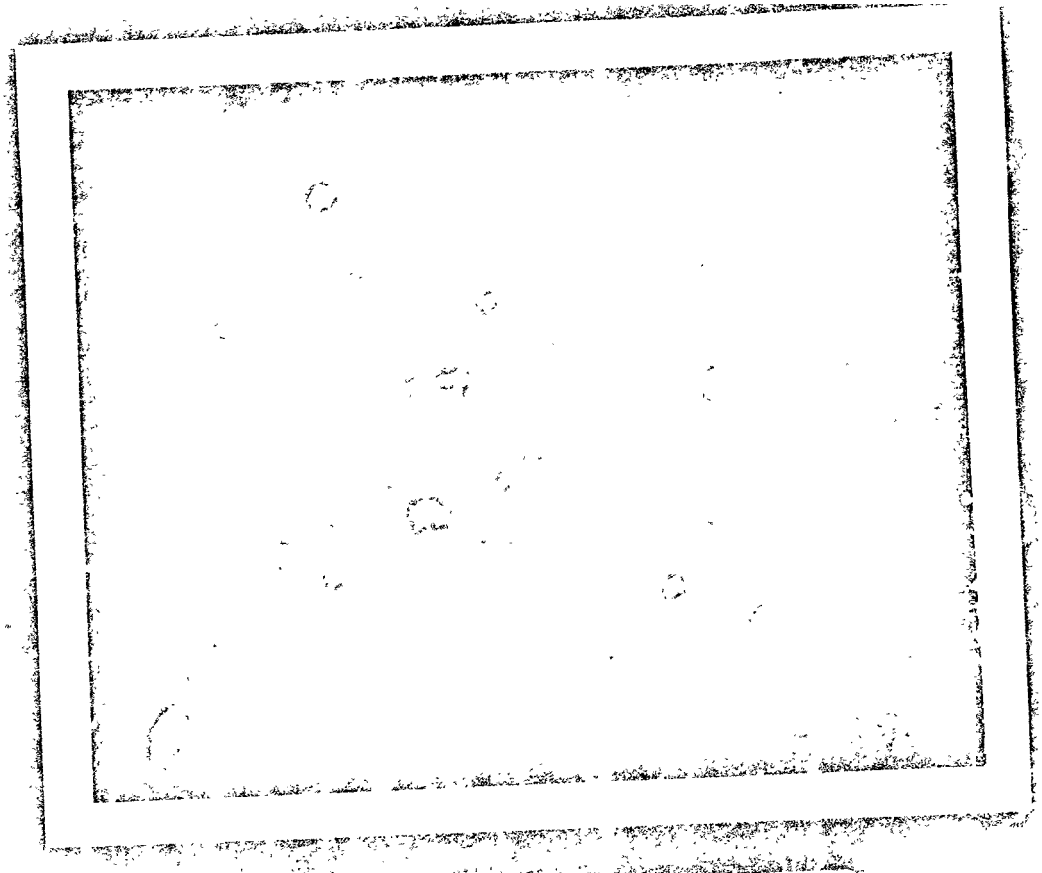
#25 GENERAL ELECTRIC - OLD

SEM 1000X

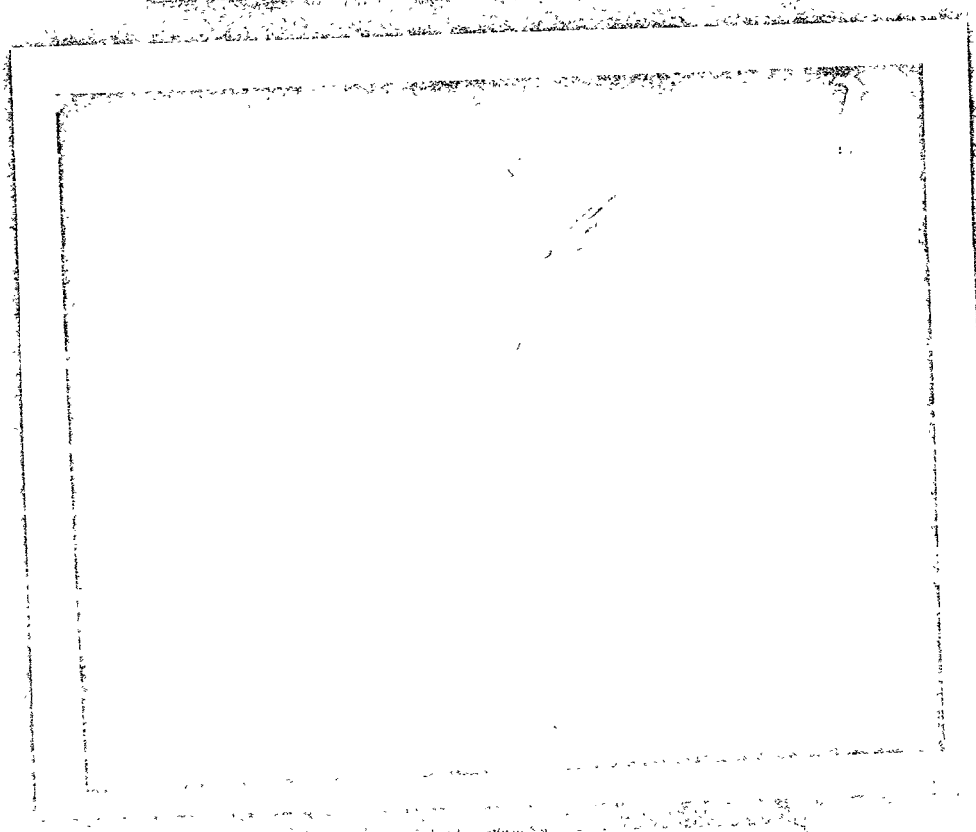


#26 CLAIROL

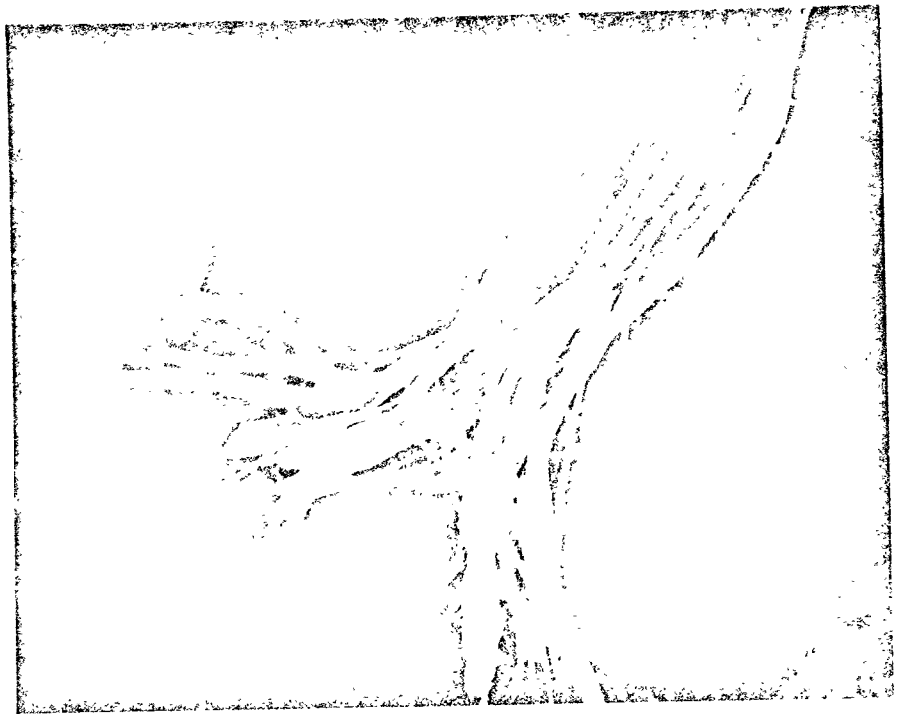
SEM 1000X



#25-1 GENERAL ELECTRIC
OLD
SEM 1000X

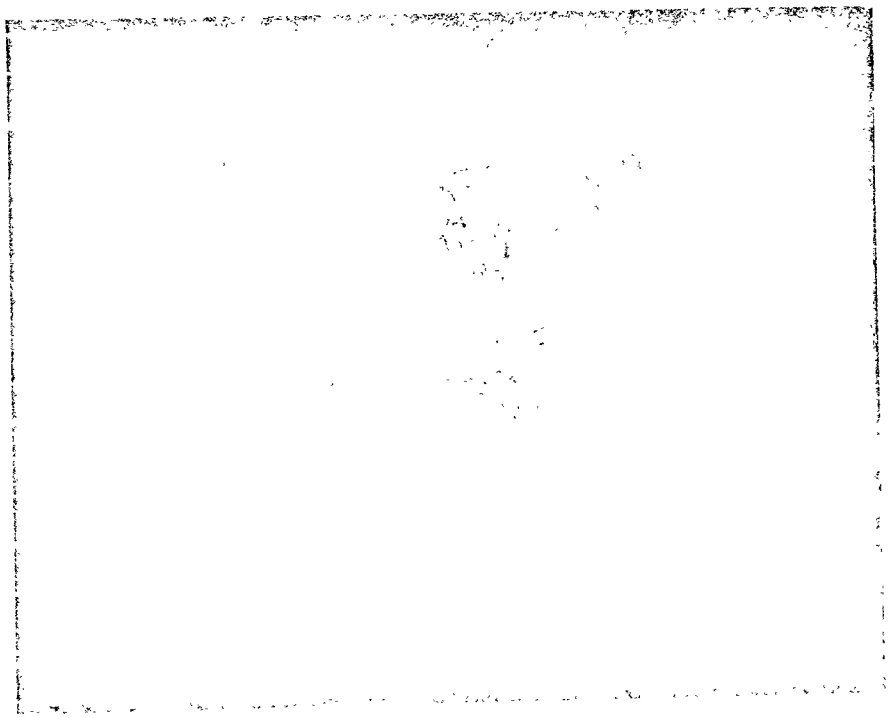


#25-1 GENERAL ELECTRIC
OLD
SEM 100X



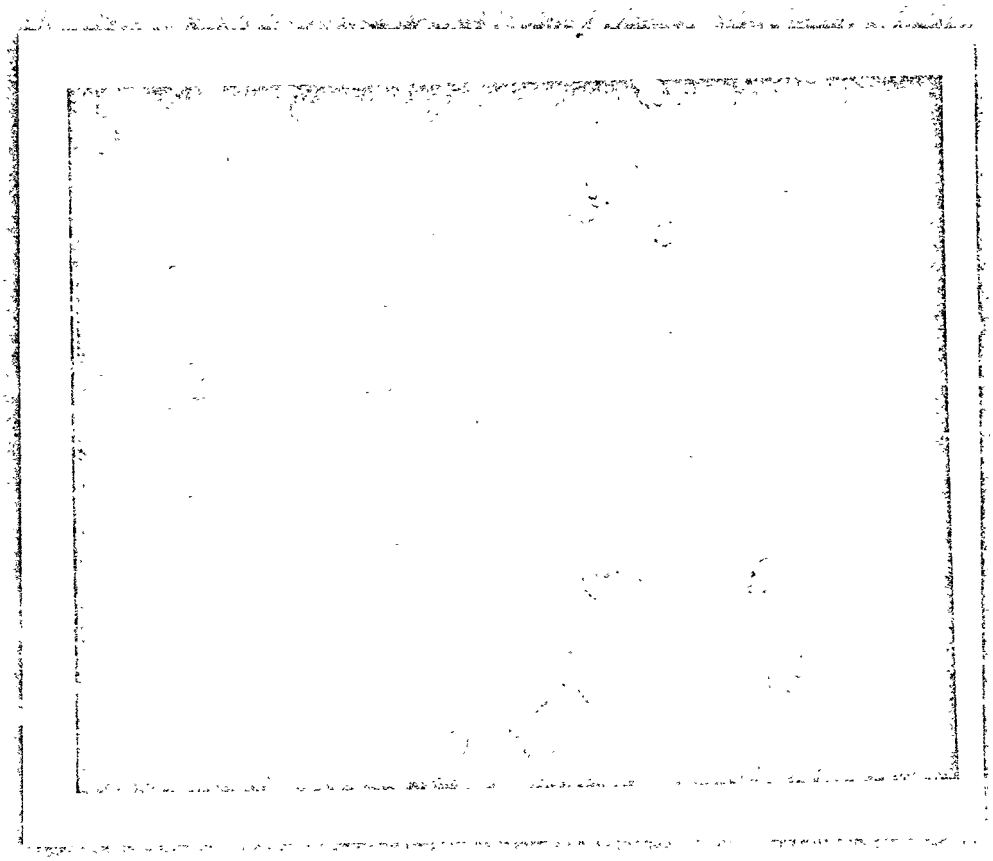
#13 GENERAL ELECTRIC - NEW

SEM 1500X



#13 GENERAL ELECTRIC - NEW

SEM 500X



#28-2 SEARS, ROEBUCK
OLD
SEM 1000X

#76 CLAIROL
LUMIN-CON-W

HAIRDRYERS - ASBESTOS DISCHARGED

HAIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR FIELDS COUNTED	SAMPLE COLLECTION MEDIA	TIME INTERVAL	STRUCTURES INTRODUCED INTO ENVIRONMENT	MASS INTRODUCED INTO ENVIRONMENT, n
26 CONTROL ON-ASBESTOS BLANK CONTROL	NEW	SEM 1500X	0	20	WATER	1 MIN 15 MIN 120 MIN	0.0 0.0 0.0	0.0 0.0 0.0
20 MINUTES CONTINUOUS		TEM BUNDLES 48000X	3	15	WATER	1 MIN 15 MIN 120 MIN	5.11×10^2 7.67×10^3 6.14×10^4	1.20×10^{-3} 1.80×10^{-2} 1.44×10^{-1}
		TEM FIBRILS 48000X	24	15	WATER	1 MIN 15 MIN 120 MIN	4.09×10^3 6.14×10^4 4.91×10^5	3.46×10^{-3} 5.18×10^{-2} 4.15×10^{-1}
		TEM CLUMPS 48000X	1	15	WATER	1 MIN 15 MIN 120 MIN	1.70×10^2 2.56×10^3 2.05×10^4	

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA *

IRDRYER ENTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
26 CLAIROL ON-ASBESTOS BLANK CONTROL	NEW	SEM 2500X	-	-	-	-	-
20 MINUTES CONTINUOUS		TEM BUNDLES 48000X	0.0416-0.0624	0.3120-0.4160	0.0555	0.3813	2.35×10^{-6}
		TEM FIBRILS 48000X	0.0166-0.0416	0.1456-9.1520	0.0221	0.8641	8.45×10^{-7}
		TEM CLUMPS 48000X			2.9162		

* = All dimensions are in MICROMETERS

#26 15 grid openings

fibrils (μm)

0.0223 ***
0.4163 ***
0.0166 ***
0.2090 ***
0.0165 ***
0.3336 ***
0.0416 ***
0.4163 ***
0.0166 ***
1.0430 ***
0.0416 ***
0.3128 ***
0.0208 ***
0.2262 ***
0.0208 ***
0.1456 ***
0.0208 ***
0.2289 ***
0.0166 ***
0.1872 ***
0.0209 ***
0.2496 ***
0.0208 ***
0.2704 ***
0.0208 ***
0.2496 ***
0.0165 ***
0.5328 ***
0.0166 ***
1.1443 ***
0.0312 ***
0.2288 ***
0.0165 ***
0.7282 ***
0.0208 ***
0.4160 ***
0.0166 ***
0.2704 ***
0.0208 ***
5.2520 ***
0.0374 ***
0.7840 ***
0.0166 ***
0.0208 ***
0.0208 ***
0.7280 ***
0.0208 ***
0.1872 ***

0.0166 ***

0.0416 ***

0.1455 ***

5.1520 ***

0.0321 ***

0.0641 ***

0.2077 ***

1.0451 ***

8.4F23+0171-07 ***

Bundles (μm)

0.0416 ***
0.4160 ***
0.0624 ***
0.3120 ***
0.2624 ***
0.4160 ***

0.0416 ***

0.0624 ***

0.0120 ***

0.4160 ***

0.0625 ***

0.0313 ***

0.0120 ***

0.0208 ***

2.34E-07223-05 ***

Clump (μm)

0.0152 ***

3

24

MAIL ROOM
DEC 1 2 53 PM '77

HAIRDRYERS - ASBESTOS DISCHARGED

AIRDRYER DENTIFICATION	CONDITION	ANALYSIS TYPE	ASBESTIFORM STRUCTURES COUNTED	GRIDS OR FIELDS COUNTED	SAMPLE COLLECTION MEDIA	TIME INTERVAL	STRUCTURES INTRODUCED INTO ENVIRONMENT	MASS INTRODUCED IN ENVIRONMENT,
25 GENERAL ELECTRIC ONTAINS ASBESTOS	OLD	SEM 1500X	0	20	WATER	1 MIN 15 MIN 120 MIN	0.0 0.0 0.0	0.0 0.0 0.0
20 MINUTES CONTINUOUS		TEM BUNDLES 48000X	20	15	WATER	1 MIN 15 MIN 120 MIN	3.44×10^{3} 5.16×10^{4} 4.12×10^{5}	3.44×10^{0} 5.16×10^{1} 4.12×10^{2}
		TEM FIBRILS 48000X	26	15	WATER	1 MIN 15 MIN 120 MIN	4.47×10^{3} 6.70×10^{4} 5.36×10^{5}	2.21×10^{-3} 3.32×10^{-2} 2.65×10^{-1}
		TEM CLUMPS 48000X	8	15	WATER	1 MIN 15 MIN 120 MIN	1.37×10^{3} 2.06×10^{4} 1.65×10^{5}	89, 89,000ng

HAIRDRYERS - ASBESTIFORM STRUCTURE SIZE DATA*

AIRDRYER IDENTIFICATION	CONDITION	ANALYSIS TYPE	DIAMETER RANGE	LENGTH RANGE	MEAN DIAMETER	MEAN LENGTH	MEAN MASS, ng
25 GENERAL ELECTRIC CONTAINS ASBESTOS	OLD	SEM 2500X	-	-	-	-	-
20 MINUTES CONTINUOUS		TEM BUNDLES 48000X	0.0312-0.9360	0.4160-28.7040	0.1251	2.7550	1.0×10^{-3}
		TEM FIBRILS 48000X	0.0125-0.0416	0.1664-2.2880	0.0211	0.5536	4.95×10^{-7}
		TEM CLUMPS 48000X	0.8332-4.5826		2.6038	Assume 1/3 the aspect ratio of 3D 0.52	mean vol - $208.13 \times 10^{-12} cm^3$ mean mass - $541.14 \times 10^{-12} g = 541 \times 10^{-1} ng$

* = All dimensions are in MICROMETERS

Fibrils (um)

3.0233 ***
3.3333 ***
3.0166 ***
3.3240 ***
3.0333 ***
3.7120 ***
3.0333 ***
3.7120 ***
3.0233 ***
3.1661 ***
3.0166 ***
3.3744 ***
3.0416 ***
3.7120 ***
3.0312 ***
2.3330 ***
3.0166 ***
3.4160 ***
3.0166 ***
3.2455 ***
3.0166 ***
3.3744 ***
3.0250 ***
3.4156 ***
3.0125 ***
3.9333 ***
3.0266 ***
3.2455 ***
3.0166 ***
3.4333 ***
3.0333 ***
3.3744 ***
3.0166 ***
3.7120 ***
3.0233 ***
3.7120 ***
3.0336 ***
1.1440 ***
3.0250 ***
3.3120 ***
3.0330 ***
3.0233 ***
3.0166 ***
3.3233 ***
3.0333 ***
3.2455 ***
3.0333 ***
3.0333 ***
3.2533 ***
5.0270 ***
3.4133 ***
3.0166 ***
1.8722 ***

3.2125 ***

3.9410 ***

3.1664 ***

3.5536 ***

3.0333 ***

3.5365 ***

4.945543371-07 ***

3 bundles (um)

3.0624 ***
3.5330 ***
3.0312 ***
3.5360 ***
3.0416 ***
2.4560 ***
3.0274 ***
3.4160 ***
3.3333 ***
29.7645 ***
3.0331 ***
3.5732 ***
3.2030 ***
3.3320 ***
3.0416 ***
1.1440 ***
3.0720 ***
2.4530 ***
3.0333 ***
3.3240 ***
3.0720 ***
3.9350 ***
3.4160 ***
3.3260 ***
3.0416 ***
3.7293 ***
3.0520 ***
2.5230 ***
3.0330 ***
1.2460 ***
3.0324 ***
1.1440 ***
3.0725 ***
3.0320 ***
3.0416 ***
1.6640 ***
3.2415 ***
3.3203 ***
3.0324 ***
3.0320 ***

3.0312 ***

3.0360 ***

3.4160 ***

22.7240 ***

2.7550 ***

3.3356 ***

6.1041 ***

3.0361 ***

Clumps (um)

3.3329 ***
3.0333 ***
3.0332 ***
1.6664 ***
3.3333 ***
4.5226 ***
4.3326 ***
1.6734 ***

SAMPLE DATA

HAIRDRYER EVALUATIONS
SAMPLE DATA

TEST #	SAMPLE DURATION	SAMPLE CCLLECTION MEDIA	MEDIA VOLUME, cc	TEM ALIQUOT, cc	SEM ALIQUOT, cc	TUNNEL CFM	HIGH VOLUME CFM
#26	120 MINUTES CONTINUOUS	WATER	7340	3700	3640	38.4	-
#25	120 MINUTES CONTINUOUS	WATER	7110	3555	3555	40.2	11.2
#25-1	120 MINUTES 30 ON/30 OFF	WATER	7004	3502	3502	40.2	11.2
#13	120 MINUTES CONTINUOUS	WATER	6980	3900	3080	40.2	11.2
#13-1	180 MINUTES 30 ON/30 OFF	AIR	-	-	-	40.2	11.2
#28	180 MINUTES 30 ON/30 OFF	AIR	-	-	-	17.0	2.6
#28-1	180 MINUTES CONTINUOUS AMBIENT	AIR	-	-	-	17.0	2.6
#28-2	120 MINUTES 30 ON/30 OFF	WATER	7120	4000	2545 575	17.0	2.6

[illegible]

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IDENTIFICATION	MANUFACTURER	CONDITION	WATTAGE	MODEL #	MANUFACTURED	ASBESTOS/NON-ASBESTOS
#26	CLAIROL	NEW	1250	TD2	TAIWAN	NON-ASBESTOS
#25	GENERAL ELECTRIC	OLD 15 MONTHS	1400	S3-5112-0	SINGAPORE	ASBESTOS
#25-1 SAME UNIT AS #25	GENERAL ELECTRIC	OLD 15 MONTHS	1400	S3-5112-0	SINGAPORE	ASBESTOS
#13	GENERAL ELECTRIC	NEW	1400	S3-5112-0	SINGAPORE	ASBESTOS
#13-1 SAME UNIT AS #13	GENERAL ELECTRIC	NEW	1400	S3-5112-0	SINGAPORE	ASBESTOS
#28	SEARS, ROEBUCK	OLD 4 YEARS 9 MONTHS	700	320 6320	USA	ASBESTOS
#28-1 SAME UNIT AS #28	SEARS, ROEBUCK	OLD 4 YEARS 9 MONTHS	700	320 6320	USA	ASBESTOS
#28-2 SAME UNIT AS #28	SEARS, ROEBUCK	OLD 4 YEARS 9 MONTHS	700	320 6320	USA	ASBESTOS

ARCHIVE

SAMPLING METHODOLOGY - IN AIR

A. EQUIPMENT
1. Hairdryer
2. 10 centimeter diameter high volume air sampler
3. 10 centimeter diameter air tunnel with 5 centimeter probe assembly for extraction of air sample
4. Thermoanemometer
5. 10 centimeter Millipore, type RA or Type GS (1.2 or 0.22 micrometer pore size respectively) filter media

B. COLLECTION SEQUENCE
1. Assemble hair dryer and high volume air sampler to air tunnel assembly.
2. Determine the best filter media to use dependant on the respective volumes. This will enable the closest to iso-kinetic sampling as possible.
3. Hairdryer set on high fan speed and the maximum heat setting allowed by the sampling apparatus.
4. Duration and sequence as prescribed by the particular test program.
5. The filters are presented for TEM analysis.

C. ASBESTIFORM STRUCTURE QUANTIFICATION

$$\text{ASBESTIFORM STRUCTURES EMITTED INTO ATMOSPHERE} = \frac{(\#\ \text{STRUCTURES})(\text{FILTER AREA})(\text{HAIR DRYER CFM})(\text{TIME EXTRAPOLATION})}{(\text{GRID AREA})(\#\ \text{GRIDS})(\text{HIGHVOLUME CFM})(\text{SAMPLE TIME})}$$

$$\text{NANOGRAMS EMITTED INTO ATMOSPHERE} = \left(\begin{array}{l}\#\ \text{ASBESTIFORM} \\ \text{STRUCTURES} \\ \text{EMITTED} \\ \text{INTO} \\ \text{ATMOSPHERE}\end{array}\right) \times (2.6\text{GM/CC})(1.0 \times 10^{9}\text{NG/GM})(\text{FIBER VOLUME})$$

Filter Area = 6.43×10^{3} mm^{2}

Hair Dryer CFM
- General Electric = 40 CFM
- Sears, Roebuck = 17 CFM

High Volume CFM
- With General Electric = 11.2 CFM
- With Sears, Roebuck = 2.6 CFM

AMBIENT AIR SAMPLE

$$\text{ASBESTIFORM STRUCTURES EMITTED INTO ATMOSPHERE} = \frac{\dfrac{(\#\ \text{STRUCTURES})(\text{FILTER AREA})}{(\#\ \text{GRIDS})(\text{GRID AREA})}}{\text{SAMPLE VOLUME}}$$

SAMPLING METHODOLOGY - IN WATER

A. EQUIPMENT
1. Hair Dryer
2. 5 centimeter ID impinger tube
3. 4 liter impinger bottle
4. Thermoanemometer
5. Millipore 47 millimeter filtration apparatus
6. 47 millimeter, type GS, o.22 micrometer pore size filter media
7. 47 millimeter, Nuclepore, 0.20 micrometer pore size filter media

B. COLLECTION SEQUENCE
1. Impinger bottle is washed thoroughly and prepared with ultra-clean water and filled with 8000 milliliters of ultra-clean water.
2. Impinger tube is connected to hair dryer discharge.
3. Impinger tube is lowered into impinger collection media approximately 5 centimeters.
4. Hair dryer set on high fan speed and the maximum heat setting allowed by the sampling apparatus.
5. Duration and sequence as prescribed by the particular test program.
6. Aliquots of equal amounts are filtered through Millipore and Nuclepore filters.
7. The filters are dryed and prepared for TEM and SEM analysis.

C. ASBESTIFORM STRUCTURE QUANTIFICATION

$$\text{ASBESTIFORM STRUCTURES EMITTED INTO ATMOSPHERE} = \frac{(\#\ \text{STRUCTURES})(\text{FILTER AREA})(\text{LIQUID VOLUME})(\text{TIME EXTRAPOLATION})}{(\text{GRID OR SCREEN AREA})(\#\ \text{GRIDS})(\text{ALIQUOT VOLUME})(\text{SAMPLE TIME})}$$

$$\text{NANOGRAMS EMITTED INTO ATMOSPHERE} = \left(\begin{array}{l}\#\ \text{ASBESTIFORM} \\ \text{STRUCTURES} \\ \text{EMITTED} \\ \text{INTO} \\ \text{ATMOSPHERE}\end{array}\right) \times (2.6\ \text{GM/CC})(1.0 \times 10^{9}\ \text{NG/GM})(\text{FIBER VOLUME})$$

Filter Area = 9.89×10^{2} mm^2
TEM grid area = 6.4×10^{-3} mm^2
SEM screen area = 4.4×10^{-3} mm^2