

AIRBORNE FIBER COUNTS

for

Union Carbide Corporation
Bound Brook, NJ

February 21, 1973

Personnel Present:	C. Martino	- R&D Group Leader - Bound Brook
	D. Albright	- Phenolic Production - Bound Brook
	G. Ealer	- R&D - Bound Brook
	R. Ream	- Phenolic Production - Bound Brook
	D. Neal	- Industrial Hygienist - Bound Brook
	R. Byrne	- "Calidria" Asbestos - Niagara Falls
Samples Collected & Analyzed By:	E. Kleber	- "Calidria" Asbestos - Niagara Falls

UNION CARBIDE CORPORATION
Mining and Metals Division
Niagara Falls, New York

X410700

OBJECTIVE

Monitor airborne concentrations of "Calidria" and Canadian Asbestos during both make up of phenolic molding compound 5303 and dumping of the final product in a simulated molding situation.

TEST METHOD

The first group of samples were collected in the phenolic production area, Bldg. 4. Personal samplers were worn by the operators during dumping of asbestos at Unit "B", raw mix side. "Calidria" products were added at the North charging station, Canadian asbestos at the South charging station. Two separate additions were monitored for "Calidria" Asbestos, one for the Canadian 7RF9. Environmental samples were also collected about 15 feet from the charging stations in the main aisleway in order to determine the quality of the ambient air in the building.

The second group of samples were collected in the Research & Development pilot plant. Two operations were monitored. The first was phenolic molding compound 5303 containing 30% Canadian 7RF9. The second compound contained 15% "Calidria" pellets. The only difference between the two was the "Calidria" containing compound had not had the fines removed due to time limitations. In each test, 5 bags of the compound were dumped into a fiber drum at the rate of one bag every 30 seconds. No local exhaust was provided and both samples appeared rather dusty.

APPARATUS AND PROCEDURE

Sampling and dust counting were carried out in accordance with OSHA Regulation 1910.93a, using the Bayer, Zummalde and Brown method for counting asbestos fibers by phase contrast microscopy (Bureau of Occupational Safety and Health, February 1969).

Battery powered air pumps (M.S.A. type) calibrated at 2 liters per minute were used to collect personal breathing zone and evnironmental samples on millipore membrane filters of 0.8 micron porosity.

Fiber counting was performed on a Vickers phase contrast microscope at 400X utilizing a Porton reticle.

TEST RESULTS

The results of the sample dust counting appears in Table 1. The count is reported as fibers greater than 5 microns in length per cubic centimeter of air sampled. A fiber is defined as a material having an aspect ratio greater than 3. These results are <u>not</u> time weighted averages.

TIME WEIGHTED AVERAGES

The formula $\frac{C_1T_1 + C_2T_2 + C_nT_n}{T}$ describes time weighted average. When C=count in fibers/cc + T = time.

For example, if the operator in sample 1929-76-5 prepared this mix 5 times a day at 4 minutes per mix and the rest of the day he inhaled 0.8 fibers/cc (1929-76-4) his 8-hour time weighted average would be:

$$\frac{(5)(4) + (5)(4) + (5)(4) + (5)(4) + (5)(4) + (0.8)(460)}{480} = 1.0 \text{ fibers/cc. TWA}$$

X410701

TABLE I

SUMMARY OF DUST COUNTS

N.B. No.	Description	Fibers/cc > 5 µm
	Phenolic Production Area	
1929-76-1	Personal (4 min.) - Operator dumping 7 Bags SG-100 into Unit "B" North charging station, raw mix side	1.6
1929-76-2	Environmental (148 min.) - On control panel in aisleway 15 ft. from charging hole at North station	1.1
1929-76-3	Personal (3 min.) - Repeat of 1929-76-1, later in the morning	1.5
1929-76-4	Environmental (22 min.) - Same position as 1929-76-2, before, during, and after Canadian asbestos dump	0.8
1929-76-5	Personal (6 min.) - Operator dumping 13 bags 7RF9 at South charging station	5.0
1929-76-6	Personal (4 min.) - Same as 1929-76-1, collected by D. Neal following operator with sampler connected to a probe	1.4
1929-76-7	Personal (4 min.) - Same as 1929-76-3, collected by D. Neal	1.5
1929-76-8	Personal (6 min.) - Same as 1929-76-5, collected by D. Neal	3.3
	Research Building	
1929-76-9	Personal (3.5 min.) - Operator dumping 5 bags (250 lbs.) phenolic molding compound 5303 containing 30% Canadian 7RF9	14.0
1929-76-10	Personal (3.5 min.) - Operator dumping 5 bags (250 lbs.) phenolic molding compound 5303 containing 15% SG-100	3.7

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127-1929-76-1
SAMPLE

1/24/73
DATE

MSA
INST.

2 l/m
FLOW RATE

BLANK

4.1 min.
TOTAL TIME

8.2 l
TOTAL AIR VOLUME

"Joe"
EMPLOYEES NAME

JOB TITLE

DESCRIPTION OF OPERATION: Personal - Operator Dumping 7 BAGS SG-100 INTO UNIT "B" RAW MIX SIDE, NORTH CHANGING STATION, PRODUCT 5303.

#Hendlic molding compound, raw ingredients addition are.

DESCRIPTION OF CONTROLS:

Hood directly over charge Hole. (Quite effective)

X4107703

ASBESTOS COUNT RECORD SHEET

SAMPLE# _____ OPERATION _____

FLOW _____ TIME _____ VOLUME _____ DATE /

INITIALS _____ F. AREA _____ BLK.CNT.AV. _____

AV.COUNT _____ CONCENTRATION 1.6

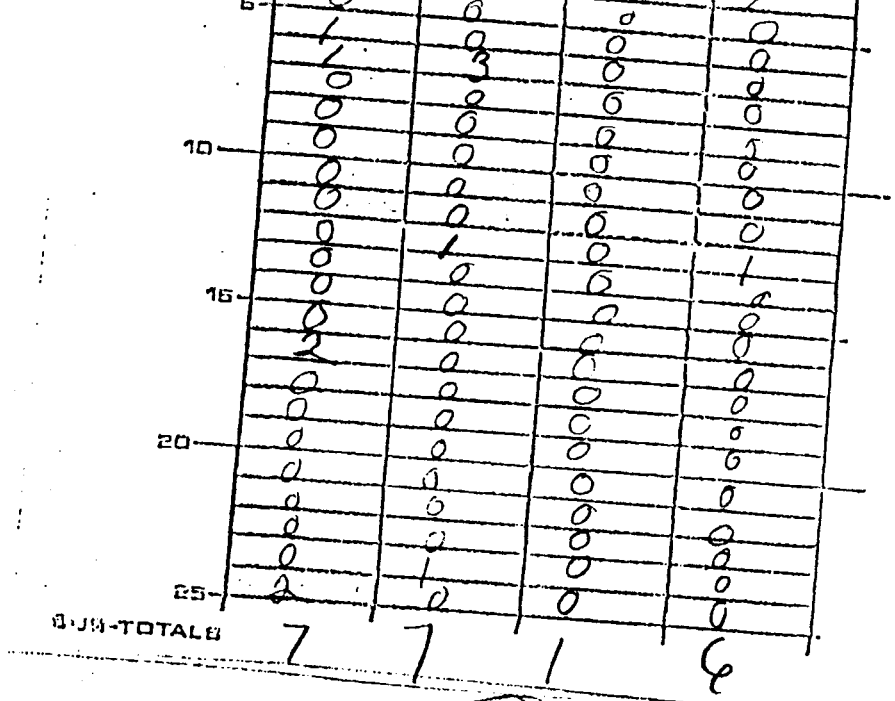
COMMENTS:

0	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
5	0	0	0	0
	0	0	0	0
	1	0	0	0
	0	0	0	0
10	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
15	0	0	0	0
	0	0	0	0
	0	0	1	0
	0	0	0	0
	1	0	0	1
20	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	1	0	2
25	0	0	0	0
GRID-TOTALS	2	1	1	3

7

DESCRIPTION OF CONTROLS:

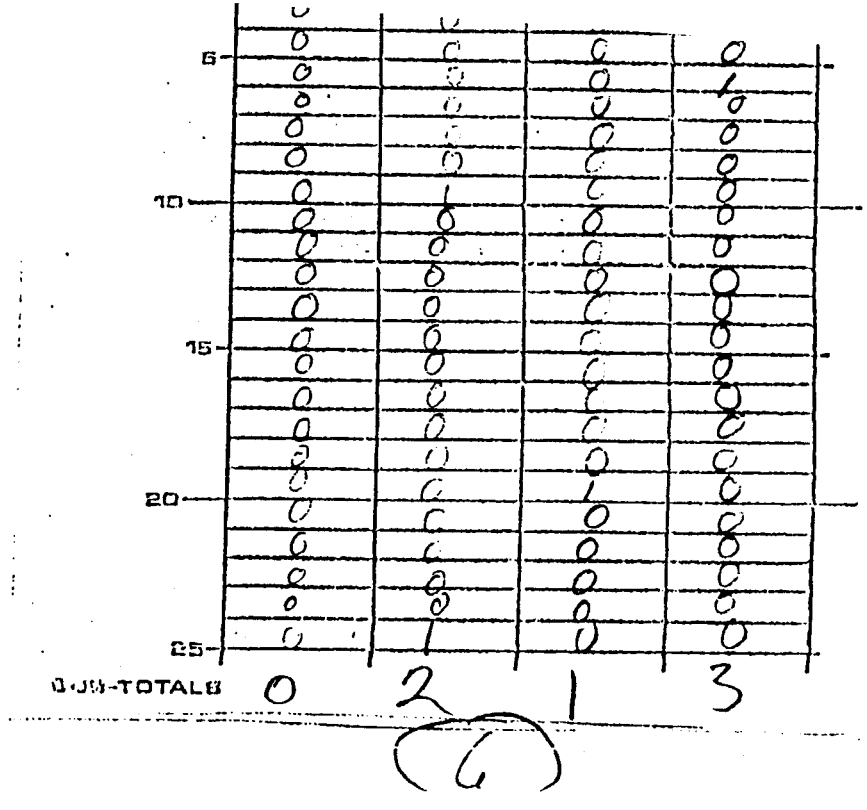
X410705



following operator visit probe.

DESCRIPTION OF CONTROLS:

X410704



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DESCRIPTION OF CONTROLS:

X410705

DESCRIPTION OF CONTROLS:

X410704

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210-1929-76-8
SAMPLE

11
DATE

INST.

2 l/m
FLOW RATE

BLANK

6 min
TOTAL TIME

12 cl
TOTAL AIR VOLUME

EMPLOYEES NAME

JOB TITLE

DESCRIPTION OF OPERATION:

SAME AS 1929-76-3

DESCRIPTION OF CONTROLS:

X410705

ASBESTOS COUNT RECORD SHEET

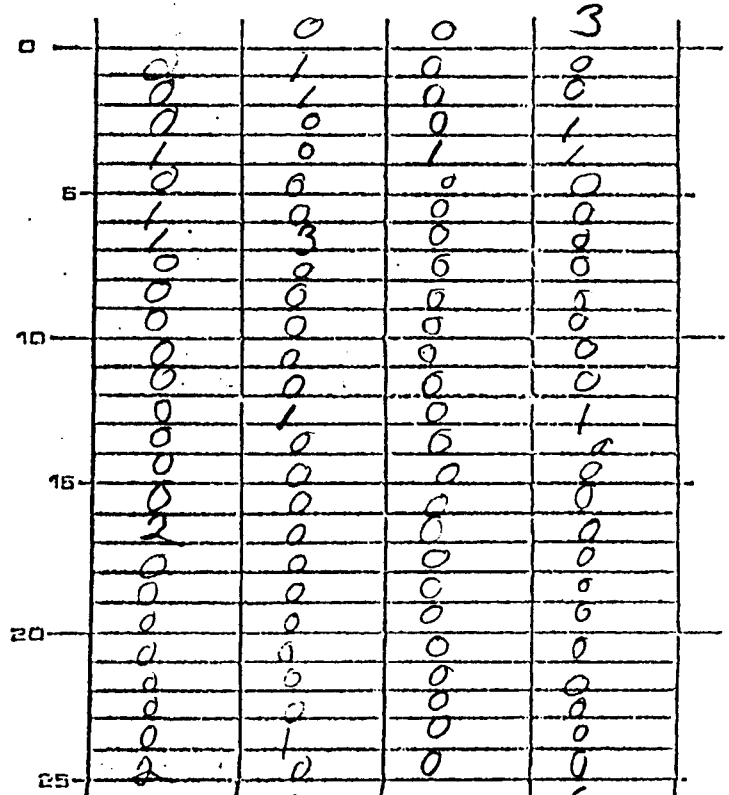
SAMPLE# _____ OPERATION _____

FLOW _____ TIME _____ VOLUME _____ DATE

INITIALS _____ F. AREA _____ BLK.CNT.AV. _____

AV.COUNT _____ CONCENTRATION 3.3

COMMENTS:



21

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G-1929-76-[redacted]
SAMPLE

11/24/73
DATE

M.S.A.
INST.

2 l/m
FLOW RATE

BLANK

3.5 min
TOTAL TIME

7.0 mcf
TOTAL AIR VOLUME

George CALER
EMPLOYEES NAME

R+D
JOB TITLE

DESCRIPTION OF OPERATION: -operator Dumping 5 BAGS (250 LBS) PHEN. mcg. Compa 5303, CONTAINING 15% SC-100

DESCRIPTION OF CONTROLS: NONE, Dumping DONE IN TO 55 gal. FIBER PAK.

X410706

ASBESTOS COUNT RECORD SHEET

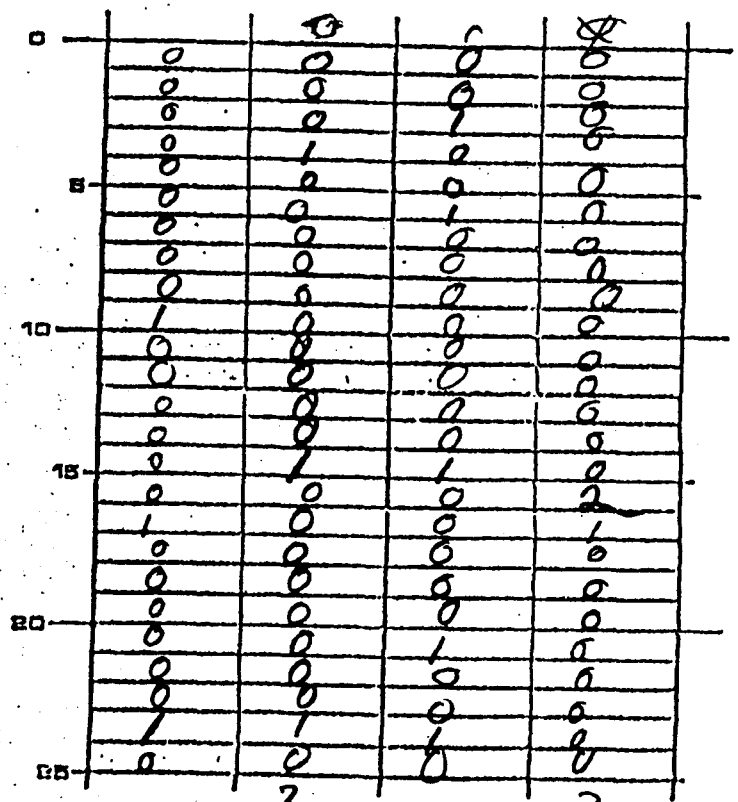
SAMPLE# _____ OPERATION _____

FLOW _____ TIME _____ VOLUME _____ DATE /

INITIALS _____ F. AREA _____ BLK.CNT.AV. _____

AV.COUNT .14 CONCENTRATION 3.7

COMMENTS:



14

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25 1929-76-C
SAMPLE

11/24/73
DATE

MSA
INST.

2 l/m
FLOW RATE

BLANK

3.5 min
TOTAL TIME

7.0 l
TOTAL AIR VOLUME

GEORGE CALER
EMPLOYEES NAME

R + O
JOB TITLE

DESCRIPTION OF OPERATION: - OPERATOR DUMPING 250 LBS 5 BAGS PHENOLIC MOLDING COMPOUND 5303, CONTAINING 30% CARBY TRFG,

DESCRIPTION OF CONTROLS: NONE, DUMPING DONE INTO 55 GAL. FIBERPAK

X410707

ASBESTOS COUNT RECORD SHEET

SAMPLE# 76-C OPERATION

FLOW TIME VOLUME 7.0 l DATE 11-4

INITIALS SK F. AREA .004624 BLK.CNT.AV.

AV.COUNT 0.53 CONCENTRATION 14.0

COMMENTS:

0	2	1	0	
0	1	0	0	
0	0	0	0	
0	0	1	0	
2	0	0	0	
1	1	0	0	
0	1	0	2	
1	1	0	0	
1	0	0	0	
0	0	0	3	
1	1	0	0	
2	0	0	0	
1	0	0	0	
0	0	1	0	
1	1	0	0	
2	0	0	0	
0	1	0	1	
1	1	0	0	
1	1	0	0	
1	0	1	2	
0	0	0	3	
1	0	0	0	
SUB-TOTALS	17	15	15	6

53

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26-1929-76-3
SAMPLE

1/24/73
DATE

MSA
INST.

2 l/m
FLOW RATE

BLANK

3.0 min
TOTAL TIME

6.0 l
TOTAL AIR VOLUME

Joe
EMPLOYEES NAME

JOB TITLE

DESCRIPTION OF OPERATION: Same as 1929-76-1

DESCRIPTION OF CONTROLS: See 1929-76-1

X410708

ASBESTOS COUNT RECORD SHEET

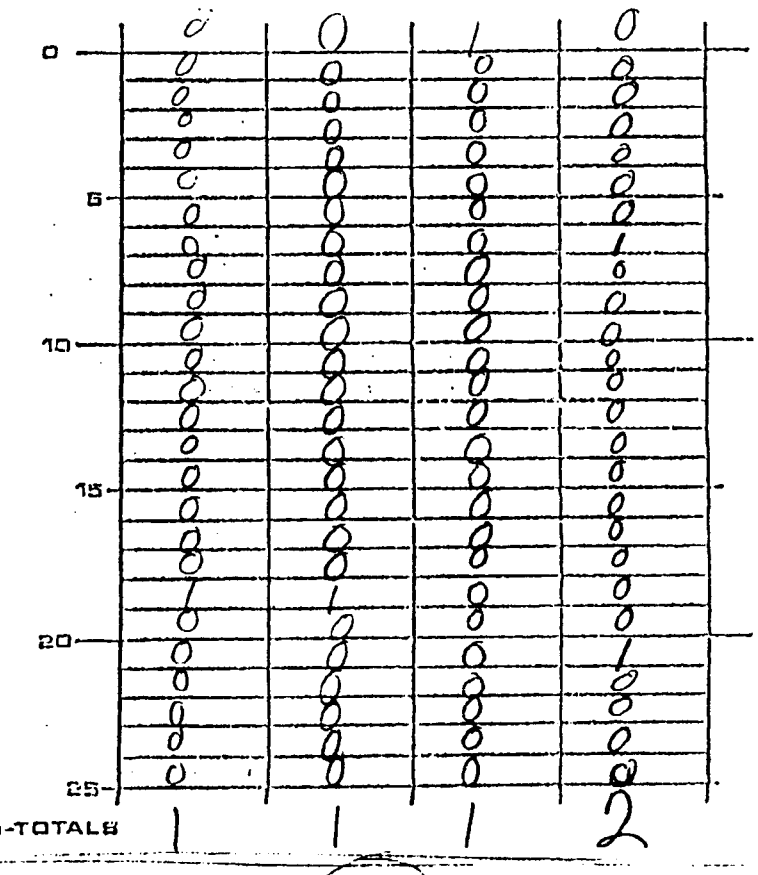
SAMPLE# _____ OPERATION _____

FLOW _____ TIME _____ VOLUME _____ DATE 1/24/73

INITIALS _____ F. AREA _____ BLK.CNT.AV. _____

AV.COUNT _____ CONCENTRATION 1.5

COMMENTS:



(3)

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26-D 1429-76-7
SAMPLE

DATE

INST.

2 l/m
FLOW RATE

BLANK

3.0 min
TOTAL TIME

6.0 l
TOTAL AIR VOLUME

EMPLOYEES NAME

JOB TITLE

DESCRIPTION OF OPERATION:

SAME AS
1429-76-1

DESCRIPTION OF CONTROLS:

X4+0709

ASBESTOS COUNT RECORD SHEET

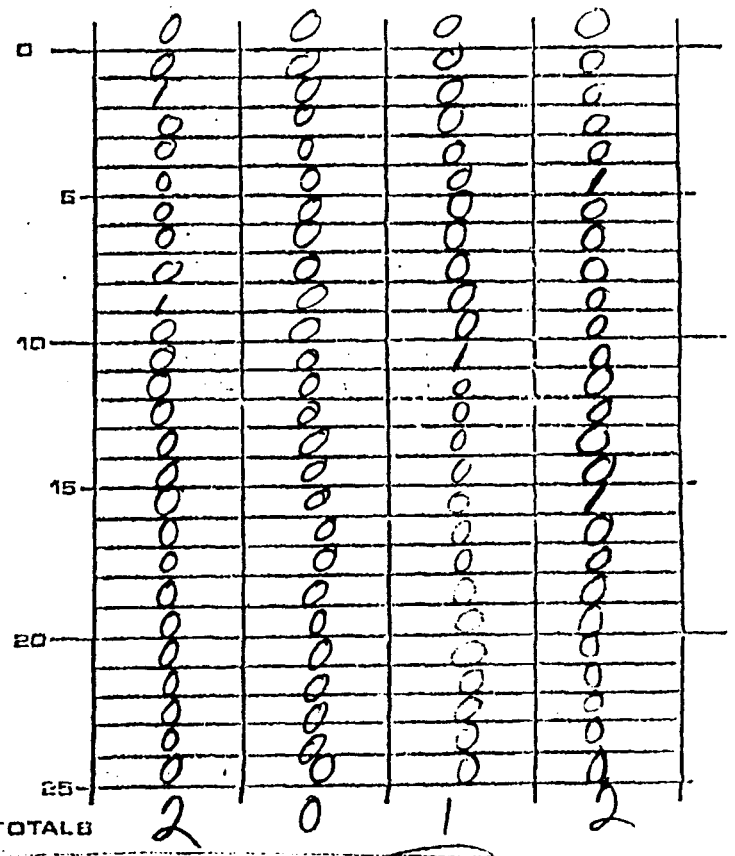
SAMPLE# _____ OPERATION _____

FLOW _____ TIME _____ VOLUME _____ DATE /

INITIALS _____ F. AREA _____ BLK.CNT.AV. _____

AV.COUNT _____ CONCENTRATION 1.5

COMMENTS:



5

SAMPLE: 71-1929-76-4

DATE: 11/24/73

INST.: MSA

FLOW RATE: 2 l/m

BLANK:

TOTAL TIME: 22.0 min

TOTAL AIR VOLUME: 44.0 l

EMPLOYEES NAME:

JOB TITLE: ENVIRONMENTAL

DESCRIPTION OF OPERATION: SAME AS 1929-76-2, Before, During & After Carey Dump

DESCRIPTION OF CONTROLS:

ASBESTOS COUNT RECORD SHEET

X 410710

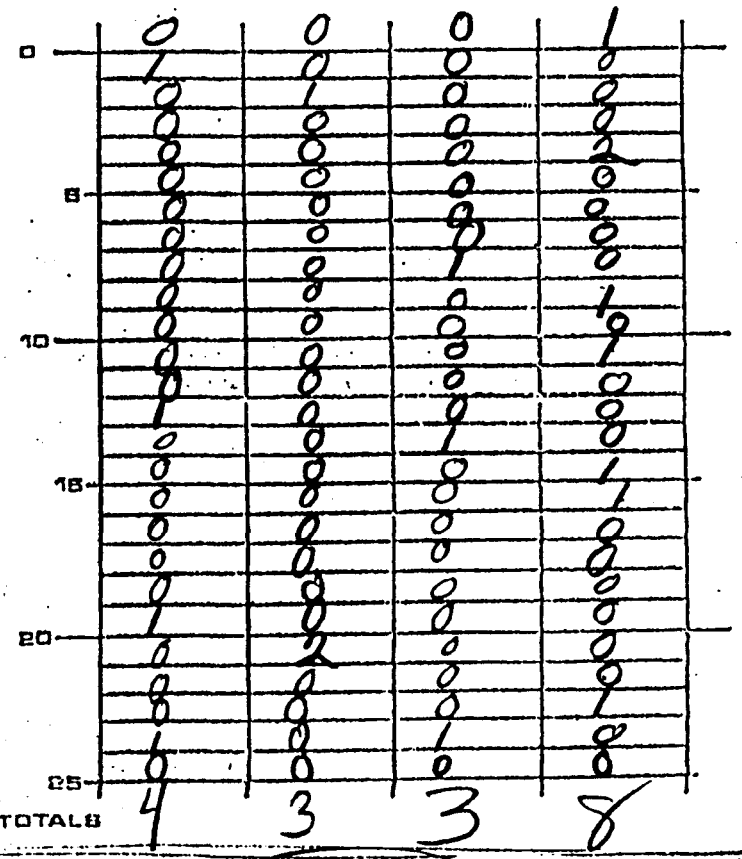
SAMPLE# _____ OPERATION _____

FLOW _____ TIME _____ VOLUME _____ DATE _____

INITIALS _____ F. AREA _____ BLK.CNT.AV. _____

AV.COUNT _____ CONCENTRATION 0.8

COMMENTS:

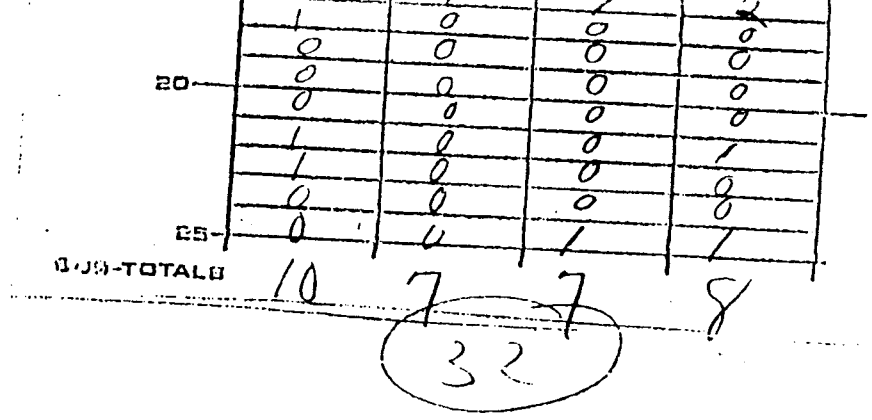


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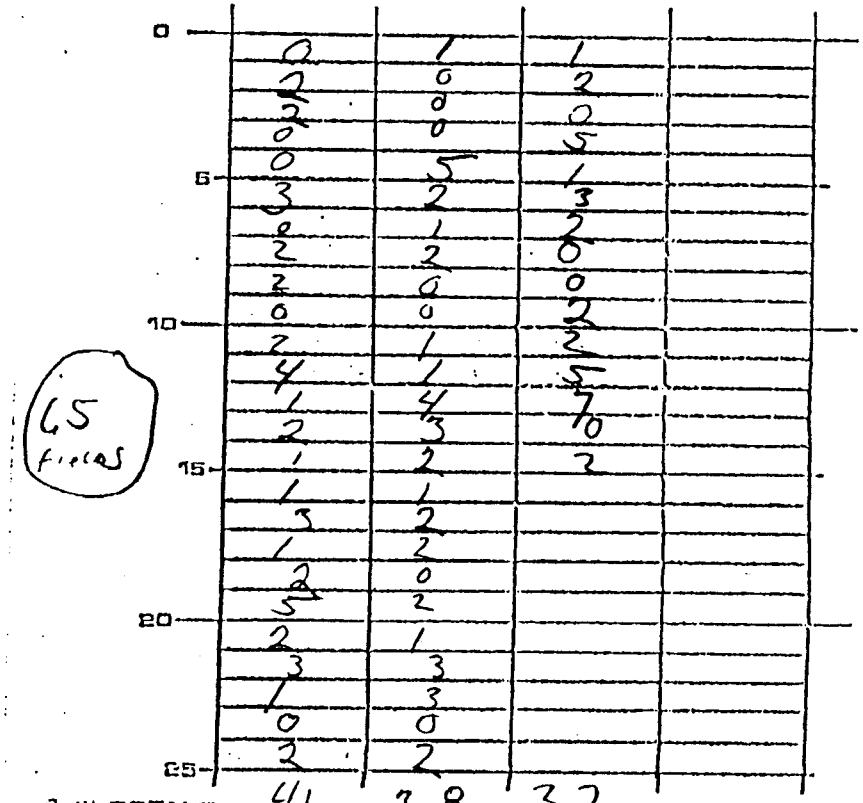
EMPLOYEES NAME

JOB TITLE

DESCRIPTION OF OPERATION: ENVIRONMENTAL-
ON CONTROL PANEL IN AISLEWAY
15 FT FROM CHARGING HOLE AT
NORTH SPAN.

DESCRIPTION OF CONTROLS: NONE

COMMENTS: VERY DIRTY, PROBABLY NOT A GOOD COUNT DUE TO BLACK PARTICLES ALL OVER.



X410711

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X410712

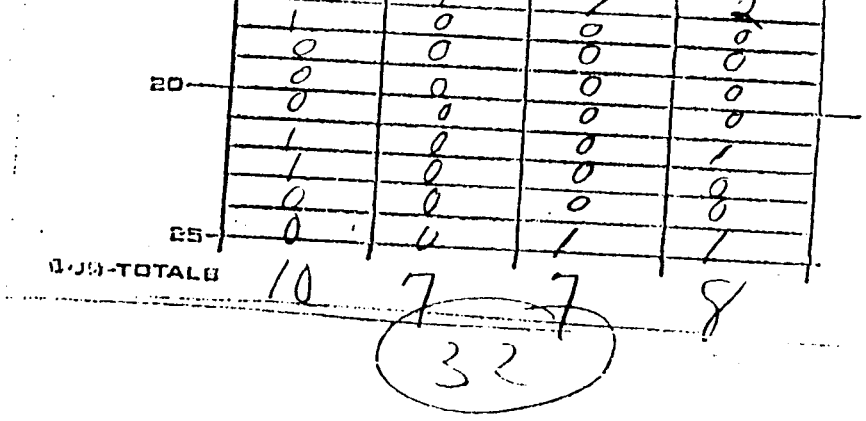
EMPLOYEES NAME

JOB TITLE

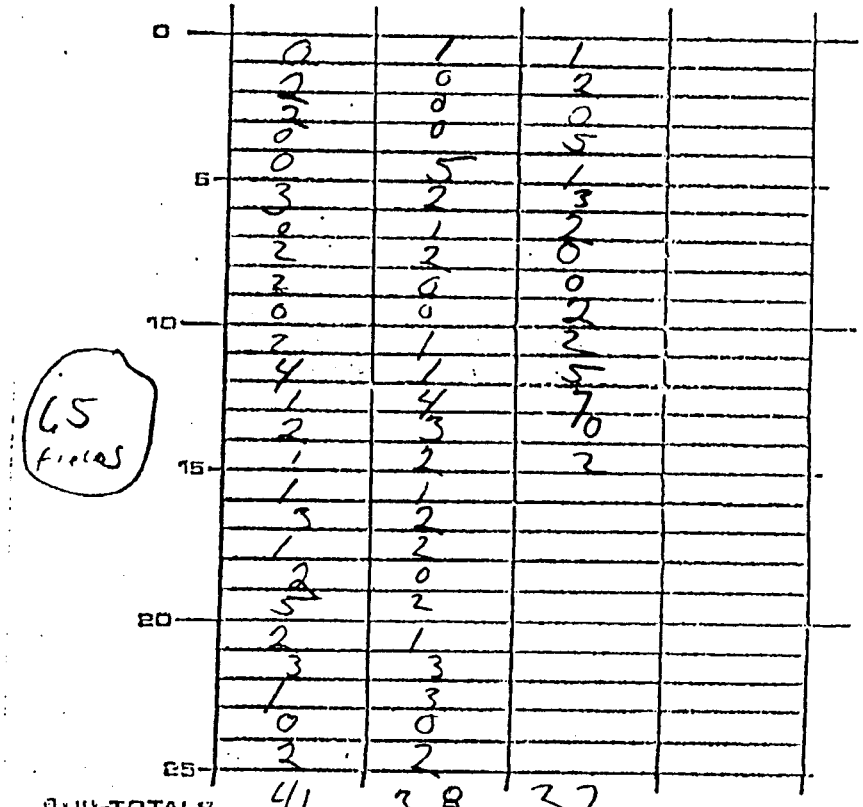
DESCRIPTION OF OPERATION: ENVIRONMENTAL-
ON CONTROL PANEL IN AISLEWAY
15 FT FROM CHARGING HOLE AT
NORTH SPAN.

DESCRIPTION OF CONTROLS: NONE

X410711



COMMENTS: VERY DIRTY, PROBABLY NOT A GOOD COUNT DUE TO BLACK PARTICLES ALL OVER.



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LL-1929-TC-5
SAMPLE

11/24/73
DATE

MSA
INST.

2 l/m
FLOW RATE

BLANK

5.9 min
TOTAL TIME

14.8 l
TOTAL AIR VOLUME

JOE
EMPLOYEES NAME

JOB TITLE

DESCRIPTION OF OPERATION: PERSONAL — OPERATOR DUMPING 13 BAGS CARBOTRED AT [illegible] CHARGING STATION.

DESCRIPTION OF CONTROLS: HOOD DIRECTLY OVER HOPE

X410712

ASBESTOS COUNT RECORD SHEET

SAMPLE#_____ OPERATION_____

FLOW_____ TIME_____ VOLUME_____ DATE

INITIALS_____ F. AREA_____ BLK.CNT.AV._____

AV.COUNT .32 CONCENTRATION 5.0

COMMENTS:

0	1	0	0	1
	0	1	1	0
	1	0	1	0
	0	0	0	1
5	4	0	0	0
	0	1	0	0
	0	0	1	0
	0	0	0	0
	0	1	3	1
10	0	0	0	1
	0	0	0	0
	0	0	0	0
	0	2	0	0
15	0	1	1	2
	1	0	0	0
	0	0	0	0
	0	0	0	0
20	1	0	0	1
	0	0	0	0
	1	0	0	0
	0	0	0	0
25	0	4	1	1
SUB-TOTALS	10	7	7	8

32

127 - Phenolic Prod. area

Personal - operator samples

10:14:50
10:18:55 BAGS SG-100 INTO UNIT "B" RAW MIX SIDE, PRODUCT 5303. Hooded. NORTH CHUTE STD

#901 - CNV Bldg. 4
"2-5-'80
10:28:00 - ON CONTROL PANEL, 15 FT FROM Bored. IN AISLEWAY.

Send Procedure "Sager".eth to Doug NEAL

X410713

F.C.4 10:48:40
10:51:40
7 Bags SAMP AS #127
SG-100 Pump

~~#171~~ - Same as 94

X410714

O. Neal RECEIVED 11/26/73

LOCATION Bound Brook FEB 3 1974 CARBIDE

SUBJECT Dust Count UCC-CALIDRIA LOCATION Niagara

Dear

Please find copy of the Calidria

Mobil Fiber Count Analysis.

USCF Fine Grade Asbestos.

Regards

Thanks Ed!!

REPLY IN SPACE BELOW. DETACH AND RETURN THIS COPY TO ORIGINATOR RETAIN ORIGINAL

My readings on samples as follows:

	CALIDRIA	TRFS
	1st Mix 4 min	2nd Mix 3 min	6 min
My sample	1.2	0.9	3.1
Your "	0.5	0.7	3.5

My pumping rate was 2.0 liters/min. I assumed same for yours.

Numbers are in fibers per cc. Your stuff sure looks good.

Hope it works in end product!

TRIPLICATE

X410715

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