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Box 11

Proc-340

4/19/39

Ref to Cause

RAYBESTOS - MANHATTAN, INC.

BRIDGEPORT AND STRATFORD PLANTS

This survey was made on the 24th, 25th, and 26th of March, 1936.

BRIDGEPORT PLANT

It is evident from the dust counts of this survey that the dust conditions of the weave rooms have been improved. The change from the dry binder to wet binder is the reason for this improvement. This survey was made under winter conditions with most of the windows closed.

Comparing the survey of 1935 and that of 1936 other facts are noticed. At the time of the 1935 survey, seven looms were running on the third floor as compared with four at the time of the 1936 survey. There were fewer looms running on the second floor at the time of the 1936 survey than were running during the 1935 survey.

The dust concentrations at the warp machines may vary to a considerable extent depending upon the moisture content of the yarn, the speed at which the machines are operating, and the amount of natural ventilation; however, the operators have been supplied with approved respirators for protection against the dust generated.

The condition of the Brake Department has been improved by the removal of the drill presses.

The exhaust hood of the Pratt and Whitney Grinder has also been improved.

Table #1 shows results of 1936 survey

Table #2 - shows comparative results of identical locations or operations of survey of 1935 and survey of 1936.

Exhibit E.

BRIDGEPORT PLANT - TABLE #1

Sample No.	Station	Date	Cu. Ft.	Millions of Particles Per cu. ft. of air Sampled		Type of Dust	Lead Results mg/cu.ft.	mg/cu.M	mg/10 hr. day	Remarks
1.	2nd floor - Between looms #225 & 227	3/24/36	40.0	.90	5	Asbestos				Old looms #30 & 31
2.	2nd floor - Between looms #234 & 236	"	39.2	1.2	7	Lead	000	000	000	Old looms #29 & 37
3.	2nd floor - at loom #9	"	37.5	.85	5	Asbestos				
4.	" " - at loom #220	"	47.1	1.1	7	"				Old loom #25
5.	" " - Between looms #238 & 240	"	34.5	1.4	8	"				Old looms #62 & 63
7.	2nd floor - at inspection table	"	42.2	3.6	21	"				Exhaust system - Damp stock "
8.	" " - at loom #45	"	42.3	1.6	9	"				
6.	1st floor - Between looms #82 Air [illegible]	"	45.6	1.2	7	"				
9.	1st floor - Warp room Between Cop. winders	"	50.9	1.3	8	"				1032 - [illegible] yarn 1030 - [illegible] cotton 1032 - [illegible]
11.	1st floor - " " #3 warp machine - run at fast speed. 1030 - 1 cotton	"	27.1	5.8	46	"				Corresponds to #2 in Parrish's survey
15.	1st floor - Warp room - warp machine #6 - 1033 mule	3/25/36	28.8	17.1	69	"				Windows closed - respirators supplied to workmen
10.	1st floor - Brake department General air	3/24/36	42.2	.90	5	Brake lining Clutch facing	.000425	.015	0.15	Taken near presses Drill presses moved to Stratford

BRIDGEPORT PLANT - TABLE #1 (CONTINUED)

Sample No.	Station	Date	Cu. Ft.	Millions of Particles per Cu. Ft. of Air Sampled		Type of Dust	Lead Results MG/CU.FT.	MG/CU.M	MG/10 HR. DAY	Remarks
12.	1ST FLOOR-BRAKE DEPARTMENT AT PRATT & WHITNEY GRINDER BRAKE LINING	3/24/36	32.9	2.3	.14	BRAKE LINING				EXHAUST HOOD IMPROVED SINCE PREVIOUS SURVEY
13.	3RD FLOOR - BETWEEN LOOMS #319 & 321	3/25/36	47.9	4.6	~1	ASBESTOS				OLD LOOMS #68 & #69
14.	GENERAL AIR NEAR LOOM #309	"	45.2	3.3	~0	"				4 LOOMS RUNNING ON 3RD FLOOR

BRIDGEPORT PLANT - TABLE #2

Survey of March, 1936 Sample Number	Dust Count in Millions of Particles per cu. ft. of air sampled	Survey of June, 1935 Sample Number	Dust Count in Millions of Particles per cu. ft. of air sampled	Remarks
2nd Floor				
3	.85	12	9.9	Loom #10 removed since 1935 survey.
1	.90	7	3.6	
2	1.2	34	4.5	
4	1.1	11	3.5	
7	3.6	15	9.6	
3rd Floor				
13	4.6	4	6.1	Loom #68 not running 1935 survey
14	3.3	8	5.4	
1st Floor				
6	1.2	16	2.5	
11	5.8	19	3.3	
9	1.3	25	2.6	
Brake Department				
10	.90	18	1.3	
12	2.3	29	2.2	

Old No.		New No.	No. Spaces	Size	Type		Type of Yarn
2(30	-	225	16	2 x 5/32	B 50 E	Wet Binder & Filling-	(1032 Mule & Jute
(31	-	227	16	2 x 5/32	B 50 E	" " "	(
(29	-	234	12	2 x 196	154 W04	Stuffed Binder & Filling	(1030 - 1 Cotton
(37	-	236	12	2 x 196	154 W04	" " " "	(1032 - 1 C.C.
							(1033 - Mule
9	-	—	3	13/4 x 1/4	BPT.	Wet Binder & Filling	(1032 - Mule
			4	$2\frac{1}{2} \times \frac{1}{4}$	BPT.	" " " "	(1030 - 1 Cot.
							(1033 - 1 Cot.
25	-	220	3	1 7/8 x 1/8	Z-120	Stuffed Binder & Wet Filling	(1033 - Mule
			3	1 7/8 x 133	Z-120	" " " "	(1030 - 1 Cot.
			3	1 11/16 x 133	Z-120	" " " "	(1032 - L C Z
			3	1 13/16 x 133	Z-120	" " " "	(1032 - Z
(62	-	238	12	2 x 3/16	Rayb.	Wet Binder & Filling	(1032 - Mule
(63	-	240	12	2 x 3/16	Rayb.	" " " "	(1030 - 1 Cot.
82	-	—	1	$2\frac{1}{2} \times 5/16$	F.W.	Wet Binder & Filling	(1030 - 1 Cot.
			1	3 x 5/16	F.W.	" " " "	(1033 - 1 Cot.
			2	5 x 5/16	F.W.	" " " "	(1030 - 2 Cot.
							(1032 - 1 Cot. Zinc
83	-	—	1	$9\frac{1}{4} \times 1$	No Wire	Dry	(1030 - 2 Cot.
			1	9 3/4 x 1	No Wire	Dry	(1090 - Rope
45	-	—	2	$3 \times \frac{1}{4}$	Bpt.	Wet Binder & Filling	(1033 - Mule
			1	$3\frac{1}{2} \times \frac{1}{4}$	Bpt.	" " " "	(1033 - 1 Cot.
			3	$4 \times \frac{1}{4}$	Bpt.	" " " "	
69	-	319	20	$1\frac{1}{2} \times 1/8$	R.S.	Wet Binder & Filling	(1032 - Mule
68	-	321	20	$1\frac{1}{2} \times 1/8$	R.S.	" " " "	

STRATFORD PLANT

The samples taken during this survey show improvement in most of the locations.

* The dust concentration around the heaters may vary with the amount of raw material used. The heater room should be separated from the rest of the plant to guard against the pollution of the atmosphere of other sections of the building. The heater used in making pulp which contains litharge should be in a separate room from the others and employees should be required to wear approved respirators.

The dust concentrations at the Blanchard Grinders, Cincinati Grinder, external grinders, and internal grinders, is probably caused more by the handling of the material than by the machines. Dust can be seen rising from the stacks of rings when they are moved. The employees at these machines have been supplied with approved respirators. The approval should be for lead dust as well as other dusts.

The exhaust equipment installed since the 1935 survey has improved dust conditions in that section of the building and around those machines that have exhaust hoods connected to it.

Sample #25 shows a very high count. This work is done on all clutch facing rings. The dustgenerated tends to pollute the atmosphere of the entire inspection room. This work should be done in a separate room or an enclosure that has an exhaust system installed to remove the dust generated. The employees doing this work should be supplied with positive pressure respirators supplied with clean air.

* Sample #1, taken in the fibre room of #6 Department, is high. The shaker screen should be enclosed; however, there is only one employee

working in this room, and he is supplied with a respirator which is adequate protection provided that it is maintained properly and used.

Table #3 shows results of 1936 survey.

Table #4 shows comparative results of identical locations or operations of survey of 1935 and survey of 1936.

STRATFORD PLANT - TABLE # 4

Survey of March, 1936 Sample Number	Dust Count in Millions of Particles per cu. ft. of air sampled	Survey of June, 1935 Sample Number	Dust Count in Millions of Particles per cu. ft. of air sampled	Remarks
2	.94	2	2.3	
3	.73	4	2.6	
6	2.8			
14	3.2	12	4.4	
4	4.5	13	1.4	
7	1.4	18	6.5	
8	3.5	22	2.6	
9	2.7	20	1.4	
11	3.0	14	1.8	
12	1.9	27	4.1	
15	4.7	30	12.8	
16	2.0	24	1.9	
17	1.6	32	2.3	
18	.94	28	1.8	
23	1.3	26	12.0	
19	1.4	16	1.4	

STRATFORD PLANT - TABLE #3

Sample No.	Station	Date	Cu. Ft.	Millions of Particles Per Cu. Ft. of Air Sampled		Type of Dust	Lead Results mg/cu.ft.	mg/cu.m.	mg/10 hr. day	Remarks
	#3 Dept.									
1.	Fibre Room - Shaker screen and opener running	3/25/36	32.6	19.0	114	Asbestos				Fibre falling into mail trucks
2.	Between mixers #11, 12, 14, & 15	"	40.2	.94	5	Asbestos Lead	.000348	.0123	0.123	
3.	Between mixers #4, 5, 17, & 18	"	52.6	.73	4	"	000	000	000	
5.	Weighing litharge from drum to pan on scale & dumping into mixer #19	"	7.5	6.4	38	Lead	.00127	.066	0.66	"
4.	Filling beater #2	"	76.0	4.5	27	Asbestos				
6.	At press #15-cutting rings on cutting presses	"	32.6	2.8	17	"				Round pipes and stacks rings on to skid
7.	At Blanchard grinder #1 clutch facing rings	"	30.0	1.4	8	Clutch facing	000	000	000	Exhaust
8.	At automobile drill press #60	"	28.8	3.5	21	" "	.00243	.858	0.858	"
9.	At Cincinati grinder 500 cure rings	3/26/36	58.6	2.7	16	" "	000	000	000	" Respirator
10.	Testing rings for Brinnell hardness	"	28.1	1.6	9	" "	000	000	000	One mask respirator
11.	General air - between two calenders	"	3 1.6	3.0	18	Asbestos				
12.	At external grinder #4 machine #46	"	40.6	1.9	11	Clutch facing	.000345	.0122	0.122	Exhaust-respirator
13.	At Stedfast-Roulston grinder machine #264	"	55.4	1.2	7	Brake lining	000	000	000	Grinding lining to width. Exhaust

STRATFORD PLANT – TABLE #3 (CONTINUED)

SAMPLE NO.	STATION	DATE	CU. FT.	MILLIONS OF PARTICLES PER CU. FT. OF AIR SAMPLED		TYPE OF DUST	LEAD RESULTS MG/CU.FT.	MG/CU.M	MG/10 HR. DAY	REMARKS
14.	SAME AS #6 JUST TAKEN AT PRESS #17	3/26/36	34.0	3.2	#9	ASBESTOS				
15.	BETWEEN FLANGARD GRINDERS #4 & 5	"	43.0	4.7	#5	BRAKE LINING CLUTCH FACING	.000326	.0115	0.115	
16.	AT SANDER-MACH. #103 BELT SANDER	"	21.6	2.0	#2	BRAKE LINING	000	000	000	ONE MAN, EXHAUST
17.	AT SANDER #102	"	28.6	1.6	#6	" "	000	000	000	2 MEN, EXHAUST
18.	AT INSIDE GRINDER MACH. #126	"	36.5	.94	#3	" "	.000727	.0257	0.257	ONE MAN. "
19.	GENERAL AIR – INSPECTION AND SHIPPING DEPT.	"	39.1	1.4	#8	CLUTCH FACING	000	000	000	
20.	AT AUTOMATIC DRILL PRESS MACH. #283	"	56.5	.82	#4	BRAKE LINING	000	000	000	ONE MAN, EXHAUST FLUES FROM BRIQUETTING PLANT
21.	AT SHAPER #130 GRINDING ENDS OF BRAKE LINING	"	27.7	3.5	#1	" "	000	000	000	ONE MAN, EXHAUST
22.	AT INSPECTION TABLE – CLUTCH FACING	"	36.9	4.2	#5	CLUTCH FACING RINGS	.000759	.0264	0.264	4 WOMEN – THREE MEN
23.	AT EXTERNAL GRINDER MACH. #235	"	38.6	1.3	#7	BRAKE LINING	.000363	.0128	0.128	SIMILAR TO #105 IN PREVIOUS SURVEY. ONE MAN EXHAUST
24.	BETWEEN SHAPER #116 AND SANDER #117	"	31.6	2.1	#3	" "	.000886	.0313	0.313	ONE MAN ON EACH MACH. EXHAUST ON " "
25.	TAPPING RINGS – INSPECTION FOR CRACKED RINGS	"	26.8	82.1	#4	RING	.00261	.0921	0.921	ONE MAN

Box 1

PHL-341

4/19/39

The National Lead Co.
of

RAYBESTOS-MANHATTAN, INC.

Stratford, Conn.

A third survey of this plant was conducted on October 15, 13 and 16, 1939 by the Industrial Health Section of the Metropolitan Life Insurance Company. The two previous surveys had been made during March, 1930 and June, 1935.

This plant is engaged in the manufacture of packing, gaskets, and brake linings. Since the previous surveys the woven brake lining processes have been eliminated and new processes have been installed.

* * *

Exhibit F.

PLANT CONSTRUCTION

The plant is housed in a number of one and two story brick buildings of modern construction. Ample natural illumination and ventilation are supplied by numerous side wall windows and skylights. Offices are located in separate buildings apart from the manufacturing departments.

PLANT PROCESSES

Bldg. 6, Dept. 12. Sheet Packing

In this building sheet packing is made, from which brake lining, gaskets, and packing are stamped or cut.

Asbestos Room

Asbestos used in sheet packing is prepared for use in a crusher and opener. The asbestos is graded on screens. The asbestos passing through the opener is dumped on the floor and then hand shoveled into the opener. The opened asbestos is then conveyed by air to a hopper on the roof and dropped through pipes into the grading screens or directly into a hand truck. Scrap material is ground in a pulverizer, then conveyed by air to hoppers on the roof and dropped through pipes directly into bags. The lone operator in this room is supplied with an approved dust respirator. This room opens directly into the dry mold mix room and the main mixing and roll room. Since the previous survey, the equipment in this room has been improved. Sample 6 of 1935 survey and sample 3 of the present survey show that good results have been obtained.

Dry Mold Mix Room

Material for the dry mold mix is hand scooped from original containers and dumped into a barrel on a scale. Most of the materials used are

kept in loosely covered or uncovered containers. After the batch is weighed out, the operator carries the barrel up a flight of stairs to a platform and dumps the batch into the mixer. The mixed batch is then dropped from the bottom of the mixer into a truck. The materials used in these batches contain asbestos, bakelite, resin, softener (plasticizer) and scrap. Two rubber mills are located in this room. At the time of sampling one of these mills was operating. The rubber is thrown around the floor scattering some accumulated dust. Respirators are available to the operator but it was noted that the respirator was not worn. No exhaust equipment is used in this department.

Rubber Compounding Room

This room is located at one end of the building and opens into the mixing and roll room. The operations in this room are intermittent. Batches containing large quantities of litharge (18% free lead) and mica are weighed out from original containers into a pan on a scale. The mica is received in bags. These bags are ripped open down the middle and allowed to lie on the floor. It was noticed that during the weighing considerable quantities of the litharge and mica were spilled upon the scale and floor where they were allowed to remain until close to the end of the shift. The floors and scale were then cleaned by dry sweeping. The complete batch contains liquid bakelite, sulphur, mica, asbestos, litharge, aroclor, scrap and rubber. The percent of litharge in the batch varies from 30 to 35%. The weighed batch is then trucked to the mixers into which it is dumped and mixed with gasoline and asbestos. The operator working in this department had been at one time supplied with a dust respirator but preferred to work without it, complaining that it interfered with his glasses. He also said it was too hot for comfort. This man stated that he has been engaged at this work for about seven years.

Mixing and Rolling

In this department the batches are mixed with a rolling in sigma mixers. The mixed material is then hand shoveled from the mixer into the rolls. One roll is hot, the other cold. The material adheres to the cold roll. The material is rolled to the desired thickness. From the rolls the material is then run into cutting tables where the sheets are cut to length. The gasoline used is recovered in a condenser located in the same room. From the sheets, rings, gaskets and packing are stamped out on power machines.

One end of the building is used for storage of raw material.

Main Building, Dept. 20 - Asbestos Board

Asbestos board used in making clutch facing and a special material called LB is made in this department.

Scrap material and new asbestos are hand dumped into paper beaters, mixed with water and starch and worked to the proper consistency. The pulp is then passed through the rolls to the required thickness. The LB material which is composed of asbestos, atomized metallic lead, alum, gilsonite, graphite, and scrap are mixed in a beater and the pulp pumped to storage tanks. The atomized lead is about 200 mesh. The lead is dumped on a piece of cardboard on the floor in front of the beater and is sieved into the pulp by hand shoveling into a sieve resting on the top of the beater. The wet pulp is run from the beaters to storage tanks. From the storage tank the wet pulp is run into troughs (coffins) where the water is drained out, leaving the solid material in the trough. The solid material is then transferred to a heated press where it is pressed to required thickness, removed and cut into strips by hand. It was noted that the operator handling the atomized lead as well as others in close

proximity did not wear respirators.

Cutting Unit. #21.

Asbestos board is cut to size for the punching machines. Facings are stamped out on machines by men and wiped and stacked on skips by girls. The composition of this board is practically 95% or more asbestos.

Finishing Unit. #24

Facings are cured and then finished. The finishing operations include grinding surfaces and edges on Blanchard, Cincinnati and cylinder grinders; drilling and shot blasting. All machines in this department are equipped with exhaust systems. On the Blanchard grinders and drilling operations these exhaust systems are augmented by the use of compressed air. At the time of this survey, the compressed air line on the grinder, machine #768, sample #19, had been moved out of position, causing puffs of dust to be dispersed into the atmosphere with each revolution of the grinder. This condition was readily remedied after attention had been called to the condition. Considerable dust adhering to the clutch facings is dispersed into the atmosphere when loading the machines and restacking the facings on the skips. No provision is made to entrap the dust at these points.

Dry Mold

This is a new operation. The mixture for this operation is made in building #6. At the time of this survey machines were being installed or renovated, so that tests taken at this operation would not have been representative. Therefore, no tests were made.

Airmold

The materials used in the airmold batch are dried in small driers

in a partitioned area on the main floor. These materials include asbestos, hardwood pitch, sulphur, lampblack, graphite, asbestine, powdered white lead and index oil. The hardwood pitch is run through a grinder four times to the required mesh. The pitch is hand scooped from the container into the grinder. This grinder is enclosed and exhausted. The powdered white lead, as well as the pitch and index oils, are kept in open barrels just outside the partition on the main floor. The compounded batch is used on the wire-mold machine which is also located in this partition. The men engaged at batch mixing wear dust respirators, but the men at the machine a few feet from the mixer are not so protected. The mixed material is pressed around a wire backing and is used to make brake lining. Information was advanced that plans and appropriations have been made to provide dust control at these operations.

Depts. # 22 and 24 - Molded and Rubber Brake

Molded and rubber brake linings are finished in these departments. The operations consist of grinding and drilling. All machines, with the exception of a few small drill presses (machines #350, 277 and 93) are exhausted.

Dept. #25 - L8 Pressing

In this department L8 brake lining is shaped and pressed in mandrels. Soapstone is hand dusted to prevent the linings from sticking. The operator on this job wears an approved dust respirator.

Saturant Room

The dopes used on the brake linings and clutch facings are prepared and stored in a separate brick building. All solvents are kept and prepared in closed tanks. The main solvents used are xylol, formaldehyde, cresylic acid and acetone. The acetone is stored in tanks outside the building. The

prepared saturant is pumped to the saturation room as required. The asphalt used in the saturation is not a coal tar product.

Other operations and departments include inspection, assembly of parts and packing of finished product, also a machine shop and stock section. These operations are located in the newest section of the main building. There are no ducts produced by these operations.

PERSONAL FACILITIES AND PLANT HOUSEKEEPING

Ample washing and toilet facilities are provided. Drinking water is supplied from mechanically cooled bubbler fountains. A restaurant is available to all employees. A first aid room under the direction of a full time nurse is maintained.

Housekeeping in general is good. Aisles are well defined and are always kept free from obstructions. Vacuum cleaning is employed on the rafters, walls and floors in the main building. It is planned to extend this to other buildings.

Safety meetings are held once a week, at which time the employees' representatives, as well as the foremen, are present and take an active part in the proceedings.

METHODS OF SAMPLING AND ANALYSIS

Atmospheric dust samples were taken with the impinger[1] and the solvent fumes with the interferometer at the breathing level of the workmen at representative operations. The interferometer is an instrument designed for use in detecting gases and vapors. The impinger, developed by the United States Public Health Service, is the standard method used in this country. Air is drawn in through a glass tube at the rate of one cubic foot per minute

(1)U.S. Public Health Service, Public Health Bulletin #17, Determination and Control of Industrial Dust, J.J. Bloomfield and J.W. Vallaveller, 1915.

The tube ends in a constricted orifice under the surface of distilled water contained in a flask. The air passes through the orifice and impinges upon a glass plate which breaks up the air stream, allowing the dust particles to be wet and entrapped in the water in the flask.

Alcohol is added to the sample as a preservative to inhibit the solution of the fine particles and also to prevent the formation of agglomerates of the fine particles by clumping.

Suction is supplied for drawing the air sample through the impinger by means of an ejector, or else an electrically driven pump where compressed air is not available to actuate the impinger.

The dust counts were made by the methods and techniques developed and used by the United States Public Health Service.

The following table offers comparison of the results of analysis of samples taken at identical locations for the 1935 and 1939 surveys. As asbestos is involved at practically all operations, dust counts are given as total count in millions of particles per cubic foot of air.

1938

Sample No.	Location	Date of Sampling	No. Ft. Air Sampled	Asbestos Dust Fibers per cu. Centi.	Milligrams Lead per cu. Ft.	Milligrams Lead per 10-hr. Day
5	Bldg. 6, Dept. 39, asbestos room at grinder	10/12/39	30.0	33.3		
8	Pulverizer, waste etc.	"	43.0	3.9		
3	AA opener	"	37.0	4.2		
4	Dry mill mix room	"	21.0	24.0		
5	Between mixer #1 and roll #48, working batch #240	"	42.0	3.3	0.001	0.353
6	Between mixers #339 and 313	"	20.0	49.0		
7	Rubber compounding room	"	9.0	58.6	0.3755	137.0
14	Check on sample #7	10/31/39	17.0	45.0	0.1339	107.0
8	Pitts, Lathe, making [illegible] #40	10/12/39	25.0	4.0	0	0
9	Between rolls #46 and mixers #342 and #348	"	42.0	2.5	0	0
10	Power press, machine #459	10/13/39	25.0	1.1	0	0
11	C to Bldg. 10, Dr. 30 between Buildings #3 & 1	"	54.0	3.5		
15	Dexter #6, LB grind	"	20.0	6.6	0.1787	0.17
22	LB job, at carriage comp press	"	23.0	9.3	0	0
13	AA #2 wet machine	"	37.0	1.2		
16	Cutting tools #21 at stripping machine #39, + floor sights, and the sing	"	18.2	5.0		
17	Cutting at machine #2	"	24.0	6.4		
18	AA calender rm, machines #459 and 29	"	27.0	3.1		
19	Finishing tools #24 between Dept. of grinders, machines #31 and 162	10/16/39	48.0	14.7	0.0135	4.5
20	Between Dept. #31 grinders and #41, 42, 44, and 45	"	47.0	3.0	0.0003	0.105
21	Between Dept. #31 grinders, machines #459 and 455	"	41.0	3.9	0.0034	1.12
22	Grinder grinder	"	4.7	2.9	0	0
23	Steel shot blast, machine #25 and wire cut belt, Dept. #31, roll grinder, machine #24	"	38.0	1.6	0	0
24	Wire old tools #24 weighing, cutting, and waste, of wire mold brass lining, machine #49	"	36.0	8.2	0.275	1.009
27	AA hardwood pitch grinder	"	18.0	2.4		
25	Dept. 24, rub or stock cutting, machine #43	"	19.0	1.6		
26	Dept. 24, rubber dry mixing between machines #31, 32, 34, 227, and 93	"	43.0	1.2	0	0
29	Rubber brake, grinding and grinding, Machines #39 and 214	"	18.0	2.5	0.0037	0.11
28	Dept. 24, [illegible] lat brake lining, [illegible] machine #24 and 174	"	47.0	1.1	0.0003	0.105
30	Dept. #31, AA internal grinder, machine #43	"	22.0	1.6	0	0
31	Dept. #31, internal grinder, machine #49	"	49.0	1.2	0	0
32	Minerals, grinding LB brake lining compressing	"	41.0	4.1		

1939

Sample No.	Date of Sampling	No. Ft. Air Sampled	Millions Dust Fibers per cu. Ft.	Milligrams Lead per cu. Ft.	Milligrams Lead per 10-hr. Day	Type of Dust	Remarks
						Asbestos	1 long exposure to dust reported to respirator [illegible]
1	6/15/39	49.0	4.7			"	Steep hurt [illegible] floor here [illegible]
6	"	8.3	20.9			"	[illegible]
						Asbestos & rep. [illegible] particles [illegible]	All materials kept [illegible] [illegible]
2	"	49.3	2.3	0.0039	0.136	Silicate asbestos rock or milling mica talc, talc or clay	[illegible]
						Carbolite	Carbolite dust [illegible]
						Silicate asbestos rubber milling mix, clay or [illegible]	1 long period exposure [illegible]
						"	No dust control applied
						"	2 men
						"	Mixers not roller clear white [illegible]
7	"	42.8	1.2	0	0	"	
13	6/ 6/39	37.3	1.4			Asbestos	1 exp. material for [illegible]
						Dust, in hair and skin also dust in air, mix with clay	[illegible]
						"	Dust control applied
11	6/ 7/39	25.0	2.4			Asbestos	
17	"	45.0	6.4			"	[illegible]
17	6/ 7/39	49.4	1.6			"	Cutting be of to stone [illegible]
14	"	45.0	1.3			"	No dust control applied
15	"	25.4	6.5	2	3	"	The [illegible]
12	"	41.5	2.6	0	0	"	Mixers use 1 exp. [illegible]
37	"	42.1	12.9	0.0329	0.95	"	In 10-5 a.m. the blow [illegible]
						"	" " "
						Asbestos Pitch	No dust control applied [illegible] Pitch [illegible]
						Pitch	Pitch and resin [illegible]
							Only workers #37, 37, and 38 not exhausted.
							Exhaust applied.
						Asbestos	Exhaust applied.
35	6/15/39	3.7	18.4			"	Exhaust applied
36	"	11.3	17.0			"	Exhaust applied
							Responsible to dust exert 1 applied respirator [illegible]

CONCLUSIONS AND RECOMMENDATIONS

In the asbestos room the count at the crusher is high (sample #1). Apparently the operator was overloading the pans. Crushed asbestos was falling upon the floor, necessitating frequent sweeping and hand shoveling. It is recommended that the amount of material that can be handled without spilling on the floor be maintained and controlled. Enclosing this crusher would also be of value. Since the other operations in this room are now well controlled, as evidenced by samples #2 and 3, it is not necessary to install an elaborate system for this one machine. The operator is supplied with and wears the proper type of respirator.

The dry mold batch weighing is a dust dispersing operation (sample #4). The operator is exposed to the heavy concentrations because of the close proximity of his face to the containers while scooping out the ingredients and carrying the weighed batch up the stairs to the mixer platform.

It is recommended that all batch weighing operations - dry mold, wire-mold and rubber compounding - be done at one point where effective control by exhaust systems should be installed.

Hand handling of materials should be eliminated as much as possible. The resin (bakelite) used in this batch may produce a dermatitis. Therefore, it will be necessary to provide some protection for the skin if the resin is to be handled by hand. Weighed batches should then be kept in closed containers when transporting to the department where they are to be used. Vacuum system should be used for all cleaning purposes.

The mixing and rolling operations do not present any dusty conditions, with the exception of mixers #312 and 313 (sample #6). At this point consider-

sible cardolite dust is dispersed when dumping and mixing, until the material becomes thoroughly wet. This is for a short time only. The floor around these mixers is slippery due to the spilled material and moisture. These operators could be adequately protected if they were supplied with and wore approved dust respirators while handling and dumping the cardolite. The floor should be kept free of the dust to eliminate the hazardous slippery condition that exists.

Concentrations of 148 to 160 parts per million of gasoline vapors were detected in department 19, mixing and milling room. This concentration is far below approximately 1,000 parts per million, which is the maximum concentration allowable for prolonged exposure.

The batch weighing operations in the rubber compounding room are definitely hazardous under the present methods of operation. Samples 7 and 14 show concentrations of lead far in excess of the toxic limits, which have been determined to be 1.5 milligrams in a ten-hour day. The dust respirators supplied to the operator are not approved for lead dust. As this operator has not worn the respirator supplied him and has been exposed for a period of seven years, on and off, it is recommended that he be physically examined. Symptoms of lead poisoning are given in the rear of the report for the information of your physician.

Sample #15 does not indicate the need for any further protection for the operators working in the vicinity of #4 baster, other than the proper type of respirator. As this is an intermittent and comparatively short operation, the insistance by the foreman that the respirators be worn should not be a serious hardship for the men.

Sample #19 (in the finishing department between Blanchard grinders 371 and 753) shows a definite hazardous condition. Although this result was

obtained under an abnormal condition due to improper setting of the exhaust system, it serves to demonstrate the need for periodic check up of these systems by the engineering staff. The lead concentration found at this point is three times greater than the toxic limit. Sample #31, between stations #47 and #48, indicates the more normal condition at the Blanchard grinders.

Sample #24, department #8, shows a lead concentration approaching closely to the toxic limit. This condition could be eliminated by means of one central batch weighing and mixing department, as has already been suggested for other batch weighing operations.

The saturant room did not show any dangerous concentrations of solvents. Sixty-four parts per million of xylol were found. The maximum concentration for prolonged exposure of xylol has been estimated to be less than 100 parts per million.

It is recommended that when new processes are to be installed a study be made of the various ingredients in the material, as to their toxicity, and the proper protection applied at the beginning of the operation and while it is in the experimental stage.

Taking into consideration the amount of grinding and drilling done, the counts found were low, indicating the efficiency of the exhaust systems. The hazards in the plant are confined solely to the batch weighing and mixing operations. Proper control of these operations will eliminate the health hazards in this plant.

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The report of the survey made in June 1935 contains a discussion of health hazards of the toxic substances used. Reference should be made to this report in connection with the findings of the present report.