PLAINTIFF'S EXHIBIT

GP-1447

Mr. I. F. Weibel — Akron

G. W. Green — Tigard

AIRBORNE ASBESTOS SURVEY AT AKRON JOINT CEMENT PLANT — March 25, 1975

cc: Mr. J. Hurd - Portland
Mr. E. B. Hollingsworth - Wilmington
G.F.E.

On March 13 an asbestos survey was made at the Akron plant. The personal samplers attached to five representative workmen showed fiber levels well below the 5 fibers per milliliter current maximum, and also below the 2 fiber maximum that will take effect on July 1, 1976.

A sixth sampling pump was placed at various locations around the plant to collect samples. The highest count was 5.0 fibers/ml for a 20 minute sample taken at the Ready Mix mixer during the charging of dry powder. As the dry powder enters the mixer, it displaces air which puffs out the gates and mixer cover, carrying dust with it. It is the practice for the mixer man to turn on a fan and blow the dust away. He stands in back of the fan during most of this operation and avoids the dust. The area sample was taken on the downwind side. During short periods such as this, the maximum allowable asbestos dust is 10 fibers/ml. A longer sample, taken for 65 minutes, shows a dust level of 2.2 fibers/ml which is probably representative of an all day level. This is within the current regulation but could pose a problem in 1976. Also, blowing the dust away with a fan, while lowering the dust level in the immediate vicinity, tends to raise the overall level in the plant. Perhaps this problem could be alleviated by venting the mixer back to the bin from which the dry powder is drawn while tightening up the seals on the mixer covers. Otherwise it may be necessary to tie the mixer into the dust collector.

The dry blender also had a 60 minute sample go to 2.5 fibers/ml, but I don't believe this should pose a problem since this was taken within the hooded area. Due to the dust collection system, the area adjacent is virtually dust free. The personal sampler on Charlie Jackson, the dry blender, averaged only 1.5 fibers/ml.

The method of sampling and analysis is by the N.I.O.S.H. Membrane Filter method in which the sample is collected by drawing air through a membrane filter by means of a battery powered personal sampling pump. The filter is transformed from an opaque solid membrane to a transparent, optically homogeneous gel. The fibers are sized and counted by a phase contrast microscope at 500X magnification. The complete method is available from N.I.O.S.H. Division of Training, 550 Main Street, Federal Office Building, Room 9503, Cincinnati, Ohio 45202.

AKRON JOINT CEMENT PLANT
AIRBORNE ASBESTOS DUST SURVEY

Summery of Data
Date Sampled: March 13, 1975

Name	Location or Job Title	Average Count fiber/ml	Filter No.	Elapsed Time (mins.)	Individual Counts fiber/ml
Clarence Blueye	Packer-Stacker	1.2	27	142	1.0
			38	146	0.5
			41	142	2.0
Leon Spears	Packer-Stacker	1.0	26	152	0.9
			36	138	0.3
			47	142	1.7
Charlie Jackson	Dry Blender	1.5	30	143	1.2
			39	142	1.2
			42	143	2.2
Al Kenworth	Ready Mix Mixer	1.5	29	136	1.1
			40	144	1.9
			46	140	1.4
Bob Krantz	Truck Drive - Dry Blender Helper	1.2	28	144	1.0
			35	142	1.2
			44	140	1.2
Area Samples	Dry Blender	---	31	60	2.5
	"	---	32	15	1.4
	Ready Mix Mixer	---	34	20	5.0
	"	---	33	65	2.2
	Packer	---	37	60	1.5
	Warehouse	---	43	89	0.3

PLANT: AKRON DATE: 3/13/75

LOCATION: PACKER - STACKER

NAME: CLARENCE Blueye

PUMP SERIAL NO: BOB-C490

SAMPLED BY: George Green SIGNATURE: [signature]

Filter No.	27	38	11			
Time: On	7:12	9:34	12.43			
Off	9:34	12.00	3:05			
Elapsed Time, Mins.	142	146	142			
Flow Rate - Pump Setting	6	6	6			
- Liters/Min.	1.7	1.7	1.7			
Sample Volume, Liters	241	245	241			
Remarks:						
Asbestos Count, Fibers/ml	1.0	0.5	2.0			

Date Counted: _____

7.2 ~~8~~-Hour Weighted Average: 1.2

Counted by: George Green Signature: [signature]

Time weighted Av. $= \frac{(1)(142) + (.5)(146) + (2)(142)}{142 + 146 + 142}$

$= \frac{142 + 73 + 284}{430}$

$= 1.16$

SGP 0022039

The fiber concentration is calculated from the following formula:

$$\text{Concentration} = \frac{(\text{Average Fiber Count})\ (\text{Filter Area})}{(\text{Field Area})\ (\text{Sample Volume})\ (1000)}$$

Average Fiber Count: Average fiber count in fibers/field; total fiber counted divided by the number of fields. In this study 100 fields were counted for each sample.

Filter Area: 855 mm^2 (The exposed area of the 37 mm dia. filters used)

Field Area: .00216 mm^2 (The area enclosed by the reticle in our microscope with a 40X objective)

Sample Volume: Sample time in minutes times the flow rate in liters/mins.

1000: milliliters/liter

Therefore:
$$\text{Concentration} = \frac{(855)\ (\text{Average fiber count})}{(.00216)\ (1000)\ (\text{Sample Volume})}$$

$$= \frac{396 \times (\text{Average fiber count})}{(\text{Sample Volume})}$$

We also ran counts on some "blanks". That is, filters which were not used to take samples but had gone through all the other handling procedures that the filters had. The average blank for Chicago had a concentration of .05 fibers/field and for Akron .06 fibers/field. These values were subtracted from the average fiber count in each case.

All of the data accumulated in this study is attached to this report.

G. W. G.

GWG:elz

Enclosures

ASBESTOS COUNT RECORD SHEET

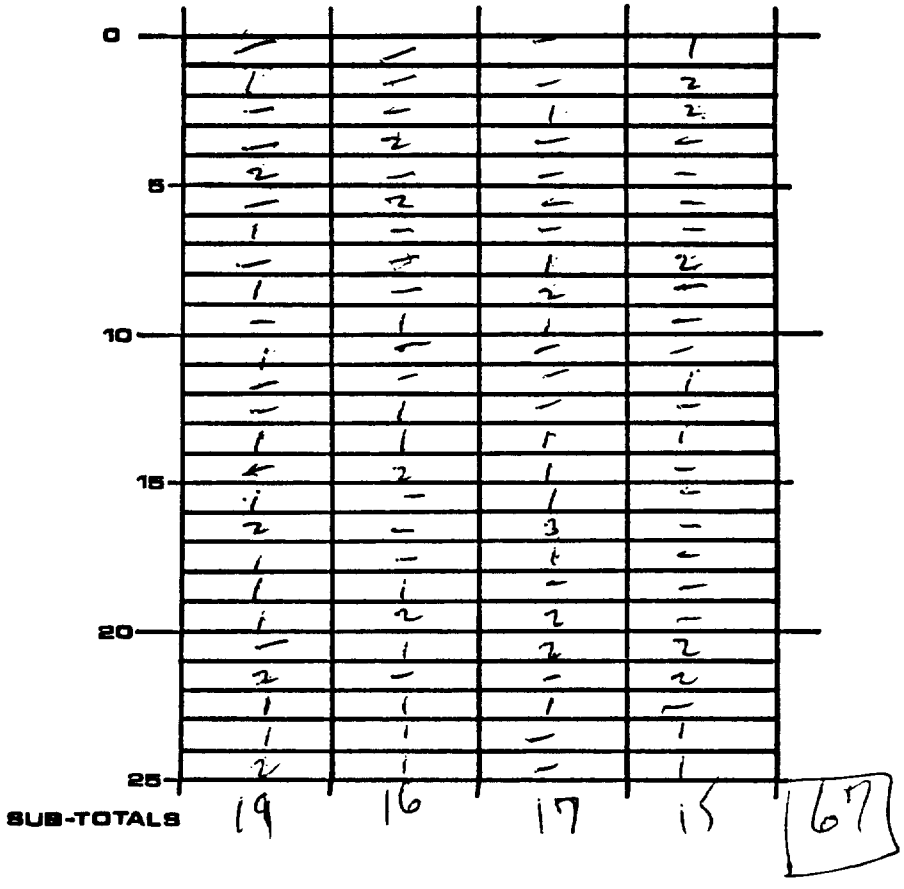
SAMPLE# 27 OPERATION PACKER STACKER - Clarence Blueeye

FLOW 1.7 TIME 142 VOLUME 241 DATE 3/19/75

INITIALS [illegible] F.AREA .00216 BLK.CNT.AV. .06

AV. COUNT .67 CONCENTRATION

COMMENTS



$$396 \times \frac{.67 - .06}{241} = 1.00$$

ASBESTOS COUNT RECORD SHEET

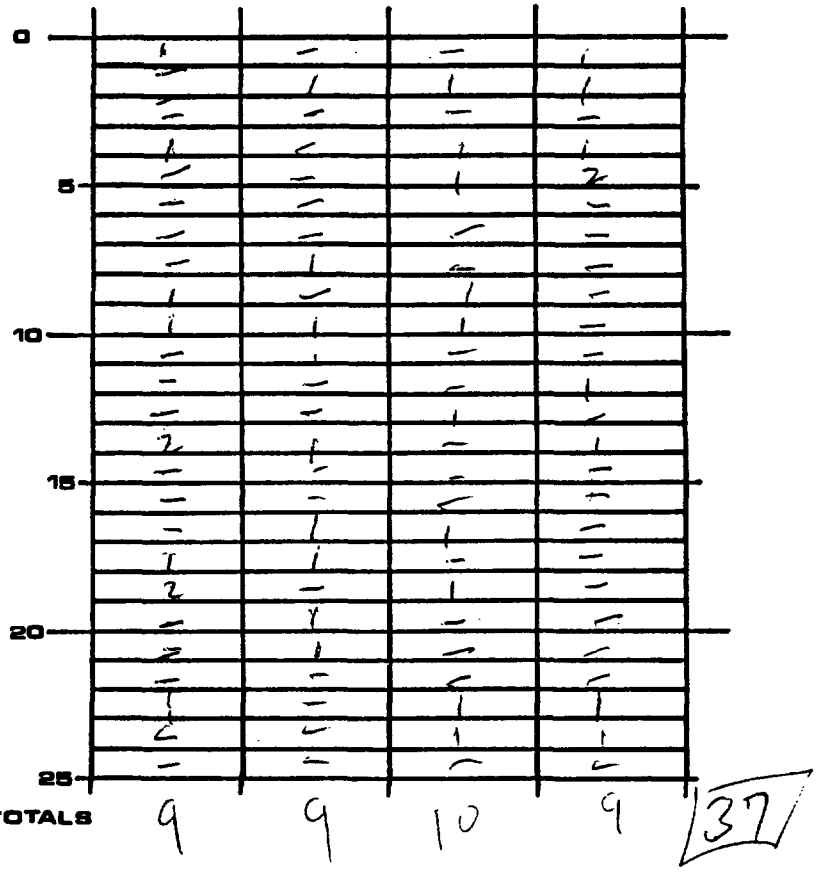
SAMPLE# 38 OPERATION PACKER-STACKER, Chrysotile Plug-in

FLOW 1.7 TIME 146 VOLUME 248 DATE / /

INITIALS JGW F.AREA 100216 BLK.CNT.AV. .06

AV.COUNT .37 CONCENTRATION

COMMENTS



$396 \times \frac{.37-.06}{248} = .50$

ASBESTOS COUNT RECORD SHEET

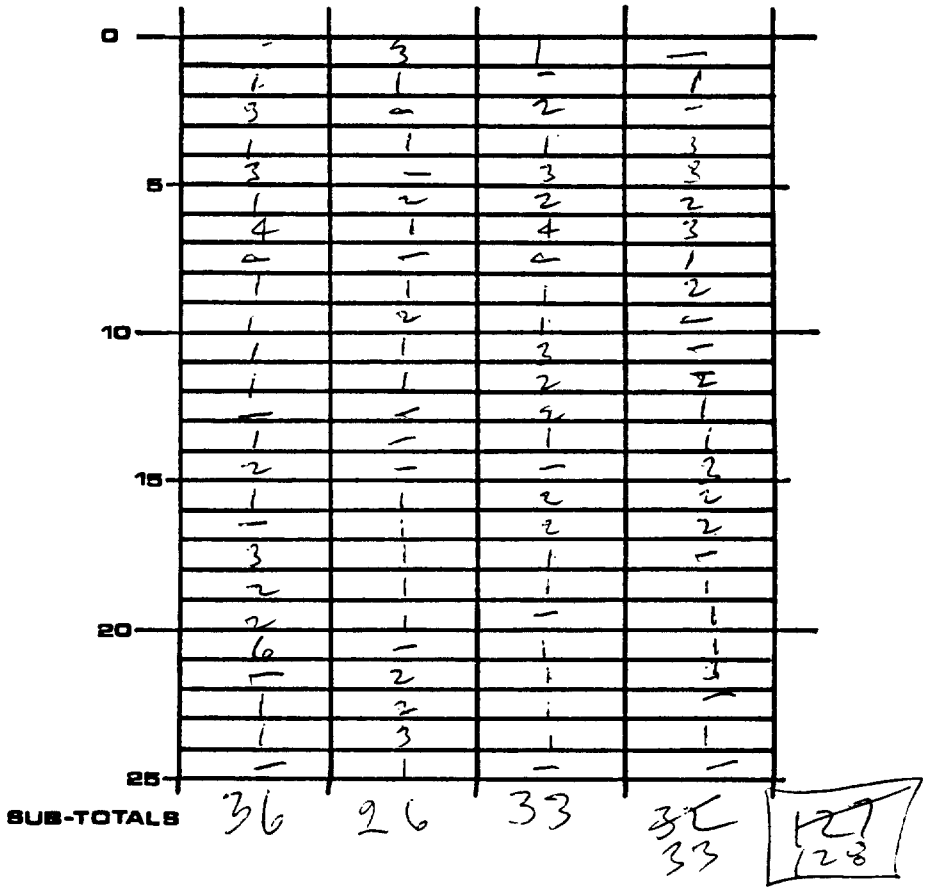
SAMPLE# 41 OPERATION PACKER - STACKER

FLOW 1.7 TIME 142 VOLUME 241 DATE 12/1/75

INITIALS MW F.AREA .00246 BLK.CNT.AV. .06

AV.COUNT 1.28 CONCENTRATION

COMMENTS



$$396 \times \frac{1.28 - .06}{241} = 2.00$$

PLANT: AKRON, NY DATE: 2/13/73

LOCATION: PACKER - STACKER

NAME: Leon Spears

PUMP SERIAL NO: B-06-0288

SAMPLED BY: George Green SIGNATURE: [signature]

Filter No.	26	36	47			
Time: On	7:10	9:42	12:45			
Off	9:42	12:00	3:05			
Elapsed Time, Mins.	152	135	142			
Flow Rate - Pump Setting	7	6	6			
- Liters/Min.	2.1	1.7	1.7			
Sample Volume, Liters	319	229	241			
Remarks:						
Asbestos Count, Fibers/ml	0.9	0.3	1.7			

Date Counted: _____

7.2 ~~8~~ Hour Weighted Average: 1.0

Counted by: George Green Signature: [signature]

$$Av. = \frac{1.9(152) + (.3)(138) + 1.7(142)}{152 + 138 + 142} = \frac{137 + 41 + 241}{432}$$

$$= 0.97$$

SGP 0022044

ASBESTOS COUNT RECORD SHEET

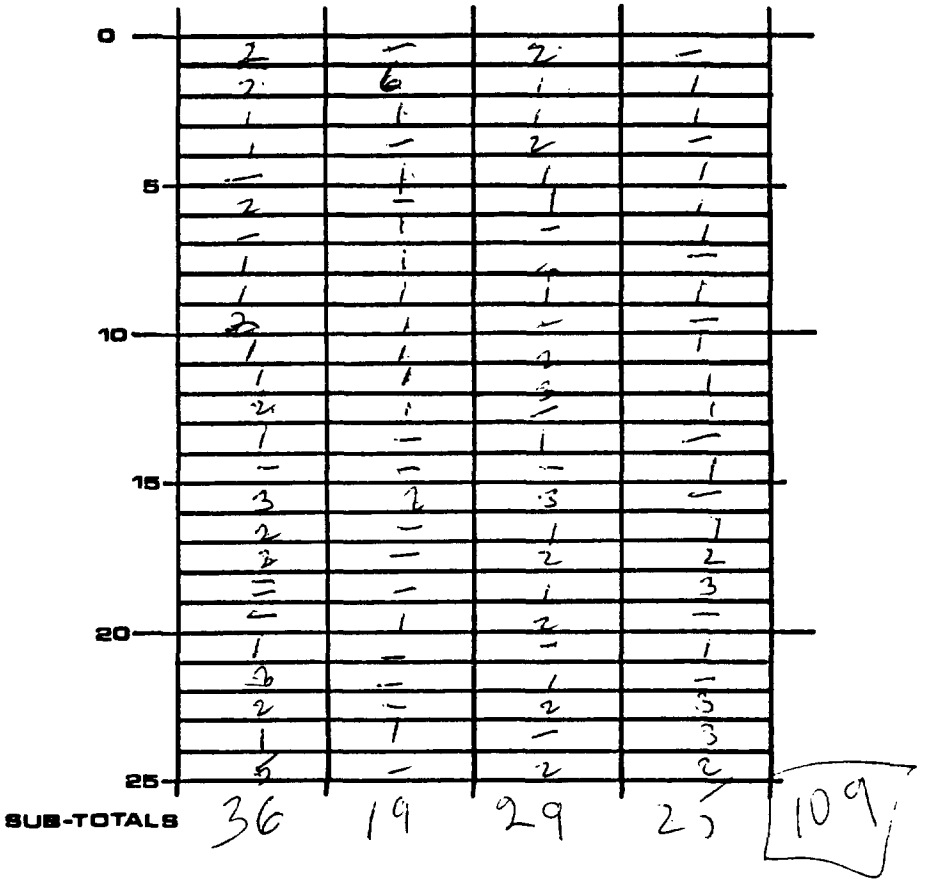
SAMPLE# 31 OPERATION _____

FLOW 1.7 TIME 142 VOLUME 241 DATE 1/15/75

INITIALS TWJ F.AREA .00216 BLK.CNT.AV. .06

AV.COUNT 1.09 CONCENTRATION _____

COMMENTS _____



$396 \frac{1.09 - .06}{241} = 1.67$

SGP 0022045

ASBESTOS COUNT RECORD SHEET

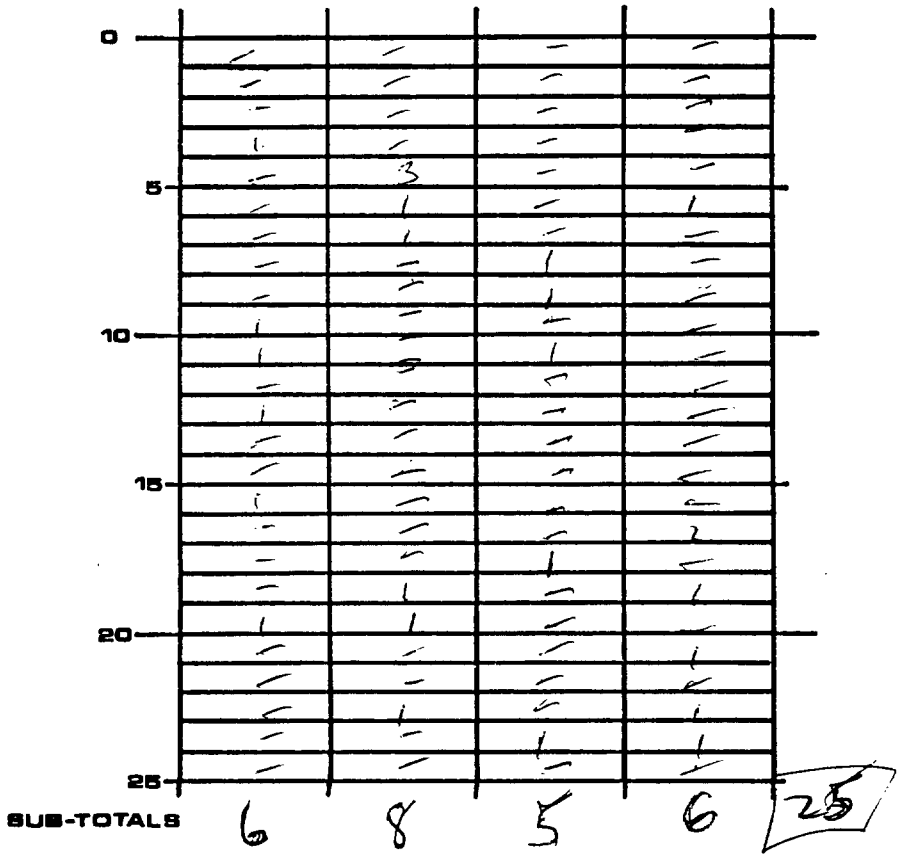
SAMPLE# 26 OPERATION PACKER STACKER Loading Specs

FLOW 1.7 TIME 138 VOLUME 235 DATE / /

INITIALS JWH F.AREA .00LIC BLK.CNT.AV. .06

AV. COUNT .25 CONCENTRATION

COMMENTS



$396 \frac{.25 - .06}{235} = .32$

ASBESTOS COUNT RECORD SHEET

SAMPLE # 26 OPERATION PACKER STACKER [illegible]

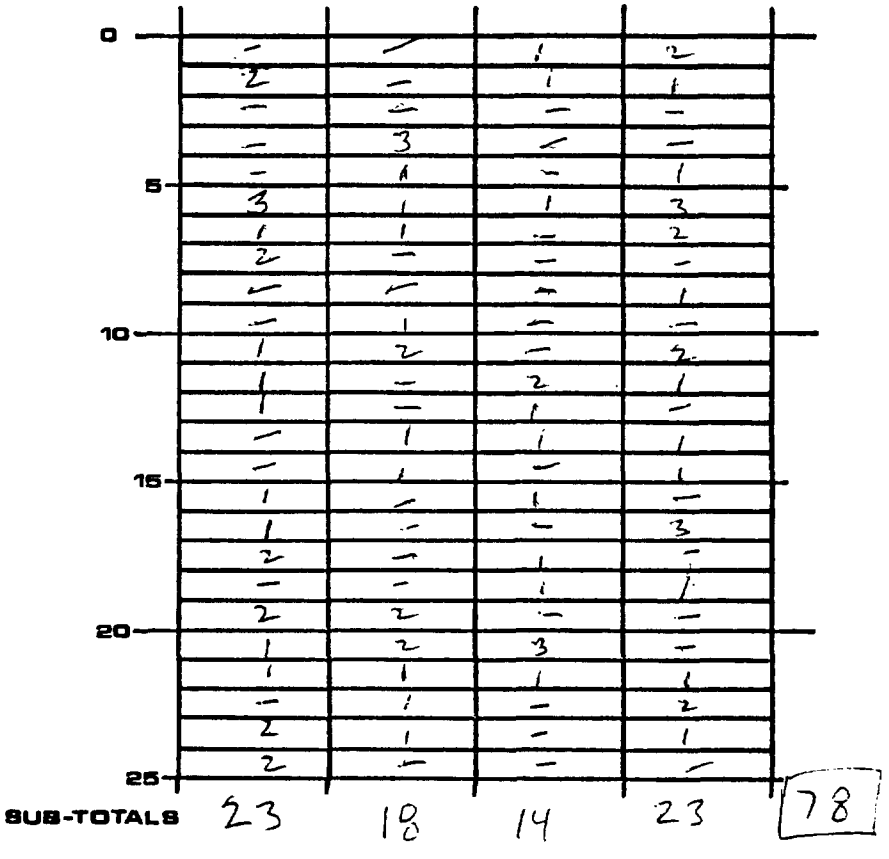
FLOW 2.1 TIME 152 VOLUME 319 DATE / /

INITIALS [illegible] F.AREA .00216 BLK.CNT.AV. .06

AV. COUNT .78 CONCENTRATION

COMMENTS

0	–	–	1	2	
	2	–	1	1	
	–	–	–	–	
	–	3	–	–	
5	–	1	–	1	
	3	1	1	3	
	1	1	–	2	
	2	–	–	–	
	–	–	–	1	
10	–	1	–	–	
	1	2	–	2	
	1	–	2	1	
	1	–	1	–	
	–	1	1	1	
15	–	1	–	1	
	1	–	1	–	
	1	–	–	3	
	2	–	1	–	
	–	–	1	1	
20	2	2	–	–	
	1	2	3	–	
	1	1	1	1	
	–	1	–	2	
	2	1	–	1	
25	2	–	–	–	
SUB-TOTALS	23	18	14	23	78



$$396 \frac{.78 - .06}{319} = .89$$

PLANT: AKRON DATE: 3/13/95

LOCATION: MIXER - DRY BLENDER

NAME: Charlie Jackson

PUMP SERIAL NO: P-06-030

SAMPLED BY: George Green SIGNATURE: G. W. Green

Filter No.	30	34	42			
Time: On	7:15	9:38	12:42			
Off	9:35	12:00	3:05			
Elapsed Time, Mins.	143	142	143			
Flow Rate - Pump Setting	6	6	6			
- Liters/Min.	1.8	1.8	1.8			
Sample Volume, Liters	257	256	257			
Remarks:						
Asbestos Count, Fibers/ml	1.2	1.2	2.2			

Date Counted: _____

~~8~~-Hour Weighted Average: 1.5

Counted by: George Green Signature: _____

$$Al = \frac{(1.2)(143) + (1.2)(142) + (2.2)(143)}{143 + 142 + 143} = \frac{172 + 170 + 315}{428}$$

$$= 1.5$$

SGP 0022048

ASBESTOS COUNT RECORD SHEET

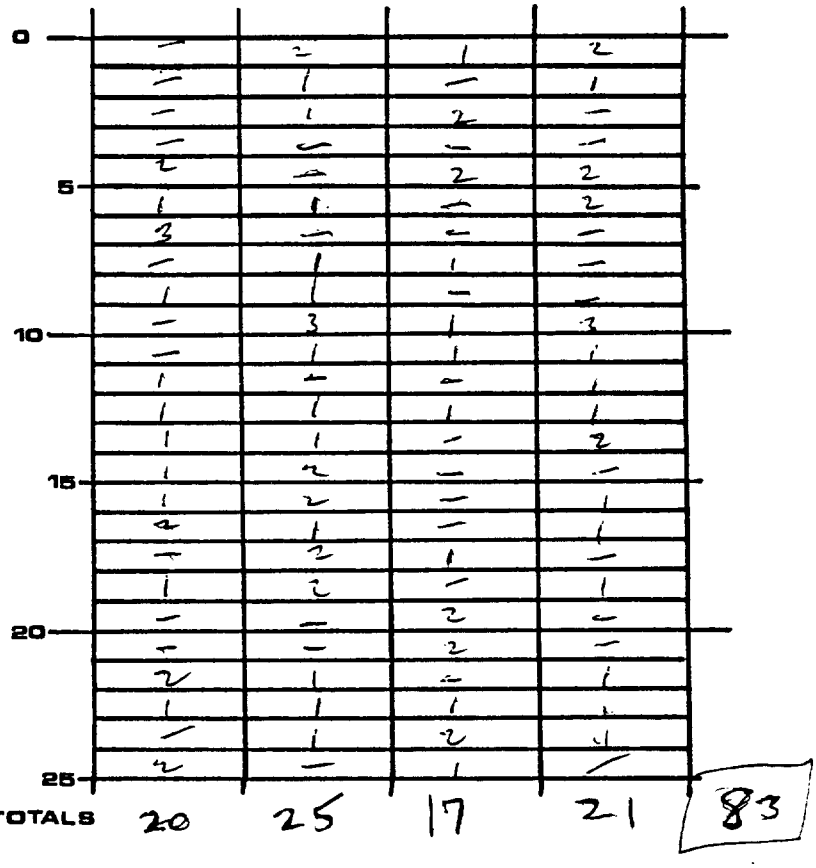
SAMPLE# 30 OPERATION DRY MIXER

FLOW 1.8 TIME 143 VOLUME 257 DATE 3/20/75

INITIALS [illegible] F.AREA [illegible] BLK.CNT.AV. _____

AV.COUNT .83 CONCENTRATION _____

COMMENTS _____



0	—	2	1	2
	—	1	—	1
	—	1	2	—
	—	—	—	—
	2	—	2	2
5	1	1	—	2
	3	—	—	—
	—	1	1	—
	1	1	—	—
	—	3	1	3
10	—	1	1	1
	1	—	—	1
	1	1	1	1
	1	1	—	2
	1	2	—	—
15	1	2	—	1
	2	1	—	1
	—	2	1	—
	1	2	—	1
	—	—	2	—
20	—	—	2	—
	2	1	—	1
	1	1	1	1
	—	1	2	1
	2	—	1	—
25				
SUB-TOTALS	20	25	17	21

$\boxed{83}$

$$396 \times \frac{.83 - .06}{257} = 1.19$$

ASBESTOS COUNT RECORD SHEET

SAMPLE# 39 OPERATION PACKER - STACKER

FLOW 1.3 TIME ~~152~~ 142 VOLUME ~~274~~ 256 DATE 2/11/75

INITIALS [illegible] F.AREA .00216 BLK.CNT.AV. .06

AV. COUNT .94 CONCENTRATION

COMMENTS

0	3	—	2	1
	—	—	1	—
	1	1	1	3
	1	3	—	—
5	1	1	2	1
	2	—	—	—
	—	1	1	1
	1	1	—	1
	2	—	—	1
10	1	—	2	1
	1	1	—	—
	2	1	1	1
	3	1	1	—
	1	—	1	1
15	1	—	—	1
	—	3	2	3
	1	—	1	—
	1	—	—	—
	2	1	—	4
20	—	1	—	—
	2	2	—	3
	2	—	1	1
	—	2	—	1
	1	1	1	1
25	—	—	1	2
SUB-TOTALS	29	20	18	27

$\boxed{94}$

$$396 \times \frac{.94 - .06}{\cancel{274}\ 256} = \cancel{1.27}\ 1.19$$

SGP 0022050

ASBESTOS COUNT RECORD SHEET

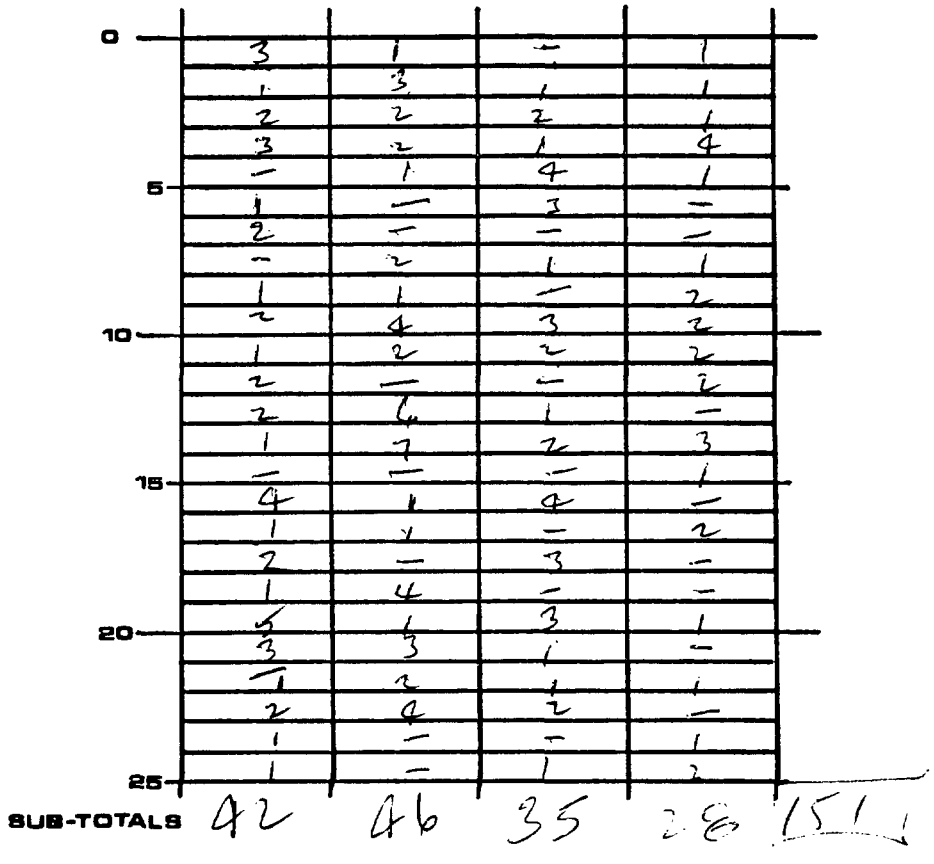
SAMPLE# 42 OPERATION Doug Shuler

FLOW 1.8 TIME 142 VOLUME 257 DATE 2/21/75

INITIALS [illegible] F.AREA 0216 BLK.CNT.AV. 106

AV.COUNT 1.51 CONCENTRATION 2.2

COMMENTS



$$396 \times \frac{1.51 - 6}{257} = 2.23$$

SGP 0022051

PLANT: AKRON DATE: 3/13/75

LOCATION: Ready Mix Mixer

NAME: Al Kenworth

PUMP SERIAL NO: B-C 6-0165

SAMPLED BY: George Green SIGNATURE: J W J

Filter No.	29	40	46			
Time: On	7:30	9:36	12:47			
Off	9:36	12:00	3:07			
Elapsed Time, Mins.	136	~~144~~	140			
Flow Rate - Pump Setting	6	6	6			
- Liters/Min.	2.0	2.0	2.0			
Sample Volume, Liters	272	~~288~~	280			
Remarks:	Dust ~~from~~ generated when dry fill is dumped into mixer was scattered by a fan operator stood behind fan during this time.					
Asbestos Count, Fibers/ml	1.1	1.9	1.4			

Date Counted: 3/21/75

~~8-Hour~~ Weighted Average: (7.1 hr) 1.5

Counted by: _____ Signature: _____

$$Av = \frac{(1.1 \times 136) + (1.9 \times 144) + 1.4 \times 140}{136 + 144 + 140} = \frac{149.6 + 273.6 + 196}{420}$$

$$= 1.48$$

ASBESTOS COUNT RECORD SHEET

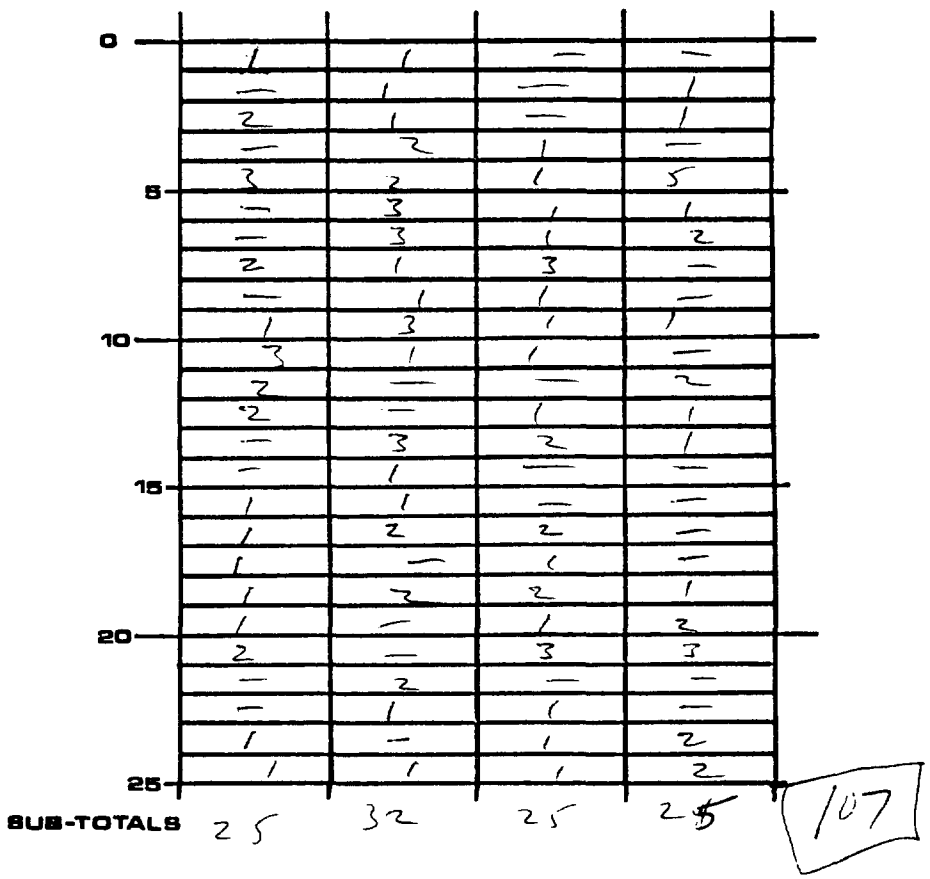
SAMPLE# 46 OPERATION Ready Mix Mixer

FLOW 2.0 TIME 140 VOLUME 280 DATE 3/21/95

INITIALS JJH F.AREA .00216 BLK.CNT.AV. .06

AV.COUNT 1.06 CONCENTRATION

COMMENTS



$$396 \times \frac{1.07 - .06}{280} = 1.43$$

ASBESTOS COUNT RECORD SHEET

SAMPLE# 40 OPERATION Rocky Mix Mixer

FLOW 2.6 TIME 144 VOLUME 250 DATE 5/21/75

INITIALS JCM F.AREA .0216 BLK.CNT.AV. .06

AV.COUNT 1.42 CONCENTRATION

COMMENTS

0	3	—	1	—
	2	6	—	—
	3	4	1	—
	—	—	4	1
5	1	1	3	1
	2	1	2	1
	1	—	1	1
	—	2	—	1
	—	1	—	3
10	3	5	4	2
	1	—	1	2
	—	1	2	3
	1	2	4	1
	3	2	3	1
15	—	—	3	2
	—	2	—	—
	1	—	2	3
	—	—	3	1
	1	2	2	1
20	1	—	—	1
	—	2	—	2
	3	1	4	2
	—	—	2	2
	2	—	—	1
25	4	3	2	1
SUB-TOTALS	32	34	42	34

142

$396 \times \frac{1.42 - .06}{250} = 1.61$

SGP 0022054

ASBESTOS COUNT RECORD SHEET

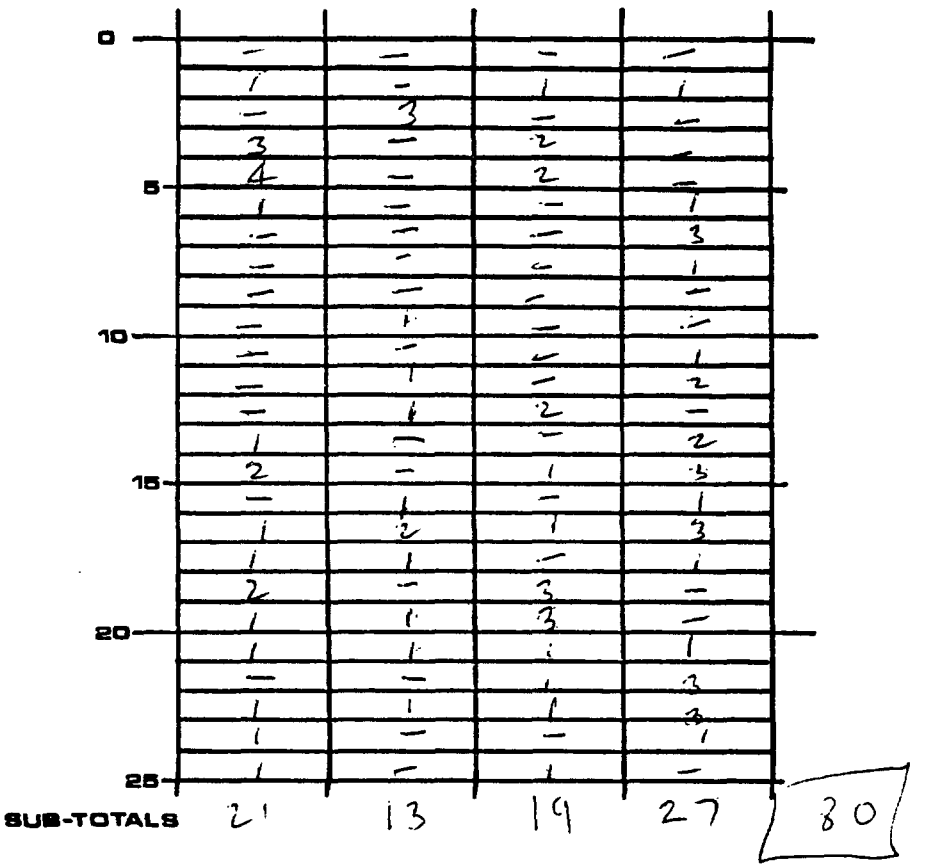
SAMPLE# 271 OPERATION RM Mixer

FLOW 2.0 TIME 134 VOLUME 272 DATE 3/19/15

INITIALS [illegible] F.AREA .00216 BLK.CNT.AV. 106

AV.COUNT 180 CONCENTRATION

COMMENTS



$$396 \times \frac{.80 - .06}{272} = 1.07$$

PLANT: AKRON

DATE: 3/13/75

LOCATION: TRUCK DRIVER + Helper

NAME: Bob Kvantz

PUMP SERIAL NO: B-06-0422

SAMPLED BY: George GREEN

SIGNATURE: GWG

Filter No.	28	35	44			
Time: On	7.14	938	12.40			
Off	939	12.00	3.00			
Elapsed Time, Mins.	144	~~142~~	140			
Flow Rate - Pump Setting	6	6	6			
- Liters/Min.	1.7	1.7	1.7			
Sample Volume, Liters	245	241	238			
Remarks:						
Asbestos Count, Fibers/ml	1.0 ~~1.1~~	1.2	1.2			

Date Counted: _____

~~8~~-Hour Weighted Average: (7.1hrs) 1.2

Counted by: G W Green

Signature: GWG

SGP 0022056

ASBESTOS COUNT RECORD SHEET

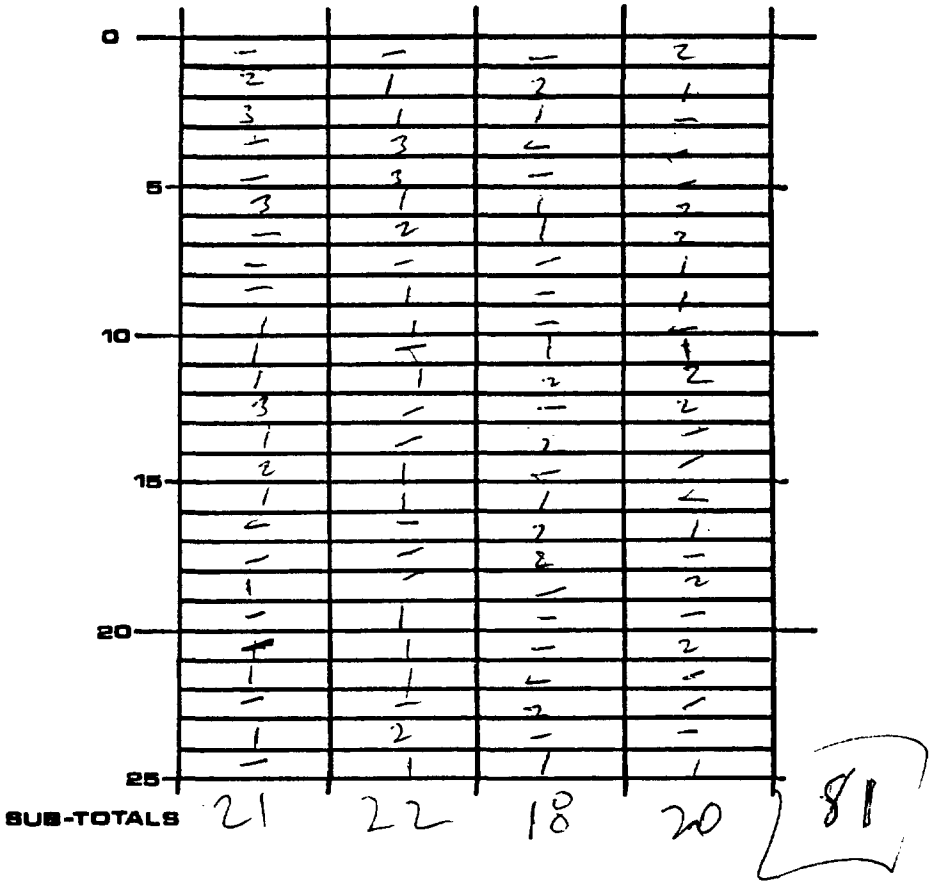
SAMPLE # 44 OPERATION _____

FLOW 1.7 TIME 140 VOLUME ~~245~~ 238 DATE 3/21/75

INITIALS [illegible] F.AREA .00216 BLK.CNT.AV. .06

AV. COUNT .81 CONCENTRATION _____

COMMENTS _____



0	–	–	–	2
	2	1	2	1
	3	1	1	–
	–	3	–	–
5	–	3	–	–
	3	1	1	2
	–	2	1	2
	–	–	–	1
	–	1	–	1
10	1	1	–	–
	1	–	1	1
	1	1	2	2
	3	–	–	2
	1	–	2	–
15	2	1	–	–
	1	1	1	–
	–	–	2	1
	–	–	2	–
	1	–	–	2
	–	1	–	–
20	–	1	–	2
	1	1	–	–
	–	–	2	–
	1	2	–	–
25	–	1	1	1
SUB-TOTALS	21	22	18	20

$\boxed{81}$

$$396 \times \frac{.81 - .06}{\cancel{245}\ 238} = 1.24$$

SGP 0022057

ASBESTOS COUNT RECORD SHEET

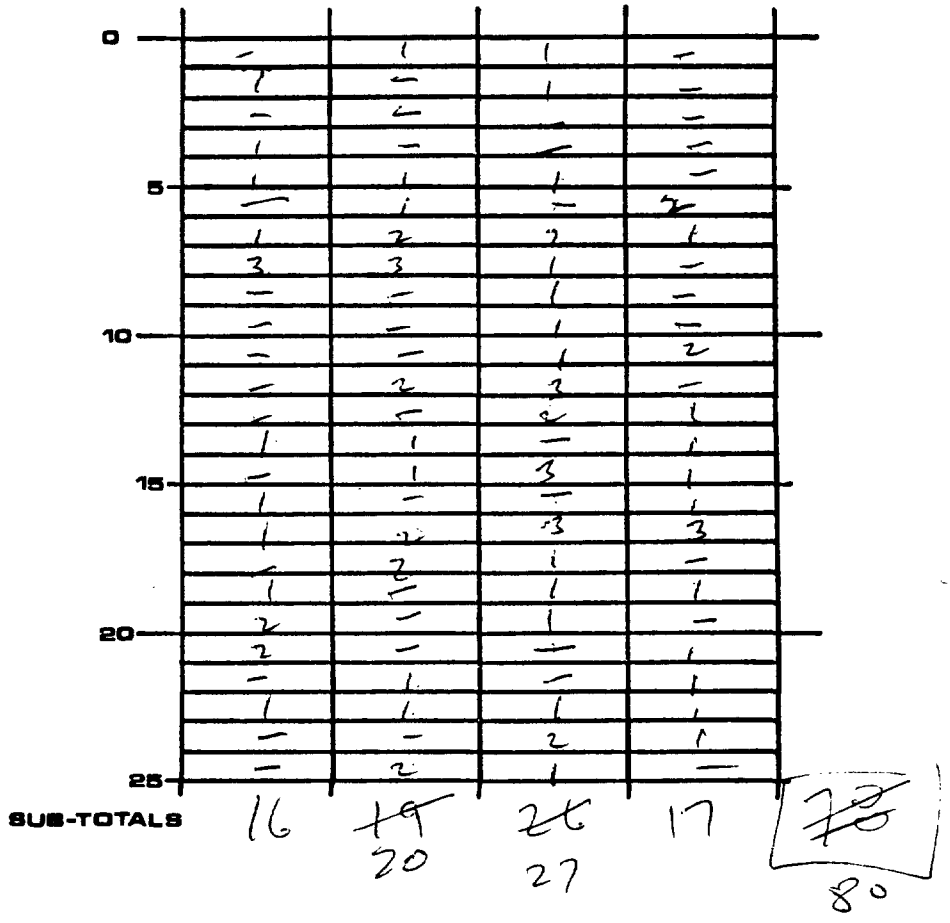
SAMPLE# 31 OPERATION TRUCK DRIVER - BLENDER HELPER

FLOW 1.7 TIME 142 VOLUME 241 DATE / /

INITIALS JGS F.AREA .00216 BLK.CNT.AV. .06

AV.COUNT .80 CONCENTRATION

COMMENTS



$$316 \times \frac{.80 - .06}{241} = 1.21$$

ASBESTOS COUNT RECORD SHEET

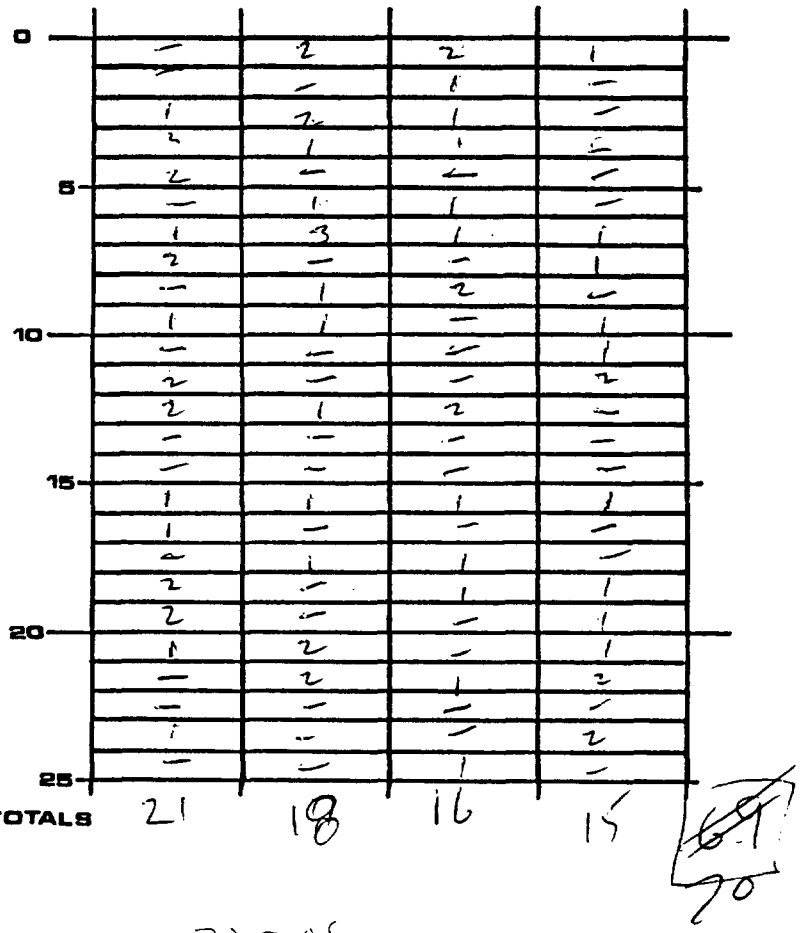
SAMPLE# 28 OPERATION TRUCK DRIVER - BLENDER HELPER

FLOW 1.7 TIME 144 VOLUME 245 DATE 7/21/15

INITIALS JGP F.AREA .00216 BLK.CNT.AV. 1.06

AV.COUNT .70 CONCENTRATION

COMMENTS



$$348 \times \frac{.70 - .06}{245} = 1.03$$

SGP 0022059

ASBESTOS COUNT RECORD SHEET

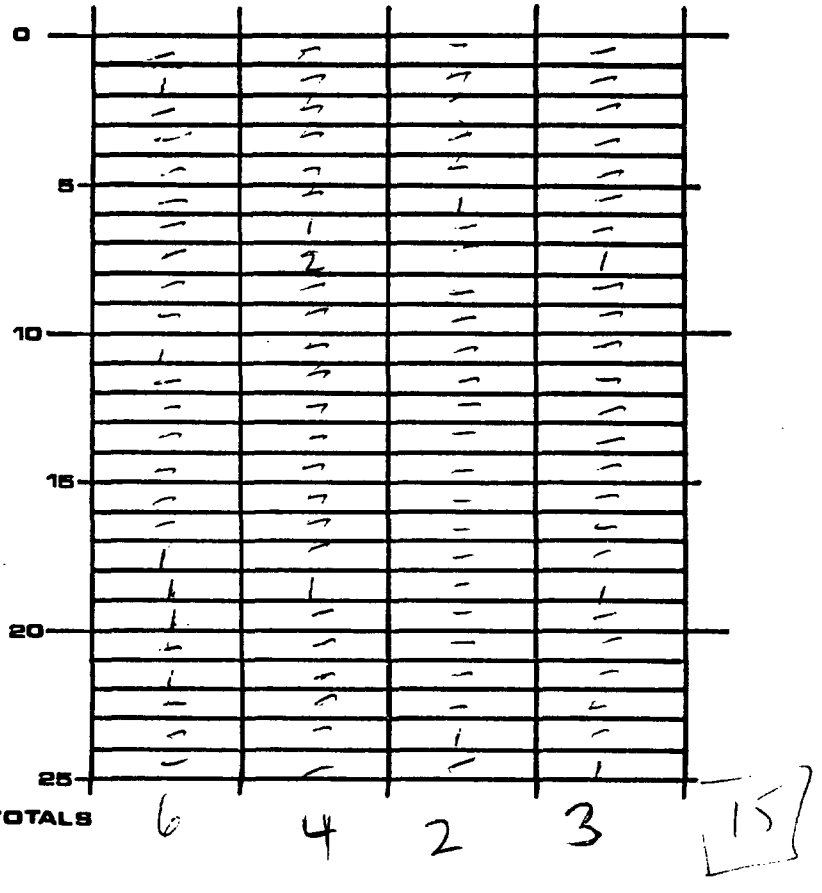
SAMPLE# 41 OPERATION WARE HOUSE AREA SAMPLE

FLOW ~~1.5~~ 1.4 TIME 89 VOLUME ~~150~~ 125 DATE 3/24/71

INITIALS MGH F.AREA .00216 BLK.CNT.AV. .06

AV. COUNT .15 CONCENTRATION

COMMENTS



$$.396 \times \frac{.15 - .06}{125} = .29$$

SGP 0022061

PLANT: AKRON DATE: 3/13/75

LOCATION: VARIOUS

NAME: AREA SAMPLES

PUMP SERIAL NO: B-06-0444

SAMPLED BY: George Green SIGNATURE: [signature]

Location:	DRY BLENDER		RM MIXER		PACKER - WAREHOUSE	
Filter No.	31	32	34	33	37	43
Time: On	7:33	8:33	8:52	9:12	10.19	11:22
Off	8:33	8:48	9:12	10:17	10:19	12:51
Elapsed Time, Mins.	60	15	20	65	60	89
Flow Rate - Pump Setting	6	6	6	6	6	5
- Liters/Min.	1.75	1.75	1.75	1.75	1.75	1.4
Sample Volume, Liters	105	26	35	113	105	125
Remarks:			on Dump Dry charge w/FAN to Clear w/ Dust.			Near Asbestos storage Area.
Asbestos Count, Fibers/ml	2.5	1.4	5.0	2.2	1.5	0.3

Date Counted: _____

8-Hour Weighted Average: NOT APPLICABLE

Counted by: George Green Signature: [signature]

ASBESTOS COUNT RECORD SHEET

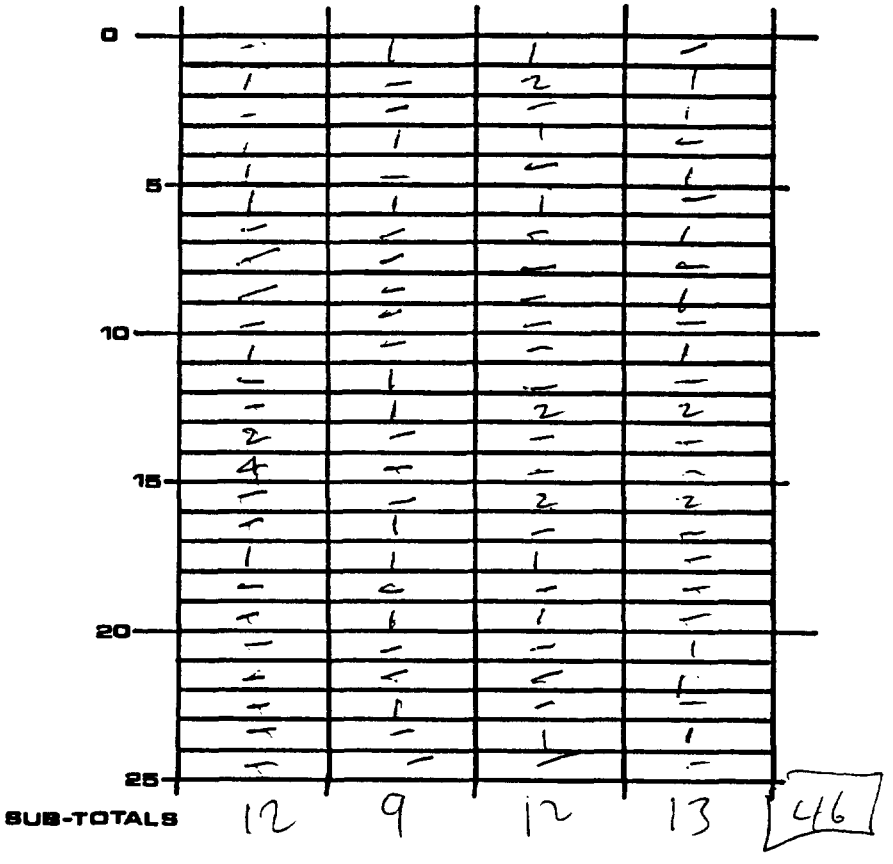
SAMPLE# 37 OPERATION PACKER

FLOW 1.75 TIME 60 VOLUME 105 DATE 3/21/75

INITIALS JWT F.AREA 2.16 BLK.CNT.AV. .06

AV. COUNT .46 CONCENTRATION

COMMENTS



$396 \frac{.46 - .06}{105} = 1.5$

SGP 0022062

ASBESTOS COUNT RECORD SHEET

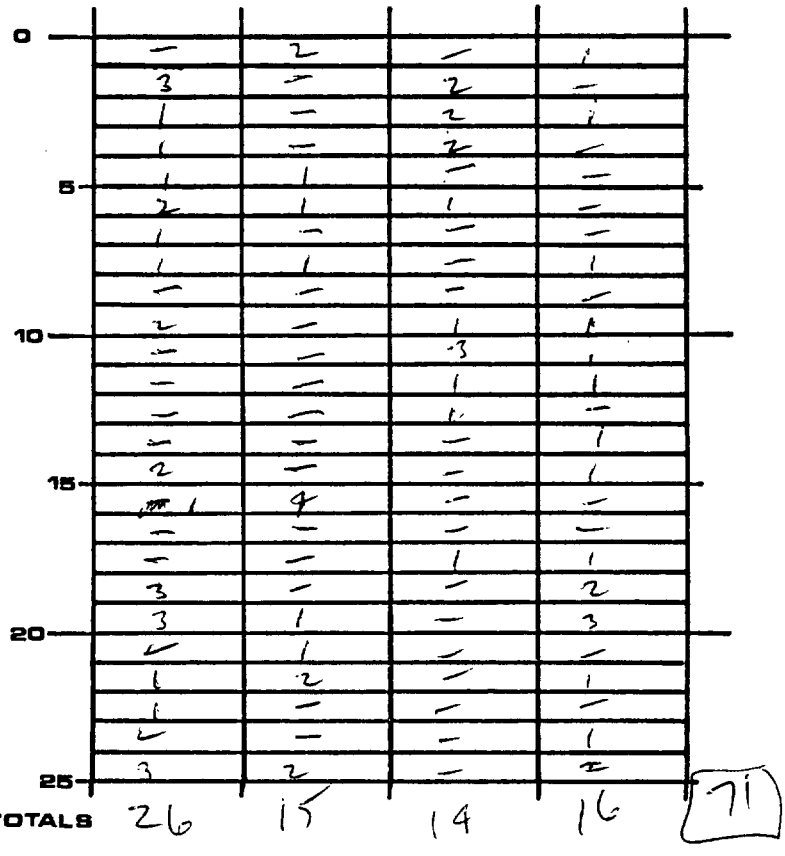
SAMPLE# 31 OPERATION D-4 MIKE 2 - A/C & SAMPLE

FLOW 1.75 TIME 60 VOLUME 105 DATE / /

INITIALS -JGR F.AREA .0045 BLK.CNT.AV. .06

AV.COUNT .71 CONCENTRATION _____

COMMENTS _____



$$396 \times \frac{.71 - .06}{105} = 2.45$$

ASBESTOS COUNT RECORD SHEET

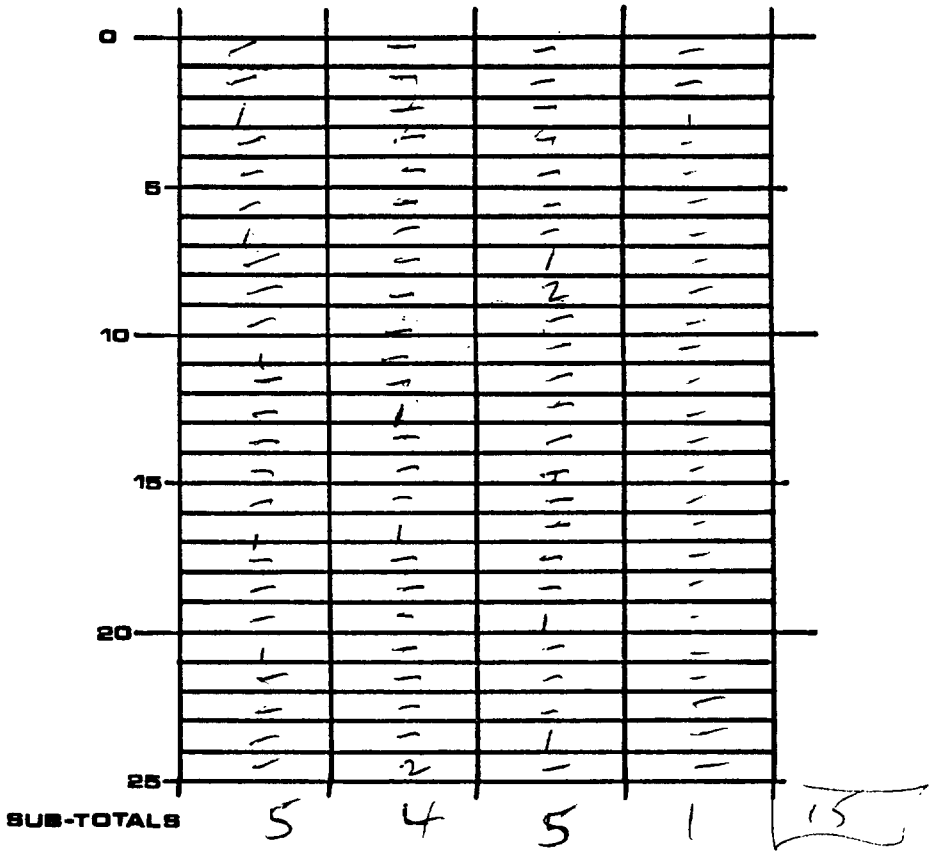
SAMPLE# 32 OPERATION DRY MIXER AREA SAMPLE

FLOW 1.75 TIME 15 VOLUME 26 DATE / /

INITIALS JGS F.AREA .00216 BLK.CNT.AV. .06

AV.COUNT .15 CONCENTRATION

COMMENTS



$$396 \times \frac{.15 - .06}{26} = 1.4$$

SGP 0022064

ASBESTOS COUNT RECORD SHEET

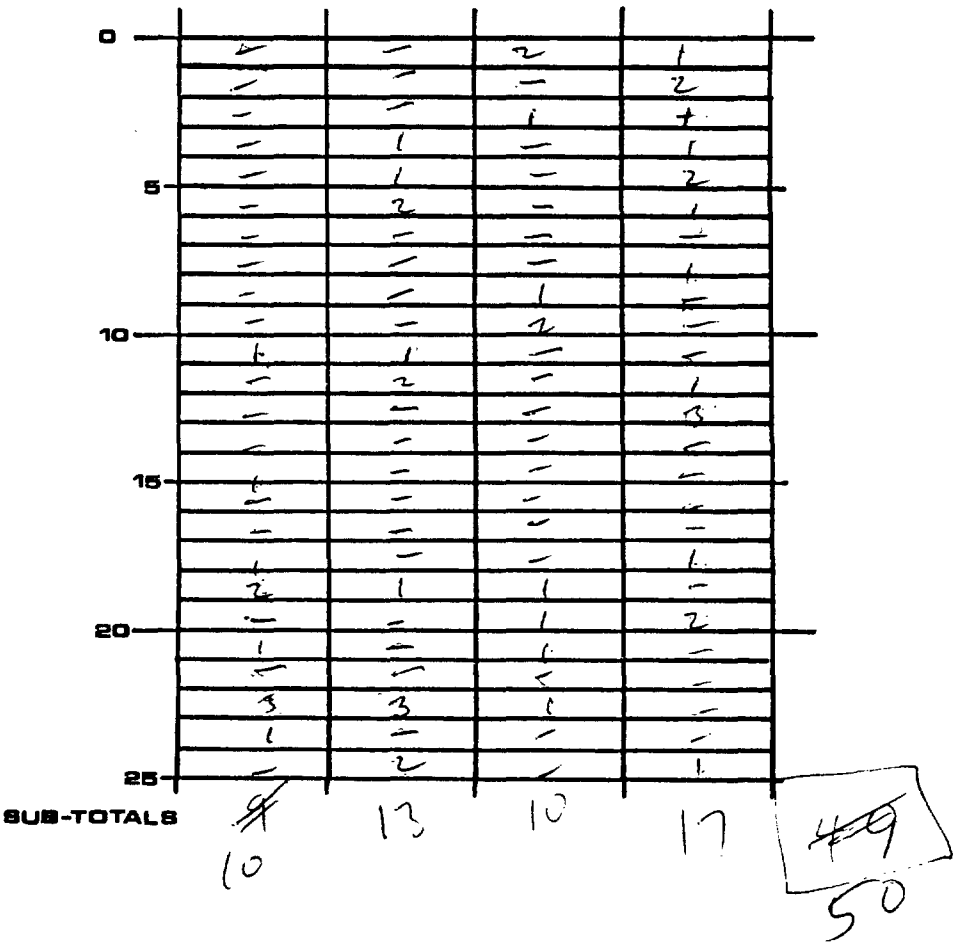
SAMPLE # 34 OPERATION R.M MIXER (AREA SAMPLE)

FLOW 1.75 TIME 20 VOLUME 35 DATE / /

INITIALS DWS F.AREA 0.216 BLK.CNT.AV. .06

AV. COUNT _____ CONCENTRATION _____

COMMENTS — on during dry charge



$$396 \times \frac{.50 - .06}{35} = 4.98$$

ASBESTOS COUNT RECORD SHEET

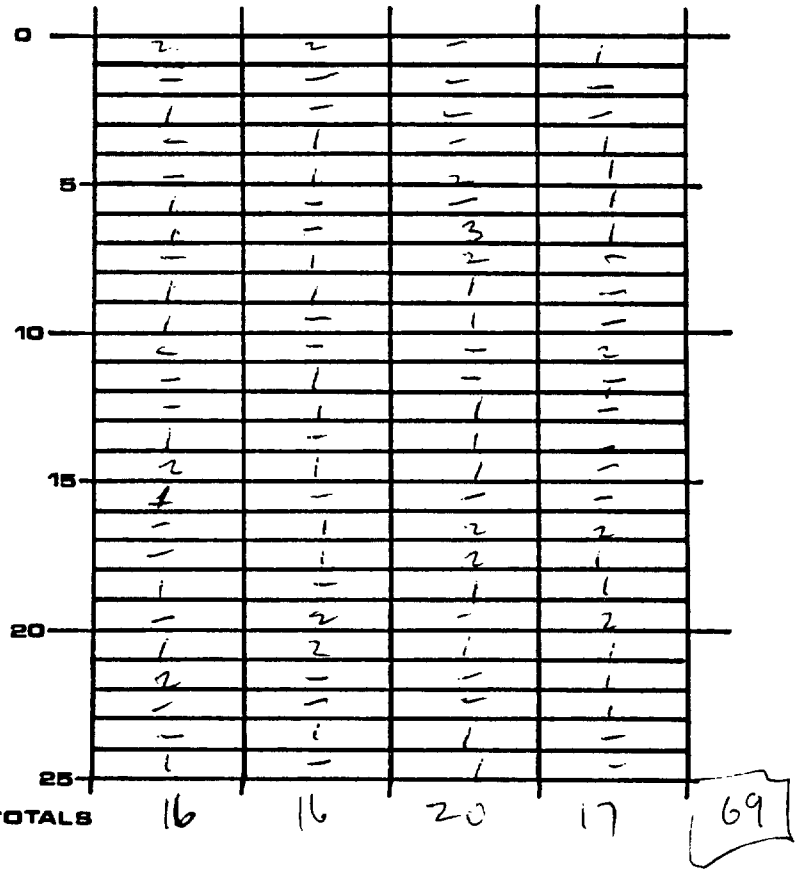
SAMPLE# 33 OPERATION RM MIXER AREA SAMPLE

FLOW 1.75 TIME 65 VOLUME 113 DATE 3/24/95

INITIALS [redacted] F.AREA 0.01216 BLK.CNT.AV. .06

AV. COUNT .69 CONCENTRATION

COMMENTS



$$396 \times \frac{.69 - .06}{113} = 2.2$$

SGP 0022066