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PLAINTIFF'S EXHIBIT

UC-4929

TECHNICAL SERVICE REPORT
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Date: April 2, 1979

Subject: Plenum Chamber Airborne Fiber Emissions of Oil-Treated Super Standard 1/8" Pellets Exposed to Ambient Conditions

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Oil-treated 1/8 inch super standard grade pellets prepared at King City were evaluated for fiber emission characteristics after exposure to ambient weathering conditions.

Several hundred grams of the oil-wetted pellets (24.5% oil by wt. as received) were subjected to weathering in an open, unheated warehouse for a period of 38 days. Ambient temperatures ranged from sub-zero to 45°F. The pellets were weighed periodically and subsequently tested for fiber emission characteristics in a laboratory plenum chamber.

The plenum test involved subjecting 50 gram samples of the pellets to 5 and 15 minutes of vibration in an 8-inch diameter pan, 2 inches high, mounted on a Derrick vibrator enclosed in a 6 ft.^{3} chamber. The degree of vibration was controlled at a constant level. Two MSA samplers containing Milliport 0.8 membrane filters were suspended inside near the top of the plenum chamber. The atmosphere in the chamber was monitored continuously at a rate of 2 liters/minute over the 5 and 15 minute periods. The airborne asbestos was counted in accordance with OSHA procedures under Federal Regulation 1910.001 using phase contrast microscopy.

The oil-treated pellets as received from the plant were dark green in color. The pellets appeared to be slightly lighter in color after four days exposure. No significant changes were observed over the following two to three weeks. After approximately three weeks, the pellets lightened in color and ultimately developed the appearance of dry untreated product (refer Figure 1). The amount of oil loss with exposure time is demonstrated in Table I and Figure 2. Approximately 2.5% by weight of the oil evaporated after four days (based on the initial loading). After 38 days, the amount of oil in the pellets had decreased from 24.5 to 18.4%, representing a 25% loss of oil due to evaporation.

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Plenum test results are summarized in Table II. Control samples were obtained throughout the tests to determine background levels in the chamber. The chamber was vacuumed and wiped with a damp sponge before and after each set of tests. However, residual background fiber averaged ~0.3 f/cc for the controls with a range of 0 to 1.0 f/cc. Samples tested after four days exposure averaged 0.6 and 1.4 f/cc for the 5 and 15 minute tests, respectively. Pellets exposed for 38 days demonstrated average fiber emissions of 1.9 and 4.5 for the 5 and 15 minute plenum tests. The plenum emission characteristics of untreated crushed supervisbestos were also included for the purpose of comparison. Fiber emissions of crushed SVB were roughly 20 times that of the oil-treated pellets exposed for 38 days.

The plenum test is far more rigorous than any conditions anticipated in field application. Furthermore, oil-wetted product would be packaged in a manner to prevent evaporation. The principle concern and objectives of this study relate to product exposed to ambient conditions due to spillage around the hopper and an occasional breakage of bags. As such, it is most unlikely, based on the data, that oil-wetted pellets would significantly raise the airborne fiber emissions.

The primary objective of oil treatment is to contain fiber emissions within a TWA of 0.1 f/cc. Emission tests conducted on oil-treated pellets in the field were all well within a 0.1 f/cc TWA. The effects of prolonged exposure on residual material should not significantly alter emissions on the basis of these data. However, an extended field trial should be conducted for confirmation.

BL Ingalls

Blair L. Ingalls

/rmm
Attachments

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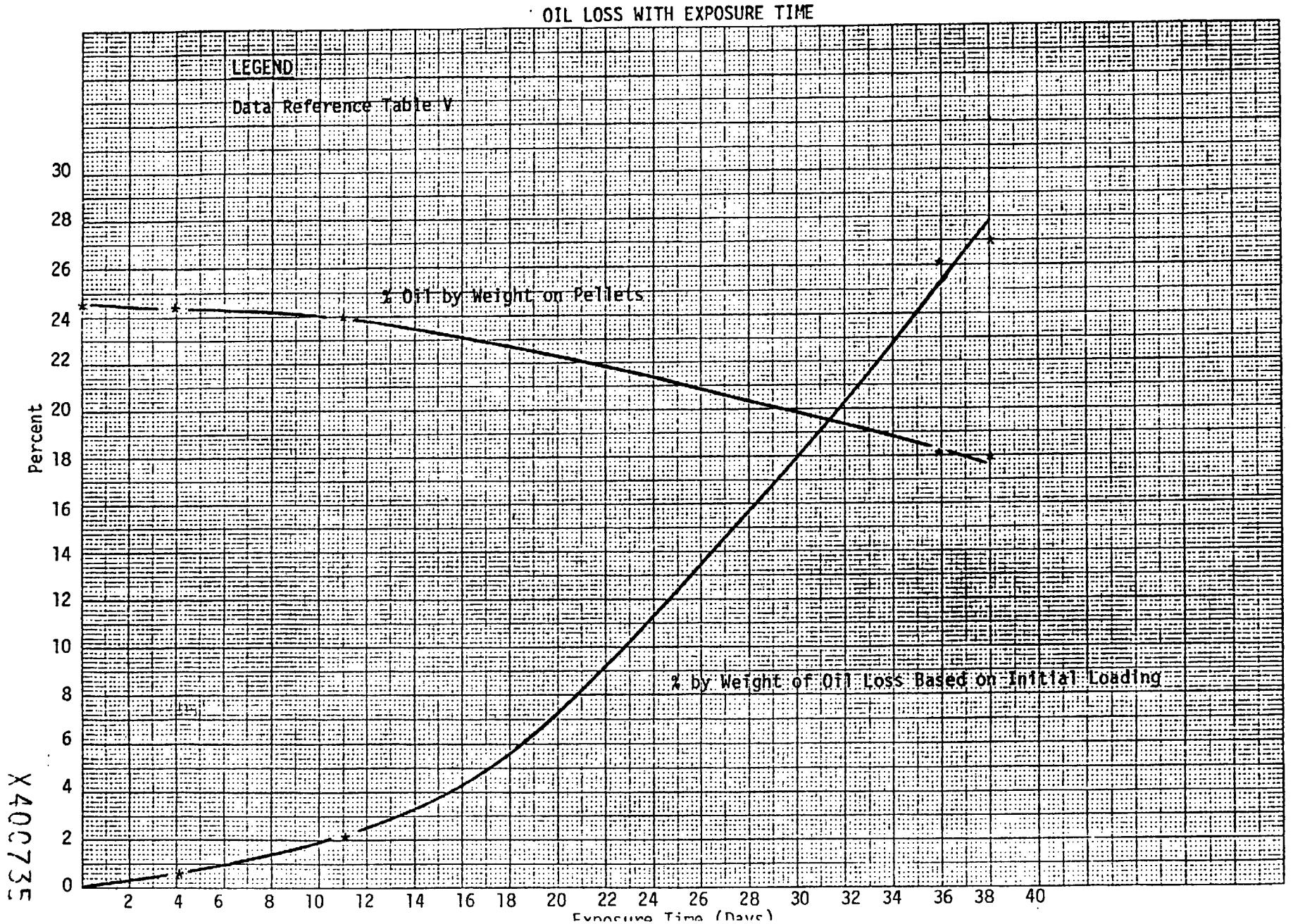
FIGURE I

Oil-treated 1/8 inch super standard pellets. Material on right as received (24.5% oil by wt.). Material on left - after 38 days exposure (18.4% oil by wt.).

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FIGURE 2



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Union Carbide trial exhibit UC-4929: B. L. Ingalls to J. L. Myers on Plenum Chamber Fiber Emissions of Oil-Treated...
ACL Doc 19436 · Page 4 of 7
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TABLE I

PERCENT OIL LOSS WITH EXPOSURE TIME*

		% Oil by Wt.	% Oil Loss
1/15/79	As Received	24.5	-
1/19/79	After 4 Days Exposure	23.9	2.5
2/23/79	After 38 Days Exposure	18.4	24.9

*Based on oven drying ~18 hours at 105°C.

TABLE II

AVERAGE PLENUM TEST RESULTS (FIBERS/CC)*

	5 Min. Plenum Test	15 Min. Plenum Test
Control	0.3(0-1.0)**	0.2(0.1-0.5)
Oil-Treated 1/8" Pellets After 4 Days Exposure	0.6(0.2-0.8)	1.4(0.2-3.3)
Oil-Treated 1/8" Pellets After 38 Days Exposure	1.9(1.5-2.4)	4.5(2.2-6.8)
Crushed SVB	35.9(30.5-40.7)	***

*Reference Data - Tables III & IV

**Range-Fibers/cc

***Too heavily loaded to count.

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TABLE III

PLENUM TEST RESULTS AFTER 4 DAYS EXPOSURE
(fibers/cc of air)

	5 Min. Plenum Test		15 Min. Plenum Test	
	Sample #1	Sample #2	Sample #1	Sample #2
Control	0.3	0.3	-	-
Oil-Treated 1/8" Pellets	0.6	0.8	-	-
Control	0.6	0.1	-	-
Oil-Teated 1/8" Pellets	0.2	0.6	-	-
Control	0.0	<0.1	-	-
Oil-Treated 1/8" Pellets	-	-	0.6	0.2
Control	-	-	0.3	0.2
Oil Treated 1/8" Pellets	-	-	2.2	3.3
Control	-	-	0.0	0.5
Oil-Treated 1/8" Pellets	-	-	0.9	1.1

TABLE IV

PLENUM TEST RESULTS AFTER 38 DAYS EXPOSURE
(fibers/cc of air)

	5 Min. Plenum Test		15 Min. Plenum Test	
	Sample #1	Sample #2	Sample #1	Sample #2
Control	0.2	0.4	-	-
Oil-Treated 1/8" Pellets	2.1	1.5	-	-
Control	0.2	1.0	-	-
Oil-Treated 1/8" Pellets	2.4	1.7	-	-
Control	-	-	0.2	0.2
Oil-Treated 1/8" Pellets	-	-	5.8	6.8
Control	-	-	0.2	0.1
Oil-Treated 1/8" Pellets	-	-	2.2	3.3

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TABLE V

PERCENT OIL LOSS WITH EXPOSURE TIME*

Date	% Oil by Wt.	% Oil Loss
1/15/79	24.5	-
1/16/79	24.5	-
1/17/79	24.5	-
1/18/79	24.5	-
1/19/79	24.4	0.4
1/26/79	23.9	2.1
2/20/79	18.0	26.1
2/23/79	17.8	27.0

*Based on total weight loss measurements.

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