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Indiana. Bureau of Industrial Hygiene

PRELIMINARY INDUSTRIAL HYGIENE SURVEY
OF INDIANA INDUSTRIES

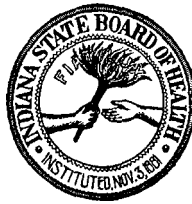
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THE BUREAU OF INDUSTRIAL HYGIENE

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INDIANA STATE BOARD OF HEALTH

INDIANAPOLIS, INDIANA

1939

TABLE 13—NUMBER OF WORKERS EXPOSED TO SPECIFIC MATERIALS IN INDUSTRIAL OR SERVICE GROUP SURVEYED

MATERIALS	Total all industries surveyed	Extraction minerals	Chemical and allied	Tobacco and cigar	Clay, glass and stone	Clothing and allied	Food and allied	Iron and steel	Metals other than iron and steel	Leather	Furniture and lumber	Paper and allied	Textiles	Miscellaneous Mfg.	Person service
Metals (N. O. S.)*	36,549	164	1,185	4	1,230	58	399	26,886	2,959	7	372	397	44	2,836	
Dermatitis producers	27,599	129	911	379	523	99	11,601	8,354	366	338	1,468	732	330	2,088	28
Organic dusts	22,948	27	843	190	355	2,548	2,164	3,025	454	215	6,448	725	3,751	2,182	
High humidity	15,923	16	435	33	222	1,083	6,102	860	94	127	206	255	2,734	1,135	2,332
Extreme temperature changes	12,921	42	1,379		1,942	11	1,831	6,746	381	8	53	36	5	480	
Silica dust	11,842	761	131		1,675	4	10	6,974	458	20	1,534	12	1	260	
Silicate dusts	11,812	144	786	3	2,308	100	688	4,711	413	20	513	167	43	1,334	
Gases (N. O. S.)	10,844	194	825		1,344	23	1,550	4,909	547	39	159	267	25	930	
Petroleum products	10,067	179	901	22	664	133	879	5,013	433	23	281	327	523	649	
Non-siliceous dusts	9,647	236	214	4	2,859	22	161	3,914	716	36	310	67	29	1,070	
Lead	6,884	4	368		128	7	112	1,794	840	8	158	1,841	18	1,605	
Bituminous coal dust	6,800	3,320	201	3	647	59	686	1,120	82	15	266	89	40	182	
Carbon monoxide	6,364	173	383	3	477	67	1,028	3,165	233	17	255	109	48	295	
Organic solvents	5,128		702		260	48	188	876	215	26	538	1,529	43	471	
Alkalis	3,209	1	512		173	27	1,033	529	202	19	28	63	41	379	
Paints	2,741	2	351		156	2	66	1,144	416	2	337	53	7	207	
Mineral acids	2,881		314		13	9	118	993	325	5	46	83	25	442	
Oils (not petroleum)	2,200		223		17		303	1,143	146	50	144	58	11	101	
Inks	2,134		107		22	29	137	75	11	37	37	1,604	27	35	
Sulphur dioxide	2,115	69	129	3	247	42	483	513	49	15	203	66	29	195	
Lacquers	1,808		67		13		11	565	139	1	689	34	12	271	
Antimony	1,506		17		3	1	10	44	64		19	1,330	1	17	
Chemicals (N. O. S.)	1,494	2	579		95	3	180	267	57	7	3	116	16	156	
Infections	1,248	1	202		16		795		4	30	2		26	170	
Dyes	971		32		21	22	17	27		90	352	91	230	79	
Alcohols, esters and ethers	901		209		10	10	224	97	100		57	46	2	80	
Salts (N. O. S.)	650		212		57	3	161	143	4	12	5	19	12	19	
Coal tar products	638		147		94		53	69	84	1	7	11		172	
Sulphur and compounds	606		124		149		1	28	70		2	4		221	
Cyanides	579		5					280	132		19	14		129	
Halogenated hydrocarbons	452		82		8	4	4	120	28			9	11	106	
Chromium	411		8					189	93	2	12	9		98	
Medicinals	318		168	1	11	2	29	75	7	1	3	1	5	15	
Asbestos dust	315		73		159		1	70	11					1	
Organic acids	296		40		5	6	54	25	6	14		40	2	35	
Aldehydes	232		10		39	1	93	59	12		5	13			
Benzene	215		18		17			15	62		23	51		11	
Accelerators	213				10			12	20		2			169	
Mercury	154		10			90		4	1	40		3		6	
Aniline	136		8			7		1		27	4	20	28	33	
Cadmium	132				4			38	39		5			46	
Arsenic	122		33		77			10						2	
Fluorides	107		14		44			47						2	
Manganese	77		2		1			69	3					2	
Chlorine	77		5			9	49				1		3		
Selenium	29				29										
Hydrogen sulphide	26		22								4				
Anthracite coal dust	11				9						2				
Amines	6		6												
Phosphorus	2		2												
Radium															

*Includes metals other than arsenic, chromium, cadmium, mercury, manganese, lead, antimony and selenium. It is chiefly iron, steel, zinc, copper and tin.
(N. O. S.) Not otherwise specified.

TABLE 14—PERCENT OF WORKERS EXPOSED TO SPECIFIC MATERIALS IN INDUSTRIAL OR SERVICE GROUP SURVEYED

MATERIALS	Total all industries surveyed	Extraction minerals	Chemical and allied	Tobacco and cigar	Clay, glass and stone	Clothing and allied	Food and allied	Iron and steel	Metals other than iron and steel	Leather	Furniture and lumber	Paper and allied	Textiles	Miscellaneous Mfg.	Person service
TOTAL NUMBER ALL WORKERS SURVEYED	247,817	4,704	15,741	1,035	15,343	17,456	35,464	80,728	9,474	2,056	18,757	12,075	8,232	21,822	4,931
Metals (N. O. S.)†	14.7	3.5	7.5	0.4	8.0	0.3	1.1	33.3	31.2	0.3	2.0	3.3	0.5	13.0	0.2
Dermatitis producers	11.1	2.7	5.8	36.6	3.4	0.6	32.7	10.3	3.9	16.4	7.8	6.1	4.0	9.6	5.7
Organic dusts	9.3	0.6	5.4	18.4	2.3	14.6	6.1	3.7	4.8	10.5	34.4	6.0	45.6	10.0	0.4
High humidity	6.3	0.3	2.8	3.2	1.4	6.2	17.2	1.1	1.0	6.2	1.1	2.1	33.2	5.2	47.1
Extreme temperature changes	5.2	0.9	8.8		12.7	*	5.2	8.4	4.0	0.4	0.3	0.3	*	2.2	0.1
Silica dust	4.8	16.2	0.8		10.9	*	*	8.6	4.8	1.0	8.2	0.1	*	1.2	
Silicate dusts	4.6	3.1	5.0	0.3	15.0	0.6	1.9	5.8	4.4	1.0	2.7	1.4	0.5	6.1	1.7
Gases (N. O. S.)	4.4	4.1	5.2		8.8	0.1	4.4	6.1	5.8	1.9	0.8	2.2	0.3	4.3	0.6
Petroleum products	4.0	3.8	5.7	2.1	4.3	0.8	2.5	6.2	4.6	1.1	1.5	2.7	6.4	3.0	0.8
Non-siliceous dusts	3.9	5.0	1.4	0.4	18.6	0.1	0.5	4.8	7.6	1.8	1.7	0.6	0.4	4.9	0.2
Lead	2.8	*	2.3		0.8	*	0.3	2.2	8.9	0.4	0.8	15.2	0.2	7.4	
Bituminous coal dust	2.7	70.6	1.3	0.3	4.2	0.3	1.9	1.4	0.9	0.7	1.4	0.7	0.5	0.8	1.8
Carbon monoxide	2.6	3.7	2.4	0.3	3.1	0.4	3.0	3.9	2.5	0.8	1.4	0.9	0.6	1.4	2.3
Organic solvents	2.0		4.5		1.7	0.3	0.5	1.1	2.3	1.3	2.9	12.7	0.5	2.2	4.7
Alkalis	1.3		3.3		1.1	0.2	2.9	0.7	2.2	0.9	0.1	0.5	0.5	1.7	4.0
Paints	1.1	*	2.2		1.0	*	0.2	1.4	4.3	*	1.8	0.4	*	0.9	
Mineral acids	1.0		2.0		*	*	0.3	1.2	3.4	0.2	0.2	0.7	0.3	2.0	0.2
Oils (not petroleum)	0.9		1.4		0.1	*	0.9	1.4	1.5	2.4	0.8	0.5	0.1	0.5	0.3
Inks	0.9		0.7		0.1	0.2	0.4	*	0.1	1.8	0.2	13.3	0.3	0.2	0.3
Sulphur dioxide	0.9	1.5	0.8	0.3	1.6	0.2	1.4	0.6	0.5	0.7	1.1	0.5	0.4	0.9	1.5
Lacquers	0.7		0.4		*	*	*	0.7	1.5	*	3.7	0.3	0.1	1.2	0.1
Antimony	0.6		0.1		*	*	*	*	0.7	*	0.1	11.0	*	*	
Chemicals (N. O. S.)	0.6		3.7		9.6	*	0.5	0.3	0.6	0.3	*	1.0	0.2	0.7	0.3
Infections	0.5		1.3		*	*	2.2	*	*	1.5	*	*	0.3	0.8	0.2
Dyes	0.4		0.2		0.1	0.1	*	0.1	1.1	4.4	1.9	0.8	2.8	0.4	1.3
Alcohols, esters and ethers	0.4		1.3		*	*	0.6	0.1	*	*	0.3	0.4	*	0.8	
Salts (N. O. S.)	0.3		1.3		0.4	*	0.5	0.2	*	0.6	*	0.2	0.1	*	
Coal tar products	0.3		0.9		0.6	*	0.1	*	0.9	*	*	*	*	1.0	
Sulphur and compounds	0.2		0.8		1.0	*	*	*	0.7	*	*	*	*	0.6	0.1
Cyanides	0.2		*		*	*	*	0.3	1.4	*	0.1	0.1	*	0.5	
Halogenated hydrocarbons	0.2		0.5		*	*	*	0.1	0.3	*	*	*	0.1	0.4	1.7
Chromium	0.2		0.1		*	*	*	0.2	1.0	*	*	*	*	0.4	
Medicinals	0.1		1.1		*	*	*	*	0.1	*	*	*	*	*	
Asbestos dust	0.1		0.5		1.0	*	*	*	*	*	*	*	*	*	
Organic acids	0.1		0.3		*	*	0.2	*	*	0.7	*	0.4	*	0.2	1.2
Aldehydes	0.1		0.1		0.3	*	0.3	*	*	*	*	*	*	*	

Chemical and Allied Industries

Exposures: Table 18 shows the number and percentage of workers exposed to the specific materials in all chemical and allied industries, ac-

TABLE 18—CHEMICAL AND ALLIED INDUSTRIES

MATERIAL	NUMBER AND PERCENT OF WORKERS IN EACH SUB GROUP EXPOSED TO SPECIFIED MATERIALS																																
	Total		Explosives etc.		Fertiliser		Gas works		Paints and varnish		Petroleum refineries		Soap		Blackening, stains, etc.		Chemical works		Compressed gases		Drugs		Glues		Greases		Oils not Pet.		Cosmetics		Chemicals (N. O. S.)		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
TOTAL NO. WORKERS EMPLOYED	15,741		84	0.5	267	1.7	166	1.1	678	4.3	7,659	48.6	1,584	10.1	351	2.2	1,156	7.3	150	1.0	2,527	16.1	47	0.3	133	0.8	46	0.3	77	0.5	816	5.2	
Extreme temperature changes	1,379	8.8	2	2.4			37	22.3	12	1.8	1,170	15.3	28	1.8	5	1.4	76	6.6			19	0.8			12	9.0					18	2.2	
Metals (N. O. S.)	1,185	7.5	3	3.6	1	0.4	9	5.4	83	12.2	782	10.2	70	4.4	18	5.1	92	8.0			72	2.8	5	10.6	1	0.8	5	10.9	8	10.4	36	4.4	
Dermatitis producers	911	5.8	8	9.5	5	1.9	9	5.4	23	3.4	314	4.1	50	3.2	112	31.9	24	2.1			199	7.9	8	17.0	20	15.0	1	2.2	12	15.6	126	15.4	
Petroleum products	901	5.7	9	10.7	2	0.8	14	8.4	29	4.3	596	7.8	56	3.5	38	10.8	48	4.2			51	2.0	1	2.1	5	3.8			3	3.9	49	6.0	
Organic dusts	843	5.4	15	17.9	139	8.1	52	1	48	7.1	122	1.6	185	11.7	25	7.1	44	3.8			72	2.8	6	12.8	23	17.3	1	2.2	2	2.6	161	19.7	
Gases (N. O. S.)	825	5.2			24	9.0	47	28.3	13	1.9	465	6.1	19	1.2	6	1.7	123	10.6	42	28.0	53	2.1			3						30	3.7	
Silicate dusts	780	5.0	2	2.4	1	0.4	10	11.4	19	2.8	494	6.4	49	3.1	4	1.1	61	5.3	5	3.3	64	2.5	1	2.1	7	5.3	1	2.2	9	11.7	50	6.1	
Organic solvents	702	4.5	1	1.2	1	0.4	4	2.4	134	19.8	386	5.0	7	0.4	85	24.2	4	0.8	8	5.3	48	1.9			2	1.5	4	8.7	2	2.6	13	1.6	
Chemicals (N. O. S.)	579	3.7					37	5.5	222	2.9	67	4.2	13	3.7	29	2.5	4	2.7	181	7.2	3	6.4			3	2.3	3	6.5	3	3.9	13	1.6	
Alkalis	512	3.3	19	22.6			7	1.0	135	1.8	139	8.8			1	0.3	80	6.9	7	4.7	73	2.9			21	15.8	1	2.2			41	6.0	
High humidity	435	2.8			6	2.2	12	7.2	2	0.3	86	1.1	160	10.1	10	2.8	25	2.2	2	1.3	74	2.9			3	2.3					36	4.4	
Carbon monoxide	383	2.4	4	4.8	1	0.4	15	9.0	17	2.5	225	2.9	20	1.3	6	1.7	51	4.4	6	4.0	12	0.5	1	2.1	7	5.3	1	2.2			17	2.1	
Lead	388	2.5							75	11.1	134	1.7	32	2.0	7	2.0	60	5.2	2	1.3	58	2.3											
Paints	351	2.2	1	1.2					78	11.5	231	3.0	4	0.3			20	1.7	1	0.7	13	0.5											
Mineral acids	314	2.0			15	5.6					99	1.3	28	1.8			80	6.9			80	3.2			4	3.0					8	1.0	
Oil (not petroleum)	223	1.4							79	11.7	2	*	75	4.7	12	3.4	5	0.4	3	2.0	14	0.6	3	6.4	15	11.3	2	4.3	2	2.6	16	2.0	
Non-siliceous dusts	214	1.4			62	23.2			9	1.3	58	0.8			14	4.0	5	0.4	8	5.3	9	0.4					5	10.9			44	5.4	
Salts (N. O. S.)	212	1.3	1	1.2	33	49.8	4	2.4	4	0.6			42	2.7	7	2.0	12	1.0			106	4.2			3	2.3					2	0.2	
Alcohols, esters and ethers	209	1.3							36	5.3	4	0.1																					
Infections	202	1.3			6	1.9					30	0.4			3	0.9					82	3.2	2	4.3	24	18.0	4	8.7			52	6.4	
Bituminous coal dust	201	1.3	5	6.0	1	0.4	51	30.7	8	1.2	51	0.7	5	0.3	3	0.9	39	3.4	4	2.7	12	0.5	1	2.1	7	5.3	2	4.3			12	1.5	
Medicinals	168	1.1									7	0.1					3	0.3			152	6.0									1	0.1	
Coal tar products	147	0.9							2	0.3	28	0.4			2	0.6	24	2.9			15	0.6			6	4.5					94	11.5	
Silica dust	131	0.8							4	0.6	71	0.9			2	0.6	34	2.9													20	2.5	
Sulphur dioxide	129	0.8	4	4.8	1	0.4	14	8.4	6	0.9	5	0.1	10	0.6			66	5.7	3	2.0	10	0.4	1	2.1	4	3.0	1	2.2			4	0.5	
Sulphur	124	0.8	16	19.0	28	10.5			8	1.2	13	0.2			7	2.0	33	2.9							2	1.5	4	8.7	2	2.6	27	3.3	
Halogenated hydrocarbons	107	0.7	2	2.4	1	0.4			4	0.6	2	*			11	3.1					65	2.6									3	0.4	
Asbestos dust	73	0.5							1	0.1	68	0.9	2	0.1							1				1	0.8							
Lacquers	67	0.4							66	9.7																							
Organic acids	40	0.3									6	0.1					1	0.1			28	1.1									5	0.6	
Arsenic	33	0.2															33	2.9															
Dyes	32	0.2							10	1.6	7	0.1			10	2.8					2	0.1									3	0.4	
Hydrogen sulphide	22	0.1									10	0.1																				11	1.3
Benzene	18	0.1							4	2.4	10	1.6									3	0.1											
Antimony	17	0.1									1	*									16	0.6											
Fluorides	14	0.1															14	1.2															
Mercury	10	0.1																															
Aldehydes	10	0.1																															
Aniline	8	0.1															2	0.6															
Chromium	8	0.1																															
Amines	6	*																															
Chlorine	5	*																															
Cyanides	5	*			1	0.4																											
Manganese	2	*																															
Phosphorus	2	*	2	2.4																													

*Less than 0.1%
(N. O. S.) Not otherwise specified