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DOCUMENT DESCRIPTION: Report - Drop Test [Fiber Counts for 3
Samples of Vermiculite Ore]

DROP TEST

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DROP TEST

PURPOSE:

To obtain under controlled conditions, fiber counts for the three (3) supplies of vermiculite ore, expanded vermiculite, Turf Builder, and Turf Builder Plus 2.

INTRODUCTION:

This test was designed for air particulate samples such that the three (3) vermiculite ore sources could be evaluated under equivalent controlled conditions. A chamber was built with a hopper having an adjustable opening to the area below it. Sampling ports were placed at various heights in the chamber. Conditions such as quantity of material, hopper opening, sampling height and sampling time were established so filters were not overloaded with dust.

TEST EQUIPMENT AND MATERIAL:

1. Sampler - Bendix C-110 calibrated at 2.0 l/min. Flow meter checked after each sample.
2. Material - Turf Builder (Sept. 29, 1977), Turf Builder plus 2 (July 20 or 21, 1977), South Carolina Ore (SAL 31532), Libby Ore (IMEX 10152), African Ore (Portsmouth Warehouse (Oct. 27, 1977), and Expanded Vermiculite Process (Sept. 29, 1977) from No. 1 and No. 4 expander and No. 2 system feeder.
3. Sampling Chamber - Dimensions - 15 in. X 15 in. X 36 in. high with a volume of 4.68 cu. ft. (0.133 cu. meters). Three (3) sides constructed of metal. The fourth side of 3/16 inch plexiglass for viewing reaction of the material dropped. Four (4) holes, three (3) to one vertical side and one (1) on top

were cut in the metal to allow an air tight seal when Millipore cassette filters were positioned in the holes (1.75 inches). A 2 in. by 12 in. slot was cut into the top of the box and a v-shaped hopper with an adjustable opening was mounted to cover the slot. The hopper has a capacity of 648 cu. in. Bottom of chamber open.

4. Cassettes with Millipore 0.8 micron filters - Catalog No. AAWP0300.
5. Miscellaneous equipment - stopwatch, scoop, broom, and shovel.

TEST PROCEDURE:

Samples of vermiculite ore were run on Nov. 9, 1977 to establish conditions to insure that filters were not overloaded with dust. Conditions were determined to be:

1. Hopper Opening - 3/4 inches (hopper emptied in 10 seconds)
2. Filter Position - Cassette port in top of chamber
3. Sampling Time - One (1) minute
4. Hopper filled level with material
5. Material cleaned up between each sample and chamber blown out well with air between each different source of ore or product.

African ore from Portsmouth Warehouse was run through chamber on Nov. 9, 1977. Remaining samples completed on Nov. 29, 1977. Filters from test and one (1) blank filter were submitted to McCrone Associates for fiber counts. McCrone used the accepted OSHA/NIOSH method for counting fibers. Fiber counts are shown in attached Table I.

DISCUSSION:

All sample types except Turf Builder gave approximately the same fiber counts. Sampling conditions were apparently not suited to Turf Builder. If additional sampling were to be done, would probably have to use a lower sampling port in the side wall of the chamber. The differences between ore sources in the Material Handling Test are not obvious in this test. Fiber identifications are necessary to more fully assess the extent of asbestos fibers present. Fiber identification has been requested on one filter from each group in Table I.

ACKNOWLEDGEMENT:

We would like to thank Gary O'Neil for his assistance in running samples and Alan Seymour for designing the chamber used for the Drop Test.

TABLE I.

DROP TEST: Fibers/cc for three raw ore sources, expanded vermiculite, and two products.

<u>Sample</u>	<u>TB</u>	<u>Libby</u>	<u>South Carolina</u>	<u>Portsmouth</u>	<u>Expanded Vermiculite</u>	<u>TB+2</u>
1	0	33.09	38.90	38.76	27.41	36.55
2	0	27.27	31.01	43.38	30.59	3.33
3	0	30.59	6.83*	0.16*	14.53	41.64
4		33.92	30.87	38.76	52.05	
5		42.92	30.59	14.53	6.83	
6		2.68*	30.87	39.46	55.51	
7		15.36	30.59	1.38*	46.24	
8		45.82	31.42	30.87	34.19	
9		36.41		0.83*		
10				336.44*		
11				36.69		
$\bar{X}$	0	33.17	32.04	34.63	33.42	27.17
S	0	9.45	3.04	9.63	17.35	20.81

*Not included in $\bar{X}$ or S calculation.

Volume: 648 cubic inches (10,620.7 cubic cms)

Sampler: C-110 (Bendix)

Flow Rate: 2 l/min

Material Drop: 10 seconds

Sampling Period: 1 minute

Sampling Description: Hopper of box filled with material of interest. Timer and sampler started and hopper slide opened to 3/4 inch. Between 7-10 seconds required to empty hopper. Sampler allowed to run for total of 60 seconds. Filter removed, material cleaned up and discarded.

DROP TEST DATA

Date: November 9, 1977
 Material Volume 9" X 9" X 8"
 Opened gate to 3/4"
 Material dropped in 10 Sec.
 Ran sampler for 1 minute.

Filter #	Sampler #	Flow Rate	Material Sample #	Remarks
7-313-1	C-110	2.0 L.P.M.	7-300-5	Portsmouth Warehouse last shipment.
7-313-2	C-110	2.0 L.P.M.	7-300-4	Portsmouth Warehouse last shipment.
7-313-3	C-110	2.0 L.P.M.	7-300-4	Portsmouth Warehouse last shipment.
7-313-4	C-110	2.0 L.P.M.	7-300-6	Portsmouth Warehouse last shipment. Seemed to have more dust.
7-313-5	C-110	2.0 L.P.M.	7-300-6	Portsmouth Warehouse last shipment. Seemed to have more dust.
7-313-6	C-110	2.0 L.P.M.	7-300-1	Portsmouth Warehouse 2nd last shipment. Seemed to have more dust.
7-313-7	C-110	2.0 L.P.M.	7-300-1	Portsmouth Warehouse 2nd last shipment. Seemed to have more dust.
7-313-8	C-110	2.0 L.P.M.	7-300-2	Portsmouth Warehouse 2nd last shipment.
7-313-9	C-110	2.0 L.P.M.	7-300-2	Portsmouth Warehouse 2nd last shipment.
7-313-10	C-110	2.0 L.P.M.	7-300-3	Portsmouth Warehouse 2nd last shipment.
7-313-11	C-110	2.0 L.P.M.	7-300-3	Portsmouth Warehouse 2nd last shipment.

LIBBY ORE Car # IMCX10152

7-333-1	C-110	2.0 L.P.M.	7-272-5	Section II
7-333-2	C-110	2.0 L.P.M.	7-272-4	Section II
7-333-3	C-110	2.0 L.P.M.	7-272-8	Section III
7-333-4	C-110	2.0 L.P.M.	7-272-6	Section II

LIBBY ORE Car # DMX10152 (Cont.)

Filter #	Sampler #	Flow Rate	Material Sample #	Remarks
7-333-5	C-110	2.0 L.P.M.	7-272-9	Section III
7-333-6	C-110	2.0 L.P.M.	7-272-7	Section III
7-333-7	C-110	2.0 L.P.M.	7-272-2	Section I
7-333-8	C-110	2.0 L.P.M.	7-272-1	Section I
7-333-9	C-110	2.0 L.P.M.	7-272-3	Section I

SOUTH CAROLINA ORE Car # SAL31532

7-333-10	C-110	2.0 L.P.M.	7-271-4	Section I
7-333-11	C-110	2.0 L.P.M.	7-271-8	Section I
7-333-12	C-110	2.0 L.P.M.	7-271-1	Section III
7-333-13	C-110	2.0 L.P.M.	7-271-6	Section I
7-333-14	C-110	2.0 L.P.M.	7-271-2	Section III
7-333-15	C-110	2.0 L.P.M.	7-271-7	Section I
7-333-16	C-110	2.0 L.P.M.	7-272-5	Section II
7-333-17	C-110	2.0 L.P.M.	7-272-3	Section III

MISCELLANEOUS TESTS

7-333-18	C-110	2.0 L.P.M.	7-272-1	Libby expanded ? #1 expander.
7-333-19	C-110	2.0 L.P.M.	7-272-1	Libby expanded ? #1 expander.
7-333-20	C-110	2.0 L.P.M.	7-272-2	Africian ore (75%) Expander #4
7-333-21	C-110	2.0 L.P.M.	7-272-2	Africian ore (75%) Expander #4
7-333-22	C-110	2.0 L.P.M.		From #2 system feeder 7-272 normal blend of Libby & Africian, may be some S.C. ore.

MISCELLANEOUS TESTS (cont.)

Filter #	Sampler #	Flow Rate	Material Sample #	Remarks
7-333-23	C-110	2.0 L.P.M.		From #2 system feeder 7-272 normal blend of Libby & Africian, may be some S.C. ore.
7-333-24	C-110	2.0 L.P.M.		From #2 system feeder 7-272 normal blend of Libby & Africian, may be some S.C. ore.
7-333-25	C-110	2.0 L.P.M.		From #2 system feeder 7-272 normal blend of Libby & Africian, may be some S.C. ore.
7-313-26	C-110	2.0 L.P.M.		Turf Builder + 2, 7-20 or 7-21-2D, 2F.
7-313-27	C-110	2.0 L.P.M.		Turf Builder + 2, 7-20 or 7-21-2D, 2F.
7-313-28	C-110	2.0 L.P.M.		Turf Builder + 2, 7-20 or 7-21-2D, 2F. Ran sampler for 75 seconds.
7-313-29	C-110	2.0 L.P.M.		Turf Builder
7-313-30	C-110	2.0 L.P.M.		9-29-2C
7-313-31	C-110	2.0 L.P.M.		
7-313-32				Blank