



ASBESTOS INFORMATION ASSOCIATION

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17 September 1976

Docket Officer
Docket H-033
U.S. Department of Labor
Room N-3620
200 Constitution Avenue, N.W.
Washington, D. C. 20210

Dear Sir:

Please refer to this Association's letter of 8 April 1976 and accompanying documents prepared and submitted in response to the proposed revision to the standard for occupational exposure to asbestos (29 CFR, Part 1910) as published in the Federal Register, October 9, 1975.

In the Association's response exception is taken to the statements on "New Evidence" noted at pages 47655-6, Federal Register, October 9, 1975. Specifically, it is stated, at page three, Volume I of the Association's response:

"Our review of the literature indicates that no credible epidemiological studies have been published which would suggest an excess of malignant tumors among persons exposed to no more than 2 asbestos fibers per cc of air (TWA), using the prescribed membrane filter test method. This is a fact simply because there have yet been identified for study no populations the exposure experience of which consistently has been as low as 2 fibers. Since all populations studies to date have been exposed to substantially higher concentrations of airborne asbestos we can conclude only that an excess of all types of asbestos disease is associated with levels of exposure significantly higher than the level currently mandated to become effective on July 1, 1976."

This summary statement is made on the basis of the study and review prepared by Hans Weill, M.D., Professor of Medicine, Tulane University, which is at Part 3, Volume I of the Association's response.

STATEMENT BY TBA INDUSTRIAL PRODUCTS LTD.

OSHA ENQUIRY

As a processor of asbestos fibre and manufacturer of asbestos textiles for almost 100 years, this Company has a unique record of experience in the field of asbestos and asbestos-related diseases. It has co-operated with U.K. Government Departments in the recognition of asbestos-related diseases and has carried out its own research into the health of its workers and means by which environmental working conditions could be monitored and improved to make them safer.

Because of this background and the fact that we appear to have been alone in our early attempts to correlate long-term exposure to asbestos airborne dust and the health history of the labour force, a degree of importance has been attached to this work which was never expected and in some quarters our work has taken on the mantle of a world authority.

In January, 1976 we were approached by Dr. Hans Weill, Medical Consultant to the A.I.A., North America, with a request for detailed information on any "new evidence" which was available to relate to the OSHA proposal for a reduction in the U.S. Occupational Exposure Standard for asbestos dust from 5 fibres/ml to 0.5 fibres/ml.

Data was made available on a cohort of our workers with at least 10 years exposure to asbestos dust but with no exposure prior to 1st January, 1951. This data included :-

- (a) details of dust counts taken in our factory by static membrane filter technique between 1961 and 1972. This information describes the location, mean dust concentration, standard deviation and number of samples.

1961 was the first year in which TBA used the membrane filter method for sampling, prior to this date the thermal precipitater had been used for sampling asbestos dust.

- (b) Mortality and morbidity of the exposed workers in relation to cumulative exposure in fibre years/ml, fibre years ml being the term used in adding the mean exposure rates for each year of exposure over the total period exposed.

The same data is herewith made available for use at the OSHA hearing.

We were given to understand that the view was mistakenly held in some quarters in the U.S.A. that dust levels in our particular factory had been at or below 2 fibres/ml for many years and it was against this background that the health record of our workers was being judged.

Whilst this was true for certain locations it was by no means the level which had obtained on many of our operations.

The U.K. Asbestos Regulations 1969 (with their associated Technical Data Note 13) were the first attempt to specifically define permissible dust levels for asbestos airborne dust. These stipulate a minimum T.L.V. of 2 fibres/ml with an upper limit of 10 fibres/ml for all types of asbestos excluding crocidolite (which is one tenth that of other asbestos fibres).

UNITED KINGDOM - ASBESTOS TEXTILE PLANT

TABLE 1

AIRBORNE ASBESTOS DUST SURVEY RESULTS - 1961 to 1972

(Fibres/ml)

LOCATION		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
WEAVING FRAMES	MEAN SD N	5.5 0.6 7	4.8 1.0 10	5.3 0.2 11	6.1 1.8 13	5.8 1.3 9	5.9 2.1 27	5.5 2.0 60	6.3 2.7 32	6.1 2.6 25	5.5 1.3 24	5.9 2.0 31	6.1 1.6 10
WIRE ROPS FRAMES	MEAN SD N												2.1 0.6 4
WIRE CAGES	MEAN SD N												1.7 0.6 10
WIRE SPINNING	MEAN SD N	4.2 1.3 7	3.4 0.9 7	3.1 1.5 4	3.4 1.3 5	2.9 1.1 4	1.9 0.4 12	2.5 1.1 11	1.1 0.7 12	2.3 1.7 20	1.3 1.1 24	2.1 1.8 16	1.3 1.6 12
INTERMEDIATE SPINNING	MEAN SD N	5.5 1.3 7	4.4 0.6 7	5.1 3.9 6	5.3 1.3 10	5.4 2.1 6	6.7 2.8 28	6.1 2.3 31	6.3 3.2 30	7.0 2.6 24	6.3 2.6 21	6.1 2.5 34	5.9 2.6 15
FINE ROPE CAGES	MEAN SD N	5.4 1.6 7	7.6 2.1 12	9.1 3.7 12	8.2 3.9 11	9.1 3.2 11	8.2 11.6 24	5.4 3.0 24	4.4 2.5 24	4.9 3.8 24	3.2 2.2 25	3.9 2.5 3	3.7 3.3 20
COARSE CAGES (SINGLE)	MEAN SD N				13.7 9.4 14	10.0 5.1 11	17.2 6.3 19	10.8 3.9 33	10.6 4.6 34	12.1 8.0 28	6.8 3.4 24	8.2 3.8 25	5.1 3.7 20
FINE CAGES	MEAN SD N	6.6 3.1 7	3.6 1.3 8	5.2 2.5 6	4.3 1.2 6	5.5 2.4 7	2.0 2.4 21	2.9 1.7 24	2.9 1.7 28	4.3 3.3 24	2.9 2.2 28	3.7 0.8 20	1.9 1.3 12
ELECTRICAL RIVET CAGES	MEAN SD N	5.4 1.9 8	4.4 1.8 11	4.6 1.7 9	4.5 2.1 10	2.2 1.9 7	1.1 0.3 13	1.1 0.6 17	1.3 0.6 12	1.3 0.8 12	1.1 1.0 12	1.6 0.9 12	2.0 1.0 11
BREKDOWN SPINNING FRAME	MEAN SD N									3.5 0.7 12		2.8 0.5 12	2.2 0.5 12
CARDING SECTION 1	MEAN SD N						7.6 2.6 24	2.6 2.3 24	2.3 2.3 24	2.6 2.6 24	2.6 2.6 24	2.6 2.6 24	2.3 2.3 24
CARDING SECTION 2	MEAN SD N						2.1 1.1 24	2.6 1.3 24	2.6 1.3 24	2.6 1.3 24	2.6 1.3 24	2.6 1.3 24	2.3 1.3 24
CARDING SECTION 3	MEAN SD N						7.2 2.2 24	2.2 2.2 24	7.2 2.2 24	7.2 2.2 24	7.2 2.2 24	7.2 2.2 24	7.2 2.2 24
CARDING SECTION 4	MEAN SD N						2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24
CARDING SECTION 5	MEAN SD N						7.2 2.2 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24
CARDING SECTION 6	MEAN SD N						2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24
CARDING SECTION 7	MEAN SD N						2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24
CARDING SECTION 8	MEAN SD N						2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24	2.6 1.1 24
CARDING SECTION 9	MEAN SD N						7.2 2.2 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24	2.2 1.1 24
FINE ROPE BRIDGES	MEAN SD N	4.9 1.4 7	5.8 2.0 11	9.2 2.2 10	6.4 1.8 11	3.8 1.4 9	2.0 1.3 28	2.1 1.6 25	3.7 2.6 22	2.0 1.7 22	1.3 1.3 25	1.8 1.1 15	
WIRE CAGE WEST	MEAN SD N									3.9 1.3 24		3.7 1.3 24	
FIBRE GALLERY	MEAN SD N						0.3 0.3 6	0.3 0.3 10	1.1 0.3 12	1.7 0.3 12	0.6 0.3 12		
NO END CAGES	MEAN SD N	4.9 1.4 7	5.8 2.0 11	9.2 2.2 10	6.4 1.8 11	3.8 1.4 9							

SD - Standard Deviation

LOCATION		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
60/60 END CAPS	FEAN	9.9	5.9	10.8	13.5	11.2							
	SD	3.7	1.3	4.5	7.6	5.6							
	N	9	10	14	18	11							
FINE SPURLED	FEAN	3.6	2.7	3.9									
	SD	0.9	0.9	2.2									
	N	7	7	8									
WILSON WASTE FLOCKER	FEAN				6.3	5.9	2.8	5.2	4.6	1.6	2.6	2.6	2.6
	SD				2.1	5.4	2.4	2.3	2.0	1.1	2.2	2.2	2.2
	N				8	13	24	20	23	21	24	24	24
MECHANICAL BAGGING	FEAN	3.8	4.0	5.0	4.6	4.6	3.7	2.5	2.7	2.8	2.2	2.2	2.2
	SD	1.4	1.0	2.1	1.9	2.5	2.4	2.3	1.1	0.3	1.7	1.7	1.7
	N	7	10	12	9	7	14	24	21	20	24	24	24
MECHALE HILL BAGGING	FEAN					1.5	2.2			2.1	1.7	1.7	1.7
	SD					0.7	1.2			1.3	1.0	1.0	1.0
	N					8	4			7	14	14	14
MECHALE HILL FIB	FEAN					2.0	2.9		7.8	1.9	2.0	1.4	1.4
	SD					0.9	1.0		0.1	1.0	0.9	1.1	1.1
	N					8	4		3	6	13	14	14
C.M. PLATFOM	FEAN								3.4	1.9	2.1	0.9	0.9
	SD								1.1	1.1	1.2	0.9	0.9
	N								8	23	24	24	24
DAS SLITTING	FEAN	6.7	3.1	3.3	3.3	3.6	3.8	4.0	4.7	1.9	3.0	2.6	2.6
	SD	1.6	1.9	3.0	1.5	1.8	4.7	1.6	4.8	0.9	1.9	1.3	1.3
	N	7	11	7	7	3	14	24	21	23	24	24	24
C.M. BAGGING	FEAN								2.8	2.9	3.4	2.9	2.9
	SD								1.2	2.0	1.9	1.9	1.9
	N								7	23	24	24	24
BLAGGING	FEAN		4.9	13.0	10.6	11.5	26.5	20.1	16.8	8.0	1.1		
	SD		2	7.9	4.5	2.1	18.3	23.3	14.3	0.5	0.8		
	N		8	9	8	8	5	3	12	6	3		
BLAGGING	FEAN			22.8	27.9	31.9	37.6	13.3	3.7	3.0	4.2		
	SD			20.3	20.9	27.3	18.0	3.0	3.1	2.1	2.9		
	N			6	6	7	5	3	3	9	3		
WILSON ORCHING	FEAN	3.1	4.6	6.1	5.5	5.9							
	SD	1.4	1.4	2.7	4.5	3.1							
	N	20	11	20	9	8							
TAM STOCK AREA	FEAN												
	SD												
	N												
HEAVY TWISTING	FEAN								7.1	4.6	6.9	6.9	6.9
	SD								2.8	2.4	2.0	2.0	2.0
	N								12	12	14	14	14
BAGGING TWISTING	FEAN							2.4	3.1	1.2	1.9	1.9	1.9
	SD							1.3	3.6	0.6	1.6	1.6	1.6
	N							8	13	13	12	12	12
CHINESE WICKING	FEAN	6.7	3.6	4.9	5.2	10.9	3.7	3.6	5.2	3.6	3.0	2.6	2.6
	SD	2.4	1.1	1.9	1.6	5.3	1.4	1.3	1.9	2.4	0.8	1.7	1.7
	N	8	10	11	10	12	21	27	20	24	20	24	24
BAGGING WITH DOUBLING	FEAN	3.6	2.8	4.1	3.6	4.3	2.7	2.9	3.5	3.9	2.3	2.6	2.6
	SD	1.9	0.6	0.9	0.5	1.9	0.9	0.9	2.1	1.4	0.9	1.8	1.8
	N	7	7	6	6	6	13	13	13	13	13	14	14
INTERMEDIATE DOUBLING	FEAN	2.4	3.1	3.8	3.3	2.4	2.9	2.9	4.2	2.9	3.7	1.1	1.1
	SD	1.4	0.7	1.4	0.8	0.8	0.8	0.7	1.9	2.7	1.6	1.6	1.6
	N	7	3	8	8	8	21	24	21	23	24	24	24
BAGGING DOUBLING	FEAN								6.7	3.9	2.3	2.3	2.3
	SD								2.9	1.3	1.3	1.3	1.3
	N								20	21	24	24	24
BAGGING LOOPS	FEAN					0.6	0.6	0.6	1.2	0.6	1.0	0.6	0.6
	SD					0.3	0.4	0.3	0.8	0.4	0.6	0.6	0.6
	N					15	27	13	13	13	9	9	9
BAGGING HEADSTOCK	FEAN	6.2	6.7	10.7	9.1	11.9	1.9	3.1	2.4	1.7	0.6	0.6	0.7
	SD	1.8	2.7	3.3	7.3	13.8	1.6	1.6	1.7	1.8	0.3	0.3	0.7
	N	7	9	12	9	8	12	20	23	24	14	14	14
BAGGING LOOPS	FEAN	2.4	1.2	2.3	0.8	0.5	0.6	0.5	0.8	0.9	0.7	0.7	0.7
	SD	1.1	0.3	0.1	0.2	0.2	0.4	0.3	0.4	0.4	0.3	0.3	0.3
	N	8	5	2	2	2	14	11	13	14	8	8	8
BAGGING WICKING (WILSON LOCUS)	FEAN										1.3	1.3	1.3
	SD										0.7	0.7	0.7
	N										10	10	10
BAGGING LOOPS	FEAN								0.9	0.6	0.7	0.7	0.7
	SD								0.4	0.4	0.3	0.3	0.3
	N								11	13	6	6	6
CLASH LOOPS	FEAN	4.9	1.6	3.3	2.8	1.8	1.2	1.0	1.4	1.1	1.2	0.7	0.7
	SD	2.4	0.4	2.7	1.4	0.8	0.6	0.3	1.0	0.5	0.6	0.6	0.6
	N	7	6	3	3	3	23	23	22	24	24	24	24

Cont'd...

LOCATION	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2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UNITED KINGDOM ASBESTOS TEXTILE PLANT

TABLE 2

Typical range of dust counts taken within enclosed area around carding machines to which maintenance workers could have been exposed.

DUST SAMPLE RESULTS (FIBRES/ML) BY LOCATION AND DATE		
<u>4.7.72</u>	7, 15, 13, 7, 2, 5, 11, 14, 5, 3, 2, 3, 5, 15, 3, 3, 5, 5, 28, 6, 9, 5, 6, 6, 6, 6, 9, 6, 6, 2, 4, 5, 4, 5, 7, 7, 27, 5, 3, 4, 3, 2, 2, 2, 36, 6, 3, 3, 2, 2, 1, 3, 2, 7, 2, 1.	
<u>Location:</u>	25/50 Card - Section 8.	<u>Range:</u> 1 - 36
<u>Sampling Method:</u>	Royco	<u>Mean:</u> = 6 f/ml
<u>25.7.72</u>	10, 10, 8, 10, 8, 4, 7, 8, 6, 6, 6, 6, 9, 11, 11, 8, 8, 10, 10, 9, 11, 16, 13, 16, 7, 9, 8, 12, 11, 11, 15, 17, 19, 26, 26, 38, 12, 13, 20, 11, 10, 6.	
<u>Location:</u>	Single & Tandem (Sect. 8)	<u>Range:</u> 4 - 38
<u>Sampling Method:</u>	Royco	<u>Mean:</u> = 13 f/ml
<u>17.7.74</u>	8, 8, 10, 10, 7, 9, 7, 6, 5, 2, 14, 14, 9, 5, 3, 10, 14, 9, 6, 2, 4, 3, 2, 2, 2, 4, 4, 4, 4.	
<u>Location:</u>	Carding West 1.	<u>Range:</u> 2 - 14
<u>Sampling Method:</u>	Royco	<u>Mean:</u> = 7 f/ml
<u>22.4.75</u>	2, 4, 5, 4, 3, 3, 2, 2, 2, 4, 5, 8, 12, 6, 6, 3, 5, 3, 3, 4, 5, 5, 9, 5, 5, 3, 6, 4, 5, 3, 3, 2, 7, 8, 5, 4, 4, 5.	
<u>Location:</u>	West Carding 2 (Single)	<u>Range:</u> 2 - 12
<u>Sampling Method:</u>	Royco	<u>Mean:</u> = 5 f/ml
<u>15.8.75</u>	35, 12, 8, 15, 4, 3, 6, 2, 3, 7, 5, 3, 4, 3, 7, 6, 3, 4, 3, 3, 3, 2, 1, 3, 2, 3, 10, 3, 6, 9, 15, 1, 1, 18, 10, 5, 11, 14, 8, 8, 3, 4, 6, 8, 2, 4, 9, 4, 9, 7, 1, 3, 4, 6, 8, 5, 7, 5, 5, 9, 1, 1, 2, 2, 1.	
<u>Location:</u>	Carding West 1.	<u>Range:</u> 1 - 35
<u>Sampling Method:</u>	Membrane Filter.	<u>Mean:</u> = 6 f/ml
<u>19.8.75</u>	6, 11, 4, 5, 7, 4, 7, 1, 4, 4, 9, 5, 3, 2, 7, 4, 3, 7, 10, 9, 3, 4, 10, 5, 11, 11, 14, 8, 21, 1, 4, 4, 4, 4, 4.	
<u>Location:</u>	Carding West 1.	<u>Range:</u> 1 - 21
<u>Sampling Method:</u>	Royco	<u>Mean:</u> 6 f/ml

UNITED KINGDOM ASBESTOS TEXTILE PLANT
Quantitative exposure relative to asbestosis and
cause of death

TABLE 3

Position at 31st December, 1974.

Minimum Estimated Fibre yrs. per ml	Number Exposed	Certified Asbestosis	Total Number of Deaths	Cause of Death			
				Asbestosis and Lung Cancer	Lung Cancer without Asbestosis	Other Cancers	Other Causes
MALES							
0 - 25	11	0	0	-	-	-	-
25 - 50	55	0	3	0	1	0	2
50 - 75	60	2	6	0	1	0	5
75 - 100	35	1	1	0	1	0	0
100 - 125	30	0	2	0	0	1	1
125 - 150	23	1	4	1	0	0	3
150 - 175	15	1	3	1	1	0	1
175 - 200	7	1	0	-	-	-	-
200 - 300	16	4	3	0	0	0	3
Over 300	3	0	0	-	-	-	-
SUB-TOTAL	255	10	22	2	4	1	15
FEMALES							
0 - 25	17	0	0	-	-	-	-
25 - 50	20	0	1	0	0	1	0
50 - 75	21	0	0	-	-	-	-
75 - 100	20	0	0	-	-	-	-
100 - 125	10	0	0	-	-	-	-
125 - 150	4	0	1	0	0	1	0
150 - 175	1	0	0	-	-	-	-
SUB-TOTAL	93	0	2	0	0	2	0
TOTAL OBSERVED	348	10	24	2	4	1	15
TOTAL EXPECTED			28.36	3.2			

11 persons exposed for at least 10 years with no exposure prior to
 1st January, 1951.

UNITED KINGDOM - ASBESTOS TEXTILE PLANT

TABLE 4.

Years since first exposure relative to asbestosis and cause of death

Position at 31st December, 1974.

Exposure. Year first Exposed	Number Exposed	Certified Asbestosis	Total Number of Deaths	Causes of Death			
				Asbestosis & Lung Cancer	Lung Cancer without Asbestosis	Other Cancers	Other Causes
MALES							
1951	30	1	2	-	-	1	1
1952	27	2	4	1	1	-	2
1953	20	1	1	-	1	-	-
1954	28	2	5	-	1	-	4
1955	25	1	3	-	1	-	2
1956	23	3	3	1	-	-	2
1957	19	-	3	-	-	-	3
1958	18	-	1	-	-	-	1
1959	18	-	-	-	-	-	-
1960	29	-	-	-	-	-	-
1961	10	-	-	-	-	-	-
1962	5	-	-	-	-	-	-
1963	2	-	-	-	-	-	-
1964	-	-	-	-	-	-	-
1965	1	-	-	-	-	-	-
TOTALS	255	10	22	2	4	1	15
FEMALES							
1951	10	-	-	-	-	-	-
1952	8	-	-	-	-	-	-
1953	-	-	-	-	-	-	-
1954	7	-	-	-	-	-	-
1955	12	-	-	-	-	-	-
1956	8	-	-	-	-	-	-
1957	15	-	1	-	-	1	-
1958	8	-	-	-	-	-	-
1959	6	-	1	-	-	1	-
1960	8	-	-	-	-	-	-
1961	6	-	-	-	-	-	-
1962	6	-	-	-	-	-	-
1963	-	-	-	-	-	-	-
1964	1	-	-	-	-	-	-
1965	-	-	-	-	-	-	-
TOTALS	93	-	2	-	-	2	-

All persons exposed for at least 10 years with no exposure prior to 1st January, 1951.

UNITED KINGDOM - ASBESTOS TEXTILE PLANT

Years since first exposure and cumulative exposure in fibre year per ml.

TABLE 5

Position at 31st December, 1974

Year first Exposed	Cumulative exposure in fibre years per millilitre.									
	0 to 25	25 to 50	50 to 75	75 to 100	100 to 125	125 to 150	150 to 175	175 to 200	200 to 300	300 +
MALES (255)										
1951 (30)	-	-	5	3	4	6	5	2	4	1
1952 (27)	-	3	5	4	5	2	4	1	2	1
1953 (20)	-	6	3	3	4	2	0	-	2	-
1954 (28)	1	5	4	3	6	3	1	1	4	-
1955 (25)	2	8	4	2	2	3	0	-	3	1
1956 (23)	0	6	7	3	1	2	2	1	1	-
1957 (19)	-	4	6	3	3	-	1	1	1	-
1958 (18)	-	5	4	4	2	2	1	-	-	-
1959 (18)	1	4	9	3	0	-	1	-	-	-
1960 (29)	4	8	9	4	2	1	-	1	-	-
1961 (10)	2	2	3	1	0	2	-	-	-	-
1962 (5)	-	4	1	-	-	-	-	-	-	-
1963 (2)	1	-	-	1	-	-	-	-	-	-
1964 (0)	-	-	-	-	-	-	-	-	-	-
1965 (1)	-	-	-	1	-	-	-	-	-	-
TOTALS	11	55	60	35	29	23	15	7	17	3
FEMALES (93)										
1951 (10)	-	2	-	4	3	1	-	-	-	-
1952 (8)	1	-	-	2	3	2	-	-	-	-
1953 (0)	-	-	-	-	-	-	-	-	-	-
1954 (7)	2	1	1	2	1	-	-	-	-	-
1955 (12)	4	4	1	2	1	-	-	-	-	-
1956 (8)	3	-	1	3	1	-	-	-	-	-
1957 (13)	5	6	3	-	1	-	-	-	-	-
1958 (8)	1	1	3	2	-	-	1	-	-	-
1959 (6)	-	1	3	1	-	1	-	-	-	-
1960 (8)	-	1	5	2	-	-	-	-	-	-
1961 (4)	1	-	2	1	-	-	-	-	-	-
1962 (6)	-	3	2	1	-	-	-	-	-	-
1963 (0)	-	-	-	-	-	-	-	-	-	-
1964 (1)	-	1	-	-	-	-	-	-	-	-
1965 (0)	-	-	-	-	-	-	-	-	-	-
TOTALS	17	20	21	20	10	4	1	-	-	-

Persons exposed for at least 10 years with no exposure prior to 1st January, 1951.

UNITED KINGDOM - ASBESTOS TEXTILE PLANT**TABLE 6**

Position at 31st December, 1974

6A. Distribution of cohort in relation to cumulative exposure

	Cumulative exposure in Fibre years/ml.				Totals
	<100	>100	>200	>300	
<u>Males</u>	161	74	17	3	255
<u>Females</u>	78	15	-	-	93

6B. Asbestosis cases in cohort relative to cumulative exposure.

	Cumulative exposure in Fibre years/ml.				Totals
	<100	>100	>200	>300	
<u>Males</u>					
Asbestosis	3	3	4	-	10
Healthy	158	71	13	3	245
Totals	161	74	17	3	255
<u>Females</u>					
Asbestosis	-	-	-	-	-
Healthy	78	15	-	-	93
Totals	78	15	-	-	93

Persons exposed for at least 10 years with no exposure prior to 1st January, 1951.

UNITED KINGDOM - ASBESTOS TEXTILE PLANT**TABLE 7****Exposure history of asbestosis cases.**

Position at 31st December, 1974.

Certified Asbestosis Cases		
Cohort Number	Exposure	
	Year First Exposed	Cumulative Fibre Years per ml.
4340	1951	213.30
4336	1952	193.09
4140	1952	81.47
4159	1953	217.96
4265 *	1954	157.24
4323	1954	280.50
4330	1955	278.39
4008	1956	139.67
4346	1956	66.10
4373	1956	66.49

Total group exposure - 1694.21

Mean group exposure - 169.4 fibre years/ml.

Mean exposure time - 14.04 years

Range - 9.66 - 18.08

Persons exposed for at least 10 years with no exposure prior to 1st January, 1951.

*The person referred to under cohort number 4265 was engaged in shipbuilding or repair between 1925 and 1930 and could have had associated exposure to asbestos dust in this occupation.

UNITED KINGDOM ASBESTOS TEXTILES PLANT**TABLE 8****Exposure history of lung cancer deaths.**

Position at 31st December, 1974

Cohort No.	Year first Exposed	Time from Exposure to death	Exposure Period	Minimum Estimated Exposure Fibre Years ml.	Year of death	Age at death	Smoking Habits
4032	1952	14.42 yrs.	14.12 yrs.	161.32	1967	58	10 cigs/day
4044	1952	20.42 yrs.	10.83 yrs.	43.64	1972	71	20/30 cigs/day
4416	1953	20.25 yrs.	18.40 yrs.	84.48	1974	48	20/30 cigs/day
4265 *	1954	17.00 yrs.	11.34 yrs.	157.24	1971	60	30 cigs/day
4090	1955	17.42 yrs.	16.83 yrs.	64.06	1972	66	20 cigs/day
4008	1956	17.50 yrs.	11.42 yrs.	139.67	1974	59	15/20 cigs/day

Persons exposed for at least 10 years with no exposure prior to 1st January, 1951.

*The person referred to under cohort number 4265 was engaged in shipbuilding or repair between 1925 and 1930 and could have had associated exposure to asbestos dust in this occupation.

UNITED KINGDOM - ASBESTOS TEXTILE PLANT
TABLE 9
Weaving Department. Years since first exposure and cumulative exposure of workers exposed to low levels of asbestos dust.

Position at 31st December, 1974.

Year first Exposed	Cumulative exposure in fibre years per millilitre.									
	0 to 25	25 to 50	50 to 75	75 to 100	100 to 125	125 to 150	150 to 175	175 to 200	200 to 300	300 +
MALES (43)										
1951 (2)	-	-	2	-	-	-	-	-	-	-
1952 (5)	-	1	4	-	-	-	-	-	-	-
1953 (4)	-	3	1	-	-	-	-	-	-	-
1954 (3)	1	2	1	-	-	-	-	-	-	-
1955 (8)	2	5	1	-	-	-	-	-	-	-
1956 (3)	-	3	1	-	-	-	-	-	-	-
1957 (2)	-	2	1	-	-	-	-	-	-	-
1958 (1)	-	1	-	-	-	-	-	-	-	-
1959 (1)	1	-	-	-	-	-	-	-	-	-
1960 (6)	3	4	-	-	-	-	-	-	-	-
1961 (3)	2	1	-	-	-	-	-	-	-	-
1962 (0)	-	-	-	-	-	-	-	-	-	-
1963 (1)	1	-	-	-	-	-	-	-	-	-
1964 (0)	-	-	-	-	-	-	-	-	-	-
1965 (0)	-	-	-	-	-	-	-	-	-	-
TOTALS	10	22	11	0	0	0	0	0	0	0
FEMALES (15)										
1951 (2)	-	2	-	-	-	-	-	-	-	-
1952 (1)	1	-	-	-	-	-	-	-	-	-
1953 (0)	-	-	-	-	-	-	-	-	-	-
1954 (2)	2	-	-	-	-	-	-	-	-	-
1955 (4)	4	-	-	-	-	-	-	-	-	-
1956 (3)	3	-	-	-	-	-	-	-	-	-
1957 (2)	2	-	-	-	-	-	-	-	-	-
1958 (0)	-	-	-	-	-	-	-	-	-	-
1959 (0)	-	-	-	-	-	-	-	-	-	-
1960 (0)	-	-	-	-	-	-	-	-	-	-
1961 (1)	1	-	-	-	-	-	-	-	-	-
1962 (0)	-	-	-	-	-	-	-	-	-	-
1963 (0)	-	-	-	-	-	-	-	-	-	-
1964 (0)	-	-	-	-	-	-	-	-	-	-
1965 (0)	-	-	-	-	-	-	-	-	-	-
TOTALS	13	2	0	0	0	0	0	0	0	0

Persons exposed for at least 10 years with no exposure prior to 1st January, 1951.

UNITED KINGDOM - ASBESTOS TEXTILE PLANT

TABLE 10

History of workers with consistently low level of exposure to asbestos dust

Position at 31st December, 1974.

Weaving Department

MALES

Cumulative exposure in fibre years/ml.	No. Exposed
0 - 25	10
25 - 50	22
50 - 75	11
75 - 100	-
100 - 125	-
125 - 150	-
150 - 175	-
175 - 200	-
200 - 300	-
Over 300	-
Total	43

Amongst male workers there have been no cases of asbestosis and only two deaths both of which were unrelated to asbestos exposure.

FEMALES

Cumulative exposure in fibre years/ml.	No. Exposed
25 - 50	13
50 - 75	2
75 - 100	-
100 - 125	-
125 - 150	-
150 - 175	-
175 - 200	-
200 - 300	-
Over 300	-
Total	15

Amongst female workers there have been no cases of asbestosis, neither have there been any deaths.

Workers exposed for at least 10 years with no exposure prior to