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Emission Test Report Thiele Kaolin Sandersonville, Georgia

FUGITIVE EMISSIONS TEST REPORT

THIELE KAOLIN COMPANY

Sandersville, Georgia

ROY F. WESTON, INC.

Barry L. Jackson
Supervisor Air Testing

Charles J. Dobroski
Assistant Project Scientist

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Prepared by:

ROY F. WESTON, INC.

ENVIRONMENTAL CONSULTANTS-DESIGNERS
Weston Way
West Chester, Pennsylvania 19380

(215) 692-3030

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SUMMARY

The Emission Measurement Branch of the U. S. Environmental Protection Agency contracted Roy F. Weston, Inc. to conduct a fugitive emission testing program at the Thiele Kaolin Company's clay processing facility in Sandersville, Georgia. The objective of the testing program was to measure fugitive emissions resulting from the rail car bulk loading operation. Three complete rail car loadings were evaluated for fugitive emissions in accordance with EPA Method 22 test procedures.

All tests were conducted during the period 6-7 December 1978 by Weston employees.

A detailed summary of test data and test results is presented in Table 1 of this report. Figure 2 shows a comparison of the emission rates observed at the point of fill during each of the three tests.

Comparison of the test results suggests relatively consistent rates of emissions for rectangular hatch rail cars. Mean emission frequencies during loading of these cars during Tests 1 and 2 are 9.3% and 7.0%, respectively.

Mean emission frequency for the "rake-back" rail car loading operations is decidely greater (16.0%) than that observed for the other rail cars. This fact results from the difference in loading processes.

The primary source of emissions for all cars tested is the topping of each compartment with product and the subsequent repositioning of the feed hose in the next compartment.

INTRODUCTION

The Emission Measurement Branch of the U. S. Environmental Protection Agency contracted Roy F. Weston, Inc. to conduct a fugitive emission testing program (EPA Method 22) at the Thiele Kaolin Company's clay processing facility in Sandersville, George. The objective of the testing program was to measure fugitive emissions resulting from the rail car bulk loading.

Three fugitive emission tests were conducted in loading port #1 which contained two loading sites that will be designated as site A (area nearest processing facility) and site B (area furthest from processing facility).

The location of each test and the type of car loaded are listed below:

Test #1
1. Loading port #1
2. Loading site A
3. Rectangular hatch rail car

Test #2
1. Loading port #1
2. Loading site B
3. Rectangular hatch rail car

Test #3
1. Loading port #1
2. Loading site A
3. "rake-back" rail car

All tests were conducted during the period 6-7 December 1978 by Weston personnel.

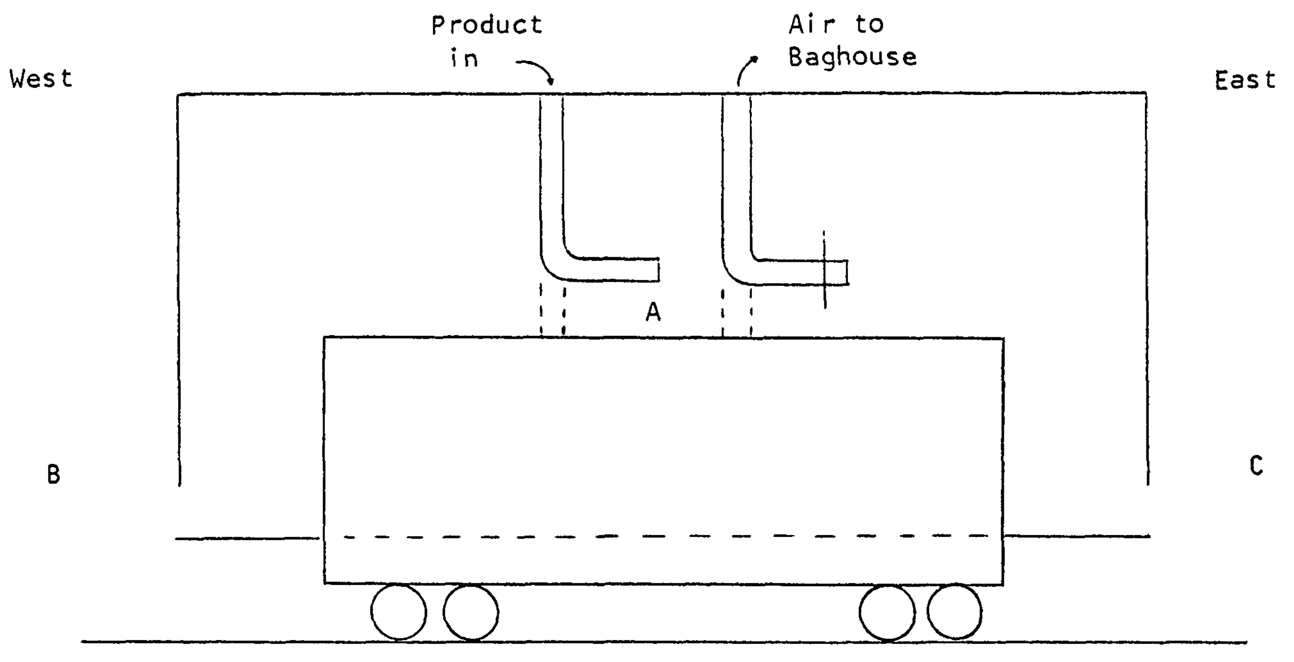
A detailed summary of test data and test results is presented in Table 1 and Figure 2 of this report. Raw test data and a list of project participants are provided in Appendices A and B, respectively.

Discussion of Loading Procedure

Rail cars with the holding capacity of 100 $\pm$ 3 tons of kaolin product are filled by means of an overhead hose which carries the product from the processing facility to the rail cars (Figure 1). During actual loading operations the feed hose is placed into either a rectangular or circular hatch within which is a filtering basket. The remaining area of the opened hatch is covered with tarpaulin to diminish any dust emission. In addition, a vacuum system is positioned in the vicinity of the feed hose to remove airborne particulates resulting from the loading operation. After filling one compartment, the rail car is drifted down the track so that the next section to be filled is beneath the feed line. The hose is then placed in this compartment and the hatch on the previous section closed. It should be noted that the topping of a compartment and the subsequent repositioning of the hose appears to be the primary source of fugitive emissions. This is found to be particularly true of the "rake-back" operation in which the product is manually pushed into the reaches of the compartment. The time required to fill an individual rail car is dependent on the type of rail car and the feed rate. Mean loading time for the rail cars observed was approximately 3 hours.

Thiele Kaolin Company
Sandersville, Georgia

SCHEMATIC OF BULK LOADING OPERATION



Areas A, B and C Denote Areas Which Were Inspected for Fugitive Emissions According to EPA Method 22.

Figure 1

Test Procedures

Three complete rail car loadings were evaluated for fugitive emissions in accordance with EPA Method 22 test procedures.

Fugitive emissions were examined at both ends of the loading shed (east and west) and at the actual point of fill into the railroad car (Figure 1).

The approximate time periods (24 hr clock) for which each test was made are presented below:

Test #1	6 December 1978	1640-2114
Test #2	7 December 1978	0815-1034
Test #3	7 December 1978	1315-1659

During each test, observations were made for 20 minute intervals followed by a 10 minute break.

Test Results

Total accumulated observation time (AOT) and total accumulated emission time (AET) for each inspection location and for three fugitive emission tests are summarized in Table 1. Also presented in this table are the emission frequencies for each location (AET/AOT x 100) and the mean emission frequencies for each test.

Figure 2 compares the rates of emission at the point of fill for the three separate rail car loadings.

THIELE KAOLIN COMPANY

Sandersville, Georgia

TABLE 1

Summary of Results of Fugitive Emission Tests performed on three separate rail car loadings

Observation Area	Accumulated Observation Period (min:sec)	Accumulated Emission Time (min:sec)	% Emission (AOP/AET x 100)
	Test #1		
A	144:32	22:42	15.7
B	144:32	17:30	12.1
C	144:32	0:00	0
			$\bar{x}$ = 9.3
	Test #2		
A	99:45	18:50	18.9
B	99:45	2:06	2.1
C	99:45	0.00	0
			$\bar{x}$ = 7.0
	Test #3		
A	154:20	63:42	41.3
B	154:20	0:20	.2
C	154:20	9:21	6.1
			$\bar{x}$ = 15.9

1. Designation of observation positions (Figure 1)

A. Loading hose
B. West end of shed
C. East end of shed

COMPARISON OF RATES OF EMISSIONS OBSERVED AT THE
POINT OF FILL FOR THREE SEPARATE RAIL CAR LOADINGS

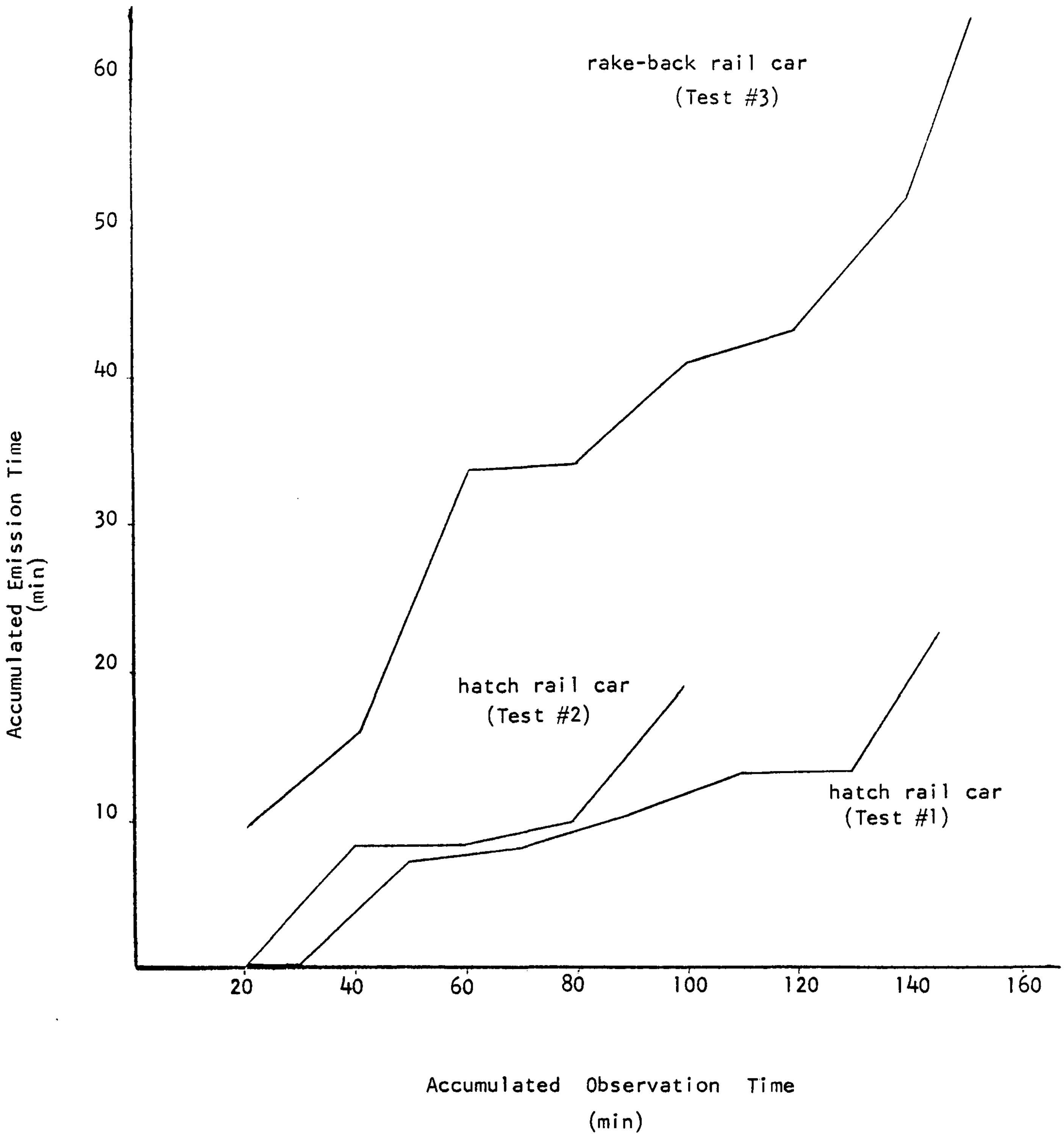


Figure 2

Discussion of Results

From Table 1, it was apparent that the primary source of fugitive emissions in the bulk loading area was in the immediate vicinity of the fill area (Figure 1, Area A). By comparison and with the exception of Test #1, an insubstantial amount of particulate emissions was observed at either end of the loading shed.

During Test #1, however, emissions at the west end of the shed (Area B) were relatively similar to those observed at the filling area. Observations of particulate transport from the source area to the outside of the shed were undoubtedly influenced by such factors as local wind conditions, particle density, relative humidity, proximity of fill area to end of shed, visibility, etc.

Comparison of test results from Tests #1 and #2 suggested relatively consistent rates of emission for rectangular hatch rail cars. In neither of these tests, were mean emission frequencies greater than 10.0%. However, fugutive emissions observed at the source (area A) during the loading of the "rake-back" rail car (Test #3) were decidedly greater than similar observations made for the other rail cars (Figure 2). Mean emission frequency for Test #3 was 16.0%.