EUBOILER#1 and EUBOILER #2
FGBOILERS123
EUTRIMMER/PBRUSH, and
EU3 PREDRYER/EU3 BAKEOVEN

Air Emissions Test Report

Alpena, Michigan

Renewable Operating Permit MI-ROP-B1476-2009a
SRN: B1476

Prepared for

Decorative Panels International, Inc.
416 Ford Avenue
Alpena, Michigan

Bureau Veritas Project No. 11014-000099.00
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Executive Summary

Decorative Panels International, Inc. retained Bureau Veritas North America, Inc. to test air emissions at their hardboard manufacturing facility in Alpena, Michigan. The sources tested included:

- EUBOILER#1 and EUBOILER#2: carbon monoxide emissions from the combined exhaust of EUBOILER#1, EUBOILER#2, and EUBOILER#3 with EUBOILER#3 not operating.
- FGBOILERS123: particulate matter emissions from the combined exhaust of EUBOILER#1, EUBOILER#2, and EUBOILER#3
- EUTRIMMER/PBRUSH: particulate matter emissions from the exhaust of Ducon Scrubber 1
- EUTRIMMER/PBRUSH: particulate matter emissions from the exhaust of Ducon Scrubber 2
- FGPREDRYER-BAKEOVEN: particulate matter emissions from the exhaust of the regenerative catalytic oxidizer (RCO)

The objective of the testing was to evaluate compliance of these sources with emission limits in:

- Michigan Department of Environmental Quality (MDEQ) Renewable Operating Permit (ROP) MI-ROP-B1476-2009a

Bureau Veritas measured volumetric flowrate, molecular weight (O_2 and CO_2), moisture content, particulate matter, and/or carbon monoxide from these sources on May 20 through 23, 2014. Three 60-minute test runs were performed under maximum routine operating conditions at each source following United States Environmental Protection Agency (USEPA) Methods 1, 2, 3, 3A, 4, 5 and 10.

Detailed results are presented in Tables 1 through 5 after the Tables Tab of this report. The following tables summarize the results of the testing in comparison to permit limits.

EUBOILER#1 and EUBOILER#2 Carbon Monoxide Results

EUBOILER#1 and EUBOILER#2 Carbon Monoxide Results

Parameter	Units	Run 1	Run 2	Run 3	Average	Limit
Carbon monoxide	lb/hr	2.2	2.2	2.2	**2.2**	**20.3**

lb/hr: pound per hour

The results of the emissions testing indicate the EUBOILER#1 and EUBOILER#2 equipment are operating in compliance with the applicable carbon monoxide permit limit.

FGBOILERS123 Particulate Matter Results

FGBOILERS123 Particulate Matter Results

Parameter	Units	Run 1	Run 2	Run 3	Average	Limit
Particulate matter	lb/hr	1.4	1.7	1.9	**1.7**	**27.1**

lb/hr: pound per hour

The results of the emissions testing indicate the FGBOILERS123 equipment was operating in compliance with the applicable particulate matter permit limit.

EUTRIMMER/PBRUSH Particulate Matter Results

EUTRIMMER/PBRUSH Particulate Matter Results

Source and Stack	Unit	Testing Results					Limit
		Run 1	Run 2	Run 3	Average Result	Combined Result	
Ducon Scrubber 1 SVDUCONSCRB-STK87	lb PM/1,000 lb exhaust gas, dry basis	0.0043	0.0073	0.0027	**0.0048**	**0.0079**	**0.10**
Ducon Scrubber 2 SVDUCONSCRB-STK88		0.017	0.011	0.0038	**0.011**		

The results of the emissions testing indicate the EUTRIMMER/PBRUSH equipment was operating in compliance with the applicable particulate matter permit limit.

FGPREDRYER-BAKEOVEN Particulate Matter Results

FGPREDRYER-BAKEOVEN Particulate Matter Results

Parameter	Units	Run 1	Run 2	Run 3	Average	Limit
Particulate matter	lb PM/1,000 lb exhaust gas, dry basis	0.0017	0.0042	0.0023	**0.0027**	**0.10**

The results of the emissions testing indicate the FGPREDRYER-BAKEOVEN equipment was operating in compliance with the applicable particulate matter permit limit.

1.0 Introduction

1.1 Summary of Test Program

Decorative Panels International, Inc. retained Bureau Veritas North America, Inc. to test air emissions at their hardboard manufacturing facility in Alpena, Michigan. The sources tested included:

- EUBOILER#1 and EUBOILER#2: carbon monoxide emissions from the combined exhaust of EUBOILER#1, EUBOILER#2, and EUBOILER#3 with EUBOILER#3 not operating.
- FGBOILERS123: particulate matter emissions from the combined exhaust of EUBOILER#1, EUBOILER#2, and EUBOILER#3
- EUTRIMMER/PBRUSH: particulate matter emissions from the exhaust of Ducon Scrubber 1
- EUTRIMMER/PBRUSH: particulate matter emissions from the exhaust of Ducon Scrubber 2
- FGPREDRYER-BAKEOVEN: particulate matter emissions from the exhaust of the regenerative catalytic oxidizer (RCO)

The objective of the testing was to evaluate compliance of these sources with emission limits and requirements in:

- Michigan Department of Environmental Quality (MDEQ) Renewable Operating Permit (ROP) MI-ROP-B1476-2009a

Bureau Veritas measured volumetric flowrate, molecular weight (O_2 and CO_2), moisture content, particulate matter, and/or carbon monoxide from these sources on May 20 through 23, 2014. Three, 60-minute test runs were performed under maximum routine operating conditions at each source following United States Environmental Protection Agency (USEPA) Methods 1, 2, 3, 3A, 4, 5 and 10.

1.2 Key Personnel

The key personnel involved in this test program are listed in Table 1-1. Mr. Thomas Schmelter, Senior Project Manager with Bureau Veritas led the emission testing. Mr. Dennis Werblow, Director of Corporate Environmental Affairs with Decorative Panels International, Inc., provided process coordination and recorded operating parameters. Messers. William Rogers Jr. and Rob Dickman, both Environmental Quality Analysts with MDEQ, witnessed portions of the testing.

Table 1-1
Key Personnel

Facility Contact	Emission Testing Project Manager
Dennis Werblow Director of Corporate Environmental Affairs **Decorative Panels International, Inc.** 416 Ford Avenue Alpena, Michigan 49707 Telephone: 989.356.8542 Facsimile: 989.356.2504 dennis.werblow@DecPanels.com	Thomas Schmelter, QSTI Senior Project Manager **Bureau Veritas North America, Inc.** 22345 Roethel Drive Novi, Michigan 48375 Telephone: 248.344.3003 Facsimile: 248.344.2656 thomas.schmelter@us.bureauveritas.com
Regulatory Agency	**Regulatory Agency**
Rob Dickman Environmental Quality Analyst **Michigan Department of Environmental Quality** Air Quality Division Cadillac District Office 120 West Chapin Street Cadillac, Michigan 49601-2158 Telephone: 231.876.4412 Facsimile: 231.775.1511 dickmanr@michigan.gov	William J. Rogers Jr. Environmental Quality Analyst **Michigan Department of Environmental Quality** Air Quality Division Gaylord District Office 2100 West M-32 Gaylord, Michigan 49735-9282 Telephone: 989.705.3406 Facsimile: 989.731.6181 rogersw@michigan.gov

2.0 Source and Sampling Locations

2.1 Process Description

Decorative Panels International, Inc. produces a variety of hardboard products including wall paneling, pegboard, and marker board. Hardwood chips such as aspen, ash, maple, and beech are purchased and stored in an outdoor raw material storage area and then reclaimed into silos. The wood chips are cooked and softened in one of four digesters using steam injection and ground into wood pulp fibers.

The pulp fibers are conveyed to a forming machine, which forms a mat of unpressed hardboard. The mats are processed through a Coe™ dryer and are cut using a trimmer and panel brush. The mats are conveyed to one of two hardboard lines, Line 1 or 3. Line 2 was historically operated but has since been decommissioned.

On the hardboard lines, the mats enter a predryer, a press, cooler, and tempering area. The predryer ensures the mat has the desired moisture content before the mat enters presses that heat and form hardboard. The hardboard is coated with linseed or Oxi-Cure® oil in the tempering area. The oil tempers the board thereby increasing its strength and "paintability." Once the board has been tempered, it is superheated to cure the binding resins in the bake ovens (No. 3 Press only). The hardboard is humidified to approximate atmospheric conditions to limit warping. The boards are inspected, graded, cut, and packed for shipping.

2.2 Process Operating Parameters

The following operating parameters for the EUBOILER#1 and EUBOILER#2, FGBOILERS123, EUTRIMMER/PBRUSH, and FGPREDRYER/BAKEOVEN sources were recorded as required by 40 CFR 63.2262(l)(1) and 40 CFR 63.2262(m)(1):

- EUBOILER#1 and EUBOILER#2, FGBOILERS123: Boiler fuel type (i.e., coal), quantity (lb/hr), heat input (MMBtu/hr) and steam load (lb/hr) during each 60-minute test run.
- EUTRIMMER/PBRUSH: Ducon dual scrubber water flowrate and pressure drop across Ducon scrubbers during each 60-minute test run.
- FGPREDRYER/BAKEOVEN: RCO combustion chamber temperature during each 60-minute test run.

Refer to Appendix E for process data recorded during testing.

2.3 Control Equipment

2.3.1 EUBOILER#1 and EUBOILER#2, FGBOILERS123

The boilers are equipped with multi-clone collectors and an ESP to control emissions. The multi-clone collectors use cyclones to remove particles from the gas stream. As the flue gas enters the cyclones, centrifugal force is applied using venturis and a conical-shaped chamber. The incoming gas is forced into a cyclonic motion, down, and along the walls of the chamber. As the air nears the bottom of the chamber, it changes directions and flows up through the center of a cyclone tube. The momentum of the entrained particles causes them to move along the side walls and collect at the bottom of the chamber where they accumulate in a hopper. The air exists the cyclone tube and is ducted to another cyclone chamber or into the ESP for further pollution control.

The ESP uses voltage to generate an electrostatic charge on vertically hung collection plates, which attract particulate matter in the flue. By removing the charge from the collection plates and using a series of plate rappers, the particulate matter is released from the plates and collected at the bottom of the ESP in a hopper for removal. The air is then directed to the common SVBOIL123-STK58 stack where it is discharged to atmosphere.

2.3.2 EUTRIMMER/PBRUSH

The Ducon Dual Scrubbers control emissions from the EUTRIMMER/PBRUSH unit. The emissions from the trimming and painting process are drawn into one of the Ducon Scrubbers. As the gas mixes with the water, particulates and other pollutants are removed. The flue gas exits the top of the scrubber through SVDUCONSCRB-STK87 or SVDUCONSCRB-STK88.

The water flowrate and pressure drop across the scrubbers are continuously monitored. These parameters are reduced to 15-minute and 1-hour averages and were recorded during testing.

2.3.3 FGPREDRYER/BAKEOVEN

The RCO controls emission from the EU3 PREDRYER and EU3 BAKEOVEN units. Emissions entering the RCO pass through a pre-filter that removes particulate matter. The flue gas is directed through an inlet damper to one of two chambers, heated by a burner, and directed through a catalyst bed. The burner increases the temperature of the flue gas to sustain the catalytic reaction. The catalyst is comprised of layers of treated ceramic saddles and rings, where pollutants are oxidized to carbon dioxide and water.

After passing through the catalyst in one chamber, the flue gas is directed through the second chamber, flowing in the opposite direction. This opposing flow allows transfer of heat to the catalyst bed in the second chamber. After exiting the second chamber, the flue gas is discharged

through the RCO exhaust stack, SV#3LNRCO-STK93. In a repeated process, after a set cycle time (i.e., 90 seconds), chamber valves open and close, and direct the flue gas through the second chamber catalyst first, before directing it through the first chamber, and through the exhaust stack.

The RCO catalyst temperature is continuously recorded by a human machine interface controller. 15-minute average catalytic oxidizer temperatures were recorded during each of the test runs.

2.4 Flue Gas Sampling Locations

The figures on the following pages provide photographs that show the sampling ports at the sampling locations for the EUBOILER#1 and EUBOILER#2, FGBOILERS123, EUTRIMMER/PBRUSH, and FGPREDRYER/BAKEOVEN sources. Appendix Figures 1 through 5 present the EUBOILER#1 and EUBOILER#2, FGBOILERS123, EUTRIMMER/PBRUSH, and FGPREDRYER/BAKEOVEN sampling ports and traverse point locations.

Figure 2-1. FGBOILERS123 (EUBOILER#1, #2 and #3) Outlet Sampling Location

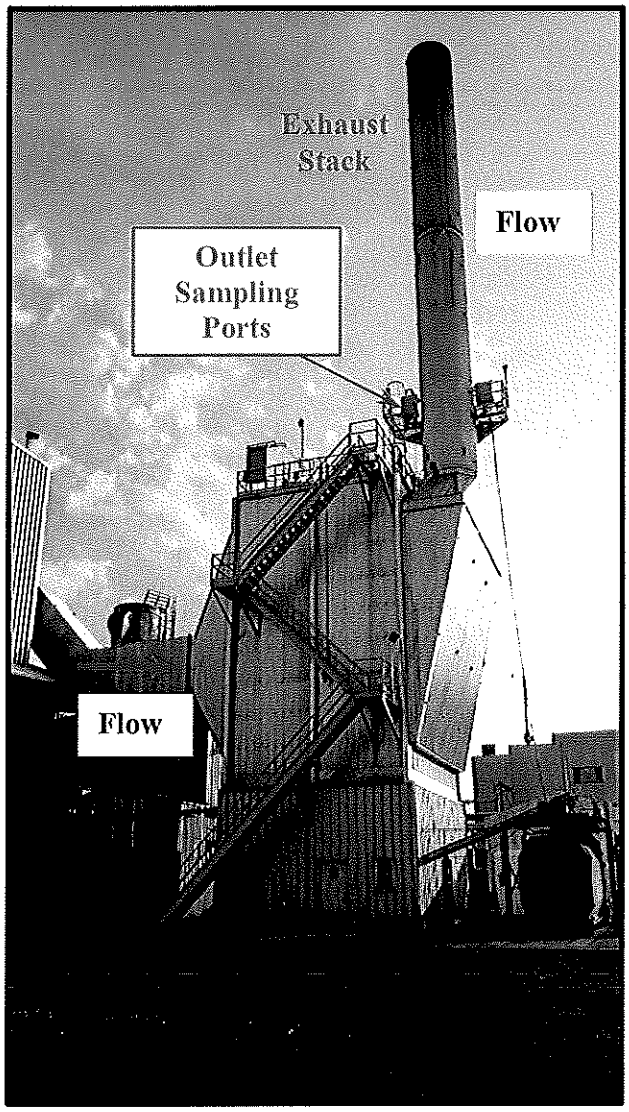


Figure 2-2. EUTRIMMER/PBRUSH Ducon Scrubber 1 and 2 Outlet Sampling Locations

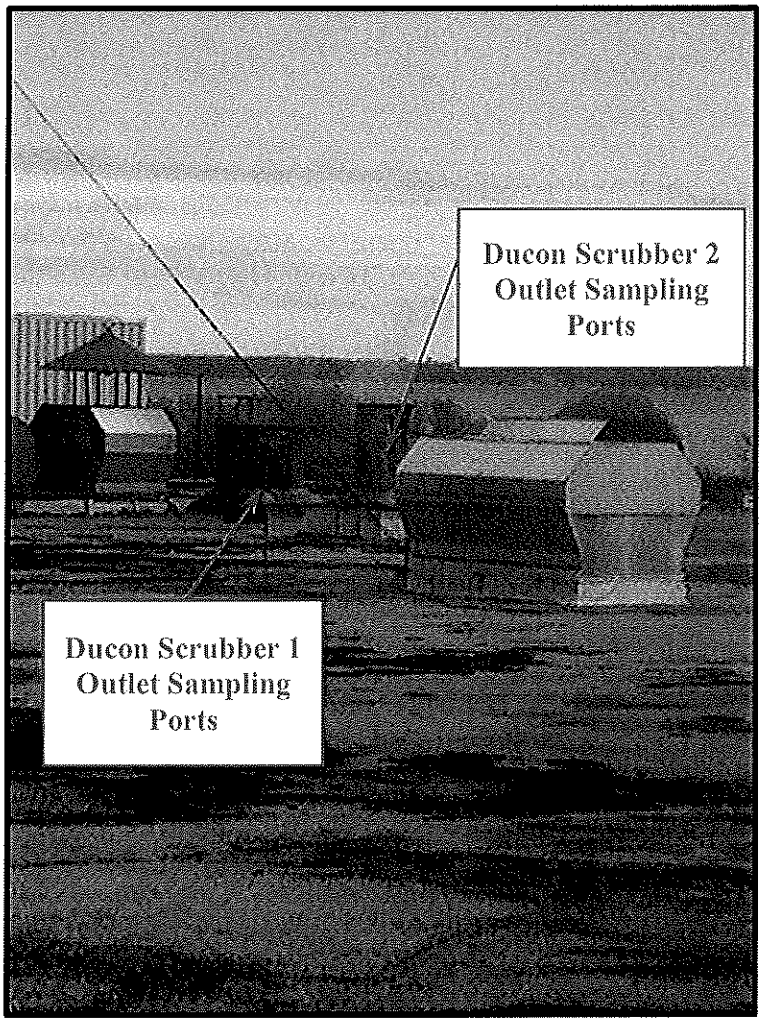
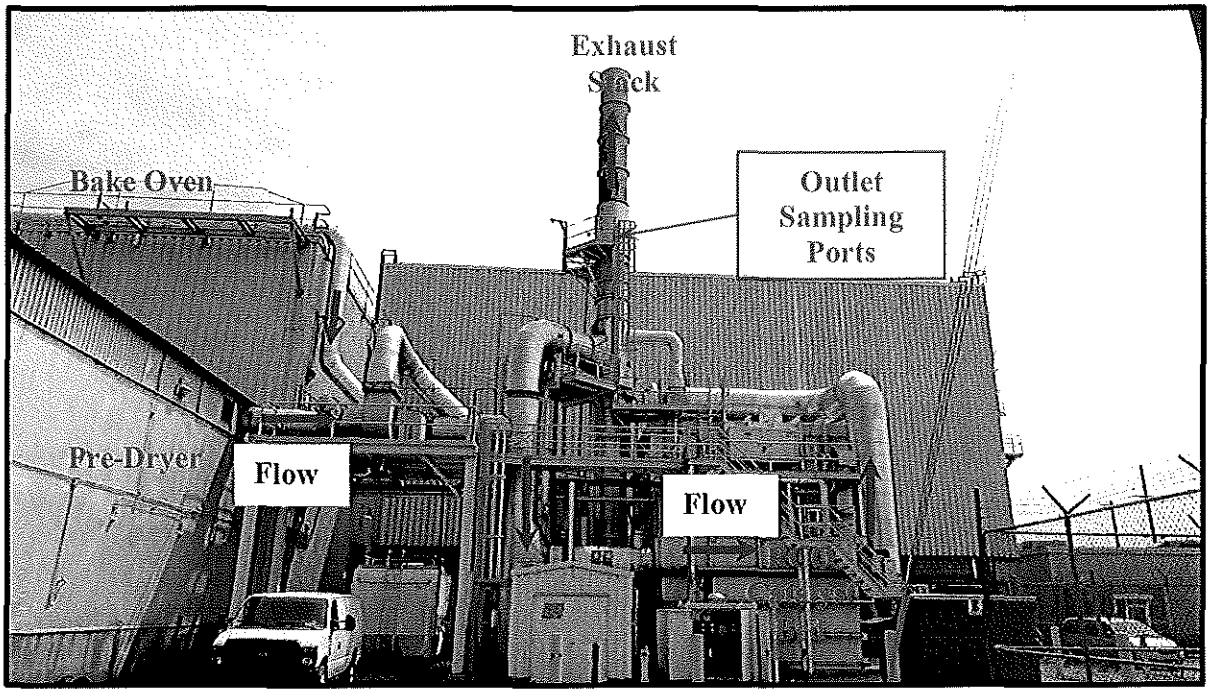


Figure 2-3. FGPREDRYER/BAKEOVEN Outlet Sampling Location



2.5 Process Sampling Locations

Process sampling was not required during this test program. A process sample is a sample that is analyzed for operational parameters, such as calorific value of a fuel (e.g., natural gas, coal), organic compound content (e.g., paint coatings), or composition (e.g., polymers).

3.0 Summary and Discussion of Results

3.1 Objective

The sources tested included:

- EUBOILER#1 and EUBOILER#2: carbon monoxide emissions from the combined exhaust of EUBOILER#1, EUBOILER#2, and EUBOILER#3 with EUBOILER#3 not operating.
- FGBOILERS123: particulate matter emissions from the combined exhaust of EUBOILER#1, EUBOILER#2, and EUBOILER#3
- EUTRIMMER/PBRUSH: particulate matter emissions from the exhaust of Ducon Scrubber 1
- EUTRIMMER/PBRUSH: particulate matter emissions from the exhaust of Ducon Scrubber 2
- FGPREDRYER-BAKEOVEN: particulate matter emissions from the exhaust of the RCO

The objective of the testing was to evaluate compliance of these sources with emission limits and requirements in:

- MDEQ ROP MI-ROP-B1476-2009a

The permit limits for the sources tested are presented in Table 3-1.

Table 3-1
ROP Emission Limits

Source Stack	Parameter	Emission Limit
EUBOILER#1 and EUBOILER#2, and FGBOILERS123		**Boilers**
EUBOILER#1 and EUBOILER#2 SVBOIL123-STK58 (Boiler 3 not operating)	Carbon monoxide	20.3 lb per hour Testing with boilers exhausting through multiclones and electrostatic precipitator.
SVBOIL123-STK58 (Boilers 1, 2 and 3 operating)	Particulate matter	27.1 lb per hour (Equivalent to 0.10 lb per million BTU heat input) Testing with boilers exhausting through multiclone collectors and electrostatic precipitator.
EUTRIMMER/PBRUSH		**Double Trimmer and Panel Brush**
SVDUCONSCRB_STK87	Particulate matter	0.10 lb per 1,000 lb exhaust gases, dry basis
SVDUCONSCRB-STK88	Particulate matter	0.10 lb per 1,000 lb exhaust gases, dry basis
FGPREDRYER-BAKEOVEN		**Predryer and Bake Oven for No. 3 Press Line**
SV#3LNRCO-STK93	Particulate matter	0.10 lb per 1,000 lb of exhaust gases, dry basis

3.2 Test Matrix

The purpose of the emission test program was to satisfy certain requirements and evaluate compliance with the permit. Table 3-2 presents the test matrix.

Table 3-2
Test Matrix

Source	Date 2014	Run	Start Time	End Time	EPA Methods
EUBOILER#1 and EUBOILER#2	May 20	1	9:35	10:35	1, 2, 3A, 4, 10
		2	10:45	11:45	
		3	12:02	13:02	
FGBOILERS123	May 21	1	9:10	10:20	1, 2, 3, 4, 5
		2	10:40	11:55	
		3	12:30	13:40	
EUTRIMMER/BRUSH Ducon Scrubber 1	May 22	1	7:45	8:50	1, 2, 3A, 4, 5
		2	9:28	10:35	
		3	11:07	12:11	
EUTRIMMER/BRUSH Ducon Scrubber 2	May 22	1	7:45	8:52	1, 2, 3A, 4, 5
		2	9:28	10:35	
		3	11:07	12:11	
FGPREDRYER-BAKEOVEN	May 23	1	7:45	8:50	1, 2, 3A, 4, 5
		2	9:20	11:55	
		3	12:25	13:30	

3.3 Field Test Changes and Issues

The testing was performed in accordance with USEPA procedures during maximum routine operating conditions as outlined in the Intent-to-Test Plan submitted to MDEQ on April 1, 2014. No field test changes or issues were encountered during the test program.

3.4 Summary of Results

The results of the testing are presented in Tables 3-3 and 3-6.

Table 3-3
EUBOILER#1 and EUBOILER#2 Carbon Monoxide Results

Parameter	Units	Run 1	Run 2	Run 3	Average	Limit
Carbon monoxide	lb/hr	2.2	2.2	2.2	**2.2**	**20.3**

lb/hr: pound per hour

The results of the emissions testing indicate the EUBOILER#1 and EUBOILER#2 equipment was operating in compliance with the applicable carbon monoxide permit limit.

Table 3-4
FGBOILERS123 Particulate Matter Results

Parameter	Units	Run 1	Run 2	Run 3	Average	Limit
Particulate matter	lb/hr	1.4	1.7	1.9	**1.7**	**27.1**

lb/hr: pound per hour

The results of the emissions testing indicate the FGBOILERS123 equipment was operating in compliance with the applicable particulate matter permit limit.

Table 3-5
EUTRIMMER/PBRUSH Particulate Matter Results

Source and Stack	Unit	Testing Results					Limit
		Run 1	Run 2	Run 3	Average Result	Combined Result	
Ducon Scrubber 1 SVDUCONSCRB-STK87	lb PM/1,000 lb exhaust gas, dry basis	0.0043	0.0073	0.0027	**0.0048**	**0.0079**	**0.10**
Ducon Scrubber 2 SVDUCONSCRB-STK88		0.017	0.011	0.0038	**0.011**		

The results of the emissions testing indicate the EUTRIMMER/PBRUSH equipment was operating in compliance with the applicable particulate matter permit limit.

Table 3-6
FGPREDRYER-BAKEOVEN Particulate Matter Results

Parameter	Units	Run 1	Run 2	Run 3	Average	Limit
Particulate matter	lb PM/1,000 lb exhaust gas, dry basis	0.0017	0.0042	0.0023	**0.0027**	**0.10**

The results of the emissions testing indicate the FGPREDRYER-BAKEOVEN equipment was operating in compliance with the applicable particulate matter permit limit.

Detailed results are presented in the Appendix Tables 1 and 5 after the Tables Tab of this report. Graphs of the CO, O_2, and/or CO_2 concentrations are presented for the EUBOILER#1 and EUBOILER#2, and FGBOILERS123 sources after the Graphs Tab of this report.

Sample calculations are presented in Appendix B.

4.0 Sampling and Analytical Procedures

Bureau Veritas measured emissions following the guidelines and procedures specified in 40 CFR 60, Appendix A, "Standards of Performance for New Stationary Sources," 40 CFR 63, Appendix A, "Test Methods Pollutant Measurement Methods from Various Waste Media," and State of Michigan Part 10 Rules, "Intermittent Testing and Sampling." The sampling and analytical methods used are presented in Table 4-1.

Table 4-1
Emission Test Methods

Method	Parameter	Analysis
EPA 1 and 2	Gas stream volumetric flowrate	Field measurement, S-type Pitot tube
EPA 3 and 3A	Oxygen, carbon dioxide, molecular weight	Fyrite® chemical absorption and paramagnetic gas analyzers
EPA 4	Moisture content	Gravimetric
EPA 5	Particulate matter	Gravimetric
EPA 10	Carbon monoxide	Infrared gas analyzers
EPA 205	Calibration gas dilutions	Field instrument verification

4.1 Emission Test Methods

4.1.1 Volumetric Flowrate (USEPA Methods 1 and 2)

Method 1, "Sample and Velocity Traverses for Stationary Sources," from the Code of Federal Regulations, Title 40, Part 60 (40 CFR 60), Appendix A, was used to evaluate the sampling location, the number of traverse points for sampling, and the measurement of velocity profiles.

Details of the sampling location and number of velocity traverse points are presented in Table 4-2.

Table 4-2
Sampling Location and Number of Traverse Points

Source	Sampling Location	Duct Diameter (inch)	Distance from Ports to Upstream Flow Disturbance (diameter)	Distance from Ports to Downstream Flow Disturbance (diameter)	Number of Ports Used	Traverse Points per Port	Total Traverse Points
FGBOILERS123	Outlet	84	2.1	10.7	2	12	24
EUTRIMMER/BRUSH Ducon Scrubber 1	Outlet	62	2	0.5	2	12	24
EUTRIMMER/BRUSH Ducon Scrubber 2	Outlet	40	6	0.5	2	12	24
FGPREDRYER-BAKEOVEN	Outlet	47.5	3.8	6.3	2	12	24

Appendix Figures 1 through 4 present the FGBOILERS123, EUTRIMMER/PBRUSH, and FGPREDRYER/BAKEOVEN sampling ports and traverse point locations.

Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)," was used to measure flue gas velocity and calculate volumetric flowrate. S-type Pitot tubes and thermocouple assemblies, calibrated in accordance with Method 2, Section 10.0, were used during testing. Because the dimensions of the Pitot tubes met the requirements outlined in Method 2, Section 10.1, and were within the specified limits, the baseline Pitot tube coefficient of 0.84 (dimensionless) was assigned. Refer to Appendix A for the Pitot tube inspection sheets.

Cyclonic Flow Check. Bureau Veritas evaluated whether cyclonic flow was present at the sampling locations on May 19 through 23, 2014. Cyclonic flow is defined as a flow condition with an average null angle greater than 20°. The direction of flow can be determined by aligning the Pitot tube to obtain zero (null) velocity head reading—the direction would be parallel to the Pitot tube face openings or perpendicular to the null position. By measuring the angle of the Pitot tube face openings in relation to the stack walls when a null angle is obtained, the direction of flow is measured. If the absolute average of the flow direction angles is greater than 20°, the flue gas is considered cyclonic at that sampling location and an alternative location should be found.

The average flue gas velocity null angles measured were:

- 1.5° from the direction of flow for the FGBOILERS123 outlet
- 15° from the direction of flow for the EUTRIMMER/BRUSH Ducon Scrubber 1 outlet
- 8.1° from the direction of flow for the EUTRIMMER/BRUSH Ducon Scrubber 2 outlet

- 6.3° from the direction of flow for the FGPREDRYER-BAKEOVEN outlet

The measurements indicate the absence of cyclonic flow at these sampling locations. Field data sheets are included in Appendix C. Computer-generated field data sheets are included in Appendix D.

4.1.2 Molecular Weight (USEPA Method 3)

Molecular weight at the SVBOIL123-STK58 source was measured using USEPA Method 3, "Gas Analysis for the Determination of Dry Molecular Weight." Flue gas was extracted from the stack through a probe positioned near the centroid of the duct and directed into a Fyrite® gas analyzer. The concentrations of carbon dioxide (CO_2) and oxygen (O_2) were measured by chemical absorption to within ±0.5%. The average CO_2 and O_2 results of the grab samples were used to calculate molecular weight.

4.1.3 Oxygen Content (USEPA Method 3A)

The flue gas oxygen content was measured at sampling locations where the emissions discharge to the atmosphere in order to correct the particulate matter concentrations to units of lb PM/1,000 lb of exhaust gas on a dry basis. USEPA Method 3A, "Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrument Analyzer Procedure)," was used to measure the oxygen concentration of the flue gas. Flue gas was extracted from the stack through:

- A stainless-steel probe.
- Heated Teflon sample line to prevent condensation.
- A chilled Teflon impinger train with peristaltic pump to remove moisture from the sampled gas stream prior to entering the analyzer.
- A Teledyne paramagnetic oxygen gas analyzer.

Data was recorded at 1-second intervals on a computer equipped with data acquisition software. Recorded O_2 concentrations were averaged over the duration of each test run.

Prior to testing at at the FGBOILERS123 source, a 3-point stratification test was conducted at 17, 50, and 83 percent of the stack diameter for at least twice the response time to determine the number of sampling traverse points. Because the gas stream was considered unstratified, a single sampling point, located near the centroid of the duct was used. Integrated bag sampling was performed on the EUTRIMMER/BRUSH and FGPREDRYER-BAKEOVEN sources and flue gas was extracted at each traverse point.

A calibration error check was performed by introducing zero-, mid-, and high-level calibration gases directly into the analyzer. The calibration error check is performed to evaluate that the analyzer respond to within ±2% of the calibration span. Prior to each test run, a system-bias test was performed where known concentrations of calibration gases are introduced at the probe tip to measure if the analyzers response is within ±5% of the calibration span. At the conclusion of the each test run, an additional system-bias check was performed to evaluate the percent drift from pre- and post-test system-bias checks. A valid system-bias check demonstrates the analyzer did not drift greater than ±3% of the calibration span throughout a test run.

Calibration data, along with the USEPA Protocol 1 certification sheets for the calibration gases used, are included in Appendix A. Figure 5 in the Appendix depicts the USEPA Method 3A sampling train.

4.1.4 Moisture Content (USEPA Method 4)

Before testing, moisture content was estimated using previous test data, psychrometric charts, and/or saturation vapor pressure tables. This estimate was used in conjunction with preliminary velocity head and temperature data to (1) calculate flue gas velocity, 2) ideal nozzle diameter, and (3) establish isokinetic sampling rates.

At each exhaust to atmosphere sampling location, the moisture content of the flue gas was measured using the reference method outlined in Section 2 of Method 4, "Determination of Moisture Content in Stack Gases" in conjunction with USEPA Method 5 sampling train.

4.1.5 Particulate Matter (USEPA Method 5)

USEPA Method 5, "Determination of Particulate Emissions from Stationary Sources," was used to measure the filterable "front-half" particulate matter emissions. The "front half" refers to the filterable particulate mass collected from the nozzle, probe, and filter. Triplicate 60-minute test runs were performed at the outlet of the FGBOILERS123, EUTRIMMER/PBRUSH, and FGPREDRYER/BAKEOVEN sources. Bureau Veritas' modular isokinetic stack sampling system consists of the following:

- A stainless steel button-hook nozzle.
- A heated (248±25°F) stainless steel-lined probe.
- A desiccated and pre-weighed 110-millimeter-diameter glass fiber filter (manufactured to at least 99.95% efficiency (<0.05 % penetration) for 0.3-micron dioctyl phthalate smoke particles) in a heated (248±25°F) filter box.
- A set of four pre-cleaned Greenburg-Smith (GS) impingers with the configuration shown in Table 4-3.

- A sample line.
- An Environmental Supply® control case equipped with a pump, dry-gas meter, and calibrated orifice.

Table 4-3
Method 5 Impinger Configuration

Impinger Order (Upstream to Downstream)	Impinger Type	Impinger Contents	Amount of Contents
1	Modified	Water	100 grams
2	Greenburg Smith	Water	100 grams
3	Modified	Empty	0 grams
4	Modified	Silica desiccant	~300 grams

Before testing, a preliminary velocity traverse was performed and a nozzle size was calculated that would allow isokinetic sampling at an average rate of 0.75 cubic feet per minute. Bureau Veritas selected a pre-cleaned stainless steel nozzle that had an inner diameter that approximates the calculated ideal value. The nozzle was measured with calipers across three cross-sectional chords to evaluate the inside diameter; rinsed and brushed with acetone; and connected to the stainless steel-lined sample probe.

The impact and static pressure openings of the Pitot tube were leak-checked at or above a velocity head of three inches of water for more than 15 seconds. The sampling train was leak-checked by capping the nozzle tip and applying a vacuum of approximately 15 inches of mercury to the sampling train. The dry-gas meter was then monitored for approximately 1 minute to measure that the sample train leak rate was less than 0.02 cubic feet per minute (cfm). The sample probe was inserted into the sampling port to begin sampling.

Ice was placed around the impingers and the probe and filter temperatures were allowed to stabilize at 248±25 °F before each sample run. After the desired operating conditions were coordinated with the facility, testing was initiated.

Stack parameters (e.g., flue velocity, temperature) were monitored to establish the isokinetic sampling rate within ±10 % for the duration of the test. Data were recorded at each of the traverse points.

At the conclusion of a test run and the post-test leak check, the sampling train was disassembled and the impingers and filter were transported to the recovery area. The filter was recovered using tweezers and placed in a Petri dish. The Petri dish was immediately labeled and sealed with Teflon tape. The nozzle, probe, and the front half of the filter holder assembly were

brushed and, at a minimum, triple-rinsed with acetone to recover particulate matter. The acetone rinses were collected in pre-cleaned sample containers.

At the end of a test run, the mass of liquid collected in each impinger was measured using a scale to within ±0.5 grams; these masses were used to calculate moisture content of the flue gas. The contents of the impinger train were discarded after the mass is measured.

Bureau Veritas labeled each container with the test number, test location, and test date, and marked the level of liquid on the outside of the container. Immediately after recovery, the sample containers were stored. Bureau Veritas personnel transported the samples to Bureau Veritas' laboratory in Novi, Michigan, for analysis. Figure 6 in the Appendix depicts the USEPA Method 5 sampling train.

4.1.6 Carbon Monoxide (USEPA Method 10)

The CO emissions were measured at the stack exhausts following USEPA Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources." The CO concentration of the gas stream was measured using a Teledyne Instruments infrared gas analyzer. The flue gas was extracted from the stack through:

- A stainless-steel probe.
- Heated Teflon sample line to prevent condensation.
- A chilled Teflon impinger train with peristaltic pump to remove moisture from the sampled gas stream prior to entering the analyzer.
- Teledyne Instruments infrared gas analyzer.

Calibration error and system-bias were evaluated to demonstrate that the analyzer was responding to introduced calibration gases within acceptable limits as described above (USEPA Method 3A).

Data was recorded at 1-second intervals on a computer equipped with data acquisition software. Recorded CO concentrations were averaged over the duration of each 60-minute test run. Triplicate 60-minute tests were performed with a single or multiple sampling points as described above (USEPA Method 3A). Figure 5 in the Appendix depicts the USEPA Method 3A/10 sampling train.

4.2 Procedures for Obtaining Process Data

Process data were recorded by Decorative Panels International, Inc. personnel during testing. Refer to Section 2.1 and 2.2 for discussions of process and control device data and Appendix E for the operating parameters recorded during testing.

4.3 Sampling Identification and Custody

Sample identification and chain of custody procedures were applicable to the sampling methods used in this test program. Applicable Chain of Custody procedures followed guidelines outlined within ASTM D4840-99 (Reapproved 2010), "Standard Guide for Sample Chain-of-Custody Procedures." Detailed sampling and recovery procedures are described in Section 4.0. For each sample collected (i.e. filter) sample identification and custody procedures were completed as follows:

- Containers were sealed with Teflon tape to prevent contamination.
- Containers were labeled with test number, location, and test date.
- The level of fluid was marked on outside of sample containers to identify if leakage had occurred before delivery of the samples to the laboratory.
- Containers were placed in a cooler for storage.
- Samples were logged using guidelines outlined in ASTM D4840-99 (Reapproved 2010), "Standard Guide for Sample Chain-of-Custody Procedures."
- Samples were delivered to the laboratory.

Chains of custody and laboratory analytical results are included in Appendix F.

5.0 QA/QC Activities

Equipment used in this emissions test program passed quality assurance/quality control (QA/QC) procedures. Refer to Appendix A for equipment calibration and inspection sheets. Field data sheets are presented in Appendix C. Computer-generated Data Sheets are presented within Appendix D.

5.1 Pretest QA/QC Activities

Before testing, the sampling equipment was cleaned, inspected, and calibrated according to procedures outlined in the applicable USEPA sampling method and USEPA's "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume and Principles" and, Volume III, "Stationary Source Specific Methods."

5.2 QA/QC Audits

The results of select sampling and equipment QA/QC audits and the acceptable USEPA tolerance are presented in the following sections.

5.2.1 Method 5 QA/QC Audits

The sampling trains described in Section 4.1 were audited for measurement accuracy and data reliability. The following table summarizes the QA/QC audits conducted on each sampling train.

Table 5-1
Method 5 Sampling Train QA/QC Audits

Parameter	Run 1	Run 2	Run 3	Method Requirement	Comment
FGBOILERS123					
Average velocity pressure head (in H_2O)	0.64	0.64	0.67	>0.05 in H_2O†	Valid
Sampling train leak check Post–test	0.000 ft^3 for 1 min at 5 in Hg	0.000 ft^3 for 1 min at 5 in Hg	0.005 ft^3 for 1 min at 5 in Hg	<0.020 ft^3 for 1 minute at ≥ recorded during test	Valid
Sampling vacuum (in Hg)	2	2	2		

Table 5-1
Method 5 Sampling Train QA/QC Audits

Parameter	Run 1	Run 2	Run 3	Method Requirement	Comment
EUTRIMMER/BRUSH Ducon Scrubber 1					
Average velocity pressure head (in H_2O)	0.069	0.070	0.065	>0.05 in H_2O†	Valid
Sampling train leak check Post–test	0.015 ft^3 for 1 min at 4 in Hg	0.000 ft^3 for 1 min at 6 in Hg	0.005 ft^3 for 1 min at 8 in Hg	<0.020 ft^3 for 1 minute at ≥ recorded during test	Valid
Sampling vacuum (in Hg)	0 to 1	1 to 3	1		
EUTRIMMER/BRUSH Ducon Scrubber 2					
Average velocity pressure head (in H_2O)	0.41	0.39	0.4	>0.05 in H_2O†	Valid
Sampling train leak check Post–test	0.005 ft^3 for 1 min at 5 in Hg	0.000 ft^3 for 1 min at 10 in Hg	0.005 ft^3 for 1 min at 10 in Hg	<0.020 ft^3 for 1 minute at ≥ recorded during test	Valid
Sampling vacuum (in Hg)	1	1	1		
FGPREDRYER-BAKEOVEN					
Average velocity pressure head (in H_2O)	0.77	0.73	0.76	>0.05 in H_2O†	Valid
Sampling train leak check Post–test	0.000 ft^3 for 1 min at 4 in Hg	0.005 ft^3 for 1 min at 10 in Hg	0.005 ft^3 for 1 min at 10 in Hg	<0.020 ft^3 for 1 minute at ≥ recorded during test	Valid
Sampling vacuum (in Hg)	1 to 2	2 to 3	1 to 2		

† Manometer capable of reading 0 to 10 in H_2O acceptable for measuring differential pressure head above 0.05 in H_2O

5.2.2 Isokinetic Sampling

Isokinetic sampling, which means collecting flue gas into the sampling nozzle at the velocity equal to that of the flue gas velocity, is a requirement of USEPA Method 5. Maintaining isokinetic sampling is important because under anisokinetic conditions, sample concentrations may be biased depending on the inertial effects of the particles.

When flue gas containing small and large particles are collected isokinetically, the small and large particle concentrations are consistent with the flue gas composition. However, in over-isokinetic conditions (200% high sampling flowrate into nozzle) the particulate matter

concentrations are biased low, because a greater number of smaller, lighter particles and fewer larger, heavier particles will be collected compared to isokinetic conditions. Under-isokinetic sampling (50% low sampling flowrate into nozzle) will bias the results high because a greater number of larger, heavy particles will be collected.

The USEPA Method 5 isokinetic sampling rate for each test run is presented in Table 5-2.

Table 5-2
Summary of Isokinetic Sampling Rates

Source	Run	Actual % Isokinetic Sampling Rate	Allowable % Isokinetic Sampling Rate
FGBOILERS123	1	105	100±10%
	2	105	
	3	100	
EUTRIMMER/BRUSH Ducon Scrubber 1	1	98	100±10%
	2	101	
	3	98	
EUTRIMMER/BRUSH Ducon Scrubber 2	1	103	100±10%
	2	100	
	3	101	
FGPREDRYER-BAKEOVEN	1	99	100±10%
	2	99	
	3	99	

The isokinetic sampling rates were within the isokinetic requirement of 100±10% percent.

5.2.3 Instrument Analyzer QA/QC Audits

The instrument analyzer sampling trains described in Section 4.1 were audited for measurement accuracy and data reliability. The analyzers passed the applicable calibration criteria. Calibration gas selection, error, bias, and drift checks are included in Appendix A.

5.2.4 Dry-Gas Meter QA/QC Audits

A dry-gas meter was used to sample the flue gas during measurement of moisture content. Table 5-3 summarizes the dry-gas meter (DGM) calibration checks in comparison to the acceptable USEPA tolerance.

Refer to Appendix A for the pre- and post- test DGM calibrations.

Table 5-3
DGM Calibration QA/QC Audit

Meter Box	Pre-test DGM Calibration Factor (Y) (dimensionless)	Post-Test DGM Calibration Check Value (Y_{qa}) (dimensionless)	Difference Between Pre- and Post-test DGM Calibrations	Acceptable Tolerance	Comment
2	1.008 (Mar. 28, 2014)	0.999 (May 29, 2014)	0.009	≤0.05	Valid
7	1.015 (Mar. 27, 2014)	1.035 (May 29, 2014)	0.020	≤0.05	Valid
8	1.002 (Apr. 16, 2014)	1.006 (May 29, 2014)	0.004	≤0.05	Valid

5.2.5 Thermocouple QA/QC Audits

Temperature measurements using thermocouples and digital pyrometers were compared to a reference temperature (i.e., ice water bath, boiling water) prior to and after testing to evaluate accuracy of the equipment. The thermocouples and pyrometers measured temperature within ±1.5% of three reference temperatures and, therefore, the equipment met USEPA acceptance criteria. Thermocouple calibration sheets are presented in the Appendix A.

5.3 QA/QC Blanks

Field blanks were analyzed for the constituent of interest. The results of the blanks are presented in Table 5-4. The blank results do not indicate significant contamination occurred in the field. Blank corrections were not applied.

Table 5-4
QA/QC Blanks

Sample Identification	Result (mg)	Comment
M5 Acetone Blank	<0.5	Reporting limit is 0.5 milligrams. Acetone blank corrections not applied.
M5 Filter Blank	<0.5	Reporting limit is 0.5 milligrams. Filter blank corrections not applied

5.4 QA/QC Problems

QA/QC problems were not encountered during this test program.

Limitations

The information and opinions rendered in this report are exclusively for use by Decorative Panels International, Inc. Bureau Veritas North America, Inc. will not distribute or publish this report without Decorative Panels International, Inc.'s consent except as required by law or court order. The information and opinions are given in response to a limited assignment and should be implemented only in light of that assignment. Bureau Veritas North America, Inc. accepts responsibility for the competent performance of its duties in executing the assignment and preparing reports in accordance with the normal standards of the profession, but disclaims any responsibility for consequential damages.

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Tables

Table 1

EUBOILER#1 and EUBOILER#2 CO Emissions Results

Decorative Panels International, Inc.

Alpena, Michigan

Bureau Veritas Project No. 11014-000099.00

Sampling Date: May 20, 2014

Parameter	Run 1	Run 2	Run 3	Average
Test Time	9:35-10:35	10:45-11:45	12:02-13:02	
Test Duration (min)	60	60	60	
Exhaust Gas Stream Volumetric Flowrate (dscfm)	**52,446**	**50,848**	**52,442**	**51,912**
O_2 Concentration (C_{Avg}, %)	9.1	8.9	9.0	9.0
Pre-test system calibration, zero gas (C_O)	0.0	0.1	0.1	0.1
Post-test system calibration, zero gas (C_O)	0.1	0.1	0.0	0.1
Certified low bracket gas concentration (C_{MA})	11.0	11.0	11.0	11.0
Pre-test system calibration, low bracket gas (C_M)	10.8	11.0	10.9	10.9
Post-test system calibration, low bracket gas (C_M)	11.0	10.9	10.9	10.9
Average Corrected O_2 Concentration (C_{Gas}, %)	**9.2**	**9.0**	**9.1**	**9.1**
CO_2 Concentration (C_{Avg}, %)	10.2	9.6	9.5	9.8
Pre-test system calibration, zero gas (C_O)	0.1	0.1	0.1	0.1
Post-test system calibration, zero gas (C_O)	0.1	0.1	0.1	0.1
Certified low bracket gas concentration (C_{MA})	11.0	11.0	11.0	11.0
Pre-test system calibration, low bracket gas (C_M)	10.9	10.9	10.9	10.9
Post-test system calibration, low bracket gas (C_M)	10.9	10.9	10.9	10.9
Average Corrected CO_2 Concentration (C_{Gas}, %)	**10.2**	**9.6**	**9.6**	**9.8**
CO Concentration (C_{Avg}, ppmvd)	9.1	9.4	9.3	9.3
Pre-test system calibration, zero gas (C_O)	0.1	-0.5	-0.4	-0.3
Post-test system calibration, zero gas (C_O)	-0.5	-0.4	-0.4	-0.4
Certified low bracket gas concentration (C_{MA})	45.0	45.0	45.0	45.0
Pre-test system calibration, low bracket gas (C_M)	43.8	44.5	44.3	44.2
Post-test system calibration, low bracket gas (C_M)	44.5	44.3	44.0	44.3
Average Corrected CO Concentration (C_{Gas}, ppmvd)	**9.5**	**9.8**	**9.8**	**9.7**
CO Mass Emission Rate (lb/hr)	**2.2**	**2.2**	**2.2**	**2.2**

ppmvd: part per million by volume, dry basis
dscfm: dry standard cubic feet per minute

Table 2 - FGBOILERS123 Particulate Matter Results

Facility		Decorative Panels International, Inc.			
Source Designation		No. 3 Biofilter Outlet			
Test Date		May 21, 2014	May 21, 2014	May 21, 2014	
Meter/Nozzle Information		**Run 1**	**Run 2**	**Run 3**	**Average**
Meter Temperature, T_m	°F	60	75	80	72
Meter Pressure, P_m	in Hg	29.97	29.97	29.97	29.97
Measured Sample Volume, V_m	ft^3	37.15	38.05	37.76	37.65
Sample Volume, V_m	std ft^3	38.09	37.94	37.26	37.76
Sample Volume, V_m	std m^3	1.08	1.07	1.06	1.07
Condensate Volume, V_w	std ft^3	5.70	5.49	5.29	5.49
Gas Density, ρ_s	std lb/ft^3	0.0737	0.0738	0.0739	0.0738
Total weight of sampled gas	lb	3.227	3.206	2.830	3.088
Nozzle Size, A_n	ft^2	0.0003274	0.0003274	0.0003274	0.0003274
Isokinetic Variation, I	%	105	105	100	103
Stack Data					
Average Stack Temperature, T_s	°F	399	401	401	400
Molecular Weight Stack Gas-dry, M_d	lb/lb-mole	29.95	29.94	29.94	29.94
Molecular Weight Stack Gas-wet, M_s	lb/lb-mole	28.40	28.43	28.45	28.43
Stack Gas Specific Gravity, G_s		0.98	0.98	0.98	0.98
Percent Moisture, B_{ws}	%	13.01	12.65	12.44	12.70
Water Vapor Volume (fraction)		0.130	0.126	0.124	0.127
Pressure, P_s	in Hg	29.84	29.84	29.84	29.84
Average Stack Velocity, V_s	ft/sec	57.75	57.61	58.89	58.08
Area of Stack	ft^2	38.48	38.48	38.48	38.48
Exhaust Gas Flowrate					
Flowrate	ft^3/min, actual	133,347	133,020	135,990	134,119
Flowrate	ft^3/min, standard wet	81,741	81,390	83,167	82,099
Flowrate	ft^3/min, standard dry	71,107	71,097	72,820	71,675
Flowrate	m^3/min, standard dry	2,014	2,013	2,062	2,030
Collected Mass					
Acetone Wash	mg	2.0	2.9	2.3	2.4
Filter	mg	3.7	3.9	5.0	4.2
Total Filterable Particulate Matter (FPM)	mg	5.7	6.8	7.3	6.6
Concentration					
Particulate Matter (FPM)	mg/dscf	0.15	0.18	0.20	0.17
Particulate Matter (FPM)	grain/dscf	0.0023	0.0028	0.0030	0.0027
Particulate Matter (FPM)	lb/1,000 lb	0.0043	0.0051	0.0056	0.0050
Mass Emission Rate					
Particulate Matter (FPM)	lb/hr	1.4	1.7	1.9	1.7

Table 3 - EUTRIMMER/PBRUSH Ducon Scrubber 1 Particulate Matter Results

Facility		Decorative Panels International, Inc.			
Source Designation		Ducon Scrubber 1			
Test Date		May 22, 2014	May 22, 2014	May 22, 2014	
Meter/Nozzle Information		**Run 1**	**Run 2**	**Run 3**	**Average**
Meter Temperature, T_m	°F	60	65	73	66
Meter Pressure, P_m	in Hg	30.06	30.07	30.06	30.06
Measured Sample Volume, V_m	ft^3	44.90	46.04	43.98	44.97
Sample Volume, V_m	std ft^3	46.50	47.21	44.46	46.05
Sample Volume, V_m	std m^3	1.32	1.34	1.26	1.30
Condensate Volume, V_w	std ft^3	1.83	2.17	1.77	1.92
Gas Density, ρ_s	std lb/ft^3	0.0738	0.0737	0.0738	0.0738
Total weight of sampled gas	lb	3.569	3.637	3.374	3.527
Nozzle Size, A_n	ft^2	0.0009575	0.0009575	0.0009575	0.0009575
Isokinetic Variation, I	%	98	101	98	99
Stack Data					
Average Stack Temperature, T_s	°F	89	90	91	90
Molecular Weight Stack Gas-dry, M_d	lb/lb-mole	28.86	28.85	28.85	28.85
Molecular Weight Stack Gas-wet, M_s	lb/lb-mole	28.45	28.38	28.44	28.42
Stack Gas Specific Gravity, G_s		0.98	0.98	0.98	0.98
Percent Moisture, B_{ws}	%	3.79	4.39	3.83	4.00
Water Vapor Volume (fraction)		0.038	0.044	0.038	0.040
Pressure, P_s	in Hg	29.92	29.92	29.92	29.92
Average Stack Velocity, V_s	ft/sec	14.86	14.76	14.26	14.63
Area of Stack	ft^2	20.97	20.97	20.97	20.97
Exhaust Gas Flowrate					
Flowrate	ft^3/min, actual	18,699	18,563	17,944	18,402
Flowrate	ft^3/min, standard wet	17,983	17,823	17,210	17,672
Flowrate	ft^3/min, standard dry	17,303	17,040	16,552	16,965
Flowrate	m^3/min, standard dry	490	483	469	480
Collected Mass					
Acetone Wash	mg	4.2	8.8	2.3	5.1
Filter	mg	2.6	2.9	1.8	2.4
Total Filterable Particulate Matter (FPM)	mg	6.8	12	4.1	7.5
Concentration					
Particulate Matter (FPM)	mg/dscf	0.15	0.25	0.092	0.16
Particulate Matter (FPM)	grain/dscf	0.0023	0.0038	0.0014	0.0025
Particulate Matter (FPM)	lb/1,000 lb	0.0043	0.0073	0.0027	0.0048
Mass Emission Rate					
Particulate Matter (FPM)	lb/hr	0.33	0.56	0.20	0.37

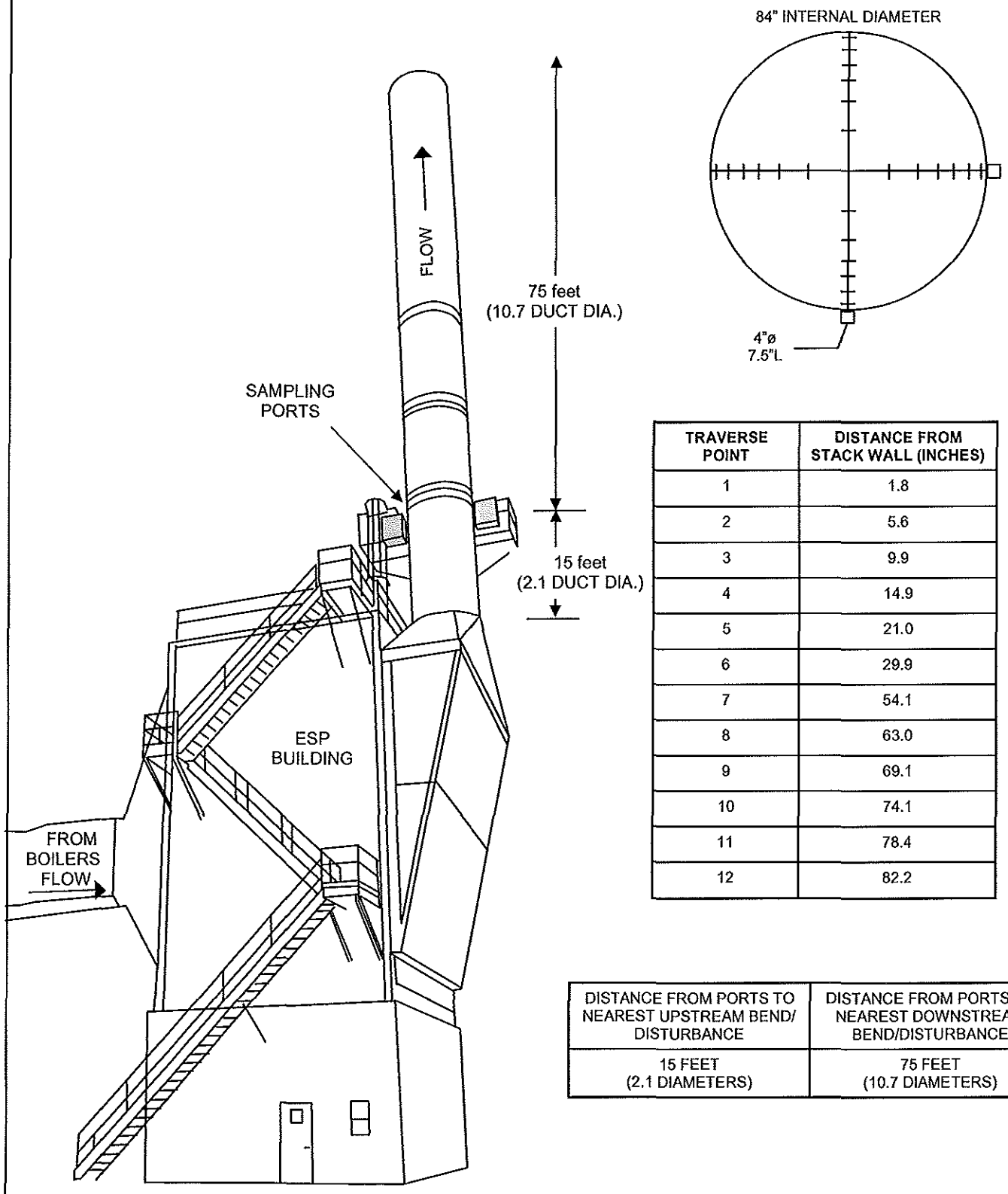
Table 4 - EUTRIMMER/PBRUSH Ducon Scrubber 2 Particulate Matter Results

Facility		**Decorative Panels International, Inc.**			
Source Designation		**Ducon Scrubber #2**			
Test Date		**May 22, 2014**	**May 22, 2014**	**May 22, 2014**	
Meter/Nozzle Information		**Run 1**	**Run 2**	**Run 3**	**Average**
Meter Temperature, T_m	°F	63	66	74	67
Meter Pressure, P_m	in Hg	30.02	30.02	30.01	30.02
Measured Sample Volume, V_m	ft^3	39.97	38.15	37.13	38.42
Sample Volume, V_m	std ft^3	40.60	38.52	36.93	38.68
Sample Volume, V_m	std m^3	1.15	1.09	1.05	1.10
Condensate Volume, V_w	std ft^3	2.44	1.12	2.25	1.94
Gas Density, ρ_s	std lb/ft^3	0.0733	0.0741	0.0732	0.0735
Total weight of sampled gas	lb	3.154	2.936	2.782	2.957
Nozzle Size, A_n	ft^2	0.0003274	0.0003274	0.0003274	0.0003274
Isokinetic Variation, I	%	103	100	101	101
Stack Data					
Average Stack Temperature, T_s	°F	95	96	96	96
Molecular Weight Stack Gas-dry, M_d	lb/lb-mole	28.84	28.84	28.84	28.84
Molecular Weight Stack Gas-wet, M_s	lb/lb-mole	28.22	28.53	28.22	28.33
Stack Gas Specific Gravity, G_s		0.97	0.99	0.97	0.98
Percent Moisture, B_{ws}	%	5.67	2.82	5.75	4.75
Water Vapor Volume (fraction)		0.057	0.028	0.058	0.047
Pressure, P_s	in Hg	29.95	29.95	29.95	29.95
Average Stack Velocity, V_s	ft/sec	37.14	35.48	34.64	35.75
Area of Stack	ft^2	8.73	8.73	8.73	8.73
Exhaust Gas Flowrate					
Flowrate	ft^3/min, actual	19,447	18,575	18,139	18,721
Flowrate	ft^3/min, standard wet	18,514	17,659	17,229	17,801
Flowrate	ft^3/min, standard dry	17,464	17,161	16,238	16,954
Flowrate	m^3/min, standard dry	495	486	460	480
Collected Mass					
Acetone Wash	mg	23	12	4.2	13
Filter	mg	<0.5	2.6	<0.5	1.2
Total Filterable Particulate Matter (FPM)	mg	24	15	4.7	14
Concentration					
Particulate Matter (FPM)	mg/dscf	0.58	0.38	0.13	0.36
Particulate Matter (FPM)	grain/dscf	0.0089	0.0058	0.0020	0.0056
Particulate Matter (FPM)	lb/1,000 lb	0.017	0.011	0.0038	0.011
Mass Emission Rate					
Particulate Matter (FPM)	lb/hr	1.3	0.86	0.27	0.82

Table 5 - FGPREDRYER-BAKEOVEN RCO Particulate Matter Results

Facility		Decorative Panels International, Inc.			
Source Designation		RCO			
Test Date		May 23, 2014	May 23, 2014	May 23, 2014	
Meter/Nozzle Information		**Run 1**	**Run 2**	**Run 3**	**Average**
Meter Temperature, T_m	°F	54	62	66	61
Meter Pressure, P_m	in Hg	30.27	30.27	30.28	30.27
Measured Sample Volume, V_m	ft^3	45.68	45.62	46.74	46.01
Sample Volume, V_m	std ft^3	47.82	47.02	47.89	47.58
Sample Volume, V_m	std m^3	1.35	1.33	1.36	1.35
Condensate Volume, V_w	std ft^3	1.45	1.16	1.41	1.34
Gas Density, ρ_s	std lb/ft^3	0.0742	0.0743	0.0742	0.0742
Total weight of sampled gas	lb	3.653	3.579	3.652	3.628
Nozzle Size, A_n	ft^2	0.0003274	0.0003274	0.0003274	0.0003274
Isokinetic Variation, I	%	99	99	98	99
Stack Data					
Average Stack Temperature, T_s	°F	263	253	246	254
Molecular Weight Stack Gas-dry, M_d	lb/lb-mole	28.89	28.88	28.88	28.88
Molecular Weight Stack Gas-wet, M_s	lb/lb-mole	28.57	28.62	28.57	28.58
Stack Gas Specific Gravity, G_s		0.99	0.99	0.99	0.99
Percent Moisture, B_{ws}	%	2.94	2.42	2.87	2.74
Water Vapor Volume (fraction)		0.029	0.024	0.029	0.027
Pressure, P_s	in Hg	30.10	30.10	30.10	30.10
Average Stack Velocity, V_s	ft/sec	57.51	55.66	56.55	56.57
Area of Stack	ft^2	12.31	12.31	12.31	12.31
Exhaust Gas Flowrate					
Flowrate	ft^3/min, actual	42,460	41,094	41,756	41,770
Flowrate	ft^3/min, standard wet	31,176	30,629	31,407	31,071
Flowrate	ft^3/min, standard dry	30,260	29,888	30,506	30,218
Flowrate	m^3/min, standard dry	857	846	864	856
Collected Mass					
Acetone Wash	mg	2.3	6.2	3.2	3.9
Filter	mg	<0.5	<0.5	<0.5	<0.5
Total Filterable Particulate Matter (FPM)	mg	2.8	6.7	3.7	4.4
Concentration					
Particulate Matter (FPM)	mg/dscf	0.059	0.14	0.077	0.093
Particulate Matter (FPM)	grain/dscf	0.00090	0.0022	0.0012	0.0014
Particulate Matter (FPM)	lb/1,000 lb	0.0017	0.0042	0.0023	0.0027
Mass Emission Rate					
Particulate Matter (FPM)	lb/hr	0.23	0.56	0.31	0.37

Figures



TRAVERSE POINT	DISTANCE FROM STACK WALL (INCHES)
1	1.8
2	5.6
3	9.9
4	14.9
5	21.0
6	29.9
7	54.1
8	63.0
9	69.1
10	74.1
11	78.4
12	82.2

DISTANCE FROM PORTS TO NEAREST UPSTREAM BEND/ DISTURBANCE	DISTANCE FROM PORTS TO NEAREST DOWNSTREAM BEND/DISTURBANCE
15 FEET (2.1 DIAMETERS)	75 FEET (10.7 DIAMETERS)

SCALE	NOT TO SCALE
DATE	JUNE 12, 2014
PRJ NO.	11014-000099.00

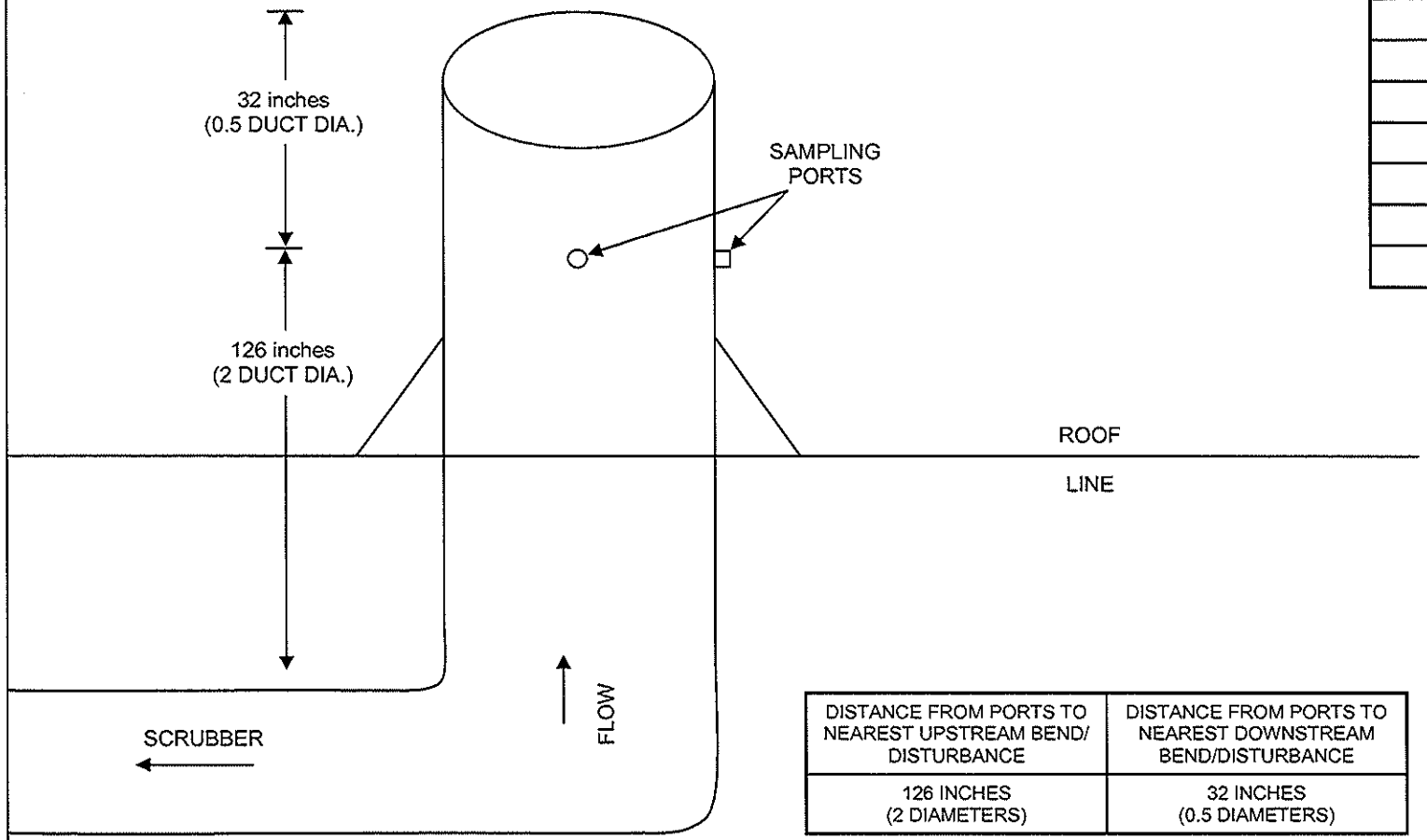
FGBOILERS123
SAMPLING PORTS AND TRAVERSE POINT LOCATIONS

DECORATIVE PANELS INTERNATIONAL, INC.
ALPENA, MICHIGAN

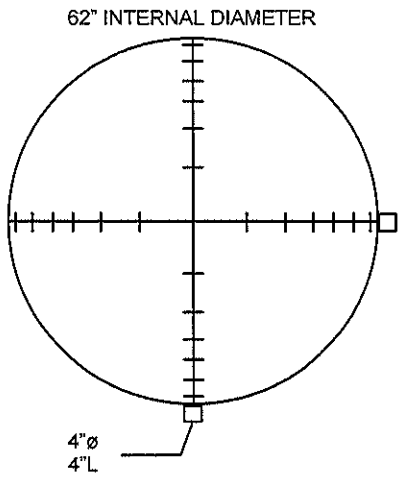
BUREAU VERITAS

FIGURE
1

TRAVERSE POINT	DISTANCE FROM STACK WALL (INCHES)
1	5.3
2	8.2
3	11.3
4	15.0
5	20.5
6	26.1
7	43.9
8	50.5
9	55.0
10	58.7
11	61.8
12	64.7



DISTANCE FROM PORTS TO NEAREST UPSTREAM BEND/ DISTURBANCE	DISTANCE FROM PORTS TO NEAREST DOWNSTREAM BEND/DISTURBANCE
126 INCHES (2 DIAMETERS)	32 INCHES (0.5 DIAMETERS)



SCALE	NOT TO SCALE
DATE	June 12, 2014
PRJ NO.	11014-000099.00

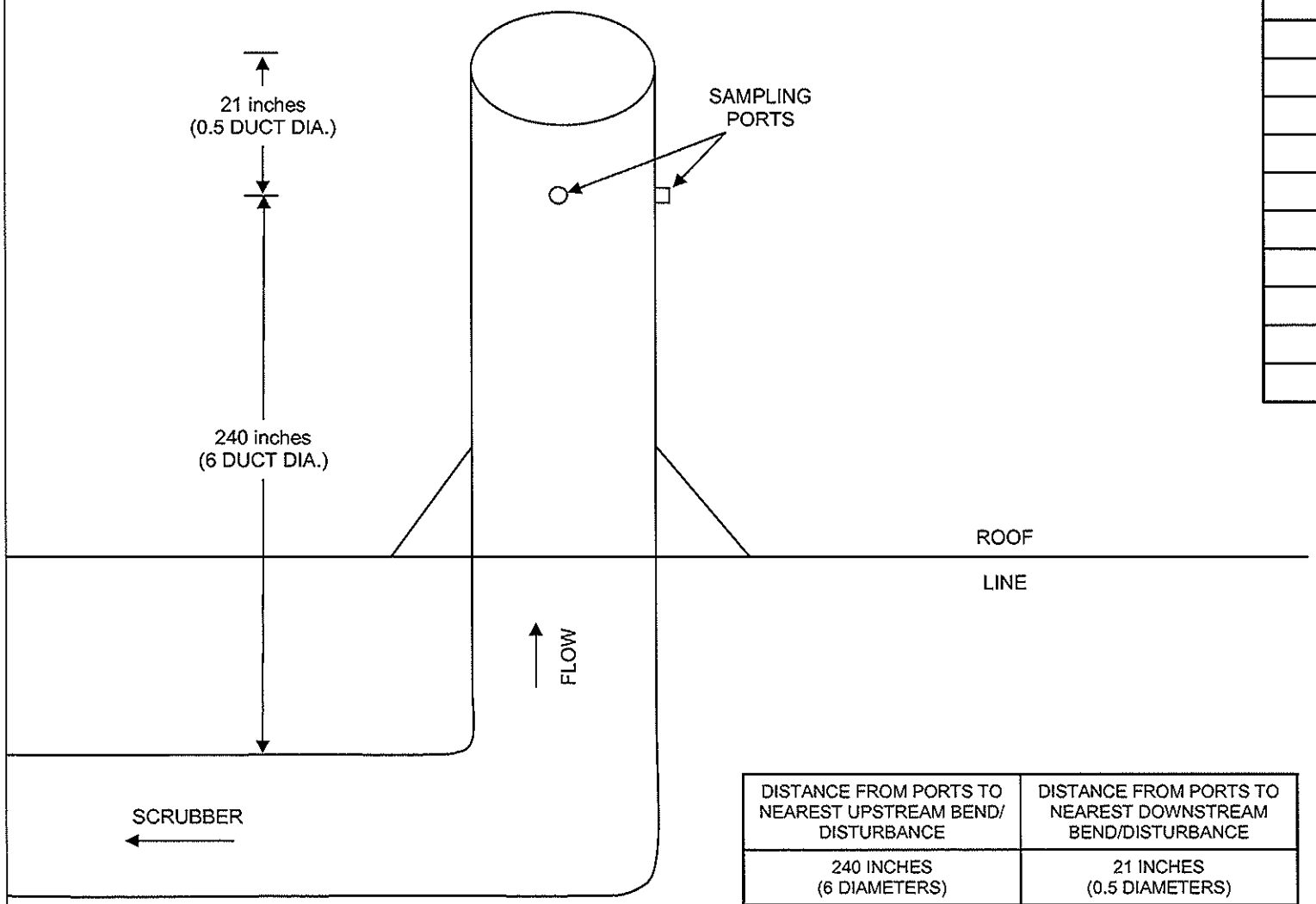
EUTRIMMER/PBRUSH DUCON SCRUBBER 1
SAMPLING PORTS AND TRAVERSE POINT LOCATIONS

DECORATIVE PANELS INTERNATIONAL, INC.
ALPENA, MICHIGAN

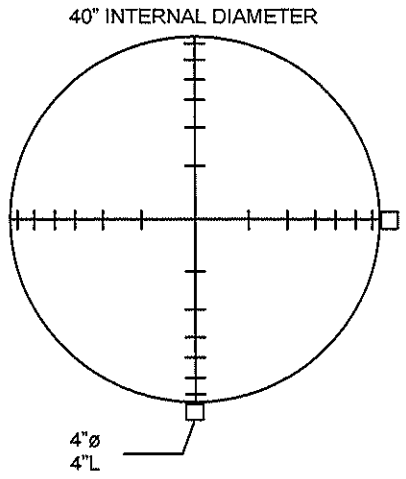
BUREAU VERITAS

FIGURE
2

TRAVERSE POINT	DISTANCE FROM STACK WALL (INCHES)
1	4.8
2	6.7
3	8.7
4	11.1
5	14.0
6	18.2
7	29.8
8	34.0
9	36.9
10	39.3
11	41.3
12	43.2



DISTANCE FROM PORTS TO NEAREST UPSTREAM BEND/ DISTURBANCE	DISTANCE FROM PORTS TO NEAREST DOWNSTREAM BEND/DISTURBANCE
240 INCHES (6 DIAMETERS)	21 INCHES (0.5 DIAMETERS)



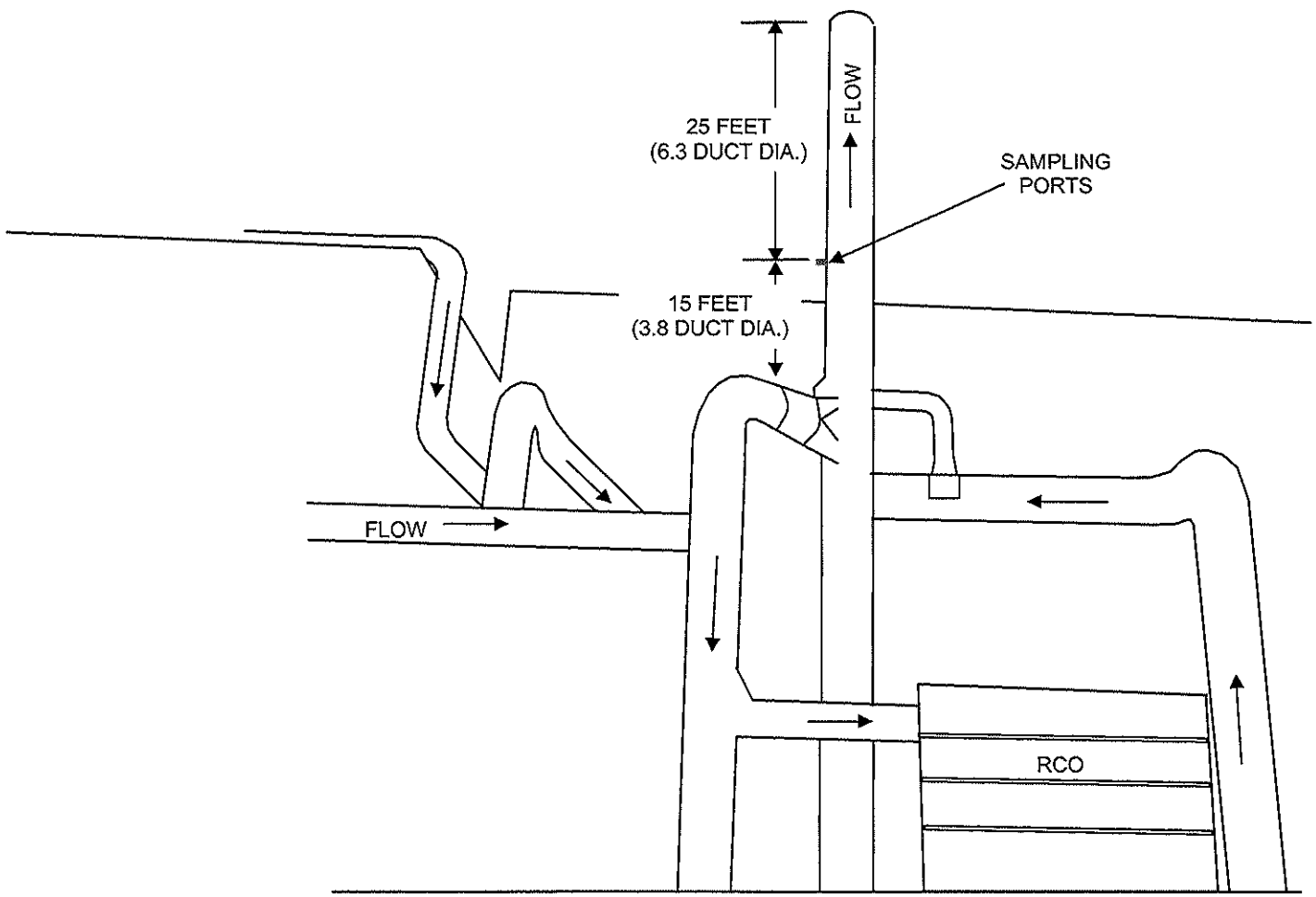
SCALE	NOT TO SCALE
DATE	June 12, 2014
PRJ NO.	11014-000099.00

EUTRIMMER/PBRUSH DUCON SCRUBBER 2
SAMPLING PORTS AND TRAVERSE POINT LOCATIONS

DECORATIVE PANELS INTERNATIONAL, INC.
ALPENA, MICHIGAN

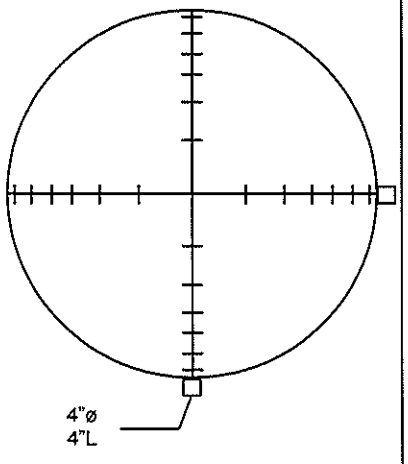
BUREAU VERITAS

FIGURE
3



TRAVERSE POINT	DISTANCE FROM STACK WALL (INCHES)
1	5.5
2	7.7
3	10.1
4	12.9
5	16.4
6	21.4
7	35.1
8	40.1
9	43.6
10	46.4
11	48.8
12	51.0

47.5" INTERNAL DIAMETER



DISTANCE FROM PORTS TO NEAREST UPSTREAM BEND/ DISTURBANCE	DISTANCE FROM PORTS TO NEAREST DOWNSTREAM BEND/DISTURBANCE
15 FEET (3.8 DIAMETERS)	25 FEET (6.3 DIAMETERS)

SCALE	NOT TO SCALE
DATE	June 12, 2014
PRJ NO.	11014-000099.00

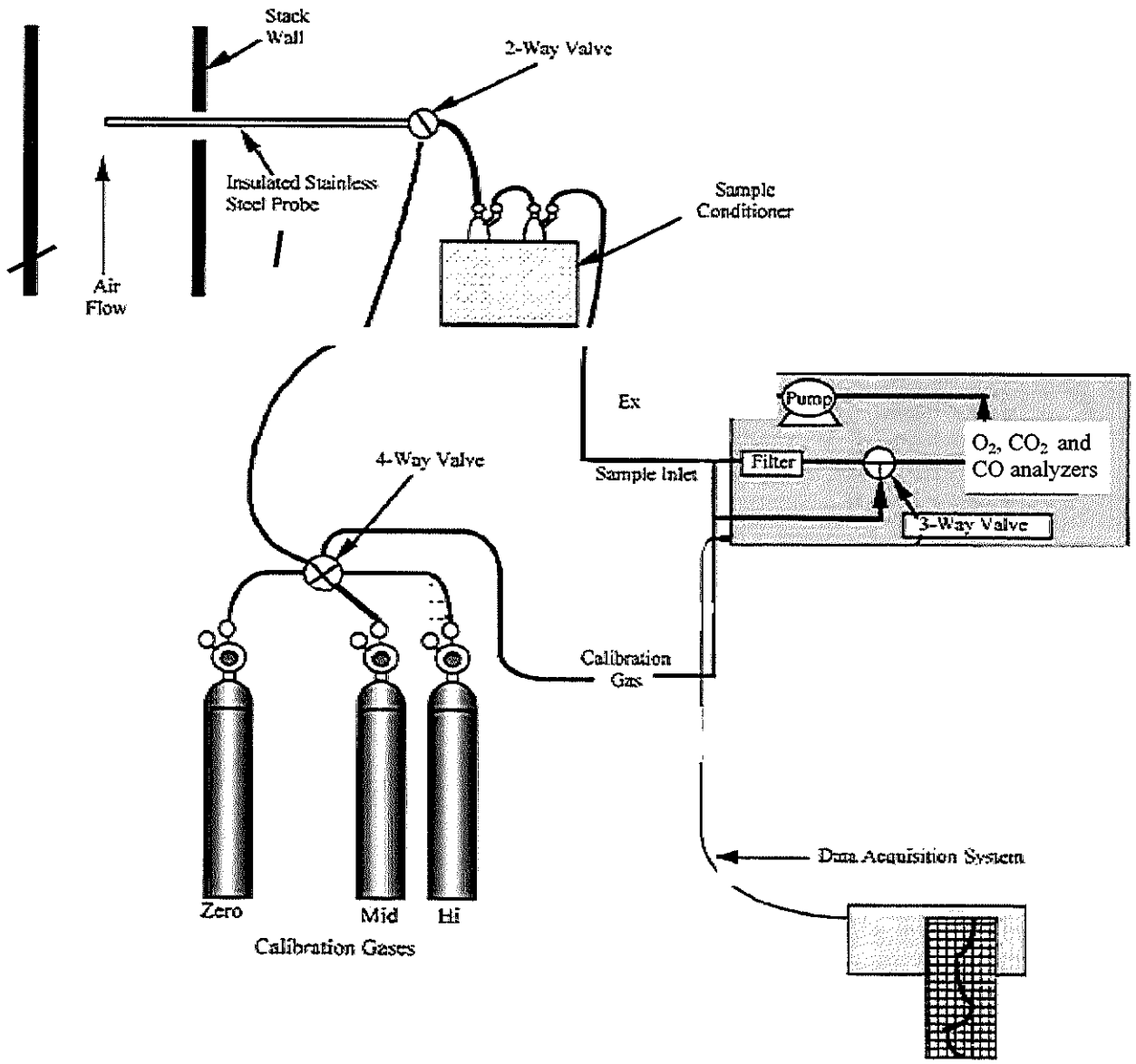
FGPREDRYER-BAKEOVEN
SAMPLING PORTS AND TRAVERSE POINT LOCATIONS

DECORATIVE PANELS INTERNATIONAL, INC.
ALPENA, MICHIGAN

BUREAU VERITAS

FIGURE

4



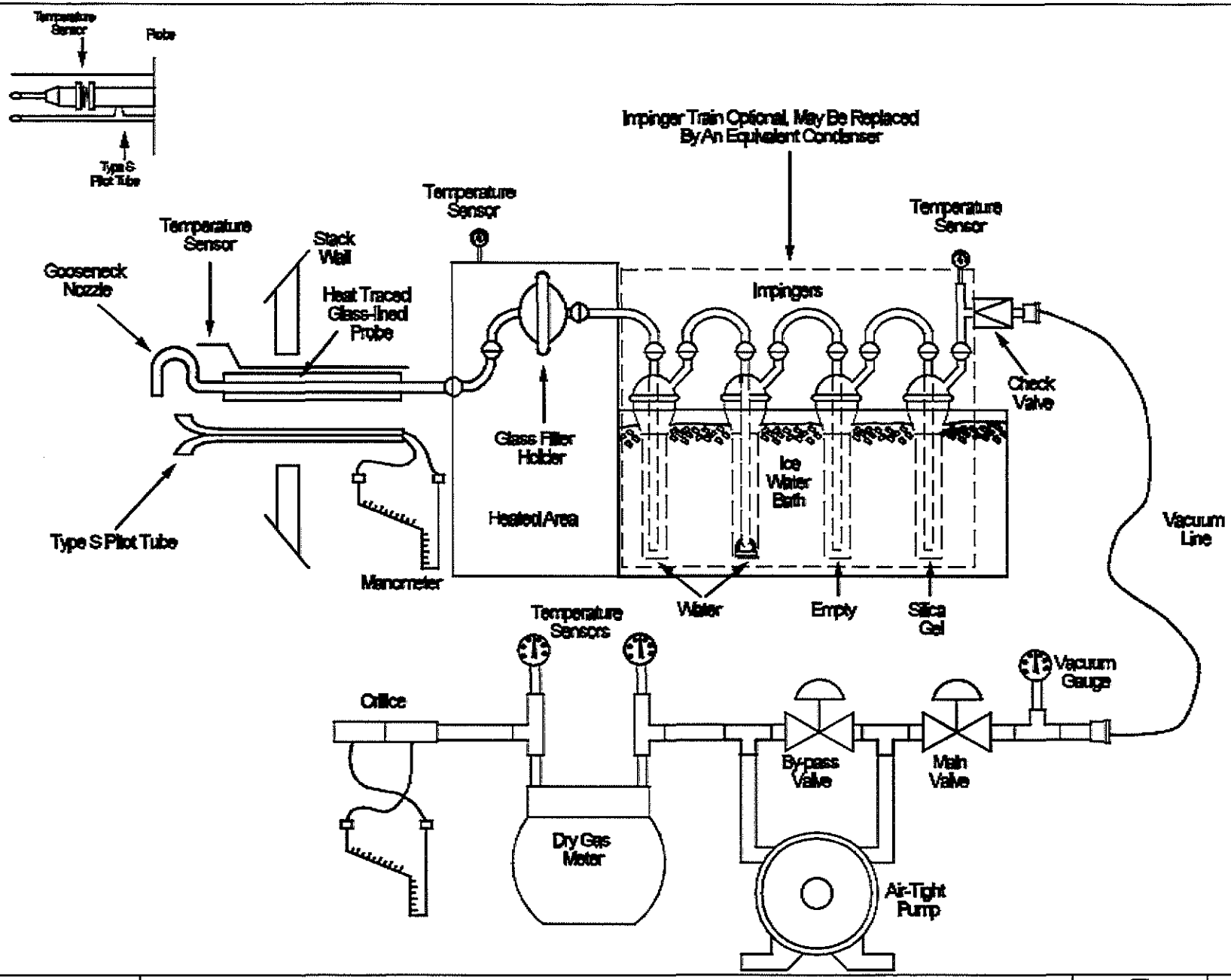
SCALE	NOT TO SCALE
DATE	June 12, 2014
PRJ NO.	11014-000099.00

USEPA METHODS 3A AND 10 SAMPLING TRAIN

DECORATIVE PANELS INTERNATIONAL, INC.
ALPENA, MICHIGAN

BUREAU VERITAS

FIGURE
5



SCALE	NOT TO SCALE
DATE	June 12, 2014
PRJ NO.	11014-000099.00

USEPA METHOD 5 SAMPLING TRAIN

DECORATIVE PANELS INTERNATIONAL, INC.
ALPENA, MICHIGAN

BUREAU VERITAS

FIGURE
6