JUNE, 1997

COMPLIANCE REPORT

SOURCE EMISSION
COMPLIANCE PROGRAM
and
EVALUATION PROGRAM
for
NON-METALLIC MINERAL PROCESSING PLANT

Prepared for:
OMYA, Inc.
61 Main Street
Proctor, Vermont 05765

Purchase Order Number: 87512

Prepared by:
Air Quality Technical Services, Inc.
18 Morse Drive
Essex Junction, Vermont 05452

Project Numbers: 971216/971217

July 14, 1997

FOREWORD

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

This report serves as a protocol to the State of Vermont Agency of Natural Resources, Air Pollution Control Division outlining test methods and analytical procedures to be used in the performance of the compliance program.

John J. Jasko
President

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1.0 INTRODUCTION

On September 13, 1996, the State of Vermont Agency of Natural Resources, Air Pollution Control Division (APCD), issued OMYA, Inc. (OMYA) an amended Air Pollution Control Permit (#AP-89-049d) to install and operate two new flash dryers systems, designated as Flash Dryer #1 and Flash Dryer #2, at the Verpol Plant it owns and operates in Florence, Vermont.

An Emissions Limitations section of the Permit address the discharge of air contaminants released to the atmosphere from the facility as follows:

Permit Condition (7) Visible Emission Standards (a) sets a limit on visible emissions (VE) of no greater than 7 percent opacity for fabric filter dust collectors, and, (c) requires that compliance with opacity standards be determined in accordance with Code of Federal Regulations (CFR) 40, Appendix A, Reference Method 9.

Permit Condition (8) specifies that emission concentrations of particulate matter (PM) from fabric filter dust collectors not exceed 0.01 grains per dry standard cubic foot (gr/dscf) and further limits the overall emission rates of PM from Flash Dryers #1 or #2 to 0.86 pounds per hour (lbs/hr), and states that compliance with emission limits be determined in accordance with CFR 40, Appendix A, Reference Method 5.

Permit Condition (10) specifies that emission rates of sulfur dioxide (SO_2) for Flash Dryers #1 or #2 not exceed 2.6 lbs/hr, and states that compliance with emission limit be determined in accordance with CFR 40, Appendix A, Reference Method 6C or other approved alternative method.

Permit Condition (32) requires that emission testing of the new flash dryers be conducted to demonstrate compliance with applicable emission limitations and a written report of the results be submitted within 180 days after the initial start-up date.

In addition, OMYA wished to conduct the necessary emission testing specified in Permit Condition (14) of the Operational Restrictions section of the Permit in order to increase the maximum allowable production rates of Surface Treater B and Spray Dryer #1. Surface Treater B is currently limited to an allowable production rate of 12.8 Mtph; Spray Dryer #1 is currently limited to 18.2 Mtph.

Permit Condition (8) specifies that emission concentrations of particulate matter (PM) from fabric filter dust collectors not exceed 0.01 grains per dry standard cubic foot (gr/dscf) and further limits the overall emission rates of PM from Surface Treater B to 2.1 lbs/hr,

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Permit Condition (9) specifies that the emission rate of particulate matter (PM) from Spray Dryer #1 shall not exceed 0.060 lbs/short ton of solids entering the spray dryer on an hourly basis, and 1.3 lbs/hr.

OMYA also wanted to include the evaluation of SO_2 emissions from Spray Dryer #1 in the testing program to obtain data necessary to investigate the potential for applying for applicable emission credits.

The field portion of the compliance and evaluation test program was performed June 9 - 13, 1997. The major on-site representatives that participated in the program and their respective affiliations were:

OMYA, Inc.
- Neal Jordan - Environmental Manager
- 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
- Tim Tomasi - Environmental Technician
- Simon Majahad - Environmental Technician

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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).

Sulfur dioxide was collected as a gaseous sample fraction in the particulate sample train back half condensing unit impingers in a solution of 3% hydrogen peroxide (H_2O_2).

Visible emissions were measured as the density of the plumes observed at 15 second intervals over the course of a one hour time period.

2.1 COMPLIANCE TESTING

2.1.1 FLASH DRYER #1

2.1.1.1 Particulate Matter

The concentrations of PM for the three test runs conducted were 0.0017, 0.0021, and 0.0029 gr/dscf, respectively, with an average of 0.0022 gr/dscf. The corresponding emission rates of PM were 0.12, 0.15 and 0.20 lbs/hr with an average of 0.16 lbs/hr.

2.1.1.2 Sulfur Dioxide

The concentrations of SO_2 for the three test runs conducted were 0, 0, and 0 ppm, respectively, with an overall average of 0 ppm. The corresponding average emission rates of SO_2 for the three test runs were 0, 0, and 0 lbs/hr with an overall average of 0 lbs/hr.

2.1.1.3 Visible Emissions

The highest average opacities determined for the highest 6 minute period during each hour of observation were 0, 0, and 0 percent.

A summary of the PM, SO_2, and VE test determinations for Flash Dryer #1 is presented in Table 2-1.

TEST DATA SUMMARY

FLASH DRYER #1

Test Run	4-1	4-2	4-4	Average
Date	06/12/97	06/12/97	06/13/97	----
Clock Time (24 hour)	1225-1427	1540-1742	1225-1427	----
Test Duration (minutes)	120	120	120	----
Test Measurements				
Isokinetics (%)	101.4	98.4	102.1	----
Moisture Content (%)	21.7	21.7	20.8	21.4
Temperature (°F)	294	300.5	294.2	296.2
Gas Composition - CO_2 (%)	1	1	1	1
O_2 (%)	18	18	18	18
CO (%)	0	0	0	0
N_2 (%)	81	81	81	81
Gas Velocity (fps)	51.1	52.7	52.5	52.1
Gas Volumetric Flow (dscfm)	8170	8334	8445	8316
(acfm)	15051	15522	15463	15345
Emission Determinations				
Particulate:				
Concentration (gr/dscf)	0.0017	0.0022	0.0028	0.0022
(mg/dscm)	3.94	4.92	6.44	5.1
(lbs/dcsf)	2.46×10^{-7}	3.07×10^{-7}	4.02×10^{-7}	3.91×10^{-7}
Emission Rate (lbs/hr)	0.12	0.16	0.2	0.16
Sulfur Dioxide:				
Concentration (ppm)	0	0	0	0
(mg/dscm)	0	0	0	0
(lbs/dcsf)	0	0	0	0
Emission Rate (lbs/hr)	0	0	0	0
Visible Emissions:				
Highest Average Opacity (%)	0	0	0	----
Number of Readings >7% Limit	0	0	0	----

Table 1-1

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3.0 COMPLIANCE PROCEDURES

The procedures used in the source emission compliance/evaluation programs were conducted in accordance with standard methods described in **40 CFR 60** (revised July 1, 1995), **Standards of Performance for New Stationary Sources, Appendix A - Test Methods.**

The specific EPA methods are referenced as follows:

Method 1 - Sample Velocity Traverses for Stationary Sources;
Method 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube);
Method 3 - Gas Analysis for Determination of Dry Molecular Weight;
Method 4 - Determination of Moisture Content in Stack Gas
Method 6 - Determination of Sulfur Dioxide Emissions from Stationary Sources;
Method 5 - Determination of Particulate Emissions form Stationary Sources;
Method 8 - Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions form Stationary Sources;
Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources.

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3.1 SAMPLING LOCATION

The sampling ports were positioned according to Method 1 - Sample and Velocity Traverses for Stationary Sources (40 CFR 60, App. A, pp. 489 - 495).

3.1.1 Flash Dryer #1

The inside diameter of the stack at the sample location was 30 inches. Two sample ports were located approximately 126 inches from a 45° transition in the ductwork and approximately 30 inches from the outlet of the stack. These dimensions placed the sample ports 4.2 diameters downstream and 1.0 diameters upstream from respective flow disturbances.

In accordance with Method 1 a minimum of twenty-four sample points were required for a particulate traverse. Twelve traverse points positioned at 1.0, 2.0, 3.5, 5.3, 7.5, 10.7, 19.3, 22.5, 24.7, 26.5, 28.0 and 29.0 inches from the stack wall were sampled through each port.

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3.2 PARTICULATE/SULFUR DIOXIDE

For sources requiring PM emission determination, sample collection and analysis was performed according to procedures outlined in Method 5 - Determination of Particulate Emissions from Stationary Sources (40 CFR 60, App. A, pp. 541 - 565); for sources requiring PM/SO_2 emission determination, sample collection and analyses was performed according to Method 8 - Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions From Stationary Sources (40 CFR 60, App. A, pp. 648 - 656) using the option for simultaneous determination of filterable particulate matter (§1.2 Applicability).

A total of three test runs were conducted for the purpose of determining compliance or evaluating emissions. Each test run conducted for compliance had a minimum sample duration of 60 minutes and collected a minimum volume of the 60 dscf required by 40 CFR Part 60, Subpart OOO for PM concentration determination (§ 60.675 Test Methods and Procedures). Each test run conducted for evaluation had a minimum sample duration of 60 minutes and collected a minimum volume of 31.4 dscf. A sampling rate, +/- 10 percent of the isokinetic rate, was maintained over the course of each test run.

3.2.1 Sampling Apparatus

3.2.1.1 Particulate

The PM sample train consisted of:

a) a stainless steel nozzle sized to maintain isokinetic sampling;

b) a borosilicate glass-lined probe heated to a temperature greater than the stack temperature;

c) an encased glass fiber filter heated to a temperature greater than the stack temperature;

d) a sample/moisture condensing unit with four 500 ml glass impingers immersed in an ice water bath:

1 modified Greenburg-Smith type containing 100 ml of H_2O,

1 Greenburg-Smith type containing 100 ml of H_2O,

1 modified Greenburg-Smith type empty; and,

1 modified Greenburg-Smith type containing 200 grams of silica gel;

e) an umbilical; and,

f) a metering console with: main valve and by-pass valve for flow adjustment, leak-free pump, calibrated dry gas meter with inlet and outlet temperature gauges, calibrated orifice, and inclined manometer.

3.2.1.2 Particulate/Sulfur Dioxide

The PM/SO_2 sample train consisted of:

a) a stainless steel nozzle sized to maintain isokinetic sampling;

b) a borosilicate glass-lined probe heated to a temperature greater than the stack temperature;

c) an encased glass fiber filter heated to a temperature greater than the stack temperature;

d) a sample/moisture condensing unit with four 500 ml glass impingers immersed in an ice water bath:

1 modified Greenburg-Smith type containing 100 ml of 80% IPA fitted with a glass wool plug at the exit to prevent carryover and weighed to the nearest 0.5 g,

1 Greenburg-Smith type containing 100 ml of 3% H_2O_2 and weighed to the nearest 0.5 g,

1 modified Greenburg-Smith type containing 100 ml of 3% H_2O_2 and weighed to the nearest 0.5 g, and,

1 modified Greenburg-Smith type containing 200 grams of silica gel;

e) an umbilical; and,

f) a metering console with: main valve and by-pass valve for flow adjustment, leak-free pump, calibrated dry gas meter with inlet and outlet temperature gauges, calibrated orifice, and inclined manometer.

The typical sampling apparatus is depicted in Figure 3-1.

Method 5 - Particulate Sampling Train

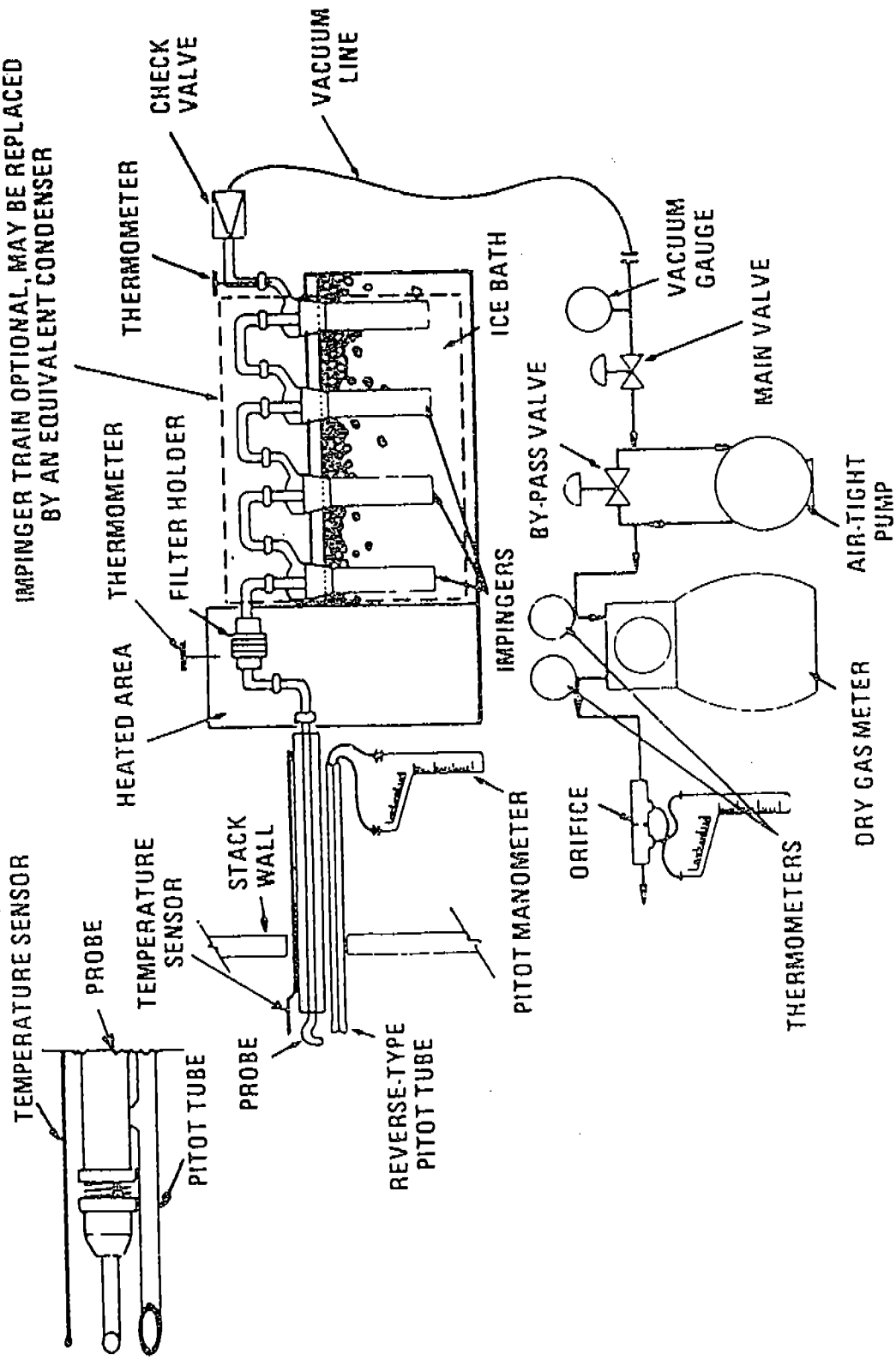

Figure 3-1

3.2.2 Sample Recovery

3.2.2.1 Particulate

The samples were handled or recovered in the field using the procedures outlined below:

Filter - The filter was removed from the filter holder, placed in it's original container, sealed, labeled for identification, and secured for transport.

Front half - The nozzle and probe were internally brushed and rinsed with acetone to remove any particulate matter which may have been deposited during a test run. The rinse was collected in a glass jar, sealed with a Teflon lined cap, labeled for identification noting the volume of the contents, and secured for transport.

Impinger catch - The volumes in the first three impingers were measured, recorded, and discarded.

Silica gel - The silica gel was transferred from the last impinger to a tared container, weighed, and the weight was recorded.

3.2.2.2 Particulate/Sulfur Dioxide

The samples were recovered in the field using the procedures outlined below:

Filter - The filter was removed from the filter holder, placed in it's original container, sealed, labeled for identification, and secured for transport.

Front half - The nozzle, probe, front half of the filter holder and connecting glassware were internally brushed and rinsed with acetone to remove any particulate matter which may have been deposited during a test run. The rinse was collected in a glass jar, sealed with a Teflon lined cap, sealed, and labeled for identification noting the volume of the contents, and secured for transport.

Impinger catch - The first impinger was weighed to the nearest 0.5 g., the weight was recorded and the contents was discarded. The second and third impingers were weighed to the nearest 0.5 g., the weights were recorded and the contents was transferred to a sample jar. The second and third impingers and connecting glassware were then rinsed with distilled deionized water, the rinse was added to the same sample jar containing the impinger catch, sealed, and labeled for identification noting the volume of the contents, and secured for transport.

Silica gel - The silica gel was transferred from the last impinger to a tared container, weighed, and the weight was recorded.

3.2.3 Sample Analysis

3.2.3.1 Particulate

Prior to use in the program, glass fiber filters were marked with an identifying number, desiccated for a minimum of 24 hours, weighed, re-desiccated for a minimum of 6 hours, re-weighed to establish a final constant weight (<0.5 mg difference), and, sealed in individual plastic petri dish containers that were labeled with the identifying number and tare weight of the filter.

After use in the program, the filters were placed in a dessicator, desiccated for a minimum of 24 hours, weighed, re-dessicated for a minimum of 6 hours, re-weighed to establish a final constant weight (<0.5 mg difference).

The front half acetone washes were transferred to tared beakers, evaporated, desiccated for a minimum of 24 hours, weighed, re-dessicated for a minimum of 6 hours, re-weighed to establish a final constant weight (<0.5 mg difference).

3.2.3.2 Sulfur Dioxide

The SO_2 samples were quantitatively transferred to 500-ml volumetric flasks. The sample jars were rinsed with distilled dionized water and the rinses were added to the volumetric flasks. The contents of the flasks were then brought to volume with distilled dionized water. A 50 ml aliquot of each diluted sample was then pipetted to separate 250 ml Erlenmeyer flasks, 40 ml of IPA and thorin indicator were added, and the solutions were titrated to a faint pink endpoint with 0.01 N barium perchlorate. Titrations were repeated with additional sample aliquots until the titrant volumes agree within 1 percent or 0.2 ml, whichever was greater.

3.3 GAS VELOCITY/VOLUMETRIC FLOW

Measurements of stack gas velocity and volumetric flow were performed according to procedures outlined in Method 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate (40 CFR 60, App. A, pp. 489 - 495).

3.3.1 Measurement Apparatus

The apparatus used to measure stack differential pressure and temperature profiles consisted of:

a) a Type S (Stausscheibe) pitot tube with an assigned design coefficient of 0.84 connected to an inclined manometer; and,

b) Type-K thermocouple probe connected to a digital pyrometer.

3.4 GAS COMPOSITION

Carbon dioxide (CO_2) and oxygen (O_2) sample collection and analyses was performed according to procedures outlined in using EPA Test Method 3 - Gas Analysis for the Determination of Dry Molecular Weight (40 CFR 60, App. A, pp. 523 - 527).

A single-point grab sample was taken and analyzed with Fyrite analyzers to measure the CO_2 and O_2 concentrations. The balance of the gas composition was considered N_2. The results were used to determine the dry molecular weight of the effluent stream.

3.5 VISIBLE EMISSIONS

Visible emission (VE) evaluation was performed according to procedures outlined in using EPA Test Method 9 - Visible Determination of the Opacity of Emissions from Stationary Sources (40 CFR 60, App. A, pp. 656 - 662).

Visible emission observations were made by a certified observer at the point of greatest opacity in that portion of the plume where condensed water vapor was not present. The observer was situated so the plume was viewed against the best available contrasting background while the sun was positioned within a 140° sector to his back. In accordance with Subpart OOO requirements the minimum distance between the observer and the emission source was 15 feet. A total of three test runs of 60 minute duration were performed. A run will consisted of 10 sets of 24 consecutive observations, recorded to the nearest 5 percent, made at 15 second intervals.

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4.0 QUALITY ASSURANCE/QUALITY CONTROL

Air Quality Technical Services, Inc. maintains a QA/QC program to ensure sampling techniques and analytical procedures are valid and data generated from test programs are accurate.

4.1 CHAIN OF CUSTODY

AQTS utilizes chain-of-custody procedures. While in the field, samples collected during each test run are sealed in appropriate sample vessels, labeled and identified by field number, and placed in secure containers. Storage containers are the responsibility of the project director or assigned personnel. Upon return to AQTS facilities, samples are logged in and assigned sample identification numbers. Samples are safely and properly stored until processed and/or shipped to an outside laboratory.

4.2 EQUIPMENT CALIBRATIONS

Dry gas meters and orifices undergo semi-annual calibration according to procedures outlined in Method 5, Section 5 - Calibration (§5.3 Metering System, §5.3.1 Calibration Prior to Use). After completion of compliance programs, dry gas meter calibrations are rechecked for accuracy according to procedures outlined in Method 5, Section 5 - Calibration (§5.3 Metering System, §5.3.2 Calibration After Use).

Prior to use in compliance programs, probe nozzles are calibrated according to procedures outlined in Method 5, Section 5 - Calibration (§5.1 Probe Nozzle).

Thermometers and barometers are calibrated according to Method 6, §5.2 and §5.4.

Prior to field use, pitot tube assemblies are checked for conformity with the design specifications listed in Method 2 (4. Calibration, §4.1 Type S Pitot Tube, §4.1.1 Type S Pitot Tube Assemblies).

Thermocouple probes undergo annual calibration according to procedures outlined in the Quality Assurance Handbook, Section 3.1 - Method 2 (§3.1.2 Calibration of Apparatus).

4.3 EQUIPMENT LEAK CHECKS

4.3.1 Particulate Sample Trains

Sample trains are leak checked according to procedures outlined in Method 5, Section 4 - Procedure (§4.1 Sampling, §4.1.4 Leak-Check Procedures). Before the start of each test run, the inlet of the probe nozzle is plugged and a vacuum of approximately 15" Hg is drawn and held. The metering dial is timed for a period of one minute and any movement during that period is noted. At the end of each test run, the same procedure is followed using the highest vacuum attained during the run. In each instance, the maximum acceptable leakage rate is 0.02 cfm.

4.3.2 Pitot Tubes

Pitot tubes are leak checked according to procedures outlined in Method 2 (§3. Procedure, §3.1). The pitot tubes are subjected to leak checks prior to and after a test run. The impact opening of a pitot is blown through until a minimum pressure of 3" H_2O registers on an inclined manometer. The impact opening is then closed off and a pressure reading observed. The reading must remain stable for a period of 15 seconds to be accepted. The same procedure is used to check the static pressure side of the pitot by applying suction to the static opening.

4.4 METHOD BLANKS

Method blanks (filters, absorbing solution, rinses, and digestion media) are handled and processed like actual samples. The blanks are weighed, evaporated, digested, and analyzed accordingly. Blanks reported greater than analytical detection levels are subtracted from sample results.

4.5 DATA REDUCTION AND HANDLING

Data are generally reported in English units, however, metric units are reported as requested by clients or regulatory agencies. The flow of data conforms to standard chain-of-custody procedures. Raw data generated from AQTS emission evaluation and compliance test programs are reduced using Lotus 1-2-3 or data acquisition systems. Calculations generally follow equations found in 40 CFR 60, Appendix A, Test Methods or other air pollution and engineering references. Spreadsheet equations and calculations are frequently verified using scientific calculators. Isokinetic tests are manually recorded on data sheets and/or

Lotus spreadsheets. Isokinetic sample rates are adjusted using a spreadsheet and/or slide rule nomograph.

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APPENDIX A

METHOD 5
PARTICULATE EQUATION FORMAT

Volume of dry gas sampled at standard conditions, 68 °F, 29.92 "Hg - Vm_{std} (scf):

$$Vm_{std} = 17.65\ (Vm)\ (Y)\ \sqrt{\frac{Pb + \frac{\Delta H}{13.6}}{Tm + 460}}$$

Stack gas moisture condensed at standard conditions - Vw_{std} (scf):

$$Vw_{std} = 0.04707\ (Vlc)$$

Decimal fraction stack gas proportion of water by volume - Bwo

$$Bwo = \frac{Vw_{std}}{Vw_{std} + Vm_{std}}$$

Stack gas dry molecular weight - MW_d (lb/lb-mole):

$$MW_d = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

Stack gas molecular weight - MW_s (lb/lb-mole):

$$MW_s = MW_d\ (1 - Bwo) + 18\ (Bwo)$$

Pressure of stack - Ps (in. Hg):

$$Ps = Pb + (Pst/13.6)$$

Stack gas velocity at stack conditions - Vs (fps):

$$Vs = 85.49\ (Cp)\left(\sqrt{\Delta P}\right)_{avg}\sqrt{\frac{Ts + 460}{(Ps)\ (MW_s)}}$$

Stack gas volumetric flow rate at standard conditions - Qs_s (scfm):

$$Qs_s = 60\ (Vs)\ (As)\left(\frac{528}{Ts + 460}\right)\left(\frac{Ps}{29.92}\right)$$

Stack gas volumetric flow rate at actual conditions - Qs_a (acfm):

$$Qs_a = 60\ (Vs)\ (As)$$

Stack gas volumetric flow at dry standard conditions - Qs_d(dscfm):

$$Qs_d = (60)\ (1 - Bwo)\ (Vs)\ (As)\left(\frac{528}{Ts + 460}\right)\left(\frac{Ps}{29.92}\right)$$

Concentration of particulate matter in stack gas, dry basis, standard conditions - Cs (gr/dscf)

$$Cs = 15.432\left(\frac{Mp}{Vm_{std}}\right)$$

Emission rate of particulate matter, dry basis, standard conditions - ER (lbs/hr)

$$ER = 0.00857\ (Qs_d)\ (Cs)$$

Isokinetic variation - Iso (%)

$$Iso = \frac{17.33\ (Ts + 460)\left[0.04707\ (Vlc) + Vm_{std}\right]}{\theta\ (Vs)\ (Ps)\ (Dn^2)}$$

Where:

As = Cross section area of stack (ft^2)
Cp = Pitot tube coefficient
Dn = Diameter of nozzle (in.)
ΔH = Pressure differential across orifice (in. H_2O)
Mp = Mass of particulate in grams
Pb = Barometric pressure (in. Hg)
Pst = Static pressure of stack (in. H_2O)
Pstd = Standard pressure, 29.92 (in. H_2O)
ΔP = Stack differential pressure (in. H_2O)
Tm = Average temperature of dry gas meter (°F)
Ts = Average stack temperature (°F)
Tstd = Standard temperture, 68 (°F)
Vlc = Volume of liquid condensate (ml)
Vm = Volume of dry gas sample metered (ft^3)
Y = Dry gas meter correction factor
θ = Sample duration (min.)
0.00857 = Conversion factor, gr to lbs and min. to hr.
0.04707 = Conversion factor, ml to ft^3
0.264 = ratio of O_2 to N_2 in air, v/v
15.432 = Conversion factor, g/ft^3 to gr/ft^3
17.65 = Conversion factor, standard temperature and pressure
17.33 = Isokinetic constant from factoring
18 = Molecular weight of water
85.49 = Pitot tube constant

APPENDIX B

FIELD DATA TEST RESULTS

CLIENT: OMYA, INC.
FACILITY: FLORENCE, VT
PROJECT: 971216
UNIT: FLASH DRYER 1
TEST DATE: JUNE 12, 1997
TEST RUN: 4-1

TEST DATA SUMMARY

INPUT VALUES

Pitot Coefficient - Cp:	0.84
Nozzle Diameter - Dn (in):	0.25
Dry Gas Meter Cal. (Y):	1.002
Stack Area (ft^2):	4.909
Barometric Press. - Pb ("Hg):	29.65
Static Press. - Pst ("Hg):	-0.35
Sample Duration (min.):	120
Volume of Gas Metered - Vm (ft^3):	75.585
Volume of Water Condensed - Vlc (g.):	406.2
Oxygen - O2 (%):	18
Carbon Dioxide - CO2 (%):	1
Carbon Monoxide - CO (%):	0
Nitrogen - N2 (%):	81

Average Delta P (" H2O):	0.535
Average Delta H ("H2O):	1.333
Stack Temperature - Ts (°F):	294
Meter Temperature - Tm (°F):	113.9
Average Square Root of Delta P:	0.727
Mass of Particulate Collected - Mp - (g.):	0.0077

OUTPUT VALUES

Dry Gas Volume (Standard) - Vmstd (dscf):	69.002
Volume of Water (Standard) - Vwstd (scf):	19.12
Stack Gas Water Proportion by Volume - Bwo:	0.217
Molecular Weight of Dry Stack Gas - MWd (lb/lb-mole):	28.88
Molecular Weight of Stack Gas - MWs (lb/lb-mole):	26.52
Pressure of Stack - Ps ("Hg.):	29.62
Velocity of Stack Gas - Vs (fps):	51.1
Dry Standard Volumetric Flow of Stack Gas - Qdscfm:	8170
Actual Volumetric Flow of Stack Gas - Qacfm:	15051
Test Isokinetic Sample Rate (%):	101.4
Particulate Concentration of Stack Gas - Cs (gr/dscf):	0.0017
Particulate Emission Rate - ER (lbs/hr):	0.12

FIELD DATA TEST RESULTS

CLIENT: OMYA, INC.
FACILITY: FLORENCE, VT
PROJECT: 971216
UNIT: FLASH DRYER 1
TEST DATE: JUNE 12, 1997
TEST RUN: 4-2

TEST DATA SUMMARY

INPUT VALUES	
Pitot Coefficient - Cp:	0.84
Nozzle Diameter - Dn (in):	0.255
Dry Gas Meter Cal. (Y):	1.002
Stack Area (ft^2):	4.909
Barometric Press. - Pb ("Hg):	29.58
Static Press. - Pst ("Hg):	-0.35
Sample Duration (min.):	120
Volume of Gas Metered - Vm (ft^3):	76.693
Volume of Water Condensed - Vlc (g.):	418.1
Oxygen - O2 (%):	18
Carbon Dioxide - CO2 (%):	1
Carbon Monoxide - CO (%):	0
Nitrogen - N2 (%):	81

Average Delta P (" H2O):	0.562
Average Delta H ("H2O):	1.419
Stack Temperature - Ts (°F):	300.5
Meter Temperature - Tm (°F):	104.2
Average Square Root of Delta P:	0.745
Mass of Particulate Collected - Mp - (g.):	0.0099

OUTPUT VALUES	
Dry Gas Volume (Standard) - Vmstd (dscf):	71.049
Volume of Water (Standard) - Vwstd (scf):	19.68
Stack Gas Water Proportion by Volume - Bwo:	0.217
Molecular Weight of Dry Stack Gas - MWd (lb/lb-mole):	28.88
Molecular Weight of Stack Gas - MWs (lb/lb-mole):	26.52
Pressure of Stack - Ps ("Hg.):	29.55
Velocity of Stack Gas - Vs (fps):	52.7
Dry Standard Volumetric Flow of Stack Gas - Qdscfm:	8334
Actual Volumetric Flow of Stack Gas - Qacfm:	15522
Test Isokinetic Sample Rate (%):	98.4
Particulate Concentration of Stack Gas - Cs (gr/dscf):	0.0022
Particulate Emission Rate - ER (lbs/hr):	0.16

FIELD DATA TEST RESULTS

CLIENT: OMYA, INC.
FACILITY: FLORENCE, VT
PROJECT: 971216
UNIT: FLASH DRYER 1
TEST DATE: JUNE 13, 1997
TEST RUN: 4-3

TEST DATA SUMMARY

INPUT VALUES			
Pitot Coefficient - Cp:	0.84	Average Delta P (" H2O):	0.563
Nozzle Diameter - Dn (in):	0.25	Average Delta H ("H2O):	1.41
Dry Gas Meter Cal. (Y):	1.002	Stack Temperature - Ts (°F):	294.2
Stack Area (ft^2):	4.909	Meter Temperature - Tm (°F):	101.1
Barometric Press. - Pb ("Hg):	29.5	Average Square Root of Delta P:	0.745
Static Press. - Pst ("Hg):	-0.35	Mass of Particulate Collected - Mp - (g.):	0.0131
Sample Duration (min.):	120		
Volume of Gas Metered - Vm (ft^3):	77.267		
Volume of Water Condensed - Vlc (g.):	401		
Oxygen - O2 (%):	18		
Carbon Dioxide - CO2 (%):	1		
Carbon Monoxide - CO (%):	0		
Nitrogen - N2 (%):	81		

OUTPUT VALUES	
Dry Gas Volume (Standard) - Vmstd (dscf):	71.781
Volume of Water (Standard) - Vwstd (scf):	18.875
Stack Gas Water Proportion by Volume - Bwo:	0.208
Molecular Weight of Dry Stack Gas - MWd (lb/lb-mole):	28.88
Molecular Weight of Stack Gas - MWs (lb/lb-mole):	26.62
Pressure of Stack - Ps ("Hg.):	29.47
Velocity of Stack Gas - Vs (fps):	52.5
Dry Standard Volumetric Flow of Stack Gas - Qdscfm:	8445
Actual Volumetric Flow of Stack Gas - Qacfm:	15463
Test Isokinetic Sample Rate (%):	102.1
Particulate Concentration of Stack Gas - Cs (gr/dscf):	0.0028
Particulate Emission Rate - ER (lbs/hr):	0.20

APPENDIX C

OMYA, INC., FLORENCE, VT

PROJECT: 971216

FLASH DRYER #1

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)
C611/C612	4-1	0.0081	0.0077	69.002	0.0017	3.94	2.46E-07	8225	0.12
C614/C615	4-2	0.0103	0.0099	71.049	0.0022	4.92	3.07E-07	8437	0.16
C617/C618	4-3	0.0135	0.0131	71.781	0.0028	6.44	4.02E-07	8225	0.20
C621	BLANK	0.0004							
AVERAGES					0.0022	5.1	3.19E-07	8296	0.16

APPENDIX D

ISOKINETIC STACK CALCULATOR
(Revised 06/03/96)

INPUT PARAMETERS	
PITOT COEFFICIENT (Cp):	0.84
METER TEMPERATURE (°F):	115
STACK TEMPERATURE (°F):	300
AVERAGE DELTA P ("H2O):	0.545
MAXIMUM DELTA P ("H2O):	0.9
ESTIMATED MOISTURE (%):	18
METER BOX NUMBER:	1284-239
DELTA H @:	1.965

NOZZLE DIAMETER (Dn) DATA	
CALCULATED DIAMETER (in.):	0.2681
SELECTED SIZE (in.):	0.25

CALCULATED PARAMETERS	
K FACTOR =	2.513
ISOKINETIC DELTA H ("H2O) =	1.37
MAX DELTA H ("H2O) =	2.26

SAMPLING PARAMETERS	
MIMIMUM SAMPLE VOLUME REQUIRED (dscf):	60
SAMPLE TIME REQUIRED (min):	108
AVERAGE SAMPLE RATE (cfm):	0.63
MAX SAMPLE RATE > 0.75 cfm:	0.8

PROJECT NUMBER: 971216
TEST RUN NUMBER: 4-1

METHOD 5

CLIENT:	OMYA, INC.
FACILITY:	FLORENCE, VT
PROJECT:	971216
UNIT:	FLASH DRYER 1
TEST DATE:	JUNE 12, 1997
TEST RUN:	4-1

Run Clock Time (24-Hr.):	1225-1427
Sample Duration (min.):	120
Number of Sample Points:	24

Barometric Press. - Pb ("Hg):	29.65
Static Press. - Pst ("H2O):	-0.35
Stack Press. - Ps ("Hg.):	29.62
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):	1.002
Stack area (ft²):	4.909
Filter Number(s):	110-753

Impinger Volume (ml)		
	Initial	Final
1>	570.7	868.5
2>	614.6	676.1
3>	621.1	642.1
Silica Gel (g)		
	Initial	Final
4>	721.1	747.0
Total Volume>		406.2

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:	0.009	15
Post-test:	0.003	9

Gas Composition	
O2	18
CO2	1
CO	0
N2	81

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
A1	12:25	952.601	0.8	2.01	2	292	104	90	0.894	99.9
2	12:30	956.43	0.6	1.51	1.5	289	117	93	0.775	97
3	12:35	959.71	0.3	0.75	0.75	293	116	96	0.548	101.6
4	12:40	962.14	0.7	1.76	1.75	295	119	97	0.837	97.4
5	12:45	965.7	0.6	1.51	1.5	294	121	99	0.775	97.1
6	12:50	969	0.65	1.63	1.6	294	125	101	0.806	97.4
7	12:55	972.46	0.55	1.38	1.4	293	127	103	0.742	98.3
8	13:00	975.69	0.45	1.13	1.1	291	127	104	0.671	97.6
9	13:05	978.6	0.45	1.13	1.1	296	126	105	0.671	96.6
10	13:10	981.47	0.5	1.26	1.25	291	127	107	0.707	97.6
11	13:15	984.54	0.45	1.13	1.1	285	127	101	0.671	97.8
12	13:20	987.46	0.45	1.13	1.1	280	127	108	0.671	97.4
END	13:25	990.395								
B1	13:27	990.395	0.6	1.51	1.5	294	124	108	0.775	96.2
2	13:32	993.7	0.65	1.63	1.6	298	127	108	0.806	96.6
3	13:37	997.15	0.7	1.76	1.75	297	127	109	0.837	97
4	13:42	1000.75	0.5	1.26	1.25	296	125	109	0.707	98.5
5	13:47	1003.84	0.56	1.41	1.4	296	125	108	0.748	97.5
6	13:52	1007.07	0.5	1.26	1.25	298	124	108	0.707	98.8
7	13:57	1010.16	0.55	1.38	1.4	297	125	107	0.742	99.3
8	14:02	1013.42	0.56	1.41	1.4	301	126	108	0.748	100.1
9	14:07	1016.73	0.5	1.26	1.25	302	127	109	0.707	97.8
10	14:12	1019.79	0.36	0.9	0.9	300	125	109	0.6	102
11	14:17	1022.5	0.5	1.26	1.25	295	124	108	0.707	96.4
12	14:22	1025.52	0.36	0.9	0.9	290	123	108	0.6	99.9
END	14:27	1028.186								

ISOKINETIC STACK CALCULATOR

(Revised 06/03/96)

INPUT PARAMETERS	
PITOT COEFFICIENT (Cp):	0.84
METER TEMPERATURE (°F):	115
STACK TEMPERATURE (°F):	300
AVERAGE DELTA P ("H2O):	0.545
MAXIMUM DELTA P ("H2O):	0.9
ESTIMATED MOISTURE (%):	18
METER BOX NUMBER:	1284-239
DELTA H @:	1.965

NOZZLE DIAMETER (Dn) DATA	
CALCULATED DIAMETER (in.):	0.2681
SELECTED SIZE (in.):	0.255

CALCULATED PARAMETERS	
K FACTOR =	2.7202
ISOKINETIC DELTA H ("H2O) =	1.48
MAX DELTA H ("H2O) =	2.45

SAMPLING PARAMETERS	
MIMIMUM SAMPLE VOLUME REQUIRED (dscf):	60
SAMPLE TIME REQUIRED (min):	105
AVERAGE SAMPLE RATE (cfm):	0.65
MAX SAMPLE RATE > 0.75 cfm:	0.84

PROJECT NUMBER: 971216

TEST RUN NUMBER: 4-2

METHOD 5

CLIENT: OMYA, INC.
FACILITY: FLORENCE, VT
PROJECT: 971216
UNIT: FLASH DRYER 1
TEST DATE: JUNE 12, 1997
TEST RUN: 4-2

Run Clock Time (24-Hr.): 1540-1742
Sample Duration (min.): 120
Number of Sample Points: 24

Barometric Press. - Pb ("Hg): 29.58
Static Press. - Pst ("H2O): -0.35
Stack Press. - Ps ("Hg.): 29.55
Pitot Coefficient - Cp: 0.84
Nozzle Number: A-4
Nozzle Diameter - Dn (in): 0.255
Meter Box Number: 1284-239
Dry Gas Meter Cal. (Y): 1.002
Stack area (ft²): 4.909
Filter Number(s): 110-754

Impinger Volume (ml)		
	Initial	Final
1>	590.7	895.2
2>	623.7	682.3
3>	618.8	642.2
Silica Gel (g)		
	Initial	Final
4>	690.1	721.7
Total Volume>		418.1

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:	0.001	9

Gas Composition	
O2	18
CO2	1
CO	0
N2	81

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
B1	15:40	28.501	0.75	2.04	1.9	295	99	80	0.866	96.1
2	15:45	32.16	0.55	1.5	1.4	302	111	87	0.742	95.8
3	15:50	35.33	0.6	1.63	1.5	305	111	88	0.775	94.8
4	15:55	38.6	0.5	1.36	1.25	304	110	91	0.707	95.3
5	16:00	41.61	0.34	0.92	0.85	305	107	91	0.583	96.3
6	16:05	44.11	0.64	1.74	1.6	308	109	91	0.8	94.5
7	16:10	47.47	0.6	1.63	1.5	305	113	91	0.775	93.2
8	16:15	50.7	0.55	1.5	1.4	303	113	91	0.742	94.8
9	16:20	53.85	0.58	1.58	1.45	301	113	93	0.762	94.1
10	16:25	57.07	0.3	0.82	0.75	299	111	93	0.548	96.2
11	16:30	59.44	0.55	1.5	1.5	298	113	94	0.742	95.1
12	16:35	62.62	0.5	1.36	1.25	291	115	94	0.707	94.1
END	16:40	65.638								
A1	16:42	65.638	0.55	1.5	1.4	295	113	94	0.742	95.3
2	16:47	68.83	0.75	2.04	1.9	302	119	95	0.866	95.4
3	16:52	72.56	0.75	2.04	1.9	301	122	96	0.866	95.2
4	16:57	76.3	0.7	1.9	1.75	299	122	97	0.837	94.3
5	17:02	79.89	0.6	1.63	1.5	302	122	98	0.775	95.7
6	17:07	83.26	0.55	1.5	1.4	305	122	98	0.742	94.8
7	17:12	86.45	0.6	1.63	1.5	307	121	98	0.775	94.7
8	17:17	89.77	0.62	1.69	1.55	305	121	98	0.787	96.5
9	17:22	93.21	0.55	1.5	1.4	302	120	98	0.742	94.8
10	17:27	96.4	0.55	1.5	1.4	299	117	97	0.742	95.5
11	17:32	99.61	0.4	1.09	1	294	116	97	0.632	97.8
12	17:37	102.42	0.4	1.09	1	285	116	97	0.632	96
END	17:42	105.194								

ISOKINETIC STACK CALCULATOR
(Revised 06/03/96)

INPUT PARAMETERS	
PITOT COEFFICIENT (Cp):	0.84
METER TEMPERATURE (°F):	115
STACK TEMPERATURE (°F):	300
AVERAGE DELTA P ("H2O):	0.545
MAXIMUM DELTA P ("H2O):	0.9
ESTIMATED MOISTURE (%):	18
METER BOX NUMBER:	1284-239
DELTA H @:	1.965

NOZZLE DIAMETER (Dn) DATA	
CALCULATED DIAMETER (in.):	0.2681
SELECTED SIZE (in.):	0.25

CALCULATED PARAMETERS	
K FACTOR =	2.513
ISOKINETIC DELTA H ("H2O) =	1.37
MAX DELTA H ("H2O) =	2.26

SAMPLING PARAMETERS	
MIMIMUM SAMPLE VOLUME REQUIRED (dscf):	60
SAMPLE TIME REQUIRED (min):	108
AVERAGE SAMPLE RATE (cfm):	0.63
MAX SAMPLE RATE > 0.75 cfm:	0.8

PROJECT NUMBER: 971216
TEST RUN NUMBER: 4-3

METHOD 5

CLIENT: OMYA, INC.
FACILITY: FLORENCE, VT
PROJECT: 971216
UNIT: FLASH DRYER 1
TEST DATE: JUNE 13, 1997
TEST RUN: 4-3

Run Clock Time (24-Hr.): 1225-1427
Sample Duration (min.): 120
Number of Sample Points: 24

Barometric Press. - Pb ("Hg):	29.5
Static Press. - Pst ("H2O):	-0.35
Stack Press. - Ps ("Hg.):	29.47
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):	1.002
Stack area (ft²):	4.909
Filter Number(s):	110-755

Impinger Volume (ml)	Initial	Final
1>	564.1	841.1
2>	611.5	674.8
3>	622.3	648.4
Silica Gel (g)	Initial	Final
4>	679.7	714.3
Total Volume>		401.0

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:	0.009	15
Post-test:	0.003	9.5

Gas Composition	
O2	18
CO2	1
CO	0
N2	81

SAMPLE POINT	CLOCK TIME	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.
A1	10:43	105.502	0.55	1.38	1.4	290	79	74	0.742	101.6
2	10:48	108.63	0.7	1.76	1.75	293	90	74	0.837	100.9
3	10:53	112.16	0.8	2.01	2	290	100	76	0.894	100.1
4	10:58	115.95	0.75	1.88	1.9	290	108	79	0.866	99.9
5	11:03	119.65	0.7	1.76	1.75	298	112	82	0.837	98.8
6	11:08	123.19	0.5	1.26	1.25	297	113	84	0.707	101.3
7	11:13	126.27	0.24	0.6	0.6	294	108	88	0.49	101.7
8	11:18	128.42	0.5	1.26	1.25	298	110	87	0.707	99.7
9	11:23	131.45	0.5	1.26	1.25	298	115	90	0.707	100.3
10	11:28	134.52	0.6	1.51	1.5	293	115	92	0.775	99.1
11	11:33	137.86	0.5	1.26	1.25	290	113	93	0.707	97.4
12	11:38	140.86	0.4	1.01	1	285	113	94	0.632	100.5
END	11:43	143.642								
B1	11:45	143.662	0.68	1.71	1.7	294	114	95	0.825	98.3
2	11:50	147.19	0.6	1.51	1.5	295	118	95	0.775	97.5
3	11:55	150.49	0.65	1.63	1.6	296	117	98	0.806	100.2
4	12:00	154.02	0.6	1.51	1.5	299	118	98	0.775	99.6
5	12:05	157.39	0.6	1.51	1.5	298	117	96	0.775	99.2
6	12:10	160.74	0.52	1.31	1.3	295	117	97	0.721	99.6
7	12:15	163.88	0.55	1.38	1.4	295	116	97	0.742	99
8	12:20	167.09	0.6	1.51	1.5	299	116	97	0.775	98.4
9	12:25	170.41	0.5	1.26	1.25	297	116	97	0.707	100.2
10	12:30	173.5	0.55	1.38	1.4	298	117	97	0.742	101.6
11	12:35	176.79	0.58	1.46	1.45	293	119	97	0.762	99.7
12	12:40	180.12	0.34	0.85	0.85	286	119	97	0.583	103
END	12:45	182.769								

APPENDIX E

SAMPLE LOG RECORD

AQTS CLIENT:	OMYA Inc.
PROJECT:	971216/971217
CLIENT P.O. NUMBER:	VE087512

Sample Number	Date Collected	Date Received	Test Number	Description
C611	06/12/97	06/13/97	4-1	Glass fiber filter #110-753
C612	06/12/97	06/13/97	4-1	Front half acetone wash -
C613	06/12/97	06/13/97	4-1	Back half H_2O_2 catch & rinse
C614	06/12/97	06/13/97	4-2	Glass fiber filter #110-754
C615	06/12/97	06/13/97	4-2	Front half acetone wash -
C616	06/12/97	06/13/97	4-2	Back half H_2O_2 catch & rinse
C617	06/13/97	06/13/97	4-3	Glass fiber filter #110-755
C618	06/13/97	06/13/97	4-3	Front half acetone wash -
C619	06/13/97	06/13/97	4-3	Back half H_2O_2 catch & rinse
C620	06/13/97	06/13/97	All	Glass fiber filter blank - #110-756
C621	06/13/97	06/13/97	All	Acetone wash blank -
C622	06/13/97	06/13/97	All	H_2O_2 blank

Samples Logged By: John J. Jasko Date: 06/14/97 Time: 700

FILTER TARE WEIGHT LOG

CLIENT:	OMYA, Inc.
PROJECT:	971216/971217
FILTER TYPE:	GFF
SIZE:	110 mm

Filter Number	Date/Time	Weight (g)		
110 750	7/3/96 0800	7/3/96 1400		
	0.5836	0.5835		
110 751	7/3/96 0800	7/3/96 1400		
	0.5828	0.5827		
110 752	7/3/96 0800	7/3/96 1400		
	0.5742	0.5741		
110 753	7/3/96 0800	7/3/96 1400		
	0.5813	0.5814		
110 754	7/3/96 0800	7/3/96 1400		
	0.5781	0.5782		
110 755	7/3/96 0800	7/3/96 1400		
	0.5803	0.5802		
110 756	7/3/96 0800	7/3/96 1400		
	0.5803	0.5803		
110 757	7/3/96 0800	7/3/96 1400		
	0.5844	0.5844		
110 758	7/3/96 0800	7/3/96 1400		
	0.5786	0.5787		
110 759	7/3/96 0800	7/3/96 1400		
	0.5851	0.585		
110 760	7/3/96 0800	7/3/96 1400		
	0.5835	0.5835		
110 761	7/3/96 0800	7/3/96 1400		
	0.5824	0.5824		
110 762	7/3/96 0800	7/3/96 1400		
	0.5825	0.5825		
110 763	7/3/96 0800	7/3/96 1400		
	0.5875	0.5876		
110 764	7/3/96 0800	7/3/96 1400		
	0.5856	0.5857		
110 765	7/3/96 0800	7/3/96 1400		
	0.583	0.583		
110 766	7/3/96 0800	7/3/96 1400		
	0.5852	0.5851		
110 767	7/3/96 0800	7/3/96 1400		
	0.5843	0.5842		
110 768	7/3/96 0800	7/3/96 1400		
	0.5908	0.591		
110 769	7/3/96 0800	7/3/96 1400		
	0.5895	0.5896		

BEAKER TARE WEIGHT LOG SHEET

Client: OMYA, Inc.
Facility: Florence, VT
Project: 971216/971217

Beaker Number	Date/Time / Tare Weight (g.)			
25/13	6/14 0820	6/14 1430		
	94.0647	94.0647		
25/14	6/14 0820	6/14 1430		
	97.8127	97.8125		
25/15	6/14 0820	6/14 1430		
	106.1153	106.1153		
25/16	6/14 0820	6/14 1430		
	105.7693	105.7692		

SAMPLE WEIGHT LOG SHEET

Client: OMYA, Inc.
Facility: Florence, VT
Project: 971216/971217

Sample Number	Identification	Date/Time			
	Tare Weight (g.)	Gross Weight (g.)			
C611	GFF 110-753	6/15 2010	6/16 1020	6/22 1050	
	0.5814	0.5818	0.5805	0.5803	
C612	Beaker 25/13	6/22 1100	6/23 0705	6/23 1325	
	94.0647	94.0741	94.0734	94.0739	
C614	GFF 110-754	6/15 2010	6/16 1020	6/22 1030	6/23 0715
	0.5782	0.5811	0.5790	0.5780	0.5778
C615	Beaker 25/14	6/22 1100	6/23 0705	6/23 1320	
	97.8125	97.8243	97.8254	97.8232	
C617	GFF 110-755	6/15 2035	6/16 1020	6/22 1030	6/23 0715
	0.5802	0.5774	0.5766	0.5760	0.5759
C618	Beaker 25/15	6/22 1100	6/23 0655	6/23 1320	
	106.1153	106.1337	106.1334	106.1331	
C620	GFF 110-756	6/15 2010			
	0.5803	0.5803			
C621	Beaker 25/16	6/22 1100	6/23 0705		
	105.7692	105.7697	105.7696		

PARTICULATE LAB ANALYSIS
SUMMARY SHEET

Client: OMYA, Inc. Project Number: 971216 Test/Run: 4-1 FD#1

Sample Identification

Number	Description
C611	GFF 110-753
C612	Front half acetone wash - 300 ml as processed
C621	Acetone blank - 300 ml as processed

Acetone Blank Background Data

Manufacturer: Anachemia Lot/Batch: 690120 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 = Density of acetone (mg/ml)

$$C_a = m_a/(V_a \rho_a) = (\ 0.4\ )/(\ 300\ )(\ 0.0007857\ ) = 1.697 \text{ mg/mg}$$

Front Half Acetone Wash Data

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

$$W_a = C_a V_a \rho_a = (\ 1.697\ )(\ 300\ )(\ 0.0007857\ ) = 0.4 \text{ mg}$$

Acetone Wash Data

Beaker Number: 25/13

Gross Weight (g):	94.0739
Tare Weight (g):	94.0647
Blank Weight (g):	0.0004
Net Weight (g):	0.0088

Filter Data

Filter Number: 110-753

Gross Weight (g):	0.5803
Tare Weight (g):	0.5814
Net Weight (g):	-0.0011

Particulate Weight Summary

Weight of particulate in front half wash (g):	0.0088
Weight of particulate on filter (g):	-0.0011
Total weight of particulate catch (g):	0.0077

PARTICULATE LAB ANALYSIS
SUMMARY SHEET

Client: OMYA, Inc. Project Number: 971216 Test/Run: 4-2 FD#1

Sample Identification

Number	Description
C614	GFF 110-754
C615	Front half acetone wash - 300 ml as processed

Acetone Blank Background Data

Manufacturer: Anachemia Lot/Batch: 690120 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)

$$C_a = m_a/(V_a \rho_a) = (\ 0.4\ )/(\ 300\ )(\ 0.0007857\ ) = 1.697 \text{ mg/mg}$$

Front Half Acetone Wash Data

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

$$W_a = C_a V_a \rho_a = (\ 1.697\ )(\ 300\ )(\ 0.0007857\ ) = 0.4 \text{ mg}$$

Acetone Wash Data

Beaker Number: 25/14

Gross Weight (g):	97.8232
Tare Weight (g):	97.8125
Blank Weight (g):	0.0004
Net Weight (g):	0.0103

Filter Data

Filter Number: 110-754

Gross Weight (g):	0.5778
Tare Weight (g):	0.5782
Net Weight (g):	-0.0004

Particulate Weight Summary

Weight of particulate in front half wash (g):	0.0103
Weight of particulate on filter (g):	-0.0004
Total weight of particulate catch (g):	0.0099

PARTICULATE LAB ANALYSIS
SUMMARY SHEET

Client: OMYA, Inc. Project Number: 971216 Test/Run: 4-3 FD#1

Sample Identification

Number	Description
C617	GFF 110-755
C618	Front half acetone wash - 300 ml as processed

Acetone Blank Background Data

Manufacturer: Anachemia Lot/Batch: 690120 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)
$_a$ = Density of acetone (mg/ml)

$$C_a = m_a/(V_a \rho_a) = (\ 0.4\ )/(\ 300\ )(\ 0.0007857\ ) = \underline{1.697}\ \text{mg/mg}$$

Front Half Acetone Wash Data

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

$$W_a = C_a V_a \rho_a = (\ 1.697\ )(\ 300\ )(\ 0.0007857\ ) = \underline{0.4}\ \text{mg}$$

Acetone Wash Data

Beaker Number: 25/15

Gross Weight (g):	106.1331
Tare Weight (g):	106.1153
Blank Weight (g):	0.0004
Net Weight (g):	0.0174

Filter Data

Filter Number: 110-755

Gross Weight (g):	0.5759
Tare Weight (g):	0.5802
Net Weight (g):	-0.0043

Particulate Weight Summary

Weight of particulate in front half wash (g):	0.0174
Weight of particulate on filter (g):	-0.0043
Total weight of particulate catch (g):	0.0131

APPENDIX F

METER BOX CALIBRATION
(ANNUAL)

DATE: 01-Feb-97
CALIBRATED BY: Tom Perry

METER BOX NUMBER: 1084-239
NEXT CAL DUE: 03-Aug-97

BAROMETRIC PRESSURE (In. Hg)	ORIFICE MANOMETER SETTING (In. H2O)	WET TEST METER VOLUME (cf)	DRY GAS METER VOLUME		TEMPERATURES				TIME (min)	Yi	DELTA H@
			INITIAL (cf)	FINAL (cf)	WET TEST METER (°F)	DRY GAS METER INLET (°F)	DRY GAS METER OUTLET (°F)	DRY GAS METER AVERAGE (°F)			
29.63	0.5	5	472.010	477.109	57.0	77 88	61 67	73.25	13.07	1.01	1.832
29.63	1.0	5	477.661	482.869	58.0	91 97	71 75	83.5	9.47	1.005	1.895
29.63	1.5	10	483.184	493.769	58.0	96 108	77 82	90.75	16.18	1.001	2.047
29.63	2.0	10	494.335	505.026	58.0	105 114	82 86	96.75	13.88	1	1.987
29.63	3.0	10	505.456	516.211	59.0	111 118	86 89	101	11.45	0.998	2.02
29.63	4.0	10	516.656	527.460	59.0	115 119	90 92	104	9.92	0.996	2.011
									AVERAGE	1.002	1.965

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

Yi	Yi DIFF	DELTA H@	DELTA H@ DIFF
1.01	0.008	1.832	-0.133
1.005	0.003	1.895	-0.07
1.001	-0.001	2.047	0.082
1	-0.002	1.987	0.022
0.998	-0.004	2.02	0.055
0.996	-0.006	2.011	0.046

AQTS PROJECT: 971216/971217

METER BOX CALIBRATION
(POST-TEST)

DATE: June 17, 1997
CALIBRATED BY: Tim Tomasi

METER BOX NUMBER: 1084-239
PRETEST CAL Y: 1.002

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)		
29.51	1.40	7	10.00	197.320	207.620	71.5	95 112	80 85	93	16.56	1.007
29.51	1.40	7	10.00	207.620	218.035	71.5	98 115	84 91	97	16.22	1.003
29.51	1.40	7	10.00	218.035	228.566	71.5	107 114	91 94	101.5	16.28	1
										AVERAGE	1.003

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

Difference from Pretest Calibration : 0.1 % >>>> ACCEPTABLE

METER BOX CALIBRATION
(ANNUAL)

DATE: 01-Feb-97
CALIBRATED BY: Tom Perry

METER BOX NUMBER: 1286-340
NEXT CAL DUE: 03-Aug-97

BAROMETRIC PRESSURE (In. Hg)	ORIFICE MANOMETER SETTING (In. H2O)	WET TEST METER VOLUME (cf)	DRY GAS METER VOLUME		TEMPERATURES				TIME (min)	Yi	DELTA H@
			INITIAL (cf)	FINAL (cf)	WET TEST METER (°F)	DRY GAS METER INLET (°F)	DRY GAS METER OUTLET (°F)	DRY GAS METER AVERAGE (°F)			
30.53	0.5	5	255.896	261.001	61.0	90 95	77 79	85.25	12.09	1.024	1.511
30.53	1.0	5	261.420	266.635	61.0	90 98	78 79	86.25	8.82	1.003	1.606
30.53	1.5	10	266.955	277.439	61.0	94 103	79 82	89.5	14.89	1.002	1.706
30.53	2.0	10	277.624	288.149	61.0	100 106	82 84	93	13.26	1.004	1.792
30.53	3.0	10	288.376	298.945	61.0	104 109	84 86	95.75	10.65	1.002	1.726
30.53	4.0	10	299.401	309.965	61.0	102 108	85 85	95	9.32	0.999	1.764
									AVERAGE	1.006	1.684

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

Yi	Yi DIFF	DELTA H@	DELTA H@ DIFF
1.024	0.018	1.511	-0.173
1.003	-0.003	1.606	-0.078
1.002	-0.004	1.706	0.022
1.004	-0.002	1.792	0.108
1.002	-0.004	1.726	0.042
0.999	-0.007	1.764	0.08

AQTS PROJECT: 971216/971217

METER BOX CALIBRATION
(POST-TEST)

DATE: June 17, 1997
CALIBRATED BY: Tim Tomasi

METER BOX NUMBER: 1286-340
PRETEST CAL Y: 1.006

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)		
29.51	1.40	6	10.00	54.228	64.568	71.5	93 111	75 81	90	14.85	0.997
29.51	1.40	6	10.00	64.568	75.030	71.5	100 115	82 88	96.25	14.92	0.997
29.51	1.40	6	10.00	75.030	85.585	71.5	105 117	89 93	101	14.97	0.997
										AVERAGE	0.997

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

Difference from Pretest Calibration : -0.9 % >>>> ACCEPTABLE

REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT VALUE OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # FE 103 DATE 6-6-97 OBSERVATIONS BY Tim Thomas

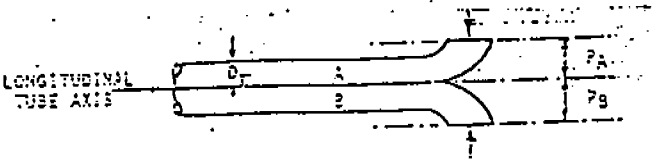
1.) All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t: 0.23 in. < D_t < 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. < P_A=P_B < 0.60 in.

D_t= 0375
P_A= .49
P_B= .49



2.) All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

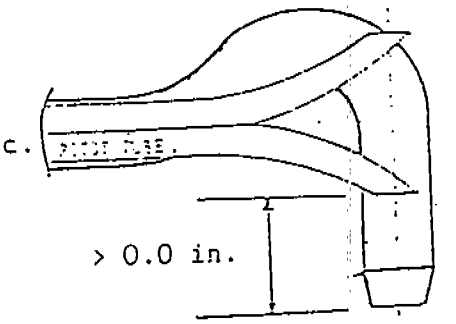
b. Pitot / nozzle separation, X, X ≥ 0.75 in. for nozzle diameter, D_n = 0.50 in.

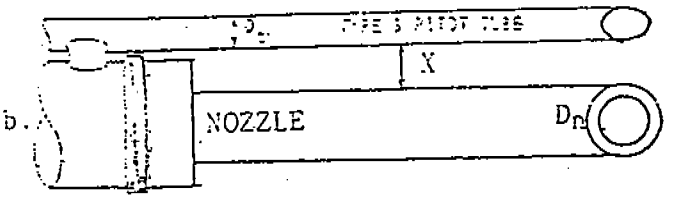
c. Plane of impact side of pitot in relation to plane of nozzle opening.

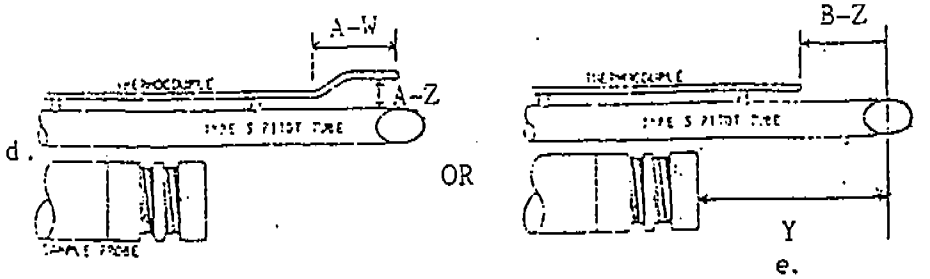
d. Thermocouple placement, Z, A-Z ≥ 0.75 in., A-W ≥ 3.0 in., B-Z ≥ 2.0 in.

e. Pitot / probe sheath distance, Y, Y ≥ 3.0 in.

D_n= .625
X = 1.1
Z = 2.10
Y = 3.0







REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT VALUE OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # FE-103 DATE 6-6-97 OBSERVATIONS BY Tim Tomas

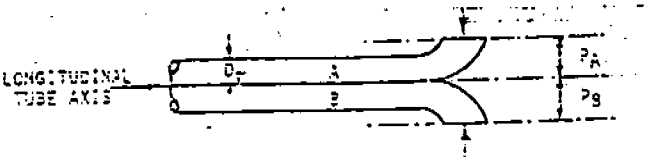
1. All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t, 0.23 in. < D_t < 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. < P_A=P_B < 0.60 in.

D_t= 0.375
P_A= 0.49
P_B= 0.49



2. All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register, Vol. 42, No. 160, Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

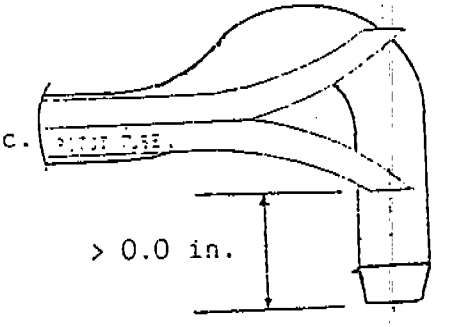
b. Pitot / nozzle separation, X, X ≥ 0.75 in. for nozzle diameter, D_n = 0.50 in.

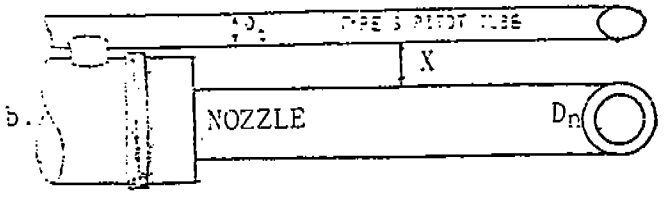
c. Plane of impact side of pitot in relation to plane of nozzle opening.

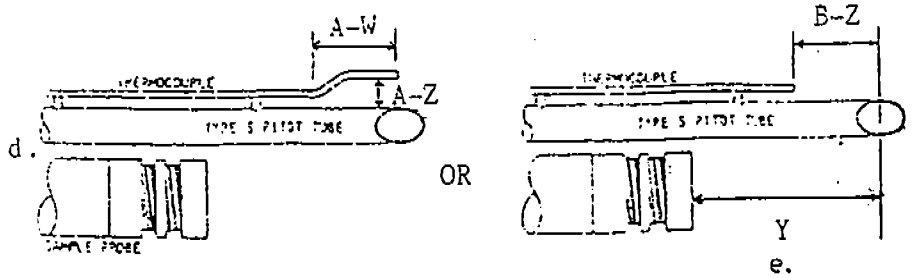
d. Thermocouple placement, Z, A-Z ≥ 0.75 in., A-W ≥ 3.0 in., B-Z ≥ 2.0 in.

e. Pitot / probe sheath distance, Y, Y ≥ 3.0 in.

D_n= .375
X = 1.1
Z = 2.10
Y = 3.0







REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT VALUE OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # EE 1048 DATE 6-6-97 OBSERVATIONS BY Tim Tomasi

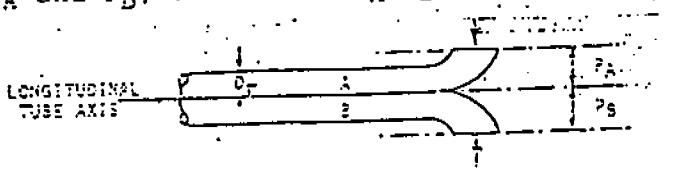
1.) All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t, 0.23 in. < D_t < 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. < P_A=P_B < 0.60 in.

D_t= 6.375
P_A= .49
P_B= .49



2.) All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

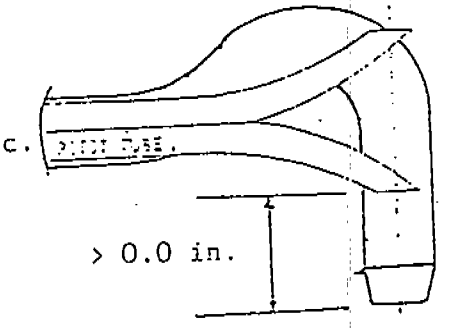
b. Pitot / nozzle seperation, X, X ≥ 0.75 in. for nozzle diameter, D_n = 0.50 in.

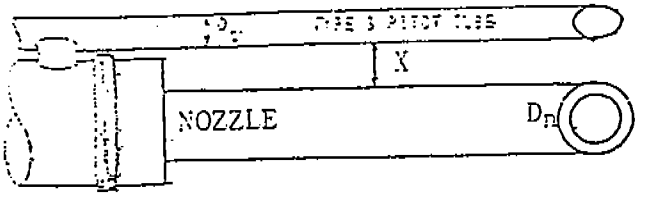
c. Plane of impact side of pitot in relation to plane of nozzle opening.

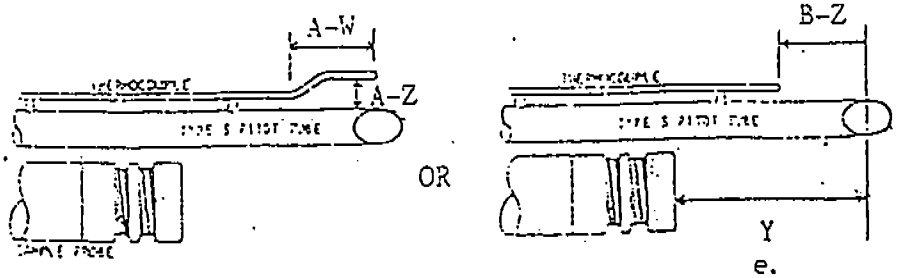
d. Thermocouple placement, Z, A-Z ≥ 0.75 in., A-W ≥ 3.0 in., B-Z ≥ 2.0 in.

e. Pitot / probe sheath distance, Y, Y ≥ 3.0 in.

D_n= .625
X = 1.1
Z = 2.10
Y = 3.0







REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT VALUE OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # FE-104 DATE 6-6-97 OBSERVATIONS BY Tim TOMASI

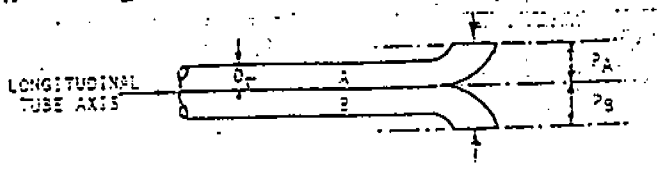
1.) All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t, 0.23 in. < D_t < 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. < P_A=P_B < 0.60 in.

D_t= 0.375
P_A= 0.49
P_B= 0.49



2.) All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

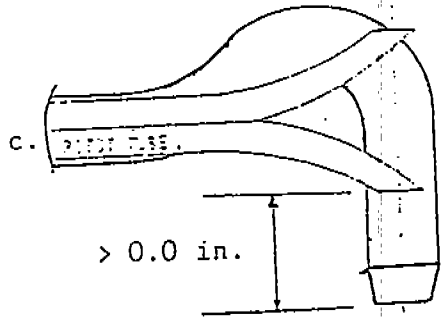
b. Pitot / nozzle separation, X, X ≥ 0.75 in. for nozzle diameter, D_n = 0.50 in.

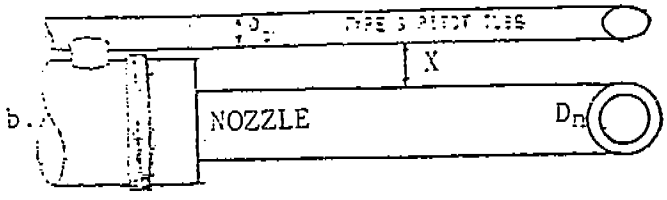
c. Plane of impact side of pitot in relation to plane of nozzle opening.

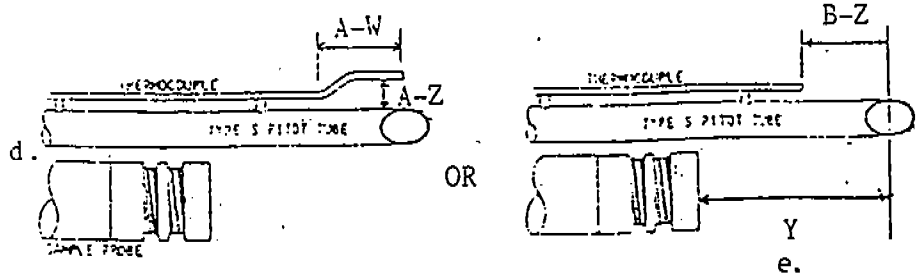
d. Thermocouple placement, Z, A-Z ≥ 0.75 in., A-W ≥ 3.0 in., B-Z ≥ 2.0 in.

e. Pitot / probe sheath distance, Y, Y ≥ 3.0 in.

D_n= .370
X = 1.1
Z = 2.10
Y = 3.0







REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT VALUE OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # FS-105 DATE 6-6-97 OBSERVATIONS BY Tim TOMASI

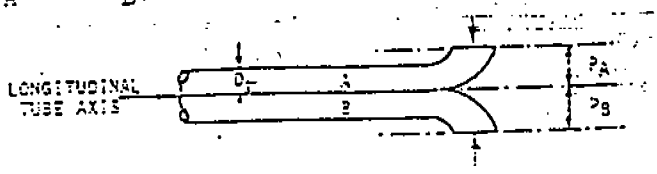
1) All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t, 0.23 in. $< D_t <$ 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. $< P_A = P_B <$ 0.60 in.

D_t= 0.375
P_A= 0.49
P_B= 6.49



2) All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

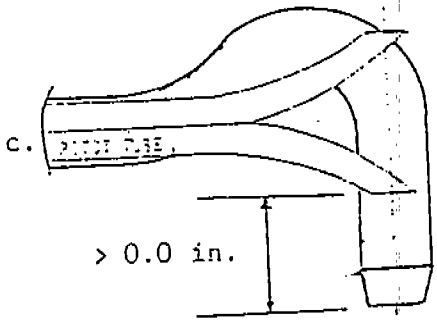
b. Pitot / nozzle separation, X, X $\geq$ 0.75 in. for nozzle diameter, D_n = 0.50 in.

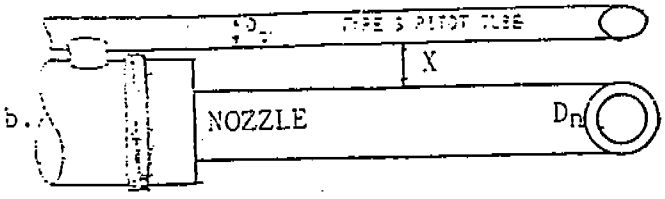
c. Plane of impact side of pitot in relation to plane of nozzle opening.

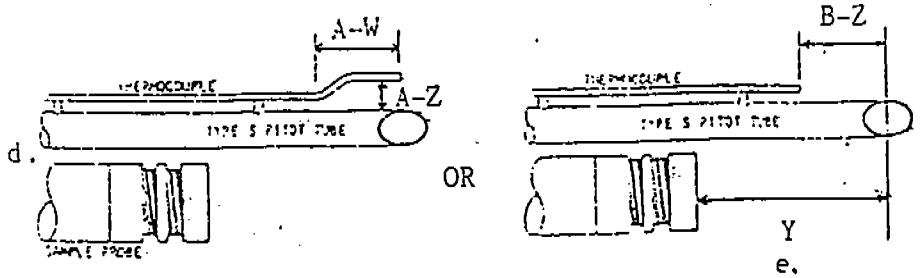
d. Thermocouple placement, Z, A-Z $\geq$ 0.75 in., A-W $\geq$ 3.0 in., B-Z $\geq$ 2.0 in.

e. Pitot / probe sheath distance, Y, Y $\geq$ 3.0 in.

D_n= 0.187
X = 1.1
Z = 2.0
Y = 3.0







REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT VALUE OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # FE-106 DATE 6-6-97 OBSERVATIONS BY Tim Tomasi

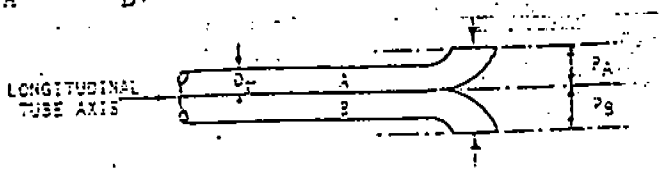
1.) All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t, 0.23 in. < D_t < 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. < P_A=P_B < 0.60 in.

D_t= 0.375
P_A= 0.49
P_B= 0.49



2.) All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register. Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

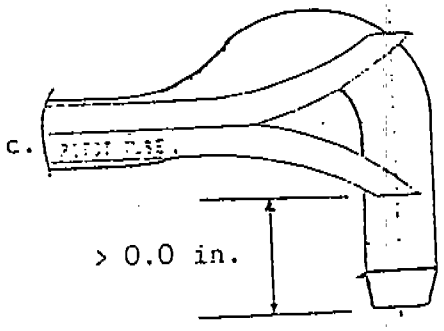
b. Pitot / nozzle separation, X, X ≥ 0.75 in. for nozzle diameter, D_n = 0.50 in.

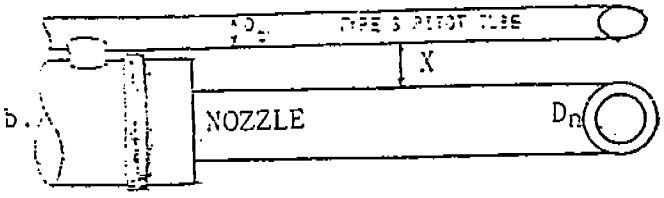
c. Plane of impact side of pitot in relation to plane of nozzle opening.

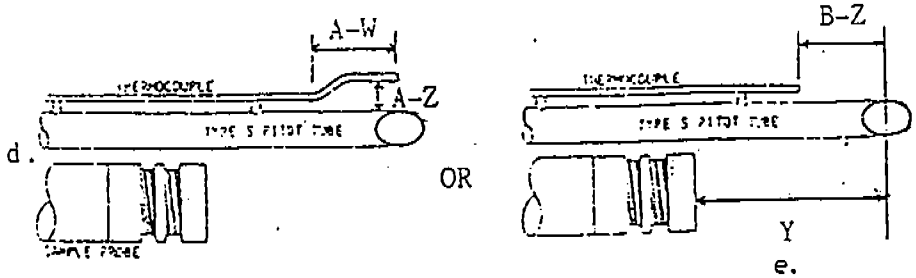
d. Thermocouple placement, Z. A-Z ≥ 0.75 in., A-W ≥ 3.0 in., B-Z ≥ 2.0 in.

e. Pitot / probe sheath distance, Y, Y ≥ 3.0 in.

D_n= 0.187
X = 1.1
Z = 2.10
Y = 3.0







REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT
OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # FE-108 DATE 6-6-57 OBSERVATIONS BY Tim Tomas

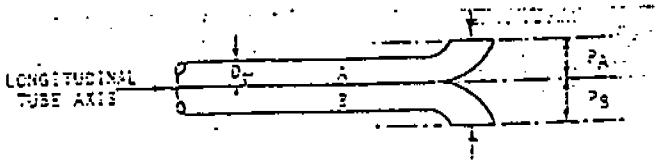
1.) All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t, 0.23 in. < D_t < 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. < P_A=P_B < 0.60 in.

D_t= .375
P_A= .49
P_B= .49



2.) All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

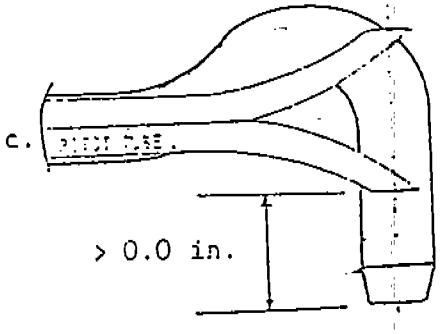
b. Pitot / nozzle separation, X, X ≥ 0.75 in. for nozzle diameter, D_n = 0.50 in.

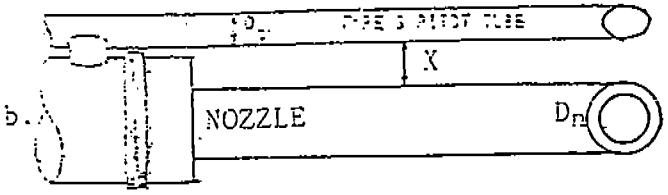
c. Plane of impact side of pitot in relation to plane of nozzle opening.

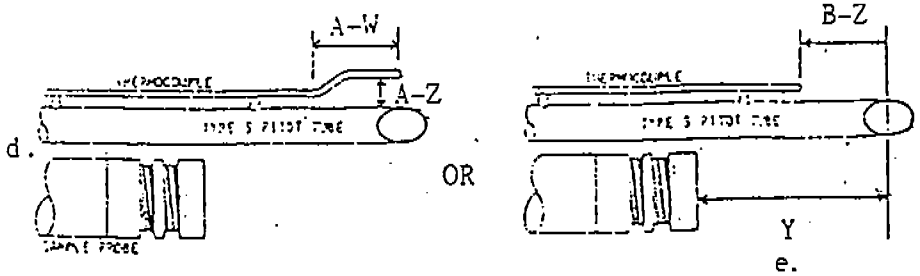
d. Thermocouple placement, Z, A-Z ≥ 0.75 in., A-W ≥ 3.0 in., B-Z ≥ 2.0 in.

e. Pitot / probe sheath distance, Y, Y ≥ 3.0 in.

D_n= .625
X = 1.1
Z = 2.10
Y = 3.0







REQUIREMENTS FOR ASSIGNING A BASELINE COEFFICIENT OF 0.84 TO AN "S" TYPE PITOT TUBE

PITOT # FE-109 DATE 6-6-97 OBSERVATIONS BY Tim Thomas

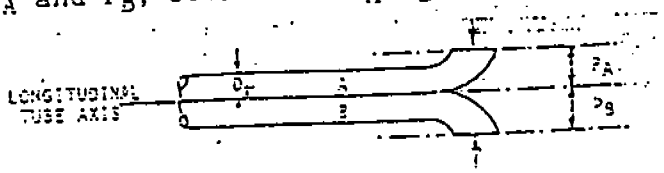
1.) All construction criteria for an isolated "S" type pitot are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter, D_t: 0.23 in. < D_t < 0.38 in.

b. Base to plane opening Distance, P_A and P_B, 0.40 in. < P_A=P_B < 0.60 in.

D_t= 0.375
P_A= .49
P_B= .49



2.) All assembly criteria to prevent aerodynamic interference for a sampling arrangement of an "S" type pitot, nozzle and thermocouple, are within given tolerances prescribed in Federal Register, Vol. 42, No. 160. Thursday, August 18, 1977.

REQUIRED MEASUREMENTS

a. External tubing diameter. See 1.a. above

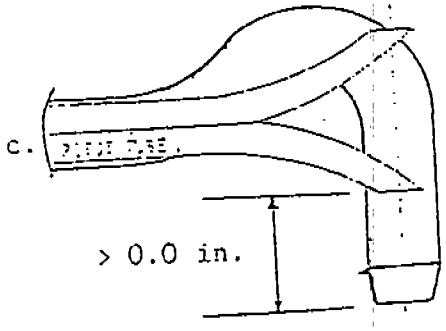
b. Pitot / nozzle separation, X, X ≥ 0.75 in. for nozzle diameter, D_n = 0.50 in.

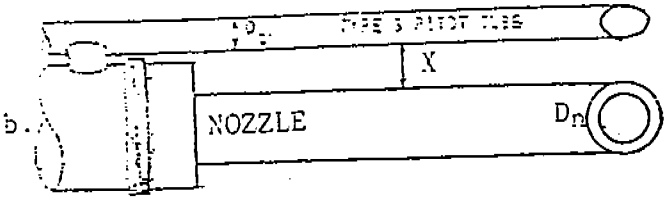
c. Plane of impact side of pitot in relation to plane of nozzle opening.

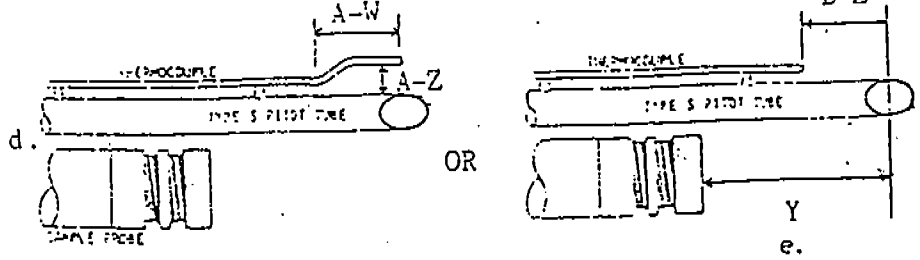
d. Thermocouple placement, Z, A-Z ≥ 0.75 in., A-W ≥ 3.0 in., B-Z ≥ 2.0 in.

e. Pitot / probe sheath distance, Y, Y ≥ 3.0 in.

D_n= .255
X = 1.1
Z = 2.10
Y = 3.0



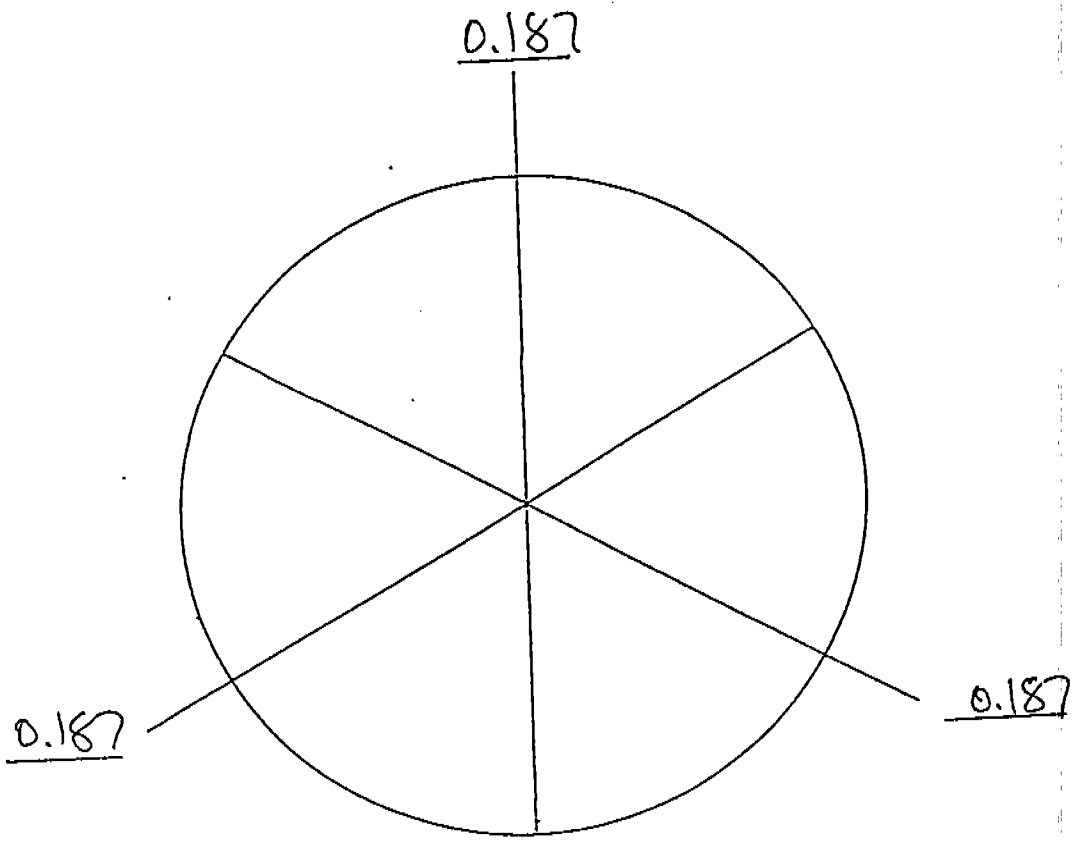




NOZZLE CALIBRATION DATA FORM

Date: 6-6-97

Calibrated by: Tim Tomasi



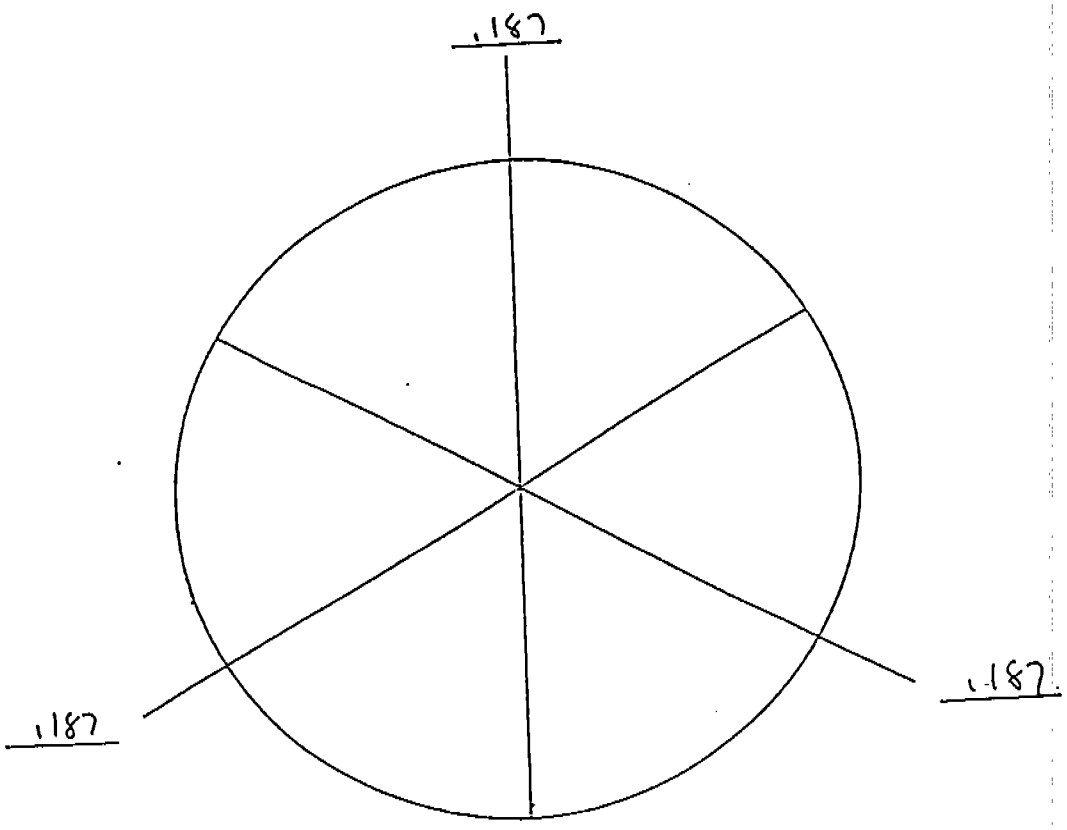
Nozzle Identification Number	Nozzle Diameter[a]			ΔD[b] mm (in.)	D_{avg}[c]
	D_1 mm (in.)	D_2 mm (in.)	D_3 mm (in.)		
B-3	0.187	0.187	0.187	0	.187

Where:
a = nozzle diameters b = maximum difference c = average diameter

NOZZLE CALIBRATION DATA FORM

Date: 6-6-97

Calibrated by: TIM THOMAS



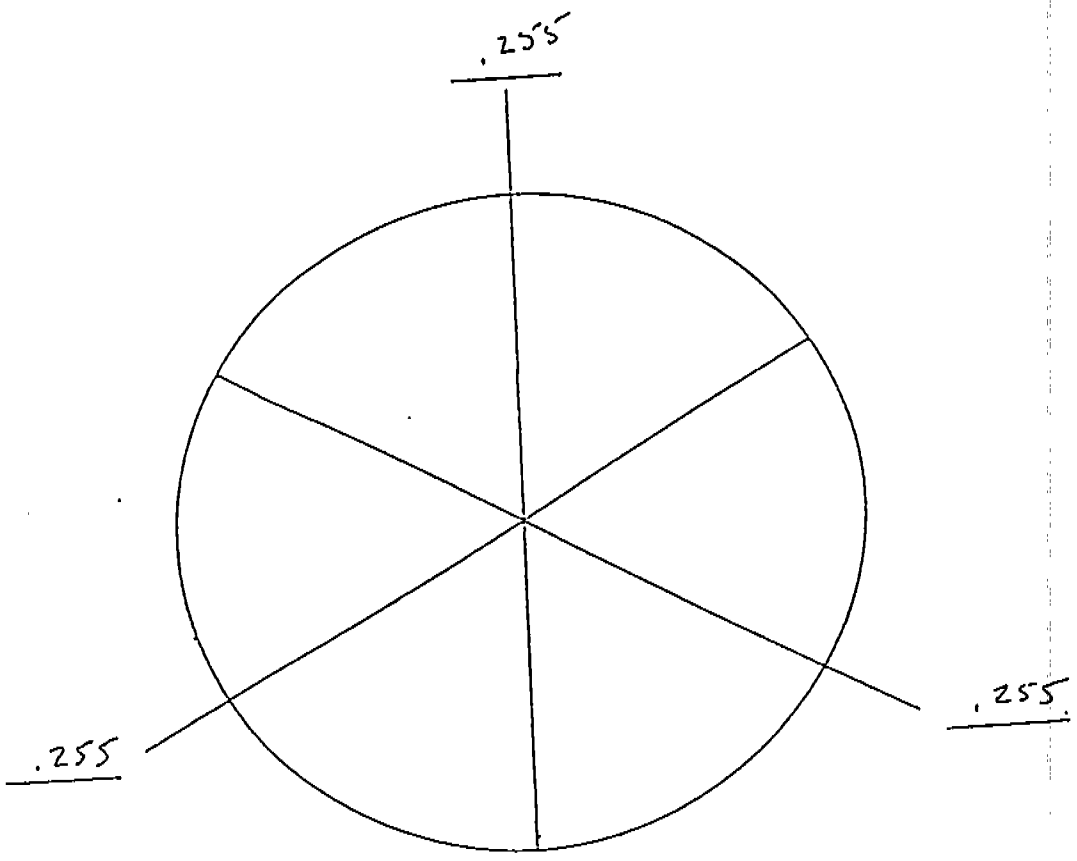
Nozzle Identification Number	Nozzle Diameter[a]			ΔD[b] mm (in.)	D_{avg}[c]
	D_1 mm (in.)	D_2 mm (in.)	D_3 mm (in.)		
C-3	.187	.187	.187	0	.187

Where:
a = nozzle diameters b = maximum difference c = average diameter

NOZZLE CALIBRATION DATA FORM

Date: 6-6-97

Calibrated by: Tim Tomasi



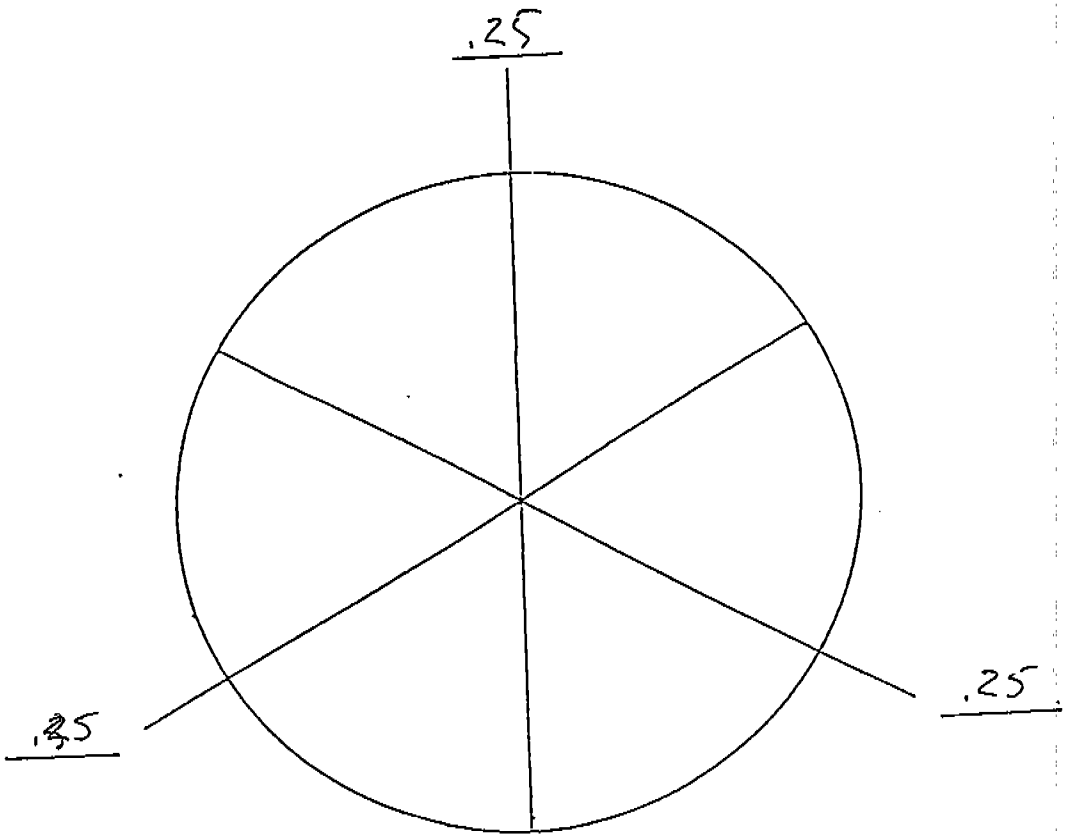
Nozzle Identification Number	Nozzle Diameter[a]			ΔD[b] mm (in.)	D_{avg}[c]
	D_1 mm (in.)	D_2 mm (in.)	D_3 mm (in.)		
A-4	.255	.255	.255	0	.255

Where:
a = nozzle diameters b = maximum difference c = average diameter

NOZZLE CALIBRATION DATA FORM

Date: 6-6-97

Calibrated by: TIM TOMASI



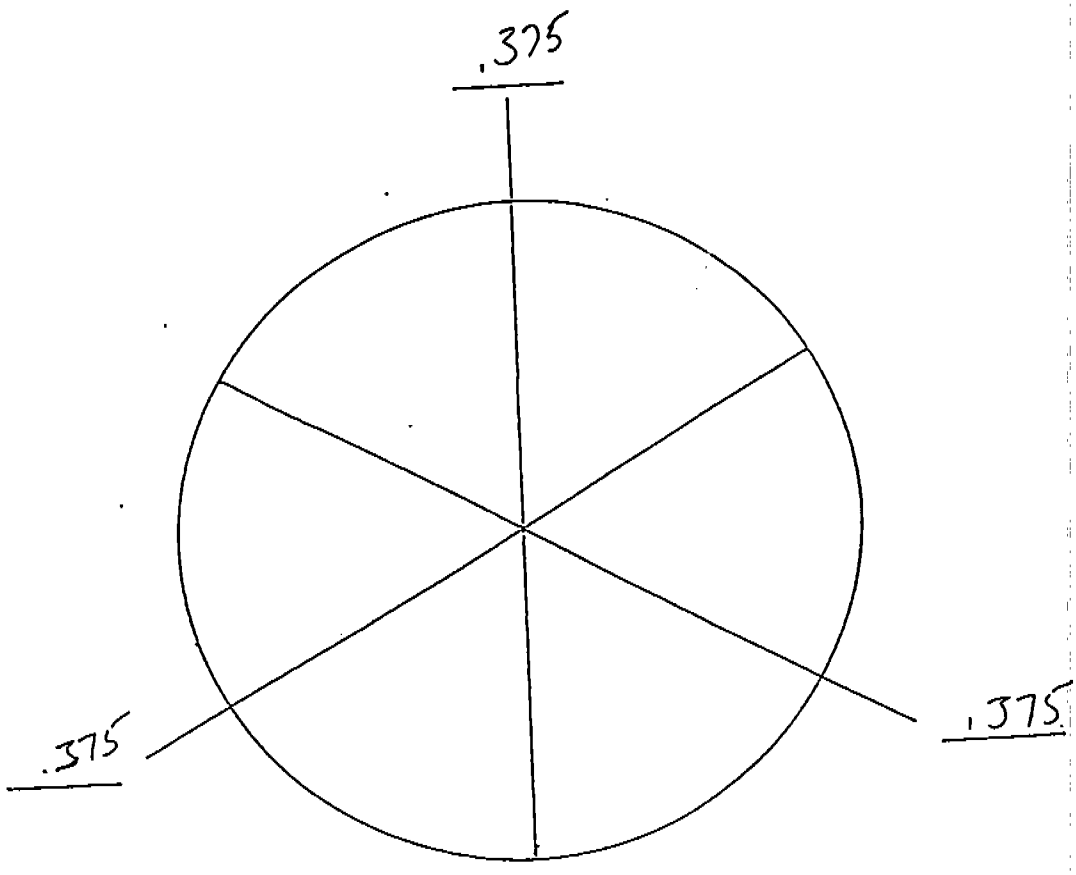
Nozzle Identification Number	Nozzle Diameter[a]			ΔD[b] mm (in.)	D_{avg}[c]
	D_1 mm (in.)	D_2 mm (in.)	D_3 mm (in.)		
B-4	.25	.25	.25	0	.25

Where:
a = nozzle diameters b = maximum difference c = average diameter

NOZZLE CALIBRATION DATA FORM

Date: 6-4-97

Calibrated by: Tim Tomas



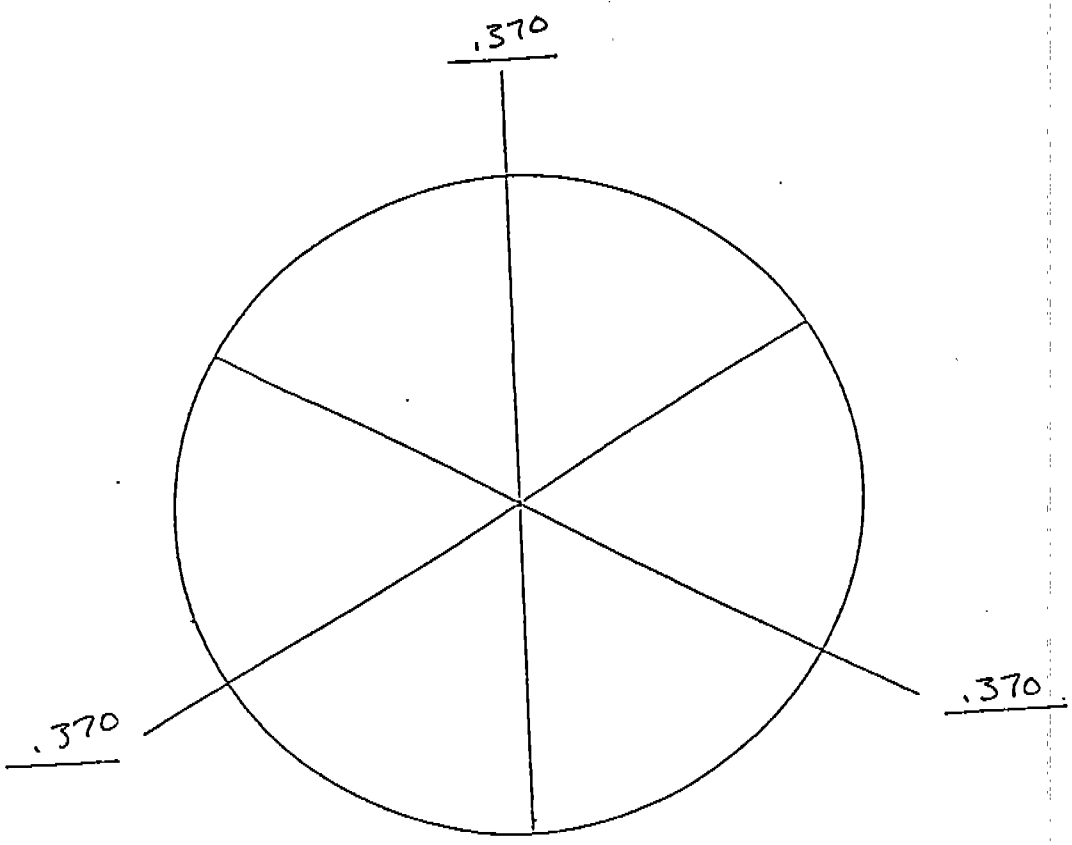
Nozzle Identification Number	Nozzle Diameter[a]			ΔD[b] mm (in.)	D_{avg}[c]
	D_1 mm (in.)	D_2 mm (in.)	D_3 mm (in.)		
A-6	.375	.375	.375	0	.375

Where:
a = nozzle diameters b = maximum difference c = average diameter

NOZZLE CALIBRATION DATA FORM

Date: 6-6-97

Calibrated by: C.M Thomas



Nozzle Identification Number	Nozzle Diameter[a]			ΔD[b] mm (in.)	D_{avg}[c]
	D_1 mm (in.)	D_2 mm (in.)	D_3 mm (in.)		
B-4	.370	.370	.370	0	.370

Where:
a = nozzle diameters b = maximum difference c = average diameter

APPENDIX J

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
64 No. Main Street, P.O. Box 2033, Concord, NH 03302-2033
(603) 271-1370 FAX (603) 271-1381

May 29, 1997

Mr. John J. Jasko
Air Qualty Technical Services, Inc.
18 Morse Drive
Essex Junction, VT 05452

Subject: N.H. "Visible Emissions Evaluation" Session, Spring 1997

Dear Mr. Jasko:

The New Hampshire Department of Environmental Services, Air Resources Division is pleased to advise you that you have successfully completed the recent "Visible Emissions Evaluation" session held in Concord, New Hampshire on April 24 & 25, 1997. Having participated in the smoke evaluation sessions, you have met the following certification criteria:

(1) The average deviation for the sets of 25 black smoke and 25 white smoke emissions was less than 7.5%.

(2) The deviation of each reading was 15%, or less.

This certification is valid until October 25, 1997. A copy of your test sheet will be supplied upon request.

Sincerely,

Kenneth A. Colburn

Kenneth A. Colburn
Director
Air Resources Division

KAC/sec/a:\smoke97.sch

SOURCE: OMYA INC

ADDRESS: P.O. BOX 10
FLORENCE ROAD

CITY: FLORENCE | STATE: VT | ZIP: 05744

PHONE: 802-459-3311

SOURCE ID NUMBER:

PROCESS: FLASH DRYER #1

OPERATING MODE: STANDARD

CONTROL EQUIPMENT: BAG HOUSE

OPERATING MODE: STANDARD

EMISSION POINT DESCRIPTION: STACK ON ROOFTOP

HEIGHT ABOVE GROUND LEVEL: DISCHARGE ≈12' ABOVE ROOF

HEIGHT RELATIVE TO OBSERVER: +6'

DISTANCE FROM OBSERVER: 30'

DIRECTION FROM OBSERVER: NE

EMISSION DESCRIPTION: NONE VISIBLE

EMISSION COLOR: NONE

PLUME TYPE: NONE

POINT AT WHICH OPACITY WAS DETERMINED: ≈4' ABOVE DISCHARGE

BACKGROUND DESCRIPTION: GREEN HILLSIDE

BACKGROUND COLOR: GREEN

SKY CONDITIONS: BLUE SKY WITH SOME BROKEN CLOUDS/LIGHT OVERCAST

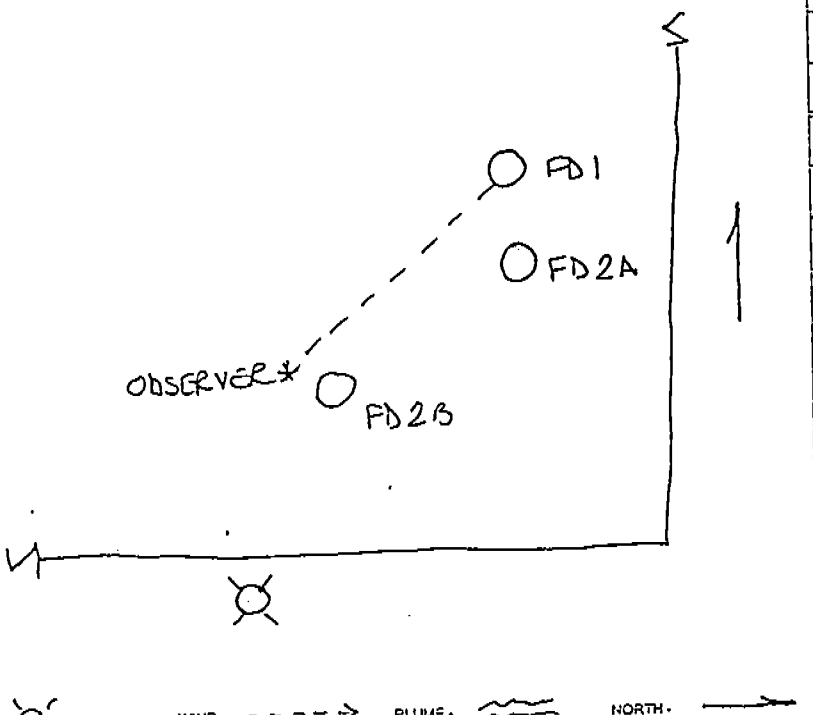
WIND SPEED: <5 mph

WIND DIRECTION: S CHANGING TO W

AMBIENT TEMPERATURE:

WET BULB TEMPERATURE:

OBSERVATION LAYOUT SKETCH:



OBSERVATION DATE: 6/12/97 | START TIME: 12:45 | STOP TIME: 13:45

SEC MIN	0	15	30	45	SEC MIN	0	15	30	45
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2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
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7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR HIGHEST PERIOD: 0

OPACITY LIMIT: 7%

NUMBER OF READINGS ABOVE LIMIT: 0

READING RANGE: 0% MINIMUM 0% MAXIMUM

OBSERVERS NAME PRINTED: JOHN J. JASKO

OBSERVERS SIGNATURE: John J. Jasko | DATE: 6/12/97

OBSERVERS AFFILIATION: AIR QUALITY TECHNICAL SERVICES INC.

CERTIFYING AGENCY: NHARNG-DES | CERTIFICATION DATE: 4/24/97

M9 Visible Emissions

AQTS, Inc.

SOURCE: OMYA INC

ADDRESS: P.O. BOX 10
FLORENCE ROAD

CITY: FLORENCE | STATE: VT | ZIP: 05744

PHONE: 802-459-3311

SOURCE ID NUMBER:

PROCESS: FLASH DRYER #1

OPERATING MODE: STANDARD

CONTROL EQUIPMENT: BAGHOUSE

OPERATING MODE: STANDARD

EMISSION POINT DESCRIPTION: STACK ON ROOFTOP

HEIGHT ABOVE GROUND LEVEL: DISCHARGE ≈ 12' ABOVE ROOF

HEIGHT RELATIVE TO OBSERVER: +6'

DISTANCE FROM OBSERVER: 40'

DIRECTION FROM OBSERVER: ESE

EMISSION DESCRIPTION: NONE VISIBLE

EMISSION COLOR: NONE

PLUME TYPE: NONE

POINT AT WHICH OPACITY WAS DETERMINED: ≈ 4' ABOVE DISCHARGE

BACKGROUND DESCRIPTION: SKY

BACKGROUND COLOR: GRAY

SKY CONDITIONS: OVERCAST

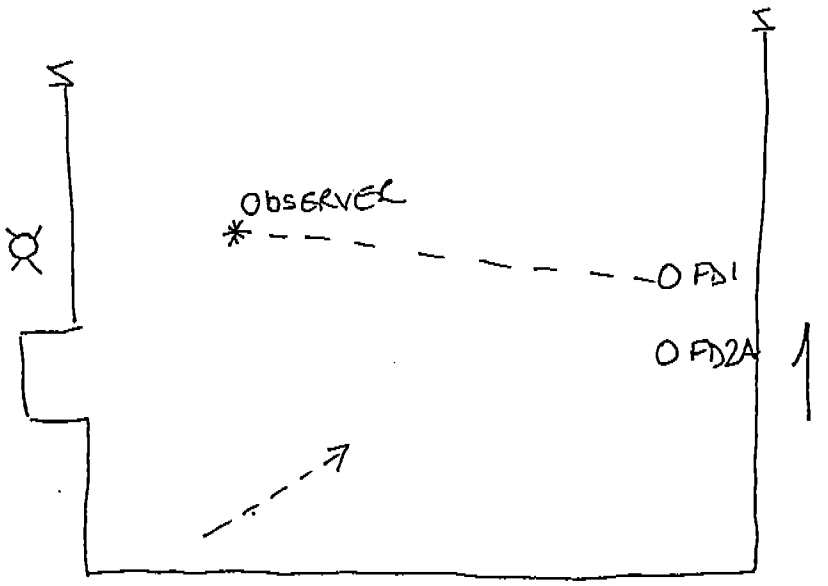
WIND SPEED: ≈ 10 mph

WIND DIRECTION: SW

AMBIENT TEMPERATURE:

WET BULB TEMPERATURE:

OBSERVATION LAYOUT SKETCH:



OBSERVATION DATE: 6/12/97 | START TIME: 16:29 | STOP TIME: 17:29

SEC MIN	0	15	30	45	SEC MIN	0	15	30	45
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3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
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11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
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17	0	0	0	0	47	0	0	0	0
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23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
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26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR HIGHEST PERIOD: 0%

OPACITY LIMIT: 7%

NUMBER OF READINGS ABOVE LIMIT: 0

READING RANGE: 0% MINIMUM 0% MAXIMUM

OBSERVERS NAME PRINTED: JOHN J. JASKO

OBSERVERS SIGNATURE: John J. Jasko | DATE: 6/12/97

OBSERVERS AFFILIATION: AIR QUALITY TECHNICAL SERVICES INC.

CERTIFYING AGENCY: NHARD-DES | CERTIFICATION DATE: 4/24/97

AQTS, Inc.

M9 Visible Emissions

SOURCE: OMYA INC

ADDRESS: P. O. BOX 10
FLORENCE ROAD

CITY: FLORENCE | STATE: VT | ZIP: 05744

PHONE: 802-459-3311 | SOURCE ID NUMBER:

PROCESS: FLASH DRYER #1 | OPERATING MODE: STANDARD

CONTROL EQUIPMENT: BAGHOUSE | OPERATING MODE: STANDARD

EMISSION POINT DESCRIPTION: STACK ON ROOFTOP

HEIGHT ABOVE GROUND LEVEL: DISCHARGE ≈12' ABOVE ROOF | HEIGHT RELATIVE TO OBSERVER: +6'

DISTANCE FROM OBSERVER: ≈30' | DIRECTION FROM OBSERVER: NW

EMISSION DESCRIPTION: NONE VISIBLE | EMISSION COLOR: NONE

PLUME TYPE: NONE

POINT AT WHICH OPACITY WAS DETERMINED: ≈4' ABOVE DISCHARGE

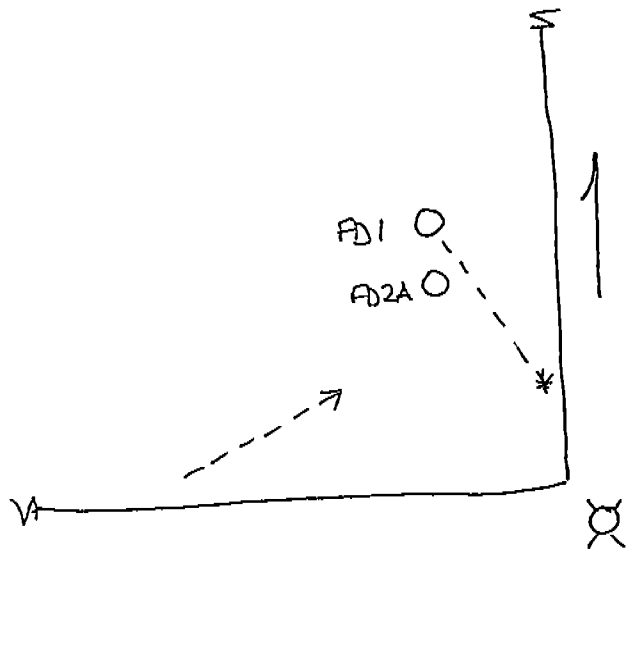
BACKGROUND DESCRIPTION: SKY | BACKGROUND COLOR: GRAY

SKY CONDITIONS: OVERCAST

WIND SPEED: 5-10 mpH | WIND DIRECTION: SSW

AMBIENT TEMPERATURE: | WET BULB TEMPERATURE:

OBSERVATION LAYOUT SKETCH:



SUN · WIND · PLUME · NORTH ·

OBSERVATION DATE: 6/13/97 | START TIME: 10:45 | STOP TIME: 11:45

SEC MIN	0	15	30	45	SEC MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

AVERAGE OPACITY FOR HIGHEST PERIOD: 0%

OPACITY LIMIT: 7%

NUMBER OF READINGS ABOVE LIMIT: 0

READING RANGE: 0% MINIMUM 0% MAXIMUM

OBSERVERS NAME PRINTED: JOHN J. JASKO

OBSERVERS SIGNATURE: John J. Jasko | DATE: 6/13/97

OBSERVERS AFFILIATION: AIR QUALITY TECHNICAL SERVICES INC.

CERTIFYING AGENCY: NHARS-DES | CERTIFICATION DATE: 4/24/97

AQTS, Inc.

M9 Visible Emissions