1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

Magna DexSys contracted Montrose Air Quality Services, LLC (Montrose) to perform a compliance emissions test program on the EUPLASTICCOATING Operations at the Magna International, Inc. - DexSys facility located in Lansing Michigan. The tests were conducted to satisfy the emissions testing requirements pursuant to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Permit No. MI-ROP-P0429-2017.

The specific objectives were to:

- Verify the total gaseous non methane organic (TGNMO) destruction efficiency (DE) of the regenerative thermal oxidizer (RTO) serving EUPLASTICCOATING Operations.
- Conduct the test program with a focus on safety

Montrose performed the tests to measure the emission parameters listed in Table 1-1.

TABLE 1-1
SUMMARY OF TEST PROGRAM

Test Date(s)	Unit ID/ Source Name	Activity/ Parameters	Test Methods	No. of Runs	Duration (Minutes)
6/30/2020	INLET/EXHAUST RTO EUPLASTICCOATING	Velocity/Volumetric Flow Rate	EPA 1 & 2	4	5-8
6/30/2020	INLET/EXHAUST RTO EUPLASTICCOATING	O_2, CO_2	EPA 3	3	5-9
6/30/2020	INLET/EXHAUST RTO EUPLASTICCOATING	Moisture	EPA 4	3	60
6/30/2020	INLET/EXHAUST RTO EUPLASTICCOATING	TGNMO	EPA 25	3	60
6/30/2020	EUPLASTICCOATING	PTE	EPA 204	1	60

To simplify this report, a list of Units and Abbreviations is included in Appendix D.1. Throughout this report, chemical nomenclature, acronyms, and reporting units are not defined. Please refer to the list for specific details.

This report presents the test results and supporting data, descriptions of the testing procedures, descriptions of the facility and sampling locations, and a summary of the quality assurance procedures used by Montrose. The average emission test results are summarized and

compared to their respective permit limits in Table 1-2. Detailed results for individual test runs can be found in Section 4.0. All supporting data can be found in the appendices.

The testing was conducted by the Montrose personnel listed in Table 1-3. The tests were conducted according to the test plan (protocol) dated February 11, 2020 that was submitted to EGLE.

TABLE 1-2
SUMMARY OF AVERAGE COMPLIANCE RESULTS - EUPLASTICCOATING
JUNE 30, 2020

Parameter/Units	Average Results	Allowable Limits
TGNMO DE		
%*	>97.8	95
PTE		
%*	100	100

* See Section 4.0 for details.

1.2 KEY PERSONNEL

A list of project participants is included below:

Facility Information

Source Location:	Magna International, Inc - DexSys 5589 W. Mount Hope Hwy Lansing, MI 48917
Project Contact:	Timothy Gibbons
Role:	Environmental Specialist
Company:	Magna International, Inc - DexSys
Telephone:	517-243-4892
Email:	Timothy.gibbons@magna.com

Agency Information

Regulatory Agency:	EGLE
Agency Contact:	David Patterson
Telephone:	517-256-4388
Email:	pattersond2@michigan.gov

Testing Company Information

Testing Firm:	Montrose Air Quality Services, LLC	
Contact:	Robert J. Lisy, Jr.	Jeremiah Hicks
Title:	District Manager	Client Project Manager
Telephone:	440-262-3760	440-262-3760
Email:	rlisy@montrose-env.com	jhicks@montrose-env.com

Laboratory Information

Laboratory:	VOC Reporting, Inc.
City, State:	Newberry, FL
Method:	US EPA Method 25

Test personnel and observers are summarized in Table 1-3.

TABLE 1-3
TEST PERSONNEL AND OBSERVERS

Name	Affiliation	Role/Responsibility
John Grech	Montrose	Senior Field Technician, QI
Shane Rabideau	Montrose	Field Technician
Ben Durham	Montrose	Field Technician
Ryan McWhinnie	Montrose	Field Technician
Timothy Gibbons	Magna DexSys	Client Liaison/Test Coordinator
David Patterson	EGLE	Observer

2.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

2.1 PROCESS DESCRIPTION, OPERATION, AND CONTROL EQUIPMENT

Magna International, Inc - Magna DexSys is a manufacturer of plastic front and rear bumpers for the automobile industry. The coating operation consists of an uncontrolled paint kitchen; a five - stage parts washer with a natural gas-fired hot water heater; three (3) water wash spray booths for application of adhesion promoter (AdPro), basecoats, and clearcoats; and three (3) natural gas-fired drying ovens. The spray coating operation occurs in a permanent total enclosure (PTE) and is controlled by a regenerative thermal oxidizer (RTO).

2.2 FLUE GAS SAMPLING LOCATION(S)

Information regarding the sampling location(s) is presented in Table 2-1.

TABLE 2-1
SAMPLING LOCATION(S)

Sampling Location	Stack Inside Dimension (in.)	Distance from Nearest Disturbance		Number of Traverse Points
		Downstream EPA "B" (in./dia.)	Upstream EPA "A" (in./dia.)	
EUPLASTICCOATING RTO INLET	55.3 X 55.0 Rectangular	293 / 5.3	93 / 1.7	Flow: 16 (4/port); Gaseous: 1
EUPLASTICCOATING RTO EXHAUST	47.0	372 / 7.9	300 / 6.4	Flow: 12 (6/port); Gaseous: 1

Sample location(s) were verified in the field to conform to EPA Method 1. Acceptable cyclonic flow conditions were confirmed prior to testing using EPA Method 1, Section 11.4. See Appendix A.1 for more information.

2.3 OPERATING CONDITIONS AND PROCESS DATA

Emission tests were performed while the source/units and air pollution control devices were operating at the conditions required by the permit. The units were tested when operating normally.

Plant personnel were responsible for establishing the test conditions and collecting all applicable unit-operating data. The process data that was provided is presented in Appendix B. Data collected includes the following parameters:

- RTO Temperature, F°
- Coating Use, Gallons
- Line Speed, FPM

3.0 SAMPLING AND ANALYTICAL PROCEDURES

3.1 TEST METHODS

The test methods for this test program were presented previously in Table 1-1. Additional information regarding specific applications or modifications to standard procedures is presented below.

3.1.1 EPA Method 1, Sample and Velocity Traverses for Stationary Sources

EPA Method 1 is used to assure that representative measurements of volumetric flow rate are obtained by dividing the cross-section of the stack or duct into equal areas, and then locating a traverse point within each of the equal areas. Acceptable sample locations must be located at least two stack or duct equivalent diameters downstream from a flow disturbance and one-half equivalent diameter upstream from a flow disturbance.

3.1.2 EPA Method 2, Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)

EPA Method 2 is used to measure the gas velocity using an S-type pitot tube connected to a pressure measurement device, and to measure the gas temperature using a calibrated thermocouple connected to a thermocouple indicator. Typically, Type S (Stausscheibe) pitot tubes conforming to the geometric specifications in the test method are used, along with an inclined manometer. The measurements are made at traverse points specified by EPA Method 1.

3.1.3 EPA Method 3, Gas Analysis for the Determination of Dry Molecular Weight

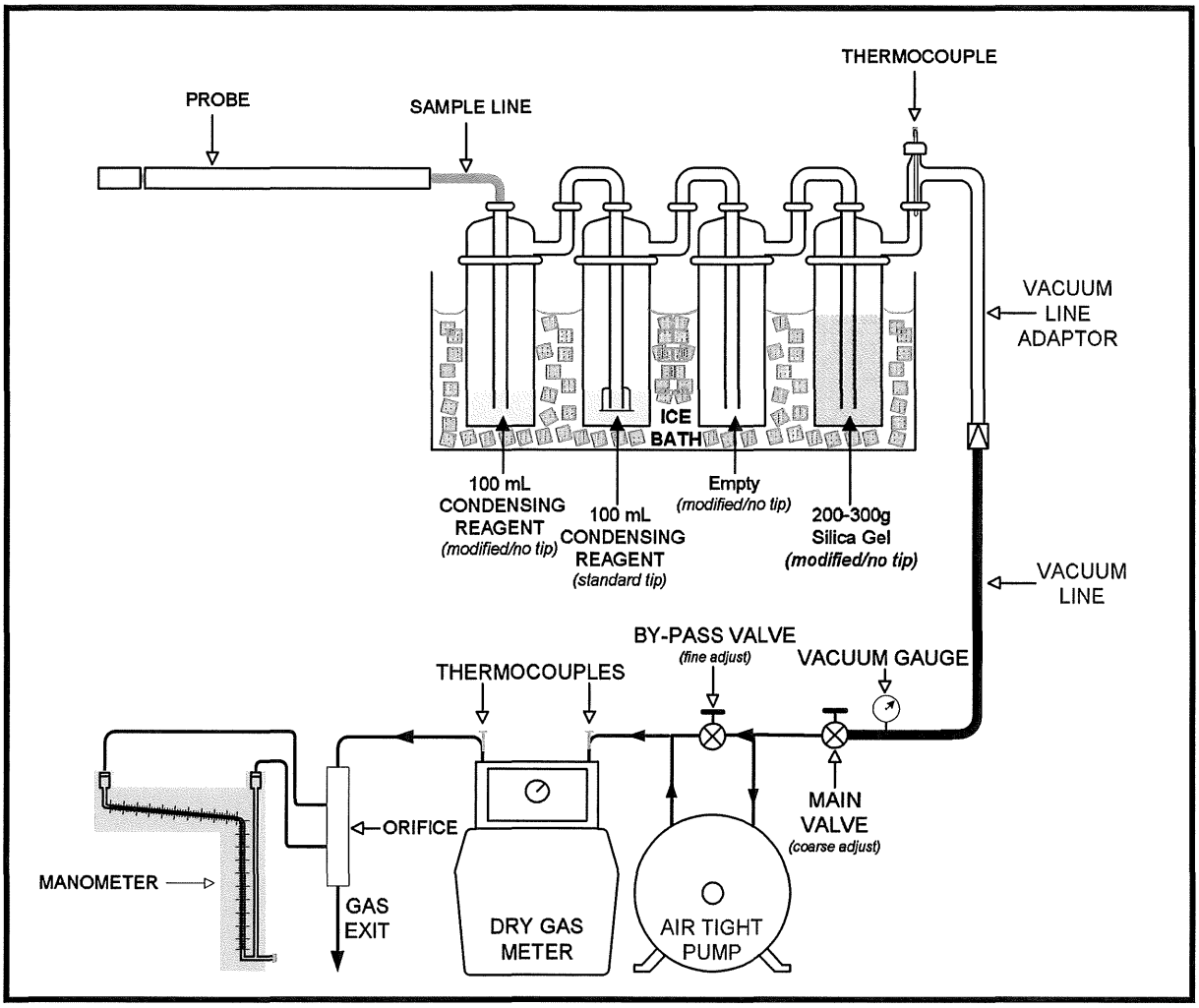
EPA Method 3 is used to calculate the dry molecular weight of the stack gas using one of three methods. The first choice is to measure the percent O_2 and CO_2 in the gas stream. A gas sample is extracted from a stack by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample is analyzed for percent CO_2 and percent O_2 using either an Orsat or a Fyrite analyzer.

3.1.4 EPA Method 4, Determination of Moisture Content in Stack Gas

EPA Method 4 is a manual, non-isokinetic method used to measure the moisture content of gas streams. Gas is sampled at a constant sampling rate through a probe and impinger train. Moisture is removed using a series of pre-weighed impingers containing methodology-specific liquids and silica gel immersed in an ice water bath. The impingers are weighed after each run to determine the percent moisture.

The sampling system is detailed in Figure 3-1.

FIGURE 3-1
EPA METHOD 4(DETACHED) SAMPLING TRAIN

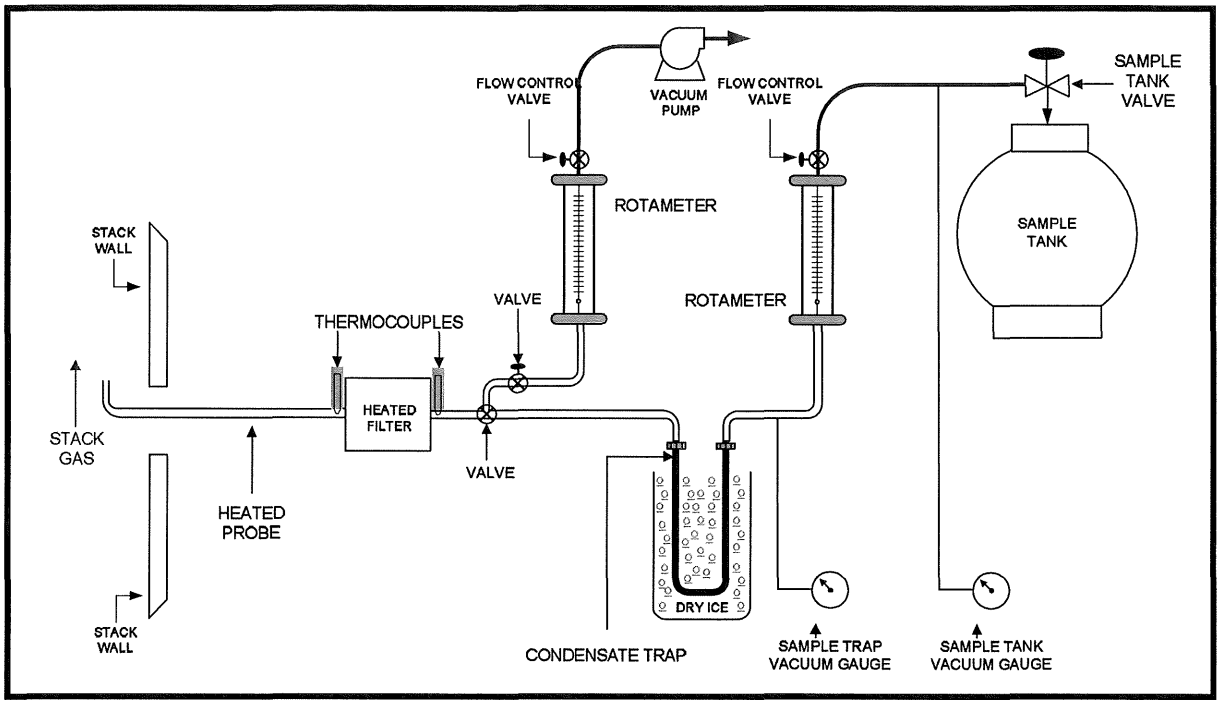


3.1.5 EPA Method 25, Determination of Total Gaseous Nonmethane Organic Emissions as Carbon

An emission sample is withdrawn from the stack at a constant rate through a heated filter and a chilled condensate trap by means of an evacuated sample tank. After sampling is completed, the TGNMO are determined by independently analyzing the condensate trap and sample tank fractions and combining the analytical results. The organic content of the condensate trap fraction is determined by oxidizing the NMO to carbon dioxide (CO_2) and quantitatively collecting in the effluent in an evacuated vessel; then a portion of the CO_2 is reduced to CH_4 and measured by an FID. The organic content of the sample tank fraction is measured by injecting a portion of the sample into a gas chromatographic column to separate the NMO from carbon monoxide (CO), CO_2, and CH_4; the NMO are oxidized to CO_2 reduced to CH_4, and measured by an FID. In this manner, the variable response of the FID associated with different types of organics is eliminated.

Figure 3-2 details the sampling system.

FIGURE 3-2
EPA METHOD 25 SAMPLING TRAIN



3.2 PROCESS TEST METHODS

The test plan did not require that process samples be collected during this test program; therefore, no process sample data are presented in this test report.

4.0 TEST DISCUSSION AND RESULTS

4.1 FIELD TEST DEVIATIONS AND EXCEPTIONS

During this test an audit of the Fyrite analyzer was not performed as outlined in EPA Method 3 Section 10.1. The measured O_2 and CO_2 concentrations were used for determining dry molecular weight purposes and were close to ambient at both locations.

NDO 2 at the PTE associated with EUPLASTICCOATING did not meet EPA Method 204, Section 5.1 criteria which requires that any NDO shall be at least four equivalent opening diameters (242-inches) from the VOC emitting point unless otherwise specified by the Administrator. NDO 2 was measured to be 150-inches from the VOC emitting point. Verification of the PTE on April 28, 2015 yielded a similar result for NDO 2 and was accepted by Tom Gasloli, EGLE for that test event.

4.2 PRESENTATION OF RESULTS

Concentration values in Table 4-2 denoted with a '<' were measured to be below the minimum detection limit (MDL) of the applicable analytical method. Emissions denoted with a '<' in Table 4-2 were calculated utilizing the applicable MDL concentration value instead of the "as measured" concentration value.

The average results are compared to the permit limits in Table 1-2. The results of individual compliance test runs performed are presented in Tables 4-1 and 4-2. Emissions are reported in units consistent with those in the applicable regulations or requirements. Additional information is included in the appendices as presented in the Table of Contents.

Table 4-3 displays the results of the EPA Method 204 PTE verification. As displayed, the PTE associated with EUPLASTICCOATING met EPA Method 204, Sections 5.3 through 5.5 criteria. Continuous inward flow through the NDO was verified with a micromanometer and smoke tubes as per EPA Method 204, Section 8.4. Therefore, the VOC CE for the PTE met the criteria for 100% CE as outlined in EPA Method 204 Section 2. See Section 4.1 regarding EPA Method 204, Section 5.1.

Due to the size and complexity of the PTE associated with EUPLASTICCOATING, no measurements were performed for total surface area determination by Montrose personnel. However, Magna DexSys personnel, provided the measurements of the PTE. Only the NDOs of the PTE were measured by Montrose personnel. The PTE measurements provided by the Magna DexSys are located in Appendix A.4. Note that the surface area of the PTE only includes the tunnels and the six booths. The oven sections are not considered part of the PTE.

TABLE 4-1
TGNMO EMISSIONS RESULTS -
RTO INLET

Run Number	1	2	3	Average
Date	6/30/2020	6/30/2020	6/30/2020	--
Time	8:51-9:51	10:55-11:55	12:36-13:56	--
Flue Gas Parameters				
O_2, % volume dry	20.9	20.9	20.9	20.9
CO_2, % volume dry	0.0	0.0	0.0	0.0
flue gas temperature, °F	99.8	100.6	101.5	100.6
moisture content, % volume	2.52	2.28	2.54	2.45
volumetric flow rate, dscfm	24,776	24,361	24,148	24,428
TGNMO as Carbon				
ppmvd	2,270	2,423	2,274	2,322
lb/hr	105.2	110.4	102.7	106.1

TABLE 4-2
TGNMO AND TGNMO DE EMISSIONS RESULTS -
RTO OUTLET

Run Number	1	2	3	Average
Date	6/30/2020	6/30/2020	6/30/2020	--
Time	8:50-9:50	10:56-11:56	12:37-13:57	--
Flue Gas Parameters				
O_2, % volume dry	20.9	20.9	20.9	20.9
CO_2, % volume dry	0.0	0.0	0.0	0.0
flue gas temperature, °F	228.1	229.3	28.9	229.1
moisture content, % volume	2.88	2.81	2.68	2.79
volumetric flow rate, dscfm	24,858	24,440	23,952	24,416
TGNMO as Carbon				
ppmvd*	<50.0	<50.0	<50.0	<50
lb/hr*	<2.32	<2.29	<2.24	2.28
TGNMO DE				
%	>97.8	>97.9	>97.8	>97.8

* The "<" symbol indicates that compound was below the Minimum Detection Limit (MDL) of the analytical method. See Section 4.2 for details.

TABLE4-3
PTE AND PTE CE VERIFICATION-
EUPLASTICCOATING PTE

Parameter/Units	Results	Allowable
NDO 1 (East Elevation)		
Equivalent Diameter, in.	60.6	--
Differential Pressure, in-H_2O	0.012	≥0.007
Distance to Nearest VOC Emitting Point, in.	>242	≥242
NDO 2 (West Elevation)		
Equivalent Diameter, in.	60.6	--
Differential Pressure, in-H_2O	0.011	≥0.007
Distance to Nearest VOC Emitting Point, in.*	150	≥242
PTE		
Total Area of NDO(s) (A_N), ft.^{2}	40.0	--
Total Surface Area of PTE (A_T)†, ft.^{2}	45,660	--
NEAR (A_N/A_T), %	0.088	≤5

* See Section 4.1 for details.

† PTE dimensions were provided by Magna DexSys facility personnel. See Section 4.2 for details.

5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA/QC AUDITS

The meter box(es) and sampling train(s) used during sampling performed within the requirements of their respective methods. All post-test leak checks, minimum metered volumes and minimum sample durations met the applicable QA/QC criteria.

An EPA Method 25 train leak check audit was performed prior to each run as per Section 8.1.4. All sample trains utilized met the criteria.

5.2 QA/QC DISCUSSION

All QA/QC criteria were met during this test program.

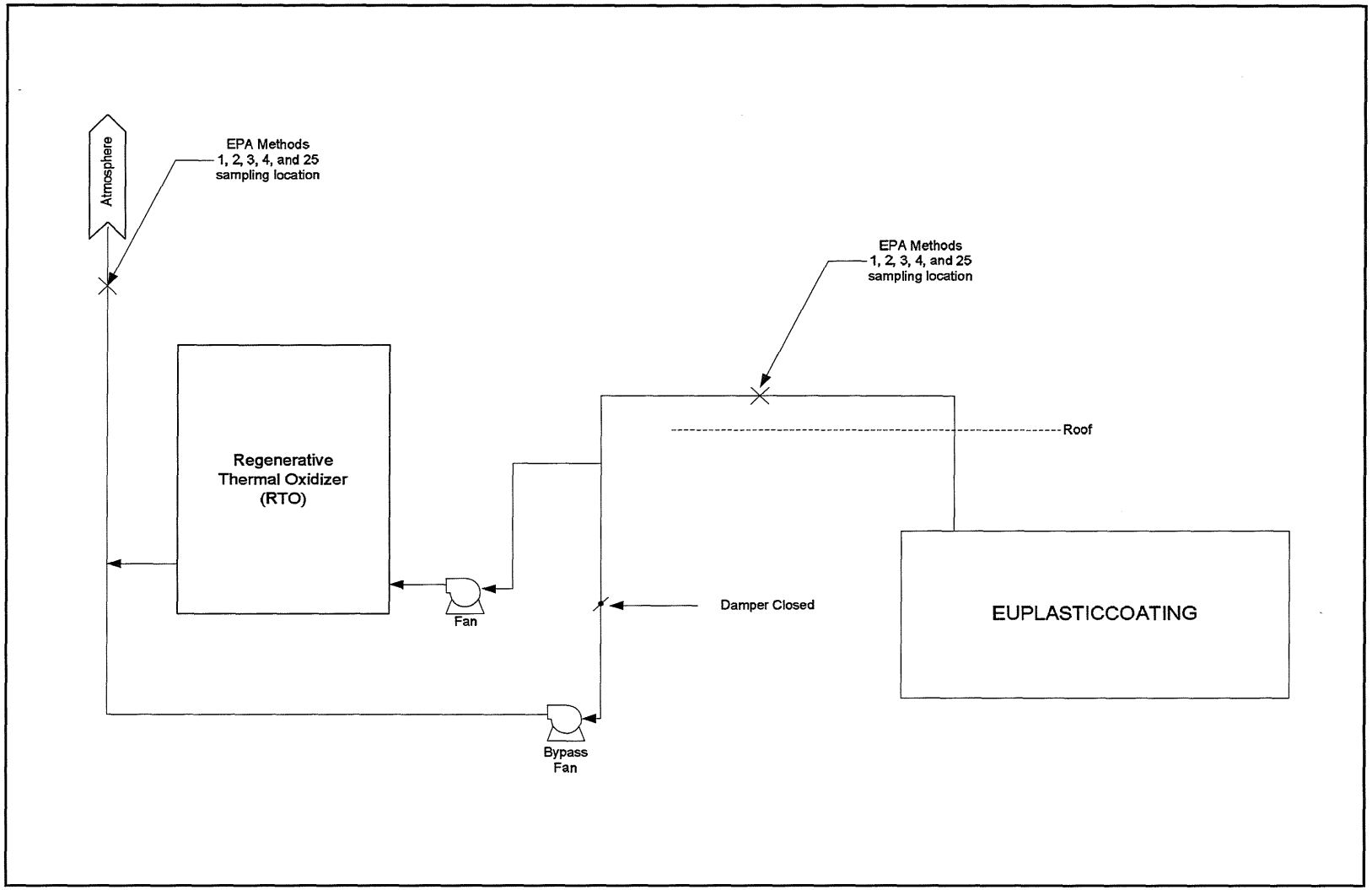
5.3 QUALITY STATEMENT

Montrose is qualified to conduct this test program and has established a quality management system that led to accreditation with ASTM Standard D7036-04 (Standard Practice for Competence of Air Emission Testing Bodies). Montrose participates in annual functional assessments for conformance with D7036-04 which are conducted by the American Association for Laboratory Accreditation (A2LA). All testing performed by Montrose is supervised on site by at least one Qualified Individual (QI) as defined in D7036-04 Section 8.3.2. Data quality objectives for estimating measurement uncertainty within the documented limits in the test methods are met by using approved test protocols for each project as defined in D7036-04 Sections 7.2.1 and 12.10. Additional quality assurance information is included in the report appendices. The content of this report is modeled after the EPA Emission Measurement Center Guideline Document (GD-043).

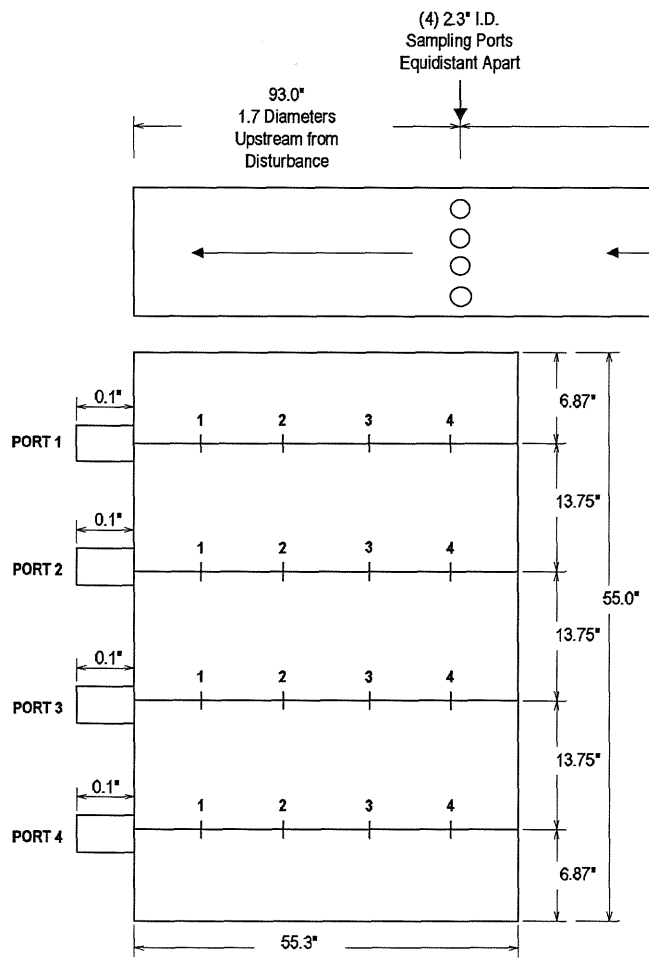
APPENDIX A
FIELD DATA AND CALCULATIONS

Appendix A.1
Sampling Locations

EUPLASTICCOATING PROCESS AND SAMPLING LOCATION SCHEMATIC

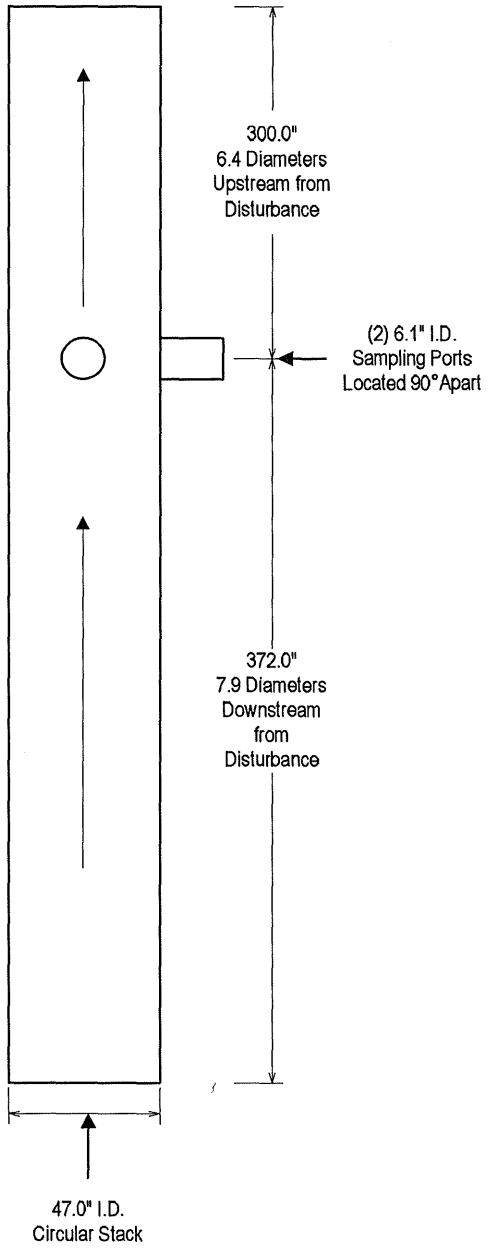


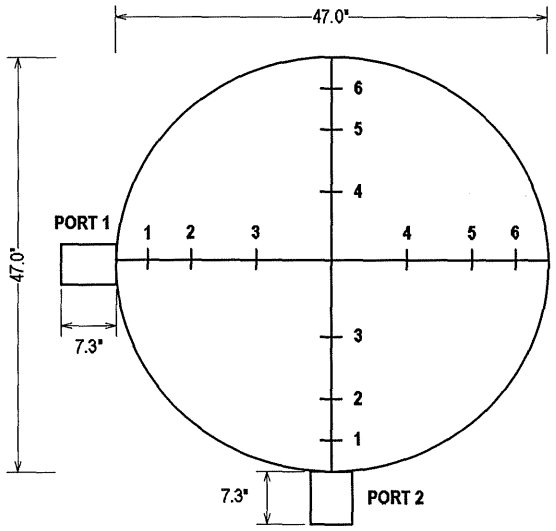
EUPLASTICCOATING RTO INLET TRAVERSE POINT LOCATION DRAWING



Point	% of Duct Depth	Distance from Inside Wall (in.) PORT 1	Distance from Inside Wall (in.) PORT 2	Distance from Inside Wall (in.) PORT 3	Distance from Inside Wall (in.) PORT 4
1	12.5	6.9	6.9	6.9	6.9
2	37.5	20.7	20.7	20.7	20.7
3	62.5	34.6	34.6	34.6	34.6
4	87.5	48.4	48.4	48.4	48.4

EUPLASTICCOATING RTO EXHAUST TRAVERSE POINT LOCATION DRAWING





Point	% of Stack Depth	Distance from Inside Wall (in.) PORT 1	Distance from Inside Wall (in.) PORT 2
1	4.4	2.1	2.1
2	14.6	6.9	6.9
3	29.6	13.9	13.9
4	70.4	33.1	33.1
5	85.4	40.1	40.1
6	95.6	44.9	44.9