

Appendix B-2 Graphical Presentation of Size Distributions Grouped by Industry

This Excel file contains graphical presentations of length and width distributions by industry. Raw data are based on values presented in Appendix B-1.

PARTICLE SIZE DISTRIBUTION IN MINING AND MILLING

Amphibole
Reference: Gibbs and Hwang 1980
Fiber Type: Amosite
Industry: Mining and Milling
Operation: Mining

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0-0.06	15.09	0.03	15.09	0-2.50	63.83	1.25	63.83
0.061-0.100	0.805	0.005	24.91	2.51-5.00	23.8	3.755	87.63
0.101-0.200	26.55	0.1505	51.36	5.01-7.50	7.35	6.255	94.98
0.201-0.300	20.45	0.2505	71.81	7.51-10.00	3.1	8.755	98.08
0.300 +	28	0.6	99.81	10.01-20.00	1.73	15.005	99.81

Amphibole
Reference: Gibbs and Hwang 1980
Fiber Type: Amosite
Industry: Mining and Milling
Operation: Bagging

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0-0.06	2.59	0.03	2.59	0-2.50	49.63	1.25	49.63
0.061-0.100	4.92	0.005	8.51	2.51-5.00	5.74	3.755	75.48
0.101-0.200	25.25	0.1505	34.76	5.01-7.50	10.7	6.255	86.18
0.201-0.300	22.24	0.2505	57	7.51-10.00	6.32	8.755	92.5
0.300 +	41.84	0.6	98.84	10.01-20.00	6.34	15.005	98.84

Chrysotile
Reference: Gibbs and Hwang 1980
Fiber Type: Chrysotile
Industry: Mining and Milling
Operation: Mining

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0-0.06	61.3	0.03	61.3	0-2.50	95.31	1.25	95.31
0.061-0.100	24.62	0.005	85.92	2.51-5.00	3.39	3.755	98.7
0.101-0.200	9.42	0.1505	95.34	5.01-7.50	0.9	6.255	99.6
0.201-0.300	1.87	0.2505	97.21	7.51-10.00	0.16	8.755	99.76
0.300 +	2.92	0.6	99.93	10.01-20.00	0.17	15.005	99.93

Chrysotile
Reference: Gibbs and Hwang 1980
Fiber Type: Chrysotile
Industry: Mining and Milling
Operation: Bagging

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0-0.06	52.56	0.03	52.56	0-2.50	90.14	1.25	90.14
0.061-0.100	25.92	0.005	78.48	2.51-5.00	5.74	3.755	95.88
0.101-0.200	15.64	0.1505	94.12	5.01-7.50	2.25	6.255	98.13
0.201-0.300	2.55	0.2505	96.67	7.51-10.00	0.78	8.755	98.91
0.300 +	31.15	0.6	99.82	10.01-20.00	0.81	15.005	99.82

Amphibole
Reference: Hwang and Gibbs 1981
Fiber Type: Crocidolite
Industry: Mining and Milling
Operation: Mining

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
<0.01	0	0.01	0	<0.07	0	0.07	0
0.01-0.060	36.61	0.03	36.61	0-2.50	85.25	1.25	85.25
0.061-0.100	35.5	0.005	67.11	2.51-5.00	10.7	3.755	95.95
0.101-0.200	25.8	0.1505	92.91	5.01-7.50	2.49	6.255	98.44
0.201-0.300	4.97	0.2505	97.88	7.51-10.00	0.65	8.755	99.09
0.301-0.400	1.19	0.3505	99.07	10.01-20.00	0.83	15.005	99.92
0.401-0.500	0.56	0.4505	99.62	>20.00	0.08	49	100
>0.500	0.38	1	100				

Amphibole
Reference: Hwang and Gibbs 1981
Fiber Type: Crocidolite
Industry: Mining and Milling
Operation: Bagging

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
<0.01	0	0.01	0	<0.07	0	0.07	0
0.01-0.060	25.11	0.035	25.11	0.07-2.50	77.77	1.285	77.77
0.061-0.100	23.83	0.005	58.94	2.51-5.00	15.19	3.755	92.95
0.101-0.200	32.85	0.1505	91.79	5.01-7.50	4.48	6.255	97.43
0.201-0.300	5.69	0.2505	97.48	7.51-10.00	1.72	8.755	99.15
0.301-0.400	1.81	0.3505	99.29	10.01-20.00	0.89	15.005	100.04
0.401-0.500	0.56	0.4505	99.65	>20.00	0	49	100.04
>0.500	0.39	1	100.04				

LA (Sebastian data)

Reference: Sebastian et al. 1983

Percentile	Length	Percentile	Width
1	1.3	1	0.1
2	1.4	2	0.2
3	1.6	3	0.2
4	1.6	4	0.2
5	1.6	5	0.2
6	1.8	6	0.2
7	2.0	7	0.2
8	2.2	8	0.2
9	2.3	9	0.2
10	2.3	10	0.2
11	2.3	11	0.2
12	2.4	12	0.2
13	2.6	13	0.2
14	2.8	14	0.2
15	2.8	15	0.2
16	2.8	16	0.2
17	3.1	17	0.2
18	3.1	18	0.2
19	3.2	19	0.2
20	3.3	20	0.2
21	3.3	21	0.2
22	3.3	22	0.2
23	3.4	23	0.2
24	3.5	24	0.2
25	3.6	25	0.2
26	3.6	26	0.2
27	3.7	27	0.3
28	4.0	28	0.3
29	4.1	29	0.3
30	4.3	30	0.3
31	4.3	31	0.3
32	4.4	32	0.3
33	4.6	33	0.3
34	4.6	34	0.3
35	5.0	35	0.3
36	5.0	36	0.3
37	5.1	37	0.3
38	5.2	38	0.3
39	5.2	39	0.3
40	5.2	40	0.3
41	5.3	41	0.3
42	5.4	42	0.3
43	5.5	43	0.3
44	5.6	44	0.3
45	6.0	45	0.3
46	6.1	46	0.3
47	6.3	47	0.3
48	6.5	48	0.3
49	6.5	49	0.3
50	6.5	50	0.3
51	6.5	51	0.3
52	6.9	52	0.3
53	7.1	53	0.3
54	7.2	54	0.4
55	7.2	55	0.4
56	7.3	56	0.4
57	7.5	57	0.4
58	7.9	58	0.4
59	8.0	59	0.4
60	8.1	60	0.4
61	8.2	61	0.4
62	8.3	62	0.4
63	8.6	63	0.4
64	9.0	64	0.4
65	9.2	65	0.4
66	9.2	66	0.5
67	9.4	67	0.5
68	9.7	68	0.5
69	9.7	69	0.5
70	10.0	70	0.5
71	10.1	71	0.5
72	10.5	72	0.5
73	11.0	73	0.5
74	11.1	74	0.5
75	11.3	75	0.6
76	11.6	76	0.6
77	11.6	77	0.6
78	11.8	78	0.6
79	12.0	79	0.7
80	12.0	80	0.7
81	12.1	81	0.7
82	12.3	82	0.7
83	12.5	83	0.7
84	14.2	84	0.7
85	15.0	85	0.8
86	15.5	86	0.8
87	16.0	87	0.8
88	16.3	88	0.8
89	16.9	89	0.9
90	19.0	90	0.9
91	21.5	91	1.1
92	22.2	92	1.2
93	23.4	93	1.2
94	26.0	94	1.2
95	29.0	95	1.2
96	30.4	96	1.3
97	33.8	97	1.4
98	34.6	98	1.6
99	44.3	99	1.8

Figure B1. Asbestos Size Distribution in Mining and Milling

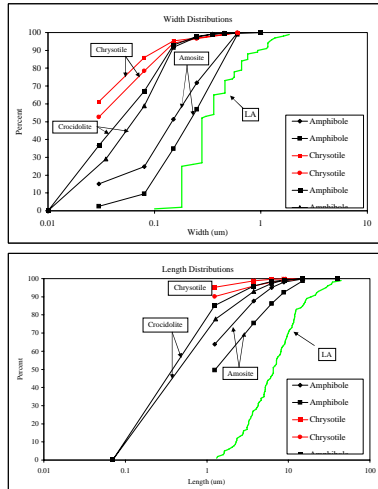
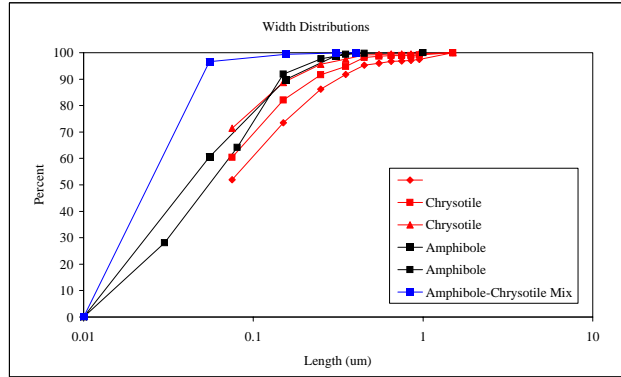


Figure B2. Asbestos Size Distribution in Cement

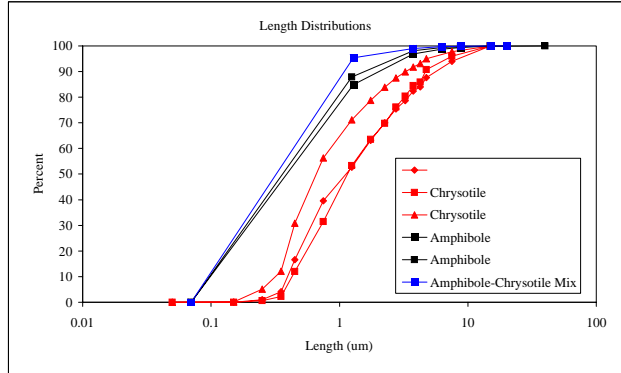
Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Cement Pipe
 Operation: Mixing

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	51.98294243	0.075	51.98294	0-0.1	0	0.05	0
0.1-0.2	21.44989339	0.15	73.43284	0.1-0.2	0	0.15	0
0.2-0.3	12.70788913	0.25	86.14072	0.2-0.3	1.023454158	0.25	1.023454
0.3-0.4	5.586353945	0.35	91.72708	0.3-0.4	3.070362473	0.35	4.093817
0.4-0.5	3.539445629	0.45	95.26652	0.4-0.5	12.45202559	0.45	16.54584
0.5-0.6	0.767590618	0.55	96.03412	0.5-1	22.98507463	0.75	39.53092
0.6-0.7	0.639658849	0.65	96.67377	1-1.5	13.09168443	1.25	52.6226
0.7-0.8	0.213219616	0.75	96.88699	1.5-2	10.57569296	1.75	63.19829
0.8-0.9	0.213219616	0.85	97.10021	2-2.5	6.865671642	2.25	70.06397
0.9-1.0	0.383795309	0.95	97.48401	2.5-3	5.330490405	2.75	75.39446
>1.0	2.515991471	1.5	100	3-3.5	3.240938166	3.25	78.63539
				3.5-4	3.795309168	3.75	82.4307
				4-4.5	1.57782516	4.25	84.00853
				4.5-5	3.582089552	4.75	87.59062
				5-10	6.396588486	7.5	93.98721
				>10	6.012793177	15	100



Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Cement Pipe
 Operation: Forming

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	60.43052838	0.075	60.43053	0-0.1	0	0.05	0
0.1-0.2	21.64383562	0.15	82.07436	0.1-0.2	0	0.15	0
0.2-0.3	9.628180039	0.25	91.70254	0.2-0.3	0.665362035	0.25	0.665362
0.3-0.4	3.091976517	0.35	94.79452	0.3-0.4	1.643835616	0.35	2.309198
0.4-0.5	3.444227006	0.45	98.23875	0.4-0.5	9.667318982	0.45	11.97652
0.5-0.6	0.391389432	0.55	98.63014	0.5-1	19.53032688	0.75	31.50685
0.6-0.7	0.273972603	0.65	98.90411	1-1.5	21.76125245	1.25	53.2681
0.7-0.8	0.039138943	0.75	98.94325	1.5-2	10.33268102	1.75	63.60078
0.8-0.9	0	0.85	98.94325	2-2.5	6.14481409	2.25	69.7456
0.9-1.0	0.234833659	0.95	99.17808	2.5-3	6.457925636	2.75	76.20352
>1.0	0.821917808	1.5	100	3-3.5	4.187866928	3.25	80.39139
				3.5-4	4.070450098	3.75	84.46184
				4-4.5	1.487279843	4.25	85.94912
				4.5-5	4.81409002	4.75	90.76321
				5-10	5.205479452	7.5	95.96869
				>10	4.031311555	15	100



Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Cement Pipe
 Operation: Finishing

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	71.41972761	0.075	71.41973	0-0.1	0	0.05	0
0.1-0.2	17.31324804	0.15	88.73298	0.1-0.2	0.165084606	0.15	0.165085
0.2-0.3	6.871648719	0.25	95.60462	0.2-0.3	4.973173752	0.25	5.138258
0.3-0.4	1.98101527	0.35	97.58564	0.3-0.4	6.995460173	0.35	12.13372
0.4-0.5	1.609574907	0.45	99.19521	0.4-0.5	18.69583161	0.45	30.82955
0.5-0.6	0.103177879	0.55	99.29839	0.5-1	25.46430045	0.75	56.29385
0.6-0.7	0.165084606	0.65	99.46348	1-1.5	14.85761453	1.25	71.15147
0.7-0.8	0.020635576	0.75	99.48411	1.5-2	7.655798597	1.75	78.80726
0.8-0.9	0.061906727	0.85	99.54602	2-2.5	5.07635163	2.25	83.88362
0.9-1.0	0.14444903	0.95	99.69047	2.5-3	3.590590177	2.75	87.47421
>1.0	0.309533636	1.5	100	3-3.5	2.434997936	3.25	89.9092
				3.5-4	1.877837392	3.75	91.78704
				4-4.5	1.341312423	4.25	93.12835
				4.5-5	1.83656624	4.75	94.96492
				5-10	2.847709451	7.5	97.81263
				>10	2.187371028	15	100

Reference: Hwang and Gibbs 1981
 Fiber Type: Crocidolite
 Industry: Cement Manufacturing
 Operation: Preparation

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
<0.01	0	0.01	0	<0.07	0	0.07	0
0.01-0.10	60.57	0.055	60.57	0.07-2.50	84.95	1.285	84.95
0.11-0.20	29.26	0.155	89.83	2.51-5.00	11.98	3.755	96.93
0.21-0.40	8.98	0.305	98.81	5.01-7.50	1.88	6.255	98.81
>0.40	1.19	0.4	100	7.51-10.00	0.62	8.755	99.43
				10.01-20.00	0.54	15.005	99.97
				>20.00	0.03	20	100

Reference: Hwang and Gibbs 1981
 Fiber Type: Crocidolite and Chrysotile
 Industry: Cement Manufacturing
 Operation: Finishing

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
<0.01	0	0.01	0	<0.07	0	0.07	0
0.01-0.10	96.63	0.055	96.63	0.07-2.50	95.34	1.285	95.34
0.11-0.20	2.79	0.155	99.42	2.51-5.00	3.68	3.755	99.02
0.21-0.40	0.5	0.305	99.92	5.01-7.50	0.7	6.255	99.72
>0.40	0.1	0.4	100.02	7.51-10.00	0.15	8.755	99.87
				10.01-20.00	0.15	15.005	100.02
				>20.00	0	20	100.02

Reference: Hwang and Gibbs 1981
 Fiber Type: Crocidolite
 Industry: Cement Mfg.
 Operation: Dumping

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
<0.01	0	0.01	0	<0.07	0	0.07	0
0-0.060	28.11	0.03	28.11	0-2.50	87.91	1.25	87.91
0.061-0.100	36.04	0.0805	64.15	2.51-5.00	10.19	3.755	98.1
0.101-0.200	27.68	0.1505	91.83	5.01-7.50	1.28	6.255	99.38
0.201-0.300	5.89	0.2505	97.72	7.51-10.00	0.36	8.755	99.74
0.301-0.400	1.67	0.3505	99.39	10.01-20.00	0.16	15.005	99.9
0.401-0.500	0.31	0.4505	99.7	>20.00	0.04	40	99.94
>0.500	0.24	1	99.94				

Figure B3. Asbestos Size Distribution in Textiles

Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Textiles
 Operation: Preparation

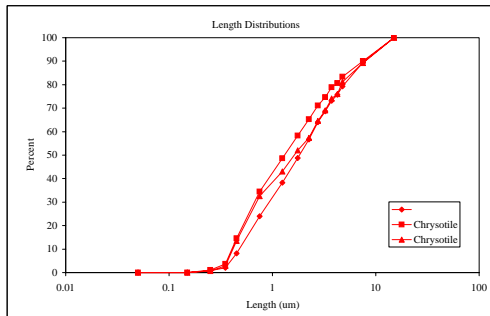
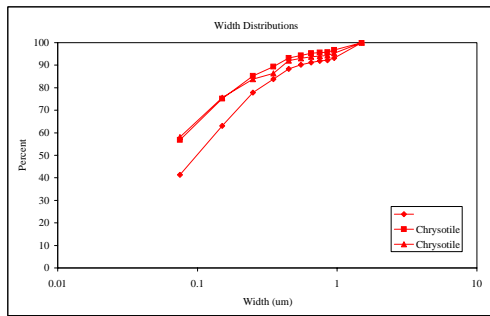
Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	41.31849068	0.075	41.31849068	0-0.1	0	0.05	0
0.1-0.2	21.74353043	0.15	63.06202111	0.1-0.2	0	0.15	0
0.2-0.3	14.76073442	0.25	77.82275553	0.2-0.3	0.780685268	0.25	0.780685
0.3-0.4	5.927425184	0.35	83.75018071	0.3-0.4	1.330056383	0.35	2.110742
0.4-0.5	4.588454532	0.45	88.31863525	0.4-0.5	6.08453665	0.45	6.197195
0.5-0.6	1.850513228	0.55	90.16914847	0.5-1	15.74381957	0.75	23.94101
0.6-0.7	0.983085153	0.65	91.15223363	1-1.5	14.28364898	1.25	38.22466
0.7-0.8	0.737313864	0.75	91.88954749	1.5-2	10.49587972	1.75	48.72054
0.8-0.9	0.332514096	0.85	92.22206159	2-2.5	7.994795432	2.25	56.71534
0.9-1.0	1.01199422	0.95	93.23406101	2.5-3	7.315310106	2.75	64.03065
>1.0	6.765938991	1.5	100	3-3.5	4.582911667	3.25	68.61356
				3.5-4	4.597368802	3.75	73.21093
				4-4.5	2.51554142	4.25	75.72647
				4.5-5	3.58536938	4.75	79.31164
				5-10	10.18336662	7.5	89.47521
				>10	10.52479399	15	100

Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Textiles
 Operation: Twisting Operations

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	56.76465532	0.075	56.76465532	0-0.1	0	0.05	0
0.1-0.2	18.44593433	0.15	75.21058965	0.1-0.2	0	0.15	0
0.2-0.3	10.05673027	0.25	85.26731992	0.2-0.3	1.151796459	0.25	1.151796
0.3-0.4	4.108647069	0.35	89.37596699	0.3-0.4	2.578648788	0.35	3.730445
0.4-0.5	3.867973162	0.45	93.24394018	0.4-0.5	10.79594293	0.45	14.52639
0.5-0.6	1.014268523	0.55	94.2582087	0.5-1	19.92435964	0.75	34.45075
0.6-0.7	0.997077531	0.65	95.25528623	1-1.5	14.14818635	1.25	48.59893
0.7-0.8	0.326628846	0.75	95.58191508	1.5-2	9.712910435	1.75	58.31184
0.8-0.9	0.154718927	0.85	95.736634	2-2.5	6.89358776	2.25	65.20543
0.9-1.0	1.031459515	0.95	96.76809352	2.5-3	5.965274186	2.75	71.17071
>1.0	3.231906481	1.5	100	3-3.5	3.48977136	3.25	74.66048
				3.5-4	4.228984012	3.75	78.88946
				4-4.5	1.78786316	4.25	80.67733
				4.5-5	2.750558707	4.75	83.42788
				5-10	6.584149905	7.5	90.01203
				>10	9.987966306	15	100

Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Textiles
 Operation: Weaving Operations

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	58.03130148	0.075	58.03130148	0-0.1	0	0.05	0
0.1-0.2	17.60708402	0.15	75.6383855	0.1-0.2	0	0.15	0
0.2-0.3	8.154859967	0.25	83.79324547	0.2-0.3	0.700164745	0.25	0.700165
0.3-0.4	2.512355848	0.35	86.30560132	0.3-0.4	2.121087315	0.35	2.821252
0.4-0.5	5.704253361	0.45	92.00986468	0.4-0.5	10.65721582	0.45	13.48847
0.5-0.6	0.967874794	0.55	92.97775947	0.5-1	19.02800659	0.75	32.51647
0.6-0.7	0.720757825	0.65	93.6985173	1-1.5	10.48187809	1.25	42.99835
0.7-0.8	0.391268534	0.75	94.08978583	1.5-2	8.978583196	1.75	51.97694
0.8-0.9	0.226523888	0.85	94.31630972	2-2.5	5.39538715	2.25	57.37232
0.9-1.0	0.926688633	0.95	95.24299835	2.5-3	7.145799012	2.75	64.51812
>1.0	4.757001647	1.5	100	3-3.5	4.592257002	3.25	69.11038
				3.5-4	4.983255535	3.75	74.0939
				4-4.5	1.894563427	4.25	75.9847
				4.5-5	5.23042504	4.75	81.21911
				5-10	7.990115321	7.5	89.20923
				>10	10.7907743	15	100



With	Length
MidBin = X	CDF = Y
0.075	0.4113185
0.15	0.63062
0.25	0.778228
0.35	0.837502
0.45	0.893196
0.55	0.901691
0.65	0.911522
0.75	0.918895
0.85	0.922221
0.95	0.932341
1.666667	1

Figure B4. Asbestos Size Distribution in Pipe Insulation

Reference: Dement and Harris 1979
 Fiber Type: Amosite
 Industry: Pipe Insulation
 Operation: Mixing

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	6.166219839	0.075	6.16622	0-0.1	0	0.05	0
0.1-0.2	15.01340483	0.15	21.17962	0.1-0.2	0	0.15	0
0.2-0.3	15.28150134	0.25	36.46113	0.2-0.3	0	0.25	0
0.3-0.4	11.79624665	0.35	48.25737	0.3-0.4	0	0.35	0
0.4-0.5	9.919571046	0.45	58.17694	0.4-0.5	0	0.45	0
0.5-0.6	8.847184987	0.55	67.02413	0.5-1	3.753351206	0.75	3.753351
0.6-0.7	13.13672922	0.65	80.16086	1-1.5	8.042895442	1.25	11.79625
0.7-0.8	3.217158177	0.75	83.37802	1.5-2	7.238605898	1.75	19.03485
0.8-0.9	2.680965147	0.85	86.05898	2-2.5	6.702412869	2.25	25.73727
0.9-1.0	4.557640751	0.95	90.61662	2.5-3	6.434316354	2.75	32.17158
>1.0	9.383378016	1.5	100	3-3.5	7.238605898	3.25	39.41019
				3.5-4	6.434316354	3.75	45.8445
				4-4.5	5.898123324	4.25	51.74263
				4.5-5	7.506702413	4.75	59.24933
				5-10	20.91152815	7.5	80.16086
				>10	19.83914209	15	100

Amphibole

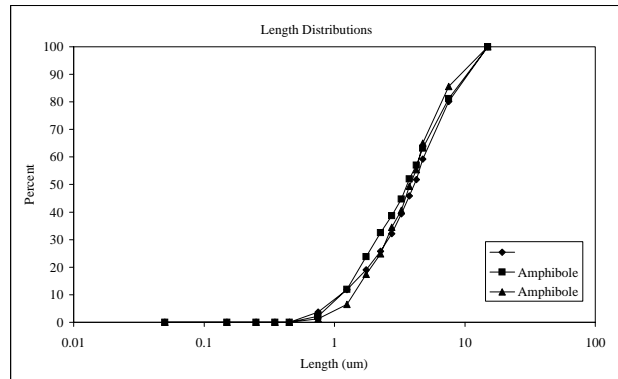
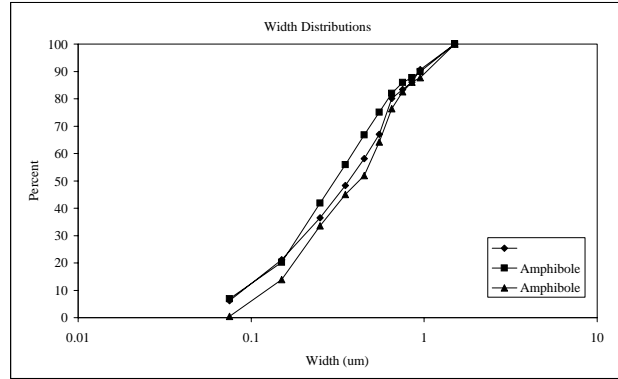
Reference: Dement and Harris 1979
 Fiber Type: Amosite
 Industry: Pipe Insulation
 Operation: Forming

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	6.859205776	0.075	6.859206	0-0.1	0	0.05	0
0.1-0.2	13.35740072	0.15	20.21661	0.1-0.2	0	0.15	0
0.2-0.3	21.66064982	0.25	41.87726	0.2-0.3	0	0.25	0
0.3-0.4	14.07942238	0.35	55.95668	0.3-0.4	0	0.35	0
0.4-0.5	10.83032491	0.45	66.787	0.4-0.5	0	0.45	0
0.5-0.6	8.303249097	0.55	75.09025	0.5-1	2.166064982	0.75	2.166065
0.6-0.7	6.859205776	0.65	81.94946	1-1.5	9.747292419	1.25	11.91336
0.7-0.8	3.971119134	0.75	85.92058	1.5-2	11.9133574	1.75	23.82671
0.8-0.9	1.805054152	0.85	87.72563	2-2.5	8.664259928	2.25	32.49097
0.9-1.0	2.166064982	0.95	89.8917	2.5-3	6.137184116	2.75	38.62816
>1.0	10.10830325	1.5	100	3-3.5	6.137184116	3.25	44.76534
				3.5-4	7.220216606	3.75	51.98556
				4-4.5	5.054151625	4.25	57.03971
				4.5-5	6.137184116	4.75	63.1769
				5-10	18.05054152	7.5	81.22744
				>10	18.77256318	15	100

Amphibole

Reference: Dement and Harris 1979
 Fiber Type: Amosite
 Industry: Pipe Insulation
 Operation: Finishing

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	0.436681223	0.075	0.436681	0-0.1	0	0.05	0
0.1-0.2	13.5371179	0.15	13.9738	0.1-0.2	0	0.15	0
0.2-0.3	19.65065502	0.25	33.62445	0.2-0.3	0	0.25	0
0.3-0.4	11.35371179	0.35	44.97817	0.3-0.4	0	0.35	0
0.4-0.5	6.986899563	0.45	51.96507	0.4-0.5	0	0.45	0
0.5-0.6	12.22707424	0.55	64.19214	0.5-1	1.310043668	0.75	1.310044
0.6-0.7	12.22707424	0.65	76.41921	1-1.5	5.240174672	1.25	6.550218
0.7-0.8	6.113537118	0.75	82.53275	1.5-2	10.91703057	1.75	17.46725
0.8-0.9	3.493449782	0.85	86.0262	2-2.5	7.423580786	2.25	24.89083
0.9-1.0	1.746724891	0.95	87.77293	2.5-3	9.6069869	2.75	34.49782
>1.0	12.22707424	1.5	100	3-3.5	6.113537118	3.25	40.61135
				3.5-4	8.733624454	3.75	49.34498
				4-4.5	6.113537118	4.25	55.45852
				4.5-5	9.6069869	4.75	65.0655
				5-10	20.52401747	7.5	85.58952
				>10	14.41048035	15	100



Chrysotile

Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Friction Products
 Operation: Mixing

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	66.6775191	0.075	66.67752	0-0.1	0	0.05	0
0.1-0.2	17.5647078	0.15	84.24223	0.1-0.2	0.309295133	0.15	0.309295
0.2-0.3	7.96027999	0.25	92.20251	0.2-0.3	3.190623474	0.25	3.499919
0.3-0.4	3.06039394	0.35	95.2629	0.3-0.4	6.54403386	0.35	10.04395
0.4-0.5	2.42552499	0.45	97.68843	0.4-0.5	15.3508058	0.45	25.39476
0.5-0.6	0.45580335	0.55	98.14423	0.5-1	20.95067557	0.75	46.34543
0.6-0.7	0.43952466	0.65	98.58375	1-1.5	13.8694449	1.25	60.21488
0.7-0.8	0.1790656	0.75	98.76282	1.5-2	9.40908351	1.75	69.62396
0.8-0.9	0.16278691	0.85	98.92561	2-2.5	5.746377991	2.25	75.37034
0.9-1.0	0.09767215	0.95	99.02328	2.5-3	4.965000814	2.75	80.33534
>1.0	0.97672147	1.5	100	3-3.5	3.206902165	3.25	83.54224
				3.5-4	3.1417874	3.75	86.68403
				4-4.5	1.318573987	4.25	88.0026
				4.5-5	2.344131532	4.75	90.34674
				5-10	4.053394107	7.5	94.40013
				>10	5.59986977	15	100

Chrysotile

Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Friction Products
 Operation: Forming

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	0	0.075	0	0-0.1	0	0.05	0
0.1-0.2	65.8083355	0.15	65.80834	0.1-0.2	0	0.15	0
0.2-0.3	18.7417043	0.25	84.55004	0.2-0.3	2.256437483	0.25	2.256437
0.3-0.4	8.09662862	0.35	92.64667	0.3-0.4	5.043801434	0.35	7.300239
0.4-0.5	2.41571542	0.45	95.06238	0.4-0.5	16.53835944	0.45	23.8386
0.5-0.6	2.17679851	0.55	97.23918	0.5-1	23.28112556	0.75	47.11972
0.6-0.7	0.3451022	0.65	97.59428	1-1.5	14.94558004	1.25	62.0653
0.7-0.8	0.18582426	0.75	97.77011	1.5-2	6.61003451	1.75	68.67534
0.8-0.9	0.47783392	0.85	98.24794	2-2.5	4.831430847	2.25	73.50677
0.9-1.0	0.05309265	0.95	98.30104	2.5-3	4.804884523	2.75	78.31165
>1.0	0.42474117	1.5	98.72578	3-3.5	3.079373507	3.25	81.39103
				3.5-4	4.194319087	3.75	85.58535
				4-4.5	1.061852933	4.25	86.6472
				4.5-5	3.9819485	4.75	90.62915
				5-10	4.61906026	7.5	95.24821
				>10	4.751791877	15	100

Chrysotile

Reference: Dement and Harris 1979
 Fiber Type: Chrysotile
 Industry: Friction Products
 Operation: Finishing

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0.05-0.1	0	0.075	0	0-0.1	0	0.05	0
0.1-0.2	56.0740741	0.15	56.07407	0.1-0.2	0.074074074	0.15	0.074074
0.2-0.3	17.5925926	0.25	73.66667	0.2-0.3	1.259259259	0.25	1.333333
0.3-0.4	8.25925926	0.35	81.92593	0.3-0.4	3.259259259	0.35	4.592593
0.4-0.5	3.62962963	0.45	85.55556	0.4-0.5	12.81481481	0.45	17.40741
0.5-0.6	5.85185185	0.55	91.40741	0.5-1	18.88888889	0.75	36.2963
0.6-0.7	1.07407407	0.65	92.48148	1-1.5	12.37037037	1.25	48.66667
0.7-0.8	0.96296296	0.75	93.44444	1.5-2	7.777777778	1.75	56.44444
0.8-0.9	0.40740741	0.85	93.85185	2-2.5	5.814814815	2.25	62.25926
0.9-1.0	0.07407407	0.95	93.92593	2.5-3	9.925925926	2.75	72.18519
>1.0	0.59259259	1.5	94.51852	3-3.5	3.703703704	3.25	75.88889
				3.5-4	3.666666667	3.75	79.55556
				4-4.5	1.296296296	4.25	80.85185
				4.5-5	2.962962963	4.75	83.81481
				5-10	7.666666667	7.5	91.48148
				>10	8.518518519	15	100

Figure B5. Asbestos Size Distribution in Friction Products

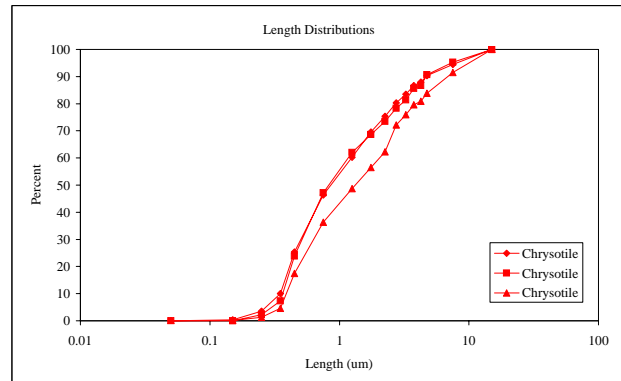
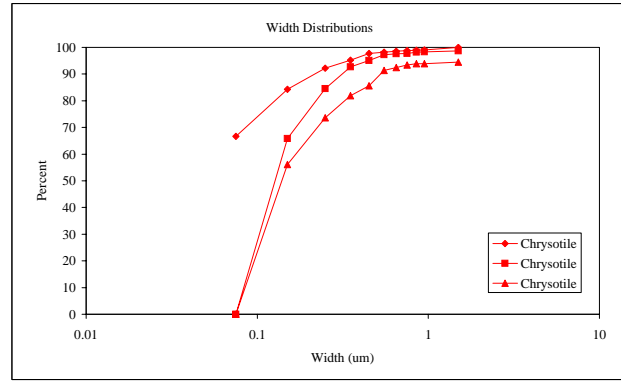
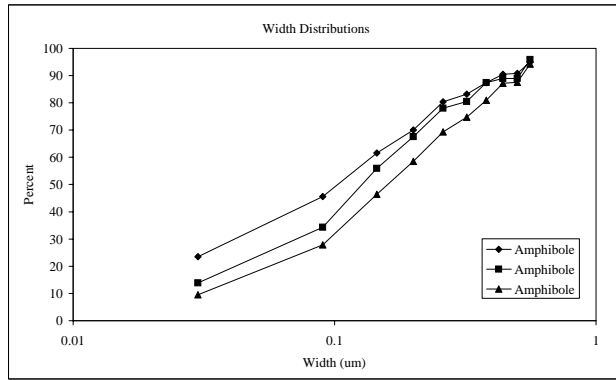


Figure B6. Asbestos Size Distribution in Talc Production

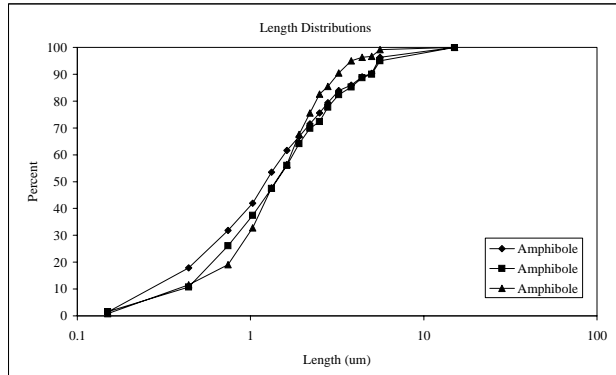
Amphibole
 Reference: Dement and Harris 1979
 Fiber Type: Anthophyllite
 Industry: Talc Production
 Operation: Mining and Milling

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0-0.06	0.23557126	0.03	23.55713	0-0.3	0.014134276	0.15	1.413428
0.06-0.12	0.220259128	0.09	45.58304	0.3-0.58	0.164899882	0.44	17.90342
0.12-0.17	0.160188457	0.145	61.60188	0.58-0.9	0.138987044	0.74	31.80212
0.17-0.23	0.084805654	0.2	70.08245	0.9-1.16	0.101295642	1.03	41.93168
0.23-0.29	0.102473498	0.26	80.3298	1.16-1.48	0.115422918	1.32	53.47468
0.29-0.35	0.028268551	0.32	83.15665	1.48-1.76	0.081272085	1.62	61.60198
0.35-0.41	0.042402827	0.38	87.39694	1.76-2.06	0.051825677	1.91	66.78445
0.41-0.47	0.030624264	0.44	90.45936	2.06-2.34	0.047114252	2.2	71.49588
0.47-0.53	0.003533569	0.5	90.81272	2.34-2.66	0.041224971	2.5	75.61837
0.53-0.59	0.041224971	0.56	94.93522	2.66-2.92	0.037691402	2.79	79.38751
>0.6	0.050647821	0.8	100	2.92-3.54	0.044758539	3.23	83.86337
				3.54-4.1	0.021201413	3.82	85.98351
				4.1-4.72	0.030624264	4.41	89.04594
				4.72-5.28	0.012956419	5	90.34158
				5.28-5.9	0.060070671	5.59	96.34865
				>6	0.036513545	15.05	100



Amphibole
 Reference: Dement and Harris 1979
 Fiber Type: Anthophyllite
 Industry: Talc Production
 Operation: Mining and Milling

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0-0.06	0.13836478	0.03	13.83648	0-0.3	0.01572327	0.15	1.572327
0.06-0.12	0.204402516	0.09	34.27673	0.3-0.58	0.091194969	0.44	10.69182
0.12-0.17	0.216981132	0.145	55.97484	0.58-0.9	0.15408805	0.74	26.10063
0.17-0.23	0.116352201	0.2	67.61006	0.9-1.16	0.113207547	1.03	37.42138
0.23-0.29	0.103773585	0.26	77.98742	1.16-1.48	0.100628931	1.32	47.48428
0.29-0.35	0.025157233	0.32	80.50314	1.48-1.76	0.08490566	1.62	55.97484
0.35-0.41	0.06918239	0.38	87.42138	1.76-2.06	0.081761006	1.91	64.15094
0.41-0.47	0.01572327	0.44	88.99371	2.06-2.34	0.056603774	2.2	69.81132
0.47-0.53	0	0.5	88.99371	2.34-2.66	0.025157233	2.5	72.32704
0.53-0.59	0.06918239	0.56	95.91195	2.66-2.92	0.053459119	2.79	77.67296
>0.6	0.040880503	0.8	100	2.92-3.54	0.047169811	3.23	82.38994
				3.54-4.1	0.028301887	3.82	85.22013
				4.1-4.72	0.034591195	4.41	86.67925
				4.72-5.28	0.012578616	5	89.93711
				5.28-5.9	0.050314465	5.59	94.96855
				>6	0.050314465	15.05	100



Amphibole
 Reference: Dement and Harris 1979
 Fiber Type: Tremolite
 Industry: Talc Production
 Operation: Mining and Milling

Diameter (um)	Width Sum	X	Y	Length (um)	Length Sum	X	Y
0-0.06	0.095435685	0.03	9.543568	0-0.3	0.008298755	0.15	0.829876
0.06-0.12	0.182572614	0.09	27.80083	0.3-0.58	0.107883817	0.44	11.61826
0.12-0.17	0.186721992	0.145	46.47303	0.58-0.9	0.074688797	0.74	19.08714
0.17-0.23	0.12033195	0.2	58.50622	0.9-1.16	0.136929461	1.03	32.78008
0.23-0.29	0.107883817	0.26	69.29461	1.16-1.48	0.149377593	1.32	47.71784
0.29-0.35	0.053941909	0.32	74.6888	1.48-1.76	0.087136929	1.62	56.43154
0.35-0.41	0.062240664	0.38	80.91286	1.76-2.06	0.112033195	1.91	67.63485
0.41-0.47	0.062240664	0.44	87.13693	2.06-2.34	0.078838174	2.2	75.51867
0.47-0.53	0.004149378	0.5	87.55187	2.34-2.66	0.070539419	2.5	82.57261
0.53-0.59	0.066390041	0.56	94.19087	2.66-2.92	0.029045643	2.79	85.47718
>0.6	0.058091286	0.8	100	2.92-3.54	0.049792531	3.23	90.45643
				3.54-4.1	0.045643154	3.82	95.02075
				4.1-4.72	0.012448133	4.41	96.26556
				4.72-5.28	0.004149378	5	96.6805
				5.28-5.9	0.024896266	5.59	99.17012
				>6	0.008298755	15.05	100