

RESULTS OF AIR SAMPLES

AMERICAN BRAKE SHOE COMPANY
Friction Plant
Winchester, Virginia

Report Prepared By:

Jeremiah R. Lynch

January, 1966

January 26, 1966

plant # 15

Mr. Charles B. Mallory
Works Manager
American Brake Shoe Company
Winchester, Virginia

Dear Mr. Mallory:

The analysis of the air samples collected in your plant during our survey in September, 1965 has been completed, and the results are attached.

The impinger samples were counted during the survey using the American Conference of Governmental Industrial Hygienists' method. The impinger filters were retained with solvent in a 50-50 mixture of distilled water, 95% ethanol phosphate and counted at 450x magnification with plane parallel illumination.

All of the dust concentrations as measured by impingers were under the 5 million particles per cubic foot threshold limit value currently in use. The impinger filter method is an analytical and no standard has been set for its interpretation. Some relationships between the impinger and filter measurement are discussed in the enclosed reprint.

Your cooperation in this study is sincerely appreciated, and the data gained from your plant is of considerable value.

Sincerely yours,

Jeremiah E. Lynch
Senior Sanitary Engineer
Engineering Section
Research and Technical
Services Branch

Enclosure

cc: D. A. Fane, Director (Through State Health Commissioner)

cc: S. Mallory

cc: J. Brown, Section III, Program Director

cc: J. Brown

American Brake Shoe Company
Results of Air Samples of September, 1965
Winchester, Virginia
Friction

Operation	Impinger		Membrane Filter		
	Sample #	mpcf	Sample #	Total Particles/cc	10 μ +
Mixing & Coating					
Compounder--EZ	116	0.7			
	107	0.2	108	0	0
	202	0.2	203	0	0
	129	0.3	130	1.9	0.5
Personal			2	0.6	0.4
			29	9.2	3.1
			30	0.6	0.2
			205	1.6	0.5
			206	0.3	0.1
			209	0.2	0.1
Weigher--EZ	10	0.4	11	0	0
	200	0.7	201	6.8	2.5
Personal			1	0.7	0.7
			3	1.1	0.6
			8	0.2	0.2
			207	3.0	1.4
Auto Roller Oper.--EZ	43	0.3	44	11.0	0.0
	45	0.3			
Personal			22	1.5	0.4
			25	1.3	0.5
			26	0.5	0.2
			27	2.9	0.8
			28	0.7	0.4

NOTES ON ABBREVIATIONS

"Personal" refers to personal samples on membrane filters

"PE" refers to breathing zone samples by companion impinger & membrane filter

"Seq." refers to unattended samples taken by a sequential sampler

"Gen." refers to sample of general plant air in the particular department

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Operation	Impinger		Membrane Filter		
	Sample #	mppcf	Sample #	Total µgm/cc	10 µ +
Mixing & Coating - Continued					
Auto Roller Oper. -- Personal (Cont'd.)			158	0.1	0.0
			159	0	0
			210	25.0	0.1
			211	8.9	0.4
			212	2.4	0.0
Hand Roller--Personal			213	3.7	0.1
			214	35.8	0.1
Sweeper--Personal			19	0.6	0.2
Service Man--Personal			20	0.7	0.4
Quality Control--Personal			21	1.3	0.3
Preform--Personal			7	1.4	0.6
Forming					
Hand Roll Operator--BZ	139	0.4	140	2.5	0.6
Radius Roll--BZ	353	0.4	354	12.9	3.3
	291	0.6	292	3.1	0.4
Personal			293	2.7	1.0
			297	4.2	0.7
			348	1.5	0.3
Preform Operator--BZ	51	1.3	52	3.1	1.0
	137	1.2	138	7.6	1.6

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Operation	Impinger		Membrane Filter		
	Sample #	mpcf	Sample #	Total	pc/cc 10 µ +
Forming (Continued)					
Preform Operator--EZ (Cont'd.)	147	1.9	148	11.5	4.5
	162	0.4	163	0	0
	176	3.9	177	3.6	1.0
Personal			142	16.9	3.9
			144	7.7	3.2
			145	4.8	2.5
			146	4.8	1.6
			153	8.4	2.9
			154	6.3	3.0
			155	7.1	2.7
			157	1.5	1.0
			160	10.8	4.6
			161	7.5	2.9
Hand Roll Operator--EZ	139	0.4	140	2.5	0.6
Radius Roll--EZ	353	0.4	354	12.9	3.3
	291	0.6	292	3.1	0.4
Personal			293	2.7	1.0
			297	4.2	0.7
			348	1.5	0.3
Preform Operator--EZ	51	1.3	52	3.1	1.0
	137	1.2	138	7.6	1.6
	147	1.9	148	11.5	4.5
	162	0.4	163	0	0
	176	3.9	177	3.6	1.0

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Operation	Impinger		Membrane Filter		
	Sample #	mpcf	Sample #	Total cells/cc	10 μ +
Forming (Continued)					
Preform Operator--Personal			142	16.9	3.9
			144	7.7	3.2
			145	4.8	2.5
			146	4.8	1.6
			153	8.4	2.9
			154	6.3	3.0
			155	7.1	2.7
			157	1.5	1.0
			160	10.8	4.6
			161	7.5	2.9
Hot Pressing					
Sweeper--Personal			60	0	0.0
Servicemen--Personal			69	2.6	0.7
			180	2.8	1.0
Cinching Forms--Personal (Form Fitter)			402	1.4	0.7
ABK & Press Oper.--EZ	84	0.1	83	0	0
Book Press Oper.--EZ (Hot)	185	1.1	186	1.6	0.9
Personal			181	5.3	1.5
Service Man, Hot Press			141	2.7	0.6
			143	3.9	0.5

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Operation	Impinger		Membrane Filter		
	Sample #	mppcf	Sample #	Total Flows/cc	10 µ +
Hot Pressing (Continued)					
Hot Press Oper.--EZ	63	1.0	64	0	0
	73	0.1	74	0.6	0.4
Personal			58	1.8	1.8
			59	3.4	0.7
			61	2.5	0.5
			62	0	0.0
			65	7.9	2.0
			66	2.9	0.9
			68	1.4	0.5
			70	2.6	0.9
			71	1.6	0.3
			72	3.3	1.2
			79	4.4	1.6
			80	4.3	2.2
			81	1.8	0.6
			82	0.2	0
			183	3.1	0.8
Baking					
Oven Oper.--EZ Conveyor	221	0.4	220	0.4	0.0
Personal			193	1.4	0.6
Oven Oper.--Personal			194	1.9	0.5
			403	5.4	1.2
			414	0.5	0.1

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Operation	Standard Time in Min. Sec.		Standard Time in Min. Sec.		
	Sample #	avg	Sample #	total	avg
Grinding & Sanding					
Radius Roll--M	245	0.5	227	0.0	0
			244	3.5	1.4
Back Grinder--M	261	0.3	262	1.8	0.2
	263	0.4	264	8.2	4.3
Strip Grinder--M	332	0.3	333	1.6	0.2
Auto Grinder--M	431	1.9	432	5.5	1.4
Block Grinder--M	535	0.6	540	2.1	0.8
Double Flank Break Grinder -- M	689	1.7	690	0.6	0.2
Rough Grind--M	611	1.2	610	1.6	0.2
Radius Grind--M	612	1.9	613	3.9	0.8
Roll Grinder	703	3.7	704	9.0	3.4
Auto Grinder BF Block	735	0.8	706	5.8	1.9
Coil Grinder--M	351	0.4	352	3.1	0.8
Personal			268	1.3	0.7
Strip Finish--Personal			299	6.9	1.3
Turner Oper.--Personal			374	12.9	2.1
			376	3.0	0.8

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Operation	Impinger		Membrane Filter	
	Sample #	mppcf	Sample #	Total $\frac{\text{mg}}{\text{cc}}$ 10 μ +
Grinding & Sanding (Continued)				
Coil Grinder			296	3.7 1.2
Double Disk Grinder--Personal			384	5.4 2.5
Sweeper--Personal			409	5.0 2.3
Auto Burr. Mach.--Personal			393	19.7 7.3
Printer--Personal			242	7.6 2.7
			267	23.1 0.5
			335	3.0 0.0
Back Grinder--Personal			249	7.9 1.4
			254	0.7 0.2
			255	2.3 0.2
			298	1.2 0.5
			338	4.4 2.2
			345	18.5 2.0
Finish Grind Block--Personal			497	2.8 2.8
			498	7.8 2.5
Strip Grind.--Personal			256	15.6 0.9
			257	0 0
			264	7.4 2.5
Chamfer. Oper.--Personal			243	1.7 0.3
			247	0.1 0.1
			281	14.3 1.2
			391	4.1 1.4
			270	5.6 0.8
			340	13.9 1.3

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Operation	Impinger		Membrane Filter		
	Sample #	mppcf	Sample #	Total Fibers/cc	10 μ +
Grinding & Sanding (Continued)					
Face Grind--Personal			394	2.4	0.6
			395	10.2	2.9
			398	6.8	3.1
Cutting & Drilling					
Milling Mach. Oper.--Personal			387	6.8	2.4
			392	2.6	0.6
Printer--Personal			279	1.7	0.4
			309	13.3	4.6
Saw Oper.--M Personal	326	0.4	327	5.1	1.4
			258	1.8	0.4
			263	7.3	2.8
			266	4.3	1.1
			275	1.2	0.1
			295	1.5	0.2
			337	3.7	1.1
			349	2.4	0.7
			350	9.0	2.5
			386	6.1	2.1
Drill Operator--BZ Personal	234	0.4	235	3.3	1.4
	306	0.2	307	6.6	3.8
	312	0.1	313	1.6	0.0
	614	1.5	615	3.5	1.0
			701	2.3	1.8
			246	0.5	0.1
			248	2.0	0.1
			250	19.9	2.8

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Operation	<u>Impinger</u>		<u>Membrane Filter</u>	
	Sample #	mppcf	Sample #	Total 10 μ +
Cutting & Drilling (Continued)				
Drill Oper. — Personal (Cont'd.)			251	0.0
			252	1.5
			259	1.4
			260	48.4
			265	6.1
			269	4.4
			277	0.5
			280	3.1
			282	2.5
			306	13.0
			397	3.5
			700	6.7
Teflon — Personal Lathe Oper.			197	0.9
			198	2.1
Ball Joint Punch			385	3.2
			67	1.0
Cutter			401	3.7
Pexto Press			376	1.9
ANK Oven			199	3.5
Inspection & Packing				
Grouping — EZ	368	0.3	369	4.7

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Operation	Impinger		Membrane Filter		
	Sample #	mppcf	Sample #	Total	10 μ +
Inspection & Packing (Continued)					
Box Segments --Personal Printer, Leader			377	1.6	0.5
			378	1.7	0.7
			380	1.4	0.5
Packer--Personal			382	1.8	0.3
			383	0.9	0.5
			460	1.8	0.5
			471	1.2	1.2
			472	2.6	0.9
			463	2.6	0.9
Inspection Dry -- DZ	459	0.8	460	1.2	0.2
	474	0.7	475	0.0	0.0
Personal			278	2.6	0.5
			308	19.1	5.8
			441	8.9	2.3
			447	7.1	2.1
			448	1.2	1.1
			470	5.3	1.9
			499	9.9	3.4
Wet--DZ	366	0.3	367	0.6	0.0
	445	0.1	446	0	0.0
	467	0.9	468	1.6	0.0
Personal			439	1.9	0.6
			443	1.4	0.7
			444	1.4	0.5
			449	7.5	2.5
			451	3.1	0.8