Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

AP42 Section:	11.19.2
Reference:	22
Title:	Performance Testing for Flash Dryer #3, Omya, Inc. Plant in Florence, Vermont, Air Quality Technical Services. August 2000.

August, 2001

COMPLIANCE REPORT

(ADDENDUM)

COMPLIANCE TEST PROGRAM
for
PARTICULATE EMISSIONS
from
FLASH DRYER #3

Submitted For:

OMYA, INC.

61 Main Street

Proctor, Vermont 05765

Purchase Order Number: 95782

Submitted To:

AGENCY OF NATURAL RESOURCES

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR POLLUTION CONTROL DIVISION

103 South Main Street

Waterbury, Vermont 05671-0402

Prepared by:

AIR QUALITY TECHNICAL SERVICES, INC.

18 Morse Drive

Essex Junction, Vermont 05452

Project Number: 001266

January 24, 2001

FOREWORD

Air Quality Technical Services, Inc., an environmental consulting company specializing in air resource management and air quality assessment, was contracted by OMYA, Inc. to conduct a source emission compliance program at the non-metallic mineral processing facility it owns and operates in Florence, Vermont.

This report presents additional program results, test and analytical data not previously presented.

To the best of my knowledge the data contained herein are correct and reliable.

John J. Jasko
President

AQTS AIR QUALITY TECHNICAL SERVICES, INC.
18 Morse Drive, Essex Junction, Vermont 05452 (802) 879-1800

1.0 INTRODUCTION

This document summarizes program data generated from test run 1-2 conducted during the initial phase of compliance testing on August 10, 2000. All other information pertaining to testing methodologies is the same as presented in the formal Compliance Report dated October 27, 2000.

The major on-site representatives that participated in the field portion of the particulate emission compliance program, on August 10, and their respective affiliations were:

OMYA, Inc.
- Neal Jordan - Environmental Engineer
- Jim Prior - Engineer

State of Vermont Agency of Natural Resources, Air Pollution Control Division
- Dave Manning - Environmental Technician

Air Quality Technical Services, Inc.
- John Jasko - Project Director
- Michael Spector - Environmental Technician

AQTS AIR QUALITY TECHNICAL SERVICES, INC.
18 Morse Drive, Essex Junction, Vermont 05452 (802) 879-1800

2.0 SUMMARY OF RESULTS

Particulate matter was measured as a non-filterable sample fraction collected by a filter media and preceding section of sample train. This fraction includes particulates greater than or equal to the particle cut point size of the filter media (0.3 μ).

2.1 FLASH DRYER #3

2.1.1 Particulate Matter

The concentrations of PM for test run 1-2, the sole valid test run conducted August 10, was 0.0069 gr/dscf. The corresponding emission rate of PM was 0.66 lbs/hr.

A summary of the PM test determinations for test run 1-2 for Flash Dryer #3 is presented in Table 2-1.

AQTS AIR QUALITY TECHNICAL SERVICES, INC.
18 Morse Drive, Essex Junction, Vermont 05452 (802) 879-1800

TEST DATA SUMMARY

FLASH DRYER #3

PARTICULATE MATTER	
Test Run	1-2
Date	08/10/2000
Clock Time (24 hour)	14:46-16:26
Test Duration (minutes)	96
Sample Volume (dscf)	68.845
Test Measurements	
Isokinetics (%)	92.3
Moisture Content (%)	18.8
Temperature (°F)	303.1
Gas Composition - CO_2 (%)	2.5
O_2 (%)	18.5
CO (%)	0
N_2 (%)	79.0
Gas Velocity (fps)	69.1
Gas Volumetric Flow (dscfm)	11198
(acfm)	20353
Emission Determinations	
Particulate:	
Concentration (gr/dscf)	0.0069
Emission Rate (lbs/hr)	0.66

Table 2-1

AQTS AIR QUALITY TECHNICAL SERVICES, INC.
18 Morse Drive, Essex Junction, Vermont 05452 (802) 879-1800

APPENDIX A

FIELD DATA TEST RESULTS

CLIENT:	OMYA, INC.
FACILITY:	FLORENCE, VT
PROJECT:	001266
UNIT:	FLASH DRYER 3
TEST DATE:	August 10, 2000
TEST RUN:	1-2

TEST DATA SUMMARY

INPUT VALUES

Pitot Coefficient - Cp:	0.84	Average Delta P (" H2O):	0.969
Nozzle Diameter - Dn (in):	0.25	Average Delta H ("H2O):	2.079
Dry Gas Meter Cal. (Y):	1.008	Stack Temperature - Ts (°F):	303.1
Stack Area (ft^2):	4.909	Meter Temperature - Tm (°F):	120.4
Barometric Press. - Pb ("Hg):	29.34	Average Square Root of Delta P:	0.981
Static Press. - Pst ("Hg):	-0.51	Mass of Particulate Collected - Mp - (g.):	0.0307
Sample Duration (min.):	96		
Volume of Gas Metered - Vm (ft^3):	76.646		
Volume of Water Condensed - Vlc (g.):	338.2		
Oxygen - O2 (%):	18.5		
Carbon Dioxide - CO2 (%):	2.5		
Carbon Monoxide - CO (%):	0		
Nitrogen - N2 (%):	79		

OUTPUT VALUES

Dry Gas Volume (Standard) - Vmstd (dscf):	68.845
Volume of Water (Standard) - Vwstd (scf):	15.919
Stack Gas Water Proportion by Volume - Bwo:	0.188
Molecular Weight of Dry Stack Gas - MWd (lb/lb-mole):	29.14
Molecular Weight of Stack Gas - MWs (lb/lb-mole):	27.05
Pressure of Stack - Ps ("Hg.):	29.3
Velocity of Stack Gas - Vs (fps):	69.1
Dry Standard Volumetric Flow of Stack Gas - Qdscfm:	11198
Actual Volumetric Flow of Stack Gas - Qacfm:	20353
Test Isokinetic Sample Rate (%):	92.3
Particulate Concentration of Stack Gas - Cs (gr/dscf):	0.0069
Particulate Emission Rate - ER (lbs/hr):	0.66

APPENDIX B

OMYA, INC., FLORENCE, VT

PROJECT: 001266 **FLASH DRYER #3**

PARTICULATE CONCENTRATION AND EMISSION DATA

SAMPLE ID	TEST RUN	GROSS SAMPLE MASS (g)	NET SAMPLE MASS (g)	AIR VOLUME SAMPLED (dscf)	EMISSION CONCENTRATIONS (gr/dscf)	(mg/dscm)	(lbs/dscf)	VOLUMETRIC AIR FLOW (dscfm)	EMISSION RATE (lbs/hr)
C819/C820	1-2	0.0324	0.0307	68.845	0.0069	15.75	9.83E-007	11198	0.66
C828	BLANK	0.0017							
VERAGES					**0.0069**	**15.75**	**9.83E-007**	**11198**	**0.66**

APPENDIX C

ISOKINETIC STACK CALCULATOR

(Revised 06/03/96)

INPUT PARAMETERS	
PITOT COEFFICIENT (Cp):	0.84
METER TEMPERATURE (°F):	115
STACK TEMPERATURE (°F):	305
AVERAGE DELTA P ("H2O):	1
MAXIMUM DELTA P ("H2O):	1.3
ESTIMATED MOISTURE (%):	24
METER BOX NUMBER:	1284-239
DELTA H @:	1.919
NOZZLE DIAMETER (Dn) DATA	
CALCULATED DIAMETER (in.):	0.2382
SELECTED SIZE (in.):	0.25
CALCULATED PARAMETERS	
K FACTOR =	2.1468
ISOKINETIC DELTA H ("H2O) =	2.15
MAX DELTA H ("H2O) =	2.79
SAMPLING PARAMETERS	
MIMIMUM SAMPLE VOLUME REQUIRED (dscf):	60
SAMPLE TIME REQUIRED (min):	86
SAMPLE RATE > 0.75 CFM	0.79
MAX SAMPLE RATE > 0.75 cfm:	0.9

PROJECT NUMBER: 001266

TEST RUN NUMBER: 1-2

METHOD 5

CLIENT:	OMYA, INC.
FACILITY:	FLORENCE, VT
PROJECT:	001266
UNIT:	FLASH DRYER 3
TEST DATE:	August 10, 2000
TEST RUN:	1-2
Run Clock Time (24-Hr.):	14:46-16:26
Sample Duration (min.):	96
Number of Sample Points:	24

Barometric Press. - Pb ("Hg):	29.34
Static Press. - Pst ("H2O):	-0.51
Stack Press. - Ps ("Hg.):	29.30
Pitot Coefficient - Cp:	0.84
Nozzle Number:	B-4
Nozzle Diameter - Dn (in):	0.250
Meter Box Number:	1284-239
Dry Gas Meter Cal. (Y):	1.008
Stack area (ft²):	4.909
Filter Number(s):	42-002

Impinger Volume (ml)		
	Initial	Final
1>	100	350
2>	100	162
3>	0	4
Silica Gel (g)		
	Initial	Final
4>	200	222.2
Total Volume>		338.2

Pitot Leak Checks		
Pre-test:	Positive	OK
	Negative	OK
Post-test:	Positive	OK
	Negative	OK

Vacuum Leak Check		
	Leak Rate (cf.)	Vacuum ("Hg.)
Pre-test:	0.006	15
Post-test:	0.009	15

Gas Composition	
O2	18.5
CO2	2.5
CO	0
N2	79

SAMPLE POINT	CLOCK TIME (24 Hr)	GAS METER READING (cf)	DELTA P (In. H20)	DESIRED DELTA H (In. H20)	ACTUAL DELTA H (In. H20)	TEMPERATURES (°F) STACK	DRY GAS METER INLET	DRY GAS METER OUTLET	SQUARE ROOT DELTA P	PERCENT ISO
E1	14:46	77.228	1.1	2.36	2.36	305	120	100	1.049	88.1
2	14:50	80.24	1.05	2.25	2.25	308	133	102	1.025	102.7
3	14:54	83.71	1.1	2.36	2.36	308	133	104	1.049	98.8
4	14:58	87.13	1.2	2.58	2.58	310	133	105	1.095	96.4
5	15:02	90.61	1.1	2.36	2.36	307	135	107	1.049	100.3
6	15:06	94.1	1.05	2.25	2.25	308	135	107	1.025	98.6
7	15:10	97.45	1.1	2.36	2.36	306	136	108	1.049	97.8
8	15:14	100.86	1.1	2.36	2.36	304	135	108	1.049	98.6
9	15:18	104.3	1.05	2.25	2.25	308	134	109	1.025	98.8
10	15:22	107.66	0.88	1.89	1.89	304	134	107	0.938	99.7
11	15:26	110.77	0.72	1.55	1.55	300	132	109	0.849	102.7
12	15:30	113.68	0.68	1.46	1.46	290	129	108	0.825	100.1
END	15:34	116.444								
B1	15:38	116.444	0.8	1.72	1.72	305	118	106	0.894	93.4
2	15:42	119.18	0.78	1.67	1.67	307	130	107	0.883	96.5
3	15:46	122	0.9	1.93	1.93	305	133	108	0.949	87.9
4	15:50	124.77	1	2.15	2.15	301	132	109	1	92.8
5	15:54	127.86	1.05	2.25	2.25	301	133	109	1.025	96.9
6	15:58	131.17	1.1	2.36	2.36	307	136	110	1.049	98.5
7	16:02	134.61	1.1	2.36	2.36	305	136	110	1.049	99.5
8	16:06	138.09	1.1	2.36	2.36	303	138	110	1.049	99
9	16:10	141.56	1.05	2.25	2.25	301	138	111	1.025	98.7
10	16:14	144.95	0.94	2.02	2.02	300	138	111	0.97	100.2
11	16:18	148.21	0.68	1.46	1.46	294	136	111	0.825	101.1
12	16:22	151.02	0.62	1.33	1.33	288	132	112	0.787	107.5
END	16:26	153.874								

000003

APPENDIX D

SAMPLE LOG/CHAIN OF CUSTODY RECORD

AQTS CLIENT:	OMYA, Inc.
PROJECT:	001266

Sample Number	Date Collected	Date Received	Test Number	Description
C819	08/10/00	08/11/00	1-2	Paper Filter 42-002
C820	08/10/00	08/11/00	1-2	Front Half Acetone wash - 150 ml

Samples Logged By:	John J. Jasko	Date:	8/11/00	Time:	18:00

Samples Relinquished By:			Date:		Time:	
Samples Received By:			Date:		Time:	

FILTER TARE WEIGHT LOG

CLIENT:	OMYA
PROJECT:	001266
FILTER TYPE:	42
SIZE:	110 mm

Filter Number		Date/Time Weight (g)			
42	001	08/09/00 15:00	08/09/00 21:20		
		0.9292	0.9296		
42	002	08/09/00 15:00	08/09/00 21:20		
		0.9238	0.9241		
42	003	08/09/00 15:00	08/09/00 21:20		
		0.9219	0.9216		
42	004	08/09/00 15:00	08/09/00 21:20		
		0.9287	0.9291		
42	005	08/09/00 15:00	08/09/00 21:20		
		0.9249	0.9252		
42	006	08/09/00 15:00	08/09/00 21:20		
		0.9305	0.9307		

SAMPLE WEIGHT LOG SHEET

Client: OMYA, Inc.
Facility: Florence, VT
Project: 001266 - FD#3

Sample Number	Identification / Tare Weight (g.)	Date/Time / Gross Weight (g.)			
C819	PF 42-002	08/15/00 - 08:00	08/16/00 - 07:30	08/16/00 - 15:30	08/21/00 - 06:30
	0.9241	0.9491	0.9482	0.9464	0.9468
C820	Beaker 150O	08/15/00 - 08:00	08/16/00 - 07:30	08/16/00 - 15:30	08/21/00 - 06:30
	69.1200	69.1311	69.1291	69.1297	69.1297

PARTICULATE LAB ANALYSIS
SUMMARY SHEET

Client: OMYA, Inc. Project Number: 001266 Test/Run: 1-2

Sample Identification

Number	Description
C819	PF 42-002
C820	Front half acetone wash - 225 ml A/P
C828	Acetone blank - 225 ml A/P

Acetone Blank Background Data

Manufacturer: Anachemia Lot/Batch: 990413 Density: 0.7857 g/ml

C_a = Acetone blank residue concentration (mg/mg)
m_a = Mass of acetone residue after evaporation (mg)
V_a = Volume of acetone blank (ml)
ρ_a = Density of acetone (mg/ml)

$$C_a = m_a/(V_a\ \rho_a) = (\ 1.7\ )/(\ 225\ )(\ 0.0007857\ ) = \underline{9.616}\ \text{mg/mg}$$

Front Half Acetone Wash Data

W_a = Weight of acetone residue in wash (mg)
V_{aw} = Volume of acetone wash (ml)

$$W_a = C_a V_a \rho_a = (\ 9.616\ )(\ 225\ )(\ 0.0007857\ ) = \underline{1.7}\ \text{mg}$$

Acetone Wash Data

Beaker Number: 150/O

Gross Weight (g):	60.1297
Tare Weight (g):	60.1200
Blank Weight (g):	0.0017
Net Weight (g):	0.0080

Filter Data

Filter Number: 42-002

Gross Weight (g):	0.9468
Tare Weight (g):	0.9241
Net Weight (g):	0.0227

Particulate Weight Summary

Weight of particulate in front half wash (g):	0.0080
Weight of particulate on filter (g):	0.0227
Total weight of particulate catch (g):	0.0307

APPENDIX E

METER BOX CALIBRATION
SEMI-ANNUAL

DATE: 03-Jul-00
CALIBRATED BY: Mike Spector

METER BOX NUMBER: 1084-239
NEXT CAL DUE: 02-Jan-01

BAROMETRIC PRESSURE (in. Hg)	ORIFICE MANOMETER SETTING (in. H2O)	WET TEST METER VOLUME (cf)	DRY GAS METER VOLUME INITIAL (cf)	DRY GAS METER VOLUME FINAL (cf)	TEMPERATURES WET TEST METER (°F)	TEMPERATURES DRY GAS METER INLET (°F)	TEMPERATURES DRY GAS METER OUTLET (°F)	TEMPERATURES DRY GAS METER AVERAGE (°F)	TIME (min)	YI	DELTA H@
29.91	0.5	5	177.848	182.862	74.0	79 100	75 80	83.5	12.78	1.014	1.816
29.91	1.0	5	183.042	188.143	74.0	95 110	81 86	93.0	9.35	1.013	1.911
29.91	1.5	10	189.145	199.526	74.0	106 114	87 93	100.0	15.43	1.006	1.927
29.91	2.0	10	199.745	210.236	74.0	110 122	93 96	105.3	13.45	1.004	1.934
29.91	3.0	10	210.767	221.315	74.0	119 127	96 98	110.0	11.07	1.005	1.949
29.91	4.0	10	221.971	232.551	74.0	122 128	99 101	112.5	9.67	1.003	1.975
									AVERAGE	1.008	1.919

TOLERANCES FROM AVERAGE FOR Yi and DELTA H@ ARE <0.02 AND 0.20, RESPECTIVELY

Yi	Yi DIFF	DELTA H@	DELTA H@ DIFF
1.014	0.006	1.816	-0.103
1.013	0.005	1.911	-0.008
1.006	-0.002	1.927	0.008
1.004	-0.004	1.934	0.015
1.005	-0.003	1.949	0.030
1.003	-0.005	1.975	0.056

METER BOX CALIBRATION
(POST-TEST)

PROJECT: 001266
DATE: 25-Oct-00
CALIBRATED BY: Roland Tremble

METER BOX NUMBER: 1084-239
PRETEST CAL Y: 1.008

BAROMETRIC PRESSURE (In. Hg)	ORIFICE MANOMETER SETTING (In. H2O)	MAXIMUM VACUUM (In. H2O)	WET TEST METER VOLUME (cf)	DRY GAS METER VOLUME		TEMPERATURES				TIME (min)	Yi
				INITIAL (cf)	FINAL (cf)	WET TEST METER (°F)	DRY GAS METER INLET (°F)	DRY GAS METER OUTLET (°F)	DRY GAS METER AVERAGE (°F)		
30.06	2.10	13.0	10	557.782	568.079	59.5	100 107	69 73	87.3	13.16	1.018
30.06	2.10	13.0	10	568.079	578.581	59.5	105 113	74 81	93.3	13.17	1.009
30.06	2.10	13.0	10	578.581	589.238	59.5	108 117	83 87	98.8	13.18	1.004
										AVERAGE	1.010

ACCEPTABLE VARIATION IN CALIBRATION
(Must be less than 5% of Pretest Meter Calibration)

Difference from Pretest Calibration = 0.2 % >>>> ACCEPTABLE