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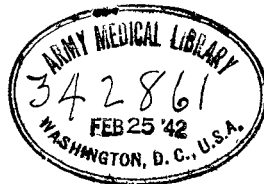
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INDUSTRIAL SURVEY OF THE STATE OF OHIO.

Evaluation of
Industrial Hygiene Problems
by
✓
Ohio Department of Health

ADULT HYGIENE DIVISION

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1940

AC. NOWLEDGE

*Asbestos dust
hazards noted
for pipefitters in
petroleum products
industry, [Table 21]
shippers and others
in paint + varnish
industry [Table 20]
maintenance
workers in soap
factories [Table 23]
and glass factories [Table 23]
welding workers
in steel industry [Table 23]
6 categories in [105]
rubber industry
(curing man, grinder,
mixer, operator,
pressman, other)
96 workers in electrical
machinery industry
(1 in storage
batteries)
[Table 106]*

	60.
	
	
Insts (47)	
Insts (10)	

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TABLE 16. CHEMICAL AND ALLIED—EXPOSURES TO SPECIFIED MATERIALS

Materials	Number of workers exposed to specified materials	Number and Percentage of Total Exposures to the Specified Materials in Each Industrial Subdivision											
		Charcoal and coke		Explosives and ammunition		Fertilizer factories		Paint and varnish		Petroleum products		Rayon	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Alkaline compounds.....	2,329	25	1.1	12	0.5	263	11.3	111	4.8	60	2.6	23	1.0
Salts.....	2,305	.....	.....	78	3.4	541	23.5	18	0.8	4	0.2	7	0.3
Organic dusts.....	2,192	.....	.....	88	4.0	507	23.1	355	16.2	23	1.3	9	0.4
Other gases.....	1,986	180	9.1	22	1.1	170	8.6	142	7.2	399	20.1	11	0.6
Petroleum products.....	1,702	66	3.9	64	3.8	33	1.9	126	7.4	606	35.6	21	1.2
Other metals.....	1,546	12	0.8	85	5.5	19	1.2	322	20.8	122	7.9	.....	.....
Carbon monoxide.....	1,487	178	12.0	32	2.2	59	4.0	179	12.0	151	10.2	4	0.3
Non-silicious dusts.....	1,472	.....	.....	28	1.9	479	32.5	208	14.1	25	1.7	.....	.....
Oils, fats and waxes.....	1,285	.....	.....	.....	.....	28	2.2	528	41.1	69	5.4	21	1.6
Silicate dusts.....	1,210	28	2.3	24	2.0	35	2.9	163	13.5	11	0.9	.....	.....
Organic solvents.....	1,160	.....	.....	4	0.3	24	2.1	472	40.7	328	28.3	16	1.4
Dermatitis producers.....	1,106	.....	.....	28	2.5	185	12.2	70	6.3	13	1.2	.....	.....
Coal dust (bituminous).....	997	267	26.8	17	1.7	19	1.9	56	5.6	21	2.1	4	0.4
Other chemicals.....	936	5	0.5	30	3.2	3	0.3	109	11.6	31	3.3	5	0.5
Lead and its compounds.....	809	.....	.....	22	2.7	27	3.3	444	64.9	13	1.6	.....	.....
Mineral acids.....	787	25	3.2	9	1.1	224	28.5	31	3.9	14	1.8	37	4.7
Chromium and its compounds.....	743	.....	.....	.....	.....	.....	.....	115	15.4	8	0.4	.....	.....
Sulfur.....	692	.....	.....	49	7.1	32	4.6	14	2.0	10	1.4	.....	.....
Dyes.....	667	.....	.....	.....	.....	.....	.....	247	37.0	.....	.....	.....	.....
Coal tar products.....	606	150	24.8	2	0.3	.....	.....	28	4.6	1	0.2	.....	.....
Paints and enamels.....	578	.....	.....	.....	.....	1	0.2	488	84.9	20	3.5	.....	.....
Antimony and its compounds.....	562	.....	.....	17	3.0	.....	.....	19	3.4	.....	.....	.....	.....
Phosphorus and compounds.....	509	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lacquers and varnishes.....	487	.....	.....	12	2.5	1	0.2	426	87.5	2	0.4	.....	.....
Silica dust.....	457	.....	.....	.....	.....	191	41.8	32	17.9	16	3.5	.....	.....
Organic acids.....	383	.....	.....	2	0.5	.....	.....	65	17.0	4	1.1	.....	.....
Inks.....	340	.....	.....	42	12.4	7	2.1	57	16.8	.....	.....	.....	.....
Alcohols, esters and ethers.....	334	.....	.....	28	8.4	.....	.....	162	48.5	.....	.....	.....	.....
Medicinals.....	314	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Benzol.....	214	66	30.8	.....	.....	181	99.5	56	26.2	19	8.9	.....	.....
Fluorides.....	182	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Manganese and its compounds.....	121	.....	.....	.....	.....	.....	.....	113	93.4	.....	.....	.....	.....
Infections.....	106	.....	.....	.....	.....	95	89.6	.....	.....	.....	.....	.....	.....
Aldehydes.....	103	.....	.....	.....	.....	.....	.....	3	2.9	.....	.....	.....	.....
Sulfur dioxide.....	99	15	15.2	.....	.....	32	32.3	3	3.0	.....	.....	.....	.....
Halogenated hydrocarbons.....	96	.....	.....	.....	.....	.....	.....	7	7.3	18	18.8	.....	.....
Asbestos dusts.....	67	.....	.....	.....	.....	.....	.....	45	67.2	17	25.4	.....	.....
Aniline and its compounds.....	62	.....	.....	.....	.....	.....	.....	8	12.9	.....	.....	.....	.....
Cadmium and its compounds.....	55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arsenic and its compounds.....	50	.....	.....	38	76.0	.....	.....	.....	.....	.....	.....	41	100.0
Hydrogen sulfide.....	41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mercury and its compounds.....	21	.....	.....	21	100	.....	.....	.....	.....	.....	.....	.....	.....
Amines.....	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cyanides.....	12	.....	.....	1	8.3	.....	.....	.....	.....	2	16.7	7	58.8
Accelerators.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Temperature change.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 20a — PAINT AND VARNISH — PERCENTAGE OF EXPOSED WORKERS PROVIDED WITH CONTROL MEASURES FOR SPECIFIED MATERIALS

Control Measures	Oils, fats, and waxes	Paints and enamels	Organic solvents	Lead and its compounds	Lacquers and varnishes	Organic dusts	Other metals	Dyes	Non-silicious dusts	Carbon monoxide
Number of workers exposed.....	523	488	472	444	426	355	322	247	208	179
General negative ventilation.....	0.4	3.1	4.4	3.6	2.8	3.1	3.4	0.4	1.0	4.5
Local exhaust	2.7	8.8	5.1	5.6	11.3	5.6	1.9	0.4	1.0	72.6
Enclosure	4.4	1.2	7.2	3.6	4.7	4.2	12.1	8.1	1.9	1.7
Wet method .....	....	....	....	4.7	....	5.6	5.6	7.3	8.7	....
Gas mask .....	....	....	0.4	....	....	....	....	....	....	....
Respirator .....	....	....	....	12.2	....	11.3	9.0	6.9	9.1	....
Pressure helmet	0.4	....	....	....	0.5	....	....	....	....	....
Protective clothing.....	5.9	1.2	7.4	4.7	0.9	10.1	9.6	8.1	7.2	....

TABLE 21 — PETROLEUM PRODUCTS — EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Occupations	Petroleum products	Other gases	Organic solvents	Carbon monoxide	Other metals	Oils, fats, and waxes	Alkaline compounds	Other chemicals	Organic dusts
Total number of workers in plants surveyed, 853									
Number of workers.....	606	399	328	151	122	69	60	31	28
Percent of workers exposed.....	71.0	46.8	88.5	17.7	14.3	8.1	7.0	3.6	3.3
Boiler makers	42	49	....	49	49	....	....	....	....
Car loaders	2	2	2	....	....	....	....	....	....
Cleaners .....	....	2	1	4	....	....	3	....	....
Compounders	40	26	....	25	....	14	....	....	....
Grease makers .....	....	....	12	....	....	25	25	....	....
Laborers	66	46	48	....	....	4	....	....	....
Mixers	25	4	7	5	....	8	5	....	....
Operators	95	28	88	....	20	2	7	....	19
Packers	15	....	18	....	....	10	1	....	....
Pipe fitters	86	74	....	....	....	....	....	....	....
Refiners .....	....	9	9	....	....	....	9	....	....
Still men	87	73	75	30	....	....	....	....	....
Supervisors	13	14	5	....	....	....	7	....	....
Technical men	28	13	21	....	....	....	....	26	....
Treaters	4	5	5	....	....	....	....	5	....
Truck drivers	11	6	9	....	....	....	....	....	....
Other	1	1	....	1	2	....	....	....	....
Maintenance	91	47	28	37	51	6	3	....	9

TABLE 20a—PAINT AND VARNISH—PERCENTAGE OF EXPOSED
WORKERS PROVIDED WITH CONTROL MEASURES FOR
SPECIFIED MATERIALS—Concluded

Other metals	Dyes	Non-silicious dusts	Carbon monoxide
822	247	208	179
3.4	0.4	1.0	4.5
1.9	0.4	1.0	72.6
12.1	8.1	1.9	1.7
5.6	7.3	8.7	.....
.....			
9.0	6.9	9.1	.....
9.6	8.1	7.2	.....

Silicate dusts	Alcohols, esters and ethers	Other gases	Petroleum products	Chromium and its compounds	Manganese and its compounds	Alkaline compounds	Other chemicals	Silica dust	Organic acids	Benzol	Coal dust (bituminous)	Asbestos dusts	Mineral acids	Coal tar products	Antimony and its compounds	Sulfur	Sulfur dioxide
163	162	142	126	115	113	111	109	82	65	56	56	45	31	28	19	14	3
1.2	2.5	5.6	...	2.6	...	...	...	...	13.8	7.1	5.4	...	35.5	14.3	...	...	...
1.8	4.3	62.7	...	2.6	13.2	...	11.0	3.7	23.1	7.1	...	...	...	...	...	...	...
0.6	9.9	2.1	10.3	2.6	...	2.7	...	1.2	...	3.6	...	...	...	...	...	...	100
12.9	...	...	...	13.9	7.1	7.2	...	23.2	...	...	...	17.8	...	...	42.1	57.1	...
...	...	1.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8.6	...	...	...	15.7	16.5	...	0.9	4.0	24.6	...	...	8.9	...	...	...	14.3	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4.3	3.7	...	...	9.6	3.6	14.4	...	...	3.1	5.4	...	...	...	...	...	...	...

Materials for which no control measures were indicated are as follows: Dermatitis producers (70), Inks (57), Salts (18), Aniline and its compounds (8), Halogenated hydrocarbons (7), Aldehydes (3).

Y OCCUPATION

[illegible]

TABLE 21 -- PETROLEUM PRODUCTS -- EXPOSURE BY OCCUPATION
TO SPECIFIED MATERIALS -- Concluded

[illegible]

Soap Factories (Tables 23 and 23a)

The principal exposures, as would be expected, are alkaline compounds and oils. Exposure to alkaline compounds was indicated not only for workmen engaged in handling caustic raw materials, but also to workers exposed to soap dust itself. The non-specific occupation of operators is dominant in this group and includes employes in various departments. Enclosures and local exhausts are the principal means of control with respirators and protective clothing applied to certain exposures.

TABLE 23—SOAP FACTORIES—EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Occupations	Number of workers exposed to specified materials by occupation									
	Alkaline compounds	Oils, fats, and waxes	Dermatitis producers	Petroleum products	Other chemicals	Organic acids	Other gases	Carbon monoxide	Silicate dusts	Organic solvents
Total number of workers in plants surveyed, 3,475	956	446	382	225	177	173	153	142	111	110
Number of workers exposed....	956	446	382	225	177	173	153	142	111	110
Percent of workers exposed.....	27.5	12.8	11.8	6.5	5.1	5.0	4.4	4.1	3.2	3.2
Assemblers	...	...	129	2	...	...	...	...	10	...
Bakers	...	...	20	...	...	...	22	20	...	...
Cleaners	76	31	...	...	...	...	...	...	...	...
Compounders	...	10	...	10	...	8	...	...	...	...
Cookers	26	30	2	4	...	...	...	3	...	...
Fillers	15	15	53	...	...	...	...	...	53	...
Glycerine makers	9	...	...	...	...	...	...	...	...	...
Laborers	64	64	2	22	4	63	12	1	20	21
Material handlers	28	12	...	...	...	...	...	...	8	...
Mixers	31	15	3	2	1	8	...	3	...	...
Operators	205	62	...	13	1	43	12	3	...	26
Packers	230	19	167	...	...	12	8	6	...	...
Pressmen	22	44	...	...	...	12	...	...	...	...
Printers	...	...	...	30	...	...	...	...	...	30
Pumpers	40	34	...	...	...	4	3	1	...	...
Receivers	2	2	1	...	...	4	...	...	...	...
Soap maker	65	51	...	1	...	2	57	21	12	2
Stampers	54	...	...	...	...	...	...	...	...	...
Stock keepers	...	15	...	...	...	...	...	...	...	...
Supervisors	24	20	...	...	10	17	11	7	...	8
Technical men	7	4	...	...	151	...	...	...	...	...
Truckers	26	...	5	...	...	...	...	...	...	...
Other	10	7	...	...	...	...	...	...	...	...
Maintenance	22	11	...	141	10	...	28	77	8	...

Blackings,

Salts; principal exposures in many types of establishments, chemicals, and, the principal occupations indicated.

TABLE 23a

Organic dusts	Silica dust	Dyes
74	66	6
2.1	1.9	1
2	10	...
...	12	...
...	...	...
...	...	...
...	...	...
...	...	...
...	...	...
...	...	...
13	26	...
...	5	...
...	1	...
12	10	...
6	...	...
21	...	...
...	...	...
4	...	...
...	...	...
4	1	...
...	...	...
6	1	...
...	...	...
6	...	...

Salts; alkaline compounds, organic dusts, and silicate dusts are the principal exposures in this group. These are well-known ingredients in many types of detergents. This group is comprised mainly of small establishments which are engaged in mixing and compounding raw chemicals, and, therefore, fillers, mixers, and packers are found to be the principal occupations. Local exhaust is the only significant control measure indicated.

Number of workers exposed to specified materials by occupation

Number of workers exposed to specified materials by occupation																	
Organic dusts	Silica dust	Dyes	Coal dust (bituminous)	Coal tar products	Salts	Lead and its compounds	Other metals	Paints and enamels	Benzol	Aldehydes	Alcohols, esters, and ethers	Infections	Lacquers and varnishes	Non-silicious dusts	Chromium and its compounds	Asbestos dusts	Fluorides
74	66	61	57	51	51	50	46	33	30	17	9	9	7	4	3	2	1
2.1	1.9	1.8	1.6	1.5	1.5	1.4	1.3	0.9	0.9	0.5	0.3	0.3	0.2	0.1	0.1	0.1	0.0
2	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	12	...	...	...	...	1	...	...	...	8	...	...	...	...	...	...	...
...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	6	...	6	...	...	...	...	...	...	...	12	...	...	...	...	...
...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...
13	26	...	6	2	16	...	...	...	...	6	2	2	...	...	...	...	...
...	5	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
...	1	11	...	13	2	...	...	2	...	3	3	...	5	...	...	...	...
12	10	6	1	7	6	...	16	...	...	...	...	...	...	...	3	...	1
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	30	...	...	30	...	...	...	...	...	...	...	...
4	...	10	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	10	2	...	...	...	...	...	2	...	2	...	...	...	...
4	1	20	...	13	22	...	...	...	...	...	2	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	50	...	...	20	28	20	...	...	...	...	...	4	...	2	...

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Table 58)

implements, automobile fac-
and boat building, which are
ired. Blast furnaces and roll-
heat treating; and machine
of manufacture. The manu-
59 and 59a) includes foundry
ork, and woodworking, as is
tomobile factories (Tables 60
isted in the appendix, include
is here are related to those of
l later in detail. Car and rail-
primarily in the manufacture
ling (Tables 63 and 63a) in-
el fabrication. There is noth-
any of these groups, classified
cannot be more satisfactorily
c.

TABLE 58 — IRON AND STEEL — EXPOSURE TO SPECIFIED MATERIALS

Number and Percentage of Total Exposures to the Specified Materials in Each Industrial Subdivision																											
Materials	Number of workers exposed to specified materials	Agricultural implements		Automobile factories		Blast furnaces and steel roll- ing mills		Car and railroad shops		Ships and boat build- ing		Foundries		Welding, forging and heat treat- ing		Machine shops											
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%										
Other metals	40,180	94	0.2	8,329	8.3	15,735	39.2	822	2.0	191	0.5	7,766	19.3	10,393	25.7	1,915	4.8										
Carbon monoxide	23,513	85	0.4	715	3.0	12,517	53.2	406	1.7	84	0.4	3,469	14.7	5,860	24.9	387	1.6										
Other gases	22,163	49	0.2	1,540	6.9	11,839	53.4	326	1.5	145	0.7	2,544	11.5	5,402	24.4	318	1.4										
Petroleum products	21,575	89	0.4	2,810	13.0	5,742	26.6	409	1.9	133	0.6	2,405	11.1	7,971	36.9	2,018	9.0										
Silicate dusts	16,363	124	0.8	1,372	8.4	3,132	19.1	91	0.6	5	0.0	8,123	49.7	3,063	18.5	483	2.0										
Temperature change	13,158	39	0.3	293	1.3	9,009	68.5	116	0.9			1,618	12.3	2,204	16.8												
Silica dust	11,685	143	1.2	293	2.5	2,312	19.8	182	1.6	43	0.4	7,920	67.9	2,617	5.3	155	1.3										
Non-silicious dusts	8,683	50	0.6	525	6.1	2,212	25.6	393	4.5	56	0.6	1,898	21.9	2,292	26.5	1,223	14.2										
Core gases	6,416	106	1.7	106	3.0	483	7.5	80	1.2			5,650	88.5			89	2.5										
Coal dust (bituminous)	3,590	24	0.7	763	21.5	459	12.9	123	3.6	135	3.8	1,069	29.3	357	24.2	128	3.6										
Organic dusts	3,548	39	1.1	528	17.5	691	22.9	41	1.4	197	6.5	507	16.8	799	26.5	242	8.0										
Lead and its compounds	3,017	12	0.4	113	4.1	1,418	51.5	26	0.9			320	11.6	667	27.7	310	11.3										
Alkaline acids	2,754			146	5.9	1,402	56.4					153	6.1	639	32.3	98	3.9										
Mineral acids	2,438			156	7.9	834	16.9	54	2.7	64	3.2	1,008	63.6	120	7.6	151	9.5										
Paints and enamels	1,982	41	2.1	133	8.4	150	9.5	12	0.8			296	26.3	398	35.4	58	5.2										
Oils, fats and waxes	1,534	10	0.6	133	18.3	104	9.2	45	4.0					178	22.4	79	9.9										
Lacquers and varnishes	1,125	13	1.2	211	18.8	106	13.4	15	1.9			151	19.0														
Organic solvents	794	1	0.1	264	33.2	106	13.4	15	1.9			90	13.0	46	6.6												
Other chemicals	692			4	0.6	532	79.3							202	30.3	24	3.6										
Dermatitis producers	667	2	0.3	90	13.5	54	8.1	40	6.0			255	38.2														
Manganese and its com- pounds	543			10	1.8	396	72.9					31	5.7	106	19.5												
Salts	443			6	1.4	329	93.1					68	15.3	235	53.0	5	1.1										
Coal tar products	332					272	81.9					1	0.3	6	1.8	53	16.0										
Cyanides	318			19	6.0			5	1.6			76	23.9	192	60.4	26	8.2										
Coal dust (anthracite)	261					100.0																					
Inks	206			4	1.9	16	7.8					114	55.3	66	32.0	6	2.9										
Asbestos dusts	192					73	38.0					5	2.6	106	55.2	8	4.2										
Chromium and its compounds	175					44	25.1	19	10.9			18	10.3	69	39.4	25	14.3										
Antimony and its compounds	155					154	100.0					137	88.4														
Phosphorus and compounds	147					139	94.6							8	5.4												
Sulfur dioxide	144											75	52.1	40	27.7	29	20.1										
Alcohols, esters and ethers	102			5	4.9							50	66.7	25	33.3	18	17.6										
Cadmium and its compounds	75															12	17.6										
Fluorides	68			6	8.8	55	88.7									1	9.7										
Halogenated hydrocarbons	62															32	80.0										
Benzol	40					40	100.0					5	71.4	2	28.6	8	20.0										
Dyes	33	1	3.0									2	100.0														
Sulfur	7																										
Medicinals	2																										
Aldehydes																											
Aniline and its compounds	1															1	100.0										

TABLE 61—BLAST FURNACES AND STEEL ROLLING MILLS—
EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Number of workers exposed to specified materials by occupation													
Occupations	Total number of workers in plants surveyed, 33,088												
	Other metals	Carbon monoxide	Other gases	Temperature change	Petroleum products	Silicate dusts	Silica dust	Non-silicious dusts	Coal dust (bituminous)	Alkaline compounds	Mineral acids	Lead and its compounds	
Number of workers exposed...	15,735	12,537	11,839	9,006	6,712	3,132	2,312	2,212	1,842	1,418	1,402	661	
Percent of workers exposed...	47.6	37.8	35.8	27.2	17.4	9.5	7.0	6.7	5.6	4.3	4.2	2.0	
Annealers	147	359	187	15	6	139	139						
Bessemer men	100	190	100	319	2	102			100				
Blockers	43	131	87	25	28							3	
Boiler makers	121	106	102		12			75	1				
Bottom makers	...	...	20			83		100					
Brass men	...	23	77			8	8						
Catchers	...	30	9	18	12						6		
Coppers	240	...	...	...	...	92	92						
Cleaners	56	...	3	...	...	6	54			16	26	6	
Core makers	41	52	90			123	123						
Crane men	408	392	349	196	110	47	33	13	35	36	27		
Cupola chargers	...	615	13	8				41	9				
Dottlers	298	401	85	269									
Draw men	183	...	52	284				9	702	26			
Feeders	66	70	66	66				6		51	16		
Furnace tappers	5	167	...	...	...	67	67	150					
Furnace tenders	369	134	433	560	40	126	206	216	28				
Galvanizers	39	...	27								2	11	
Git men	70	40	40	40				40	40				
Grinders	241	8			17	236	23	78					
Heater men	1,169	1,065	1,444	1,687	47	6	6	25					
Heat cutters	35	89	85	87									
Inspectors	680	155	154	1	10	5	5						
Keepers	25	25	23	70		28	26	3	16				
Labors	3,327	1,888	2,307	2,003	461	777	551	126	332	75	89	14	
Laborers	31	61	121	85		12	12	50					
Leaders	392	312	317	298	16	150	90	377	224				
Machinists	1,072	358	441	1,115	217			451	17	9			
Mill hands	...	370	110	275									
Mixers	9	1	9	9		1	1	17		2	1		
Molders	...	...	...	...	...	181	181	20					
Open hearth men	...	...	...	...	...	...	...	...					
Operators	2,485	2,069	1,959	1,791	1,337	61	21	108	299	124	118	65	
Other steel workers	263	245	76	54	329		8	12	12	48	11		
Packers	3									231	359		
Presmen	25	4			9	9		4	4				
Pump men	282	...	...	...	...	...	...	...	...	...	...	...	...
Reelers	39	63		3	79						2	6	
Riggers	114	58	40	46	81	41		81	12			12	
Rollers	667	681	711	715	142	23				7			
Roughers	123	48	58										
Rulers	...	...	84	24									
Shake out men	...	...			23	23							
Shear men	822	777	768										
Shippers	193	95	68	27	53			12		5	92		
Straighteners	232	128	184		10								
Supervisors	69	120	69	42	91	7	5	19	43		8	3	
Switchers	16	51			51				61				
Technical men	36	11	11		51			8		8	191		
Truck drivers	3	9		45	57	2		8					
Winders	19												
Other	146	146	105	74	51	40	89	31	113	89	69	8	
Maintenance	988	1,105	1,077	1,44	1,172	190	144	127	408	75	64	248	

TABLE 61.—BLAST FURNACES AND STEEL ROLLING MILLS—
EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Number of workers exposed to specified materials by occupation																	
Other chemicals	Core gases	Organic dusts	Manganese and its compounds	Paints and enamels	Coal tar products	Coal dust (anthracite)	Phosphorus and its compounds	Oils, fats, and waxes	Sulfur dioxide	Salts	Organic solvents	Lacquers and varnishes	Asbestos dust	Benzol	Dermatitis producers	Chromium and compounds	Inks
562	483	459	396	334	272	251	154	150	139	129	106	104	73	55	64	44	10
1.7	1.6	1.4	1.2	1.0	0.8	0.8	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.0
...	...	...	100	...	22	...	...	...	100	4	...	...	...	...	...	...	...
...	...	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	12	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...
...	123	...	...	...	...	...	...	102	...	...	...	61	...	...	...	...	...
...	23	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	95	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	27	...	...	...	...	...	...	...
...	350	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	86	130	72	6	37	42	...	...	18	2	...	...	89	...	...	...
...	50	...	...	...	60	...	50	...	...	...	...	...	...	...	...	16	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	170	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	209	...	...	...	209	104	...	...	...	...	...	...	...	...	...	...
...	3	12	18	...	46	114	...	...	39	15	12	...	...	8	...	4	...
...	...	...	...	...	...	...	...	12	...	...	12	...	...	...	...	...	...
...	...	...	155	...	...	...	...	...	...	...	45	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...
...	23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...
...	...	...	1	1	...	...	...	...	...	1	...	...	...	...	3	...	1
...	2	2	...	...	8	...	...	...	...	...	...	...	...	2	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	249	...	46	...	...	...	...	...	...	...	6	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	15	...	...	...	...	...
...	12	44	...	...	11	36	...	...	37	...	12	...	...	3	23	24	...
...	...	160	...	...	70	9	...	36	27	28	20	67	3	28	...	...	...

TABLE 64—FOUNDRIES—EXPOSURE BY OCCUPATION
TO SPECIFIED MATERIALS

Number of workers exposed to specified materials by occupation													
Occupations	Silicate dusts	Silica dust	Other metals	Core gases	Carbon monoxide	Other gases	Petroleum products	Non-silicious dusts	Temperature change	Organic dusts	Oils, fats, and waxes	Coal dust (bituminous)	Paints and enamels
Total number of workers in plants surveyed, 21,306													
Number of workers exposed . . .	8,128	7,920	7,706	5,680	8,450	2,544	2,405	1,898	1,618	1,039	1,008	935	536
Per cent of workers exposed....	38.1	37.2	36.4	26.7	16.2	12.0	11.3	8.9	7.6	4.9	4.7	4.4	2.5
Assemblers	38	...	127	...	33	15	59	14	...	4	...	...	53
Chargers	62	66	86	37	101	18	...	32	86	...	...	79	...
Chippers	482	506	518	269	40	40	...	100	...	8	8	...	...
Cleaners	98	127	167	20	18	17	5	64	1	13	...	1	...
Coremakers	492	933	21	781	686	549	99	...	5	190	717	79	...
Cranemen	136	160	51	103	34	9	3	...	19	...	...	1	...
Cupola tenders	122	125	230	96	224	127	15	43	234	10	2	140	...
Cutters	...	...	5	...	...	2	18	...	...	...	...	...	...
Drillers	2	2	40	...	...	...	45	80	...	...	...	...	...
Erectors	239	109	46	...	...	...	135	132	...	...	...	...	...
Forgers	...	...	100	...	...	...	68	85	28	...	...	7	...
Galvanizers	...	...	20	...	10	13	...	...	...	...	34	...	...
Grinders	456	219	981	56	...	...	31	380	...	90	...	...	...
Heat treaters	2	2	41	1	90	84	39	...	11	26	...	28	...
Inspectors	38	49	12	22	12	3	15	1	...	...	...	...	...
Laborers	1,246	1,307	769	804	223	63	106	29	311	53	26	171	6
Machinists	273	31	1,064	19	122	118	1,083	793	2	...	56	3	4
Millwrights	10	16	14	4	13	8	35	5	...	...	...	...	...
Mixers	113	114	...	61	8	7	...	...	67	18	10	1	...
Molders	2,921	2,967	1,273	773	170	27	11	45	781	208	67	230	...
Operators	3	3	143	...	...	76	251	...	...	...	...	1	67
Oven tenders	25	31	20	27	41	36	10	...	25	...	23	14	...
Painters	97	75	86	...	11	11	...	...	...	18	...	185	9
Pattern makers	38	96	109	10	64	65	...	26	...	268	9	21	21
Picklers	...	...	...	...	...	...	...	...	...	...	...	...	...
Platers	...	...	38	...	...	...	1	...	...	...	...	...	...
Pourers	237	240	240	233	86	8	2	1	221	...	...	12	...
Receivers	...	...	...	...	2	...	...	...	...	...	...	1	...
Sand blasters	73	132	143	4	...	...	...	...	2	...	...	...	...
Shake out men	313	313	60	253	42	...	4	...	8	...	...	...	...
Sheet metal workers	325	...	231	...	201	206	...	1	28	...	84	...	...
Shippers	7	7	2	...	...	...	1	...	...	28	2	...	...
Sorters	25	18	17	8	...	...	3	...	...	...	...	...	...
Supervisors	103	114	83	67	18	10	3	23	1	5	2	1	1
Technical men	3	5	7	1	2	2	...	...	...	3	...	...	...
Tool makers	3	3	39	...	15	15	16	...	...	...	15	...	...
Welders	14	17	892	3	760	886	200	68	...	...	...	2	205
Other	41	49	44	4	43	12	12	19	2	33	4	14	11
Maintenance	88	90	84	13	202	56	190	14	...	...	1	142	1

TABLE 61—FOUNDRIES—EXPOSURE BY OCCUPATION
TO SPECIFIED MATERIALS

[illegible]

TABLE 68—BRASS FACTORIES—EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Occupations	Number of workers exposed to specified materials by occupation										
	Other metals	Silicate dusts	Silica dust	Lead and its compounds	Petroleum products	Core gases	Carbon monoxide	Other gases	Non-silicious dusts	Oils, fats, and waxes	Temperature change
Total number of workers in plants surveyed 7,232											
Number of workers exposed	2,975	2,002	1,868	1,504	1,868	1,256	1,220	1,073	794	484	376
Percent of workers exposed	41.1	27.7	26.2	20.8	18.9	17.4	16.9	14.8	11.0	6.7	5.2
Assemblers	162	140	...	42	118	...	56	52	11	9	...
Cleaners	70	76	73	13	...	69	15	15	11	12	...
Core makers	31	261	321	6	...	298	232	198	14	249	2
Cupola tenders	162	61	63	73	9	40	156	192	...	...	89
Grinders	306	173	106	166	...	51	11	17	132	12	...
Inspectors	6	5	14	212	10	2	10	11	2	1	...
Laborers	173	146	139	89	5	113	81	66	2	28	78
Machinists	564	148	1	116	528	...	89	86	184	85	...
Mixers	44	49	40	6	...	46	2	2	1	2	...
Molders	562	707	708	297	16	568	185	157	49	26	167
Operators	68	18	1	289	501	...	16	16	1	24	1
Oven tenders	...	8	9	...	...	...	11	15	15	9	...
Painters	...	1	...	...	...	...	...	...	...	...	...
Pattern makers	182	4	84	19	...	...	148	144	155	...	72
Platers	64	...	...	8	2	...	14	14	...	...	...
Polishers	279	20	181	42	3	...	...	193	...	...	89
Pourers	30	25	25	17	3	13	6	6	...	29	...
Sand blasters	27	16	28	6	...	6	2	3	...	...	...
Shake out men	21	49	49	16	...	44	8	3	...	...	...
Shippers	9	...	...	2	8	...	...	...	8	6	40
Sheet metal workers	19	8	8	11	...	2	4	5	2	...	...
Supervisors	78	37	36	23	20	20	51	49	23	13	4
Technical men	...	...	...	5	...	...	50	52	...	...	...
Welders	52	...	...	...	...	...	41	41	9	5	8
Other	41	12	15	22	32	3	41	41	9	5	8
Maintenance	36	38	43	29	135	...	33	19	1	1	16

Brass Factories (Tables 68 and 68a)

This group includes brass and bronze casting and machining. The operations are similar to those encountered in iron foundries and machine shops but differ in the type of materials used. The principal exposures are other metals, which include copper, tin, and zinc; and silica and silicate dusts used in molding, sandblasting, grinding, and polishing. Lead, to which 20.8% of the workers in this group are exposed, originates primarily from the lead used in bronze castings. Local exhaust, which applies to crucible furnaces, grinding operations, buffing, plating, etc., is the dominant control measure. General negative ventilation for foundry atmospheres and protective clothing for plating and painting operations are also important.

TABLE 68—BRASS FACTORIES—EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Occupations	Number of workers exposed to specified materials by occupation										
	Other metals	Silicate dusts	Silica dust	Lead and its compounds	Petroleum products	Core gases	Carbon monoxide	Other gases	Non-silicious dusts	Oils, fats, and waxes	Temperature change
Total number of workers in plants surveyed 7,232											
Number of workers exposed	2,975	2,002	1,868	1,504	1,868	1,256	1,220	1,073	794	484	376
Percent of workers exposed	41.1	27.7	26.2	20.8	18.9	17.4	16.9	14.8	11.0	6.7	5.2
Assemblers	162	140	...	42	118	...	56	52	11	9	...
Cleaners	70	76	73	13	...	69	15	15	11	12	...
Core makers	31	261	321	6	...	298	232	198	14	249	2
Cupola tenders	162	61	63	73	9	40	156	192	...	...	89
Grinders	306	173	106	166	...	51	11	17	132	12	...
Inspectors	6	5	14	212	10	2	10	11	2	1	...
Laborers	173	146	139	89	5	113	81	66	2	28	78
Machinists	564	148	1	116	528	...	89	86	184	85	...
Mixers	44	49	40	6	...	46	2	2	1	2	...
Molders	562	707	708	297	16	568	185	157	49	26	167
Operators	68	18	1	289	501	...	16	16	1	24	1
Oven tenders	...	8	9	...	...	...	11	15	15	9	...
Painters	...	1	...	...	...	...	...	...	...	...	...
Pattern makers	182	4	84	19	...	...	148	144	155	...	72
Platers	64	...	...	8	2	...	14	14	...	...	...
Polishers	279	20	181	42	3	...	...	193	...	...	89
Pourers	30	25	25	17	3	13	6	6	...	29	...
Sand blasters	27	16	28	6	...	6	2	3	...	...	...
Shake out men	21	49	49	16	...	44	8	3	...	...	...
Shippers	9	...	...	2	8	...	...	...	8	6	40
Sheet metal workers	19	8	8	11	...	2	4	5	2	...	...
Supervisors	78	37	36	23	20	20	51	49	23	13	4
Technical men	...	...	...	5	...	...	50	52	...	...	...
Welders	52	...	...	...	...	...	41	41	9	5	8
Other	41	12	15	22	32	3	41	41	9	5	8
Maintenance	36	38	43	29	135	...	33	19	1	1	16

Clock and Watch Factories (Tables 69 and 69a)

Woodworking, metal stamping, and machining are the principal operations in this group. The percentage of exposures to all materials are low in comparison with those of other groups. Local exhaust in sawing, metal grinding, and buffing; and wet grinding methods are the dominant control measures listed.

TABLE 105—OTHER RUBBER FACTORIES—EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Occupations	Number of workers exposed to specified materials by occupation													
	Silicate dusts	Organic dusts	Organic solvents	Inks	Alkaline compounds	Other metals	Non-silicious dusts	Sulfur	Alcohols, esters, and ethers	Other gases	Dyes	Accelerators	Petroleum products	Carbon monoxide
Total number of workers in plants surveyed, 2,716	660	520	456	319	284	239	232	222	210	166	151	149	121	117
Percent of workers exposed.	24.5	19.6	16.8	11.7	10.5	8.7	8.6	8.2	7.7	6.8	5.6	5.5	4.5	4.3
Assemblers	1	8	77	11	11						16	13		23
Buffers	12	8												
Compounders	10	23	1		7	39	27	34		9	15	33	2	
Coverers					12									
Curing men	7	3	6		4	1	1							
Cutters	20	32	19		1	4	1	1						
Decorators			33									1		
Developers	3	3												
Dippers		2	25			1	3	3				3		
Engravers			15	15						19			1	3
Fillers														
Finishers			3										15	
Forming girls	1	4												
Grinders		23												
Inspectors	229	5	6	206	2									
Laborers		3												
Machinists	26	3												1
Mill men	39	60	1			19	39			9		15	29	
Mixers	14	16	20			26	56	61		18	26	54	7	8
Molders	20	20	41			20	15	12		1	3	12	2	1
Operators	82	63	6			80	47	44		41	3	36	7	
Platers		1	5			8	1							
Pressmen	17	5				64	2							
Printers			65	20			2			11		2	11	
Refiners	15	15												
Rollers		4	4	6		15		15						
Shippers	7	31	17	56	10	7	5	7		6				
Stampers		10	32	1										22
Stamp makers	8	10												
Strippers	59	2	4							10				
Supervisors	1	5	1											
Technical men	16						1						1	
Trimmers	16	10	19		13									2
Truckers														
Vulcanizers	2									2			2	
Washers	11	11	1											40
Other	35	20	30		3	2	6			14	8	2	12	2
Maintenance	8	16	2	1	2	16							60	53

other rubber factories. The two sub-groups, rubber tires and other rubber factories, differ primarily in the type of product manufactured, the raw materials and ingredients used being similar in both groups.

Rubber Tires (Tables 104 and 104a)

The principal exposures in the rubber tire industry are silicate dusts, organic solvents, organic dusts, and other metals. Although the incidence of exposure to the above materials is high, the dangerous properties of materials such as lead, accelerators, antimony, benzol, and halogenated hydrocarbons must not be overlooked. It is noted that the occupations, mill men, mixers, and compounders, show exposures to a variety of materials. In the editing procedure, exposures to the large number of materials which make up the compounded rubber stock were indicated only

TABLE 105—OTHER RUBBER FACTORIES—EXPOSURE BY OCCUPATION TO SPECIFIED MATERIALS

Occupations	Number of workers exposed to specified materials by occupation													
	Lead and its compounds	Oils, fats, and waxes	Laquers and varnishes	Paints and enamels	Coal dust (bituminous)	Organic acids	Salts	Silica dust	Cyanides	Asbestos dusts	Antimony and its compounds	Benzol	Mineral acids	Coal tar products
Total number of workers in plants surveyed, 2,716	88	76	65	61	52	41	38	23	20	13	9	9	8	8
Percent of workers exposed.	3.2	2.8	2.4	2.2	1.9	1.5	1.4	0.8	0.7	0.5	0.3	0.3	0.3	0.3
Assemblers			11											
Buffers	11	15												
Compounders						15					2			
Coverers														
Curing men	1									2				
Cutters	6		32	45										
Decorators														
Developers														
Dippers														
Engravers														
Fillers														
Finishers														
Forming girls														
Grinders														
Inspectors								6		1				
Laborers														
Machinists														
Mill men	28	10				26								
Mixers	8	4							2	1	7			
Molders	3													
Operators	8	33								3				
Platers														
Pressmen														
Printers	6						36			3				
Refiners														
Rollers														
Shippers														
Stampers	2													
Stamp makers														
Strippers														
Supervisors	1													
Technical men														
Trimmers														
Truckers														
Vulcanizers														
Washers														
Other	12													
Maintenance	3		12	11	50									

through the mixing, compounding, and milling operations, and were not indicated in the tire building and curing operations. A large part of the materials was controlled in part by general negative ventilation, local exhaust, enclosures, and protective clothing. Respirators are also an important method of control in certain selected exposures.

Other Rubber Factories (Tables 105 and 105a)

The materials encountered in this group are similar in type to those already discussed under rubber tires except that the order of their prevalence has changed in certain cases. Outstanding occupations are compounders, mill men, mixers, operators, molders, and inspectors. Nearly all of the exposures are controlled in part by general negative ventilation, local exhaust, and enclosure, with respirators and protective clothing applying to certain exposures.

Materials for which no control measures were indicated are as follows: Alcohols, esters and ethers (210), Petroleum products (121), Salts (38), Antimony and its compounds (9), Coal tar products (8), Other chemicals (6) and Halogenated hydrocarbons (3).

Materials	Number of workers exposed to specified materials	Number and Percentage of Total Exposure to the Specified Materials in Each Industrial Subdivision																			
		Brooms and brushes		Electrical machinery		Instruments		Gas and electrical fixtures		Storage batteries		Dental supplies		Optical goods		Signs (non-electrical)		Toys and unclassified novelties		Other manufacturing plants	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Other metals	7,670	9	0.1	5,872	76.6	128	1.7	726	9.5	356	4.6	98	1.3	8	0.1	15	0.2	127	1.7	331	4.3
Other gases	5,454	1	0.0	2,963	54.4	42	0.8	1,461	26.8	696	12.8	102	1.9	20	0.4	33	0.6	23	0.4	108	2.0
Petroleum products.....	5,146	14	0.3	3,766	73.2	86	1.7	328	6.4	479	9.3	40	0.8	25	0.5	17	0.3	29	0.6	362	7.0
Carbon monoxide.....	4,770	3	0.1	2,582	54.1	44	0.9	1,227	25.7	629	13.2	102	2.1	22	0.5	29	0.6	22	0.5	110	2.3
Lead and its compounds..	2,652	3	0.1	1,681	63.4	16	0.6	169	6.4	650	24.5	1	0.0	4	0.2	23	0.9	2	0.1	108	8.9
Organic dusts.....	2,267	129	5.7	723	31.9	5	0.2	350	15.4	424	18.7	113	5.0	3	0.1	38	1.7	110	4.9	372	16.4
Silicate dusts	2,246	129	5.7	1,321	58.8	22	1.0	339	15.1	147	6.5	82	3.7	110	4.9	13	0.6	96	4.2	105	4.7
Non-silicious dusts	1,723	4	0.2	954	55.4	93	5.4	59	3.4	7	0.4	96	5.6	75	4.4	13	0.8	96	5.6	326	18.9
Silica dust	1,232	17	1.4	758	61.5	2	0.2	53	4.3	37	3.0	69	5.6	6	0.5	19	1.5	109	8.8	162	13.1
Mineral acids	1,049	25	2.4	557	53.1	3	0.3	87	8.3	231	22.0	71	6.3	...	...	8	0.8	...	...	67	6.4
Oils, fats and waxes.....	1,000	1	0.1	818	81.8	...	...	150	15.2	58	5.9	24	2.4	2	0.2	5	0.5	35	3.5	84	8.5
Alkaline compounds.....	990	...	...	624	63.0	8	0.8	145	15.2	22	2.3	10	1.0	...	...	45	4.7	32	3.3	96	10.0
Lacquers and varnishes..	966	35	3.7	564	59.0	7	0.7	36	4.5	32	4.0	1	0.1	...	...	148	18.6	33	4.2	11	1.4
Paints and enamels.....	795	3	0.4	516	64.9	15	1.9	53	6.7	186	23.5	41	5.2	1	0.1	34	4.3	10	1.3	186	23.5
Organic solvents	793	...	...	278	35.1	4	0.5	...	...	2	0.2	...	...	...	...	...	...	...	...	...	...
Benzol	773	...	...	768	99.4	3	0.4	...	...	...	...	47	8.8	...	...	...	...	132	24.8	7	1.3
Coal tar products.....	532	...	...	344	64.7	2	0.4	...	...	152	31.8	...	...	...	...	...	...	13	2.7	...	...
Antimony and its compounds...	478	...	...	313	65.5	...	...	15	3.9	1	0.3	...	...	2	0.5	29	7.5	32	8.3	88	22.8
Dermatitis producers	386	...	...	219	56.7	...	...	...	...	2	0.6	41	12.5	...	...	...	...	...	...	1	0.3
Halogenated hydrocarbons.....	327	...	...	283	86.5																

TABLE 110a—GAS AND ELECTRIC FIXTURES—PERCENTAGE OF EXPOSED WORKERS PROVIDED WITH CONTROL MEASURES FOR SPECIFIED MATERIALS

Control Measures	Number of workers exposed	Other gases	Carbon monoxide	Other metals	Organic dusts	Silicate dusts	Petroleum products	Lead and its compounds	Alcohols, ester, and ethers	Alkaline compounds	Lacquers and varnishes	Mineral acids	Coal dust (bituminous)	Non-silicious dusts	Silica dust	Organic solvents	Paints and enamels	Manganese and its compounds	Salts	Cyanides	Fluorides	Chromium and its compounds	Asbestos dusts	Cadmium and its compounds	Dyes
General positive ventilation	1,461	1,227	726	850	839	828	169	165	150	145	87	61	59	53	53	36	33	25	22	13	12	10	10	2	
General negative ventilation	73.4	77.7	17.2	...	...	...	...	...	...	...	...	...	...	...	17.0	...	...	...	...	...	...	...	...	...	
Local exhaust	92.5	87.4	35.8	66.3	...	...	72.8	100.0	4.0	65.5	48.3	9.8	...	...	9.4	78.6	5.5	...	...	...	...	...	...	...	
Enclosure	7.1	9.9	81.7	18.8	33.6	0.9	75.1	100.0	2.7	80.3	35.6	...	...	...	52.5	43.4	71.7	55.5	9.1	...	...	...	...	...	
Respirator	1.4	0.5	2.0	...	0.9	...	...	...	10.0	...	17.2	...	...	...	5.1	...	...	...	...	...	...	...	...	...	
Protective clothing	0.6	...	1.0	...	3.8	0.9	...	...	6.7	4.8	14.9	...	...	...	16.9	18.9	...	...	...	...	...	...	...	...	
Materials for which no control measures were indicated are as follows: Other chemicals (150), Dermatitis producers (15), Inks (3) and Temperature change (1).	...	...	...	...	...	...	...	...	7.8	...	23.3	...	...	...	...	...	...	...	...	...	...	...	...	...	

TABLE 111a—STORAGE BATTERIES—PERCENTAGE OF EXPOSED WORKERS PROVIDED WITH CONTROL MEASURES FOR SPECIFIED MATERIALS

Control Measures	Number of workers exposed	Other gases	Lead and its compounds	Carbon monoxide	Petroleum products	Organic dusts	Other metals	Mineral acids	Organic solvents	Antimony and its compounds	Silicate dusts	Salts	Alkaline compounds	Silica dust	Oils, fats, and waxes	Paints and enamels	Other chemicals	Manganese and its compounds	Coal dust (bituminous)	Lacquers and varnishes	Cyanides	Chromium and its compounds	Non-silicious dusts	Accelerators	Alcohols, esters, and ethers	Sulfur	Asbestos dusts
General positive ventilation	696	650	629	479	424	856	231	186	152	147	62	58	57	57	32	30	29	27	22	12	12	7	3	3	2	1	
General negative ventilation	1.6	...	1.7	...	...	4.5	8.1	4.3	14.5	...	...	17.2	...	...	34.4	...	...	...	50.0	83.3	83.3	...	...	...	...	...	
Local exhaust	1.7	14.1	1.6	...	...	0.7	2.5	10.8	5.9	1.3	2.0	1.6	22.4	2.7	18.9	9.4	...	...	34.5	3.7	13.6	8.3	8.3	...	...	...	
Enclosure	84.0	48.0	75.0	88.2	46.9	52.2	7.8	5.9	49.3	6.1	9.8	27.6	21.6	51.3	37.5	96.7	62.1	22.2	50.0	83.3	83.3	85.7	33.3	...	...	...	
Respirator	3.2	0.8	13.2	...	...	4.9	23.3	0.4	...	...	...	11.3	...	...	...	...	...	...	...	...	...	...	...	...	...		
Protective clothing	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Materials for which no control measures were indicated are as follows: Ink (9), Organic acids (2), Sulfur dioxide (2), Halogenated hydrocarbons (2), Benzol (2) and Dermatitis producers (1).	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		