TEST REPORT

SCOPE: EMISSIONS AND OUTPUT

FUEL: EPA TEST FUEL (CRIBS)

TEST STANDARD: EPA

MODEL: FP-14 WOOD FIREPLACE

Notice to reader: Our FP-14 wood fireplace was tested as part of our FP-8 firebox. Therefore, the FP-8 is referenced throughout the attached test report.

Intertek ETL SEMKO

TEST REPORT

TEST OF A WOOD BURNING FIREPLACE
FOR
EMISSIONS AND EFFICIENCY
PER
EPA METHODS 28 AND 5G-3, July 1st, 1999

MODEL: FP8

Client: Foyers Valcourt
1345, Jacques-Cartier sud
Saint-Jean-sur-Richelieu, Quebec, Canada,
J3B 6Y8

Attention: Mr. Danick Power

TESTED BY:
Intertek Testing Services NA Ltd.
1829, 32nd Avenue
Lachine, Québec
H8T 3J1

TEST DATES: From September 19th to September 22th
REPORT DATE: November 17, 2006
Project number: 3105271

Services d'essais Intertek AN Ltée
Intertek Testing Services NA Ltd.

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1.0. INTRODUCTION

2.0. SUMMARY OF TEST RESULTS

3.0. PROCESS DESCRIPTION

1.0 INTRODUCTION

1.1 GENERAL

From September 19th to September 22th , Intertek, Lachine, Québec, conducted tests on the FP8 non-catalytic fireplace from Foyers Valcourt, to determine compliance with U.S. EPA emissions regulations.

Tests were conducted by Eric Lafontaine. The tests were conducted at the Intertek laboratory located at 1829, 32nd Avenue, Lachine, Quebec. The laboratory elevation is 860 feet above sea level. Tests were conducted to EPA Method 28 and 5G-3 criteria, July 1st, 1999.

1.2. TEST UNIT DESCRIPTION

The FP8 is a non-catalytic unit having air combustion intakes located on the right side below the door of the unit with its control located at the same place. The firechamber is lined with an insulating pad covered with a stainless steel sheet. A double shield is present above the firechamber.

1.3. RESULTS

The unit as tested, produced a weighted average emissions rate of 3.96 grams/hour and did not exceed any of the emission rate caps specified in the EPA regulations. The unit thus meets EPA certification requirements for 1990.

1.4. PRETEST INFORMATION

The test unit was received at Intertek in Lachine, Québec in September from the client. The unit was inspected upon receipt and found to be in good condition. It was set up, following the manufacturer's instructions.

Following assembly, the unit was placed on the test stand and the instrumented thermocouples were hooked up to our logging system. Prior to emission testing, a ten (10) hours break-in period was performed during which the unit was set to operate at high to medium burn rate. During the break-in period, the unit was found to operate satisfactorily.

Following inspection of the unit, the chimney system and laboratory dilution tunnel were cleaned using standard wire brush chimney cleaning equipment.

On September 19,2006, the unit was set-up for testing.

1.5. REPORT ORGANIZATION

This report includes summaries of all data necessary to determine compliance with the regulations.

2.0 SUMMARY OF TEST RESULTS

2.1 EMISSIONS

Run Number	Test Date	Burn Rate (kg/hr)	Adjusted Emission Rate (g/hr)	Heating Efficiency (% Overall)
1	19-09-2006	0.987	2.526	n/a
2	20-09-2006	0.907	3.666	n/a
3	21-09-2006	1.289	4.449	n/a
4	22-09-2006	3.059	4,602	n/a

2.2. WEIGHTED AVERAGE CALCULATION

Run Number	Burn Rate	Adjusted Emission Rate g/hr	(OHE)	Output (BTU/hr)	Prob	(K) Weighing Factor
2	0.907	3.666	n/a	10936.79	0.3039	0.3665
1	0.987	2.526	n/a	11901.44	0.3665	0.3055
3	1.289	4.449	n/a	15543.02	0.6094	0.6187
4	3.059	4.602	n/a	36886.03	0.9852	0.3906
					Sum:	1.68126

Weighted Average Emissions Rate: 3.9644. g/hr

2.3 TEST FACILITY CONDITIONS

Run Number	Room Temperature		Barometric pressure		Relative humidity		Air Velocity	
	Before (F)	After (F)	Before (in.Hg)	After (in.Hg)	Before (%)	After (%)	Before (ft/min)	After (ft/min)
1	82	81	29,65	29,65	51	51	9	9
2	81	81	29.65	29,63	48	46	4	4
3	81	81	29,95	29,95	41	34	9	9
4	83	87	30,15	30,15	39	46	4	9

2.4. FUEL QUALITIES

Run Number	Pre-test Load			Test Load					
	Loading Weight Wet Basis (lbs)	Moisture Content Dry Basis (%)	Coal bed Weight (lbs)	Weight Wet Basis (lbs)	Density Wet Basis (lbs/ft^3)	Moisture Content Dry Basis (%)	Piece Length (in.)	Number of 2 X 4's	Number of 4 x 4's
1	11.21	20.3	2.10	10.45	35.487	20.0	12.188	2	2
2	11.8	20.8	2.10	10.4	34.789	20.0	12.375	2	2
3	12.54	22.2	2.85	11.53	39.659	20.5	12.188	2	2
4	11.52	19.3	2.50	10.73	33.756	19.3	12,125	2	2

2.5 DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA (5G-3)

Average dilution tunnel measurements				Sample Data			
Run Number	Burn Rate (Min)	Volumetric Flow Rate (dscf/min)	Total Temperatures (°R)	Volume sampled (DSCF)		Particulate catch (mg)	
				1	2	1	2
1	240	138,83	573	29,98	22,69	5,4	4,0
2	260	148,75	573	34,60	25,26	9,4	6,3
3	202	146,69	580	24,67	18,67	8,4	6,1
4	80	133,78	632	10,18	7,52	3,7	3,0

2.6 DILUTION TUNNEL DUAL TRAIN PRECISION

Run Number	Sample Ratio		Total Emission (g)		
	Train 1	Train 2	Train 1	Train 2	% Deviation
1	1111,35	1468,29	6,001	5,873	0,45%
2	1117,89	1530,88	10,508	9,645	1,78%
3	1201,01	1586,91	10,089	9,680	0,86%
4	1050,90	1422,33	3,888	4,267	1,93%

2.7 GENERAL SUMMARY OF RESULT

Run Number	Burn Rate (kg/hr)	Average Surface Temperature (F)	Change in surface Temperature (F)	Initial Draft (in. H^2O)	Primary Air Setting	Run Time (min)
1	0,987	461	-64,6	0,065	0.112" opened	240
2	0,907	457	-89,6	0,060	0.112" opened	260
3	1,289	489	-28,0	0,065	0.924" opened	202
4	3,059	594	35,4	0,090	Fully opened	80

AIR INTRODUCTION SYSTEM		INLET (I) sq. in.			OUTLET (sq. in.)
Identification	Type	I_{min}	I_{max}	Controlled	
A	Secondary	---	2.0	No	1.56
B	Main	0.1	2.76	Yes	6.56
C	Secondary	---	.11	No	.012

Legend:

Identification: Tag name refers to drawings in Appendix E, section airflow pattern
Type: Characterisation of air intake
I_{min}: Minimum air intake of a particular air channel
I_{max}: Maximum air intake of a particular air channel
Controlled: Determines if a provision for air control is present
Outlet: Total air outlet of a particular air channel

NOTE: Surfaces are expressed in sq. inches

3.4 OPERATION DURING TEST

Run #1:

This run lasted 240 minutes. It was performed on September 19th, 2006.
The burn rate achieved is a Category 2 with 0.987 kg/hr.

Refer to the front page of test run data #1 in Appendix A for the detailed test sequence.

Run #2:

This run lasted 260 minutes. It was performed on September 20th 2006.
The burn rate achieved is a Category 2 with 0.907 kg/hr.

Refer to the front page of test run data #2 in Appendix A for the detailed test sequence.

Run #3:

This run lasted 202 minutes. It was performed on September 21th 2006.
The burn rate achieved is a Category 3 with 1.289 kg/hr.

Refer to the front page of test run data #3 in Appendix A for the detailed test sequence.

Run #4:

This run lasted 80 minutes. It was performed on September 22th 2006.
The burn rate achieved is a Category 4 with 3.059 kg/hr.

Refer to the front page of test run data #4 in Appendix A for the detailed test sequence.

3.5 START-UP OPERATION

3.5.1 Procedure for FP8, slow burning combustion

3.5.1.1 Stove lighting: 25% of load.

Place crumpled newspaper on ¾ of the surface of the bottom of the stove starting from the back and crisscross wood over the paper leaving some space between the wood pieces. Light up and leave the door ajar by half inches for 1 minute then close the doors with the air intake fully open.

3.5.1.2 Pre-heating of the stove:

a. When one pound of the lighting load left toss about the ashes and add all the wood for pre-load in a pyramid shape leaving air space between each piece. Pieces are 10" long. Close the door with the primary air intake open at 0.112".
b. When the weight is down to 6.5 pounds close completely the primary air intake. Stir the fire as needed to reach a good charcoalization and let burn until the weight is down to 25% of the load.
c. Place the primary air intake fully open and open the doors, carefully crush the ashes and spread them evenly on the whole surface of the bottom of the stove. Place the test load as far to the back as possible. Close the doors and leave the primary air intake fully open for 5 minutes before closing it back.

3.5.3 Procedure for FP8 semi-rapid burning combustion

3.5.3.1 Stove lighting: 25% of load.

Place crumpled newspaper on ¾ of the surface of the bottom of the stove starting from the back and crisscross wood over the paper leaving some space between the wood pieces. Light up and leave the door ajar by half inches for 1 minute then close the doors with the air intake fully open.

3.5.3.2 Pre-heating of the stove:

d. When one pound of the lighting load left toss about the ashes and add all the wood for pre-load in a pyramid shape leaving air space between each piece. Pieces are 10" long. Close the door with the primary air intake fully open.
e. At 10 lbs close the primary air intake to leave an opening of 0.924". Stir the fire as needed to reach a good charcoalization and let burn until the weight is down to 25% of the load.
f. Place the primary air intake fully open and open the doors, carefully crush the ashes and spread them evenly on the whole surface of the bottom of the stove. Place the test load as far to the back as possible. Close the doors and leave the primary air intake fully open for 5 minute before closing it back.

3.5.4 Procedure for FP8 rapid burning combustion

3.5.4.1 Stove lighting: 25% of load.

Place crumpled newspaper on ¾ of the surface of the bottom of the stove starting from the back and crisscross wood over the paper leaving some space between the wood pieces. Light up and leave the door ajar by half inches for 1 minutes then close the doors with the air intake fully open.

3.5.4.2 Pre-heating of the stove:

g. When one pound of the lighting load left toss about the ashes and add all the wood for pre-load in a pyramid shape leaving air space between each piece. Pieces are 10" long. Close the door with the primary air intake fully open.
h. Stir the fire sometime to reach a good charcoalization and let burn until the weight is down to 25% of the load.
i. Open the doors carefully crush the ashes and spread them evenly on the whole surface of the bottom of the stove. Place the test load as far to the back as possible. Close the doors and leave the primary air intake fully open.

4.0 SAMPLING SYSTEMS

4.1 SAMPLING LOCATIONS

(Particulate) Samples are collected from the dilution tunnel at a point 20 feet from the tunnel entrance. The tunnel has two elbows and two mixing baffles in the system ahead of the sampling section. The sampling section is a continuous 13-foot section of 6-inch diameter pipe straight over the entire length. A standard pilot tube located 60 inches from the start of the sampling section determines tunnel velocity pressure. Thermocouple is installed on the pilot tube to measure the dry bulb temp. MC is assumed, as allowed, to be 4%. Tunnel samplers are located 60 inches downstream of the pilot tube and 36 inches upstream from the end of this section.

4.2 DRAWINGS

Various drawings of the stack gas sampling train and of dilution tunnel system are found in Appendix I.

4.3 EMISSIONS/EFFICIENCY TESTING EQUIPMENT LIST

ITEM DESCRIPTION	WH #	MANUFACTURER	MODEL	SERIAL #	MEASUREMENT INCERTAINTY
1. CO, CO_2 & O_2 Analyzer	180-169	NOVA	7800CP3A	3819	±10%CO,±5%CO2,±1%O2
2. Dry Gas Meter 1	180-175	American Meter Co. Ltd	DTM-200A	96X547016	Refer to Equip. File
3. Dry Gas Meter 2	180-176	American Meter Co. Ltd	DTM-200A	96X547017	Refer to Equip. File
4. Rotameter (1)	180-092	Omega	FL3839ST	64605	Refer to Equip. File
5. Rotameter (2)	180-131	Omega	FL3839ST	092489	±5% fsd
6. Hot Wire Anemometer	180-414	Omega	---	Q117881	Refer to Equip. File
7. Inclined Manometer	180-139	Dwyer	125-AV	---	± 0.0025 in W
8. Pitot Tube	180-184	---	160S-18	---	Refer to Equip. File
9. Pitot Tube	180-290	---	160S-18	---	Not Applicable
10. Pressure gages (2)	180-311 / 180-312	Basco	0-15 PSI	---	Refer to Equip. File
11. Vacuum gages (2)	180-362 / 180-363	Basco	-30 - 0 in. Hg	---	Refer to Equip. File
12. Draft Indicator	180-332	Dwyer	2000-00	W42F	Refer to Equip. File
13. Scale, 1000lbs Cap./Record.	180-130	Papp	30" x 30"	---	±0.2lb
14. Readout for 1000lbs Scale	180-129	Papp	UMC600AAAC	L6990	Not Applicable
15. Scale, 8 kgs Capacity	180-280	Mettler	PB8001-S	826741	Refer to Equip. File
16. Analytical Balance	180-170	Ohaus	AP310S-0	1114501141	± 0.0001g
17. Diaphragm Pumps (2)	180-125	Barnant	400-1901	L94001630	Not Applicable
	180-126	Barnant	400-1901	L94001743	Not Applicable
18. Gases; Calibration, Zero, Span	180-265	Matheson	---	---	Refer to Equip. File
19. Moisture Meter	180-219	Delmhorst	J2000	14740	Refer to Equip. File
20. Humidity Chamber	180-160	Shop Built	---	---	Refer to Equip. File
21. Dilution Tunnel	180-142	Shop Built	---	---	Refer to Equip. File
22. Reference Dry Gas Meter	180-304	American Meter	DTM-200A	02C056244	± 0.1deg C
23. Spirometer	180-161	Shop built	---	---	±0.01 cu ft
24. Data Acquisition System	180-004	Fluke	2240-B	985022	± 0.1deg C
25. Drying Oven	180-159	Quincy Lab. Inc.	21-350	9502106	Refer to Equip. File
26. Filter Holders, 47 mm (8)	180-157 & 180-158	Millipore	SX0004700	---	Refer to Equip. File
27. Type J T/C Plugs	---	Gordon	HMP	---	Refer to Equip. File
28. Sling Psychrometer	180-317	Omega	RHSP	A4Q	±5% RH
29. Dessicator cabinet	180-162	Nalgene	5317-0180	---	Refer to Equip. File
30. Exhaust blower	180-141	---	---	---	Refer to Equip. File
31. Drying columns	180-143	W.A. Hammond	---	---	Refer to Equip. File
	180-144	Drierite Co.	26800	---	Refer to Equip. File
32. Impinger train	180-140	Shop Built	---	---	Refer to Equip. File
33. Mercurial Barometer	180-300	Princo	508-794	---	Refer to Equip. File

5.0 SAMPLING METHODS

5.1 PARTICULATE SAMPLING

Particulates were sampled in strict accordance with EPA Method 5G-3. This method uses two identical sampling systems with Gelman A/E 61631 binder free, 47 mm diameter filters. The dryers used in the sample systems are filled with "Drierite" before each test run.

6.0 QUALITY ASSURANCE

6.1 INSTRUMENT CALIBRATION

6.1.1 Dry Gas Meters

At the conclusion of each test program the dry gas meters are verified using the reference dry gas meter. This process involves sampling the train operation for 1 cubic foot of volume. With readings made to .001 ft^3, the resolution is .1%, giving accuracy higher than the ∀2% required by the standard.

6.1.2 Stack Sample Rotameter

The stack sample rotameter is checked by running three tests at each flow rate used during the test program. The flow rate is checked by running the rotameter in series with one of the dry gas meters for 10 minutes with the rotameter at a constant setting. The dry gas meter volume measured is then corrected to standard temperature and pressure conditions.

6.1.3 Gas Analyzers

The continuous analyzers are zeroed and spanned before each test with NBS traceable gases. A mid-scale multi-component calibration gas is then analyzed (values are recorded). At the conclusion of a test, the instruments are checked again with zero, span and calibration gases (values are recorded only). The drift in each meter is then calculated and must not exceed 5% of the scale used for the test.

At the conclusion of each unit test program, a five point calibration check is made and must meet accuracy requirements of the applicable standards. Consistent deviations between analyzer readings and calibration gas concentrations are used to correct data before computer processing.

6.2 TEST METHOD PROCEDURES

6.2.1 Leak Check Procedures

Before and after each test, each sample train is tested for leaks. Leakage rates are measured and must not exceed 0.02 CFM or 4% of the sampling rate. Leak checks are performed checking the entire sampling train. Pre-test and post-test leak checks are conducted with a vacuum of 5 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post test vacuum value. If leakage limits are not met, the test run is rejected. During, these tests the vacuum is typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

6.2.2 Tunnel Velocity/Flow Measurement

The tunnel velocity is calculated from a center point pilot tube signal multiplied by an adjustment factor. This factor is determined by a traverse of the tunnel as prescribed in EPA Method 1. Final tunnel velocities and flow rates are calculated from EPA Method 2, Equation 6.9 and 6.10. (Tunnel cross sectional area is the average from both lines of traverse.)

Pilot tubes are cleaned before each test and leak checks are conducted after each test.

6.2.3 Pm Sampling Proportionality (5g-3)

Proportionality was calculated in accordance with EPA Method 5G-3. The data and results are kept in file for future reference.

Tested by:

Éric Lafontaine, Tech.
Physical Testing

Written by:

Carole Boucher
Building Material's Report Writer

Verified by:

Claude Pelland, P. Eng.
Regional Manager
Physical Testing

APPENDIX A
Data and Calculation Forms

							Type of	
							Stove:	2
					Weighted Average		1=cat	
							2=noncat	
							3=pellet	
		(E)						
		Ave.		Heat		(K)		
	Burn	Emission		Output		Weighting		
Test No.	Rate	Rate g/hr	(OHE)	(BTU/HR)	Prob.	Factor	(KxE)	KxOHE
2	0.907	3.666		10936.79	0.3039	0.3665	1.3435	0.00
1	0.987	2.526		11901.44	0.3665	0.3055	0.7717	0.00
3	1.289	4.449		15543.02	0.6094	0.6187	2.7526	0.00
4	3.059	4.602		36886.03	0.9852	0.3906	1.7974	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
4				0.00				
						1.68126	6.6652	0.00
ghted average emissions rate:							3.9644	
	Weighted Average OHE						0.00	

3105271...

Intertek ETL SEMKO

Date: 14/09/2006

Manufacturer: FOYERS VACCOURT

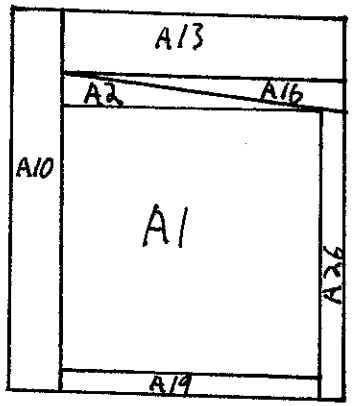
Project no.: 310 5271

Reviewer: _____ page ____ of ____

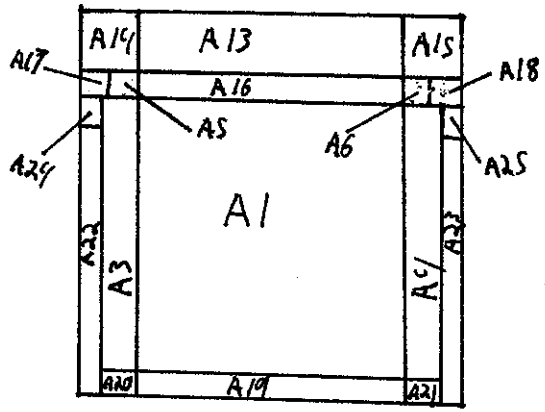
Model: FP8

Tech.: ERIC LAFONTAINE

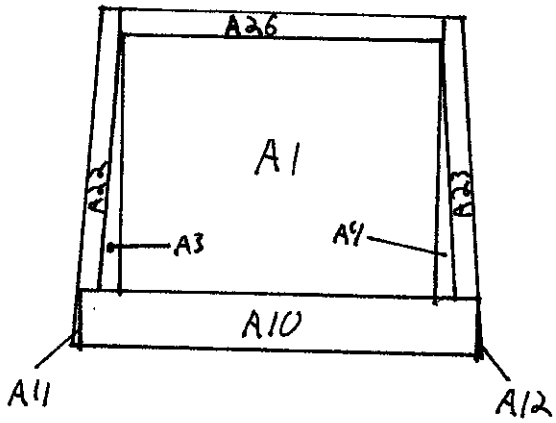
Side view



Front view



Top view



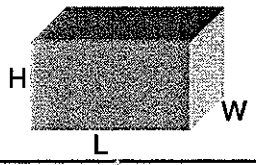
Intertek **ETL SEMKO**

Date: 14/09/2006 page _____

Manufacturer: FOYERS VALCOURT Model: FP8

Project no.: 310 5271 Tech.: ERIC LAFONTAINE

Addition ☒ Substraction ☐

Volume: A1 	L: W: H:	17.500 in. 12.375 in. 11.000 in.	L*W*H 2382.19 in.cu.
Volume: A2 	L: W: H:	17.500 in. 12.375 in. 2.250 in.	L*W*H/2 243.63 in.cu.
Volume: A3+A4 	L: W: H:	1.250 in. 12.375 in. 11.000 in.	L*W*H/2 85.08 in.cu. 170.2 in.cu.
Volume: A5+A6 	L: W: H:	1.250 in. 12.375 in. 2.250 in.	Pyramide (L*H*W/3) 11.60 in.cu. 23.20 in.cu.
Volume Total:	A1+A2+A3+A4+A5+A6 V.T. in.cu. 2819.22		A1+A2+A3+A4+A5+A6 **V.T. cu.f.** **1.631**

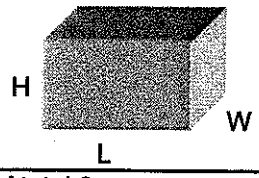
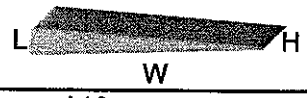
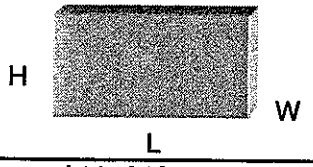
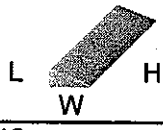
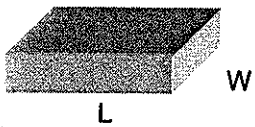
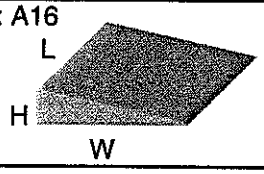
Intertek **ETL SEMKO**

Date: 14/09/2006 page _____

Manufacturer: FOYERS VALCOURT Model: FP8

Project no.: 310 5271 Tech.: ERIC LAFONTAINE

Addition ☐ Substraction ☒

Volume: Atotal 1  	L: W: H:	19.875 in. 17.188 in. 18.250 in.	l*w*h 6234.41 in.cu.
Volume Atotal 2  	L: W: H:	1.875 in. 17.188 in. 18.25 in.	l*w*h/2 294.076 in.cu. 588.1519 in. cu. **A.T. 6822.562**
Volume: A10  	L: W: H:	22.875 in. 3.313 in. 18.25 in.	l*w*h 1383.074 in. cu.
Volume: A11+A12  	L: W: H:	0.375 in. 3.313 in. 18.25 in.	l*w*h/2 11.337 in. cu. 22.673 in. cu.
Volume: A13  	L: w: h:	19.875 13.75 4.75	l*w*h 1298.086 in. cu.
Volume: A14+A15  	L: W: H:	1.875 in. 13.75 in. 4.75 in.	l*w*h/2 61.230 in. cu. 122.461 in. cu.
Volume: A16  	L: w: h:	19.875 13.875 1.875	l*w*h/2 258.530 in. cu.

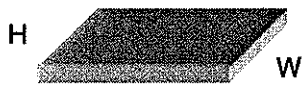
Intertek **ETL SEMKO**

Date: 14/09/2006 page _____

Manufacturer: FOYERS VACCOUNT Model: FP8

Project no.: 310 5271 Tech.: ERIC LAFONTAINE

Addition ☐ Substraction ☒

Volume: A17+A18  	L: 1.5 in. W: 13.625 in. H: 1.875 in.	Pyramide (L*H*W/3) 12.773 in.cu. 25.54688 in.cu.
Volume: A19  	L: 17.5 in. W: 12.5 in. H: 1.188 in.	l*w*h 259.875 in.cu.
Volume: A20+A21  	L: 1.5 in. W: 12.5 in. H: 1.188 in.	l*w*h/2 11.138 in.cu. 22.275 in.cu.
Volume: A22+A23  	L: 1.188 in. W: 12.375 in. H: 11.375 in.	l*w*h 167.230 in.cu. 334.459 in.cu.
Volume: A24+A25  	L: 1.188 in. W: 12.375 in. H: 1.875 in.	l*w*h/2 27.565 in.cu. 55.131 in.cu.
Volume: A26  	L: 18.25 in. W: 1.188 in. H: 11.375 in.	l*w*h/2 123.311 in.cu. 246.621 in.cu.
	ATotal1+ATotal2-(A10+A11+A12+A13+A14+A15+A16+A17+A18+A19+A20+A21+A22+A23+A24+A25+A26) V.T. in. cu. 2793.829	V.T cu. ft. **1.617**

Intertek ETL SEMKO

Date: 11/09/2006 Reviewer: ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project no.: 3105271 Tech.: ERIC LAFOUNTAINE

	ADDITION		SUBTRACTION	
	ft**3	Volume	ft**3	Volume
V measured	1,63	A1+A2+A3+A4+A5+A6	1,62	ATOTAL1+ATOTAL2-(A10+A11+A12+A13+A14+A15+A16+A17+A18+A19+A20+A21+A22+A23+A24+A25+A26)
V ashlip	____	____	____	____
%	____	____	____	____
V usable	1,63	A1+A2+A3+A4+A5+A6	1,62	ATOTAL1+ATOTAL2-(A10+A11+A12+A13+A14+A15+A16+A17+A18+A19+A20+A21+A22+A23+A24+A25+A26)

Usable firebox volume: 1,624

Test load weight: 11,37 Minimum: 10,23 Maximum: 12,51

Deviation: 0,5 (5% max.)

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Foyers Valcourt
Model:	FP8
Date:	19/09/2006
Run:	1
Project #:	3105271
Test Duration: (minutes)	240

RESULTS

AVERAGE ADJUSTED EMISSION RATE: [redacted]

Burn Rate (Dry kg/hr): [redacted]

Category II

PRESSURE FACTOR: 0.99098

TEMPERATURE FACTORS

DGM #1:	0.98003
DGM #2:	0.98076

VOLUMES SAMPLED

DGM #1:	29.98034
DGM #2:	22.69222

TOTAL TUNNEL VOLUME (scf): 33318.746

SAMPLE RATIOS

Sample Train 1:	1111.353
Sample Train 2:	1468.290

TOTAL EMISSIONS

Sample Train 1 (g):	6.0013
Sample Train 2 (g):	5.8732

EMISSION RATES

Sample Train 1 (g/hr):	1.5003
Sample Train 2 (g/hr):	1.4683

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr):	2.5486
Sample Train 2 (g/hr):	2.5034

DEVIATION: 0.45%

BAROMETRIC PRESSURE

Average:	29.65
Start:	29.65
End:	29.65

DRY GAS METER VALUES

DGM #1	Final:	506.758
	Initial:	475.733
DGM #2	Final:	949.858
	Initial:	926.274

TEMPERATURES (DEG. RANKIN)

DGM #1:	538.760
DGM #2:	538.360

CALIBRATION FACTORS

DGM #1:	0.9950
DGM #2:	0.9900

TUNNEL FLOW RATE: 138.828

PARTICULATE CATCH (mg)

Sample Train 1:	5.4000
Sample Train 2:	4.0000

Intertek ETL SEMKO

Date: 19/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 01 Tech: ERIC LAFONTAINE Reviewer: ✓

COMMENTS

8:46 START FIRE WITH KINDLING, DOOR CLOSE AFTER 1 MINUTE.

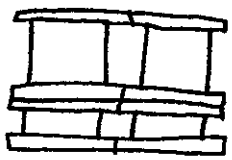
9:00 STIR THE FIRE, ADD PRE TEST LOAD

9:55 TEST AIR CONTROL SETTING

10:58 ADD TEST LOAD

11:03 TRAP CLOSE AFTER 5 MIN

TEST LOAD CONFIGURATION



Intertek **ETL SEMKO**

Date: 19/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 01 Tech: ERIC LAFONTAINE Reviewer: ____

Pre/Post Checks

Moisture Meter Calibration Check:

Time:	X:	Y:	12:	22:

Facility Conditions:

	Pre-Test	Post-Test
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	Ok	Ok

Wood Heater Conditions:

Date Wood Heater Stack Cleaned	18-09-2006	
Date Dilution Tunnel Cleaned	18-09-2006	
Induced Draft Check	<0,005	<0,005
Tunnel Velocity	Ok	
Flow Rate 140 cfm ±10%		138,828

Pitot Leak Check:

Side A	Ok	Ok
Side B	Ok	Ok

Temperature System:

Ambient (65°-90°F)	82,6 °F
Wood Heater Surface (±125°F)	-64,6 °F

Proportional Checks:

CO Analyzer Drift Check	Ok
CO_2 Analyzer Check	Ok
O_2 Analyzer Check	Ok
Thermocouple check	Ok

Sampling Train ID Numbers:

	Train 1	Train 2
Probe	157	157-13
Filter Front	1	3
Filter Back	2	4
Filter Thermocouple	30	33
Filter 5G-3 (<90°F)	81	85

Termocouple Identification Numbers:

Flue.....1
Dilution Tunnel Wet Bulb.....4
Right Side.....7
Catalyst /Combustion Chamber....10

Room.....2
Top.....5
Left Side.....8

Dilution Tunnel Dry Bulb.....3
Back.....6
Bottom.....9

Intertek ETL SEMKO

Date: 19/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 01 Tech: ERIC LAFONTAINE Reviewer: ~

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	SYSTEM 1		SYSTEM 2	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	475,734	506,766	926,274	949,870
Initial 1minute DGM (ft^3)	475,733	506,765	926,273	949,869
Change © (ft^3)	0,001	0,001	0,001	0,001
Allowable leakage .04 x Sample rate or .02cfm	0,005	0,005	0,004	0,004
Check OK	OK	OK	OK	OK

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	10	10
Flow Rate (CFM)	0,001	0,001
Allowable (.04 x Sample Rate)	0,005	0,005
Check OK	OK	OK

Intertek ETL SEMKO

Date: 19/09/2006 Page ____ of ____

Manufacturer: VACCOUNT Model: FP8

Project #: 310 5271 Run: 01 Tech: ERIC LAFONTAINE Reviewer: [illegible]

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	4,40	lbs, Class F	4,40	lbs
Wood	2,20	lbs, Class F	2,20	lbs
Analytical	100	mg, Class S	100	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

Intertek ETL SEMKO

Date: 19/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 01 Tech: GILLES LAFONTAINE Reviewer: ✓

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.55	0.511
CO_2	0.00	0.00	17.12	17.1	4.49	5.05
O_2	00.0	00.0	21.2	21.2	6.6	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.02	1.78	0.57	0,02	0,04	0,02	✓	
CO_2	0.02	16.89	4.43	0,02	0,23	0,06	✓	
O_2	00.0	21.2	6.6	00,0	0,0	0,0	✓	

- Greater than 5% of the range used.

Intertek ETL SEMKO

Date: 19/09/2006

Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 01 Tech: ERIC LAFONTAINE Reviewer: ✓

FUEL DATA

PRE-TEST LOAD

FUEL DESCRIPTION:

Kindling weight: 3.50 lbs. Consisting of: DOUGLAS FIR Fire lit Time: 8:46

Pre-test load weight: 11.21 lbs. Consisting of: 2X4X 10⅛ inches Time loaded: 9:00

Pre-test moisture content: Corrected Dry: 20.3 % Wet: ____ %

Test Air Control Settings: CLOSED TO MINIMUM Time: 9:55

Test Unit Fan Settings: NO FAN Time: ____

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	10.28 lbs.	11.42 lbs.	12.56 lbs.

Fire Box Volume:	1.629 ft.^{3}	Ideal Length:	inches
Load Volume:	0.247 ft.^{3}	Loading Density:	35.487 lbs/ft^3
Number of Spacers	:x12x5	Load Density:	6.434 lbs/ft^3

Piece Size	Weight	Meter Moisture Content (% dry)*		
1½ x 3½ x 12³⁄₁₆ in.	1.59 lbs.	20.2 %	21.1 %	21.0 %
1½ x 3½ x 12³⁄₁₆ in.	1.36 lbs.	19.3 %	19.0 %	18.9 %
3½ x 3½ x 12³⁄₁₆ in.	2.62 lbs.	19.9 %	19.0 %	19.1 %
3½ x 3½ x 12³⁄₁₆ in.	3.19 lbs.	21.1 %	20.5 %	21.2 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

***uncorrected range = 17.9% to 23.1%**

TEST LOAD WEIGHT: 10.45 lbs **DRY WEIGHT:** 3.95 kg.

AVERAGE MOISTURE CONTENT:

CORRECTED TO TWO PIN: (DRY) 20.0 % (WET) 16.7 %

COAL BED RANGE:

2.09 lbs. to 2.61 lbs. (20% to 25% of test load)

TEST CHARGE:

Time loaded: 10:58 Coal bed weight: 2.10 lbs. Coal bed weight = 20.1 % of test load weight

CHARCOALIZATION: good*--*poor

Intertek **ETL SEMKO**

Date: 19/09/2006

Manufacturer: VALCOUICT Model: FP8

Project #: 310 5271 Run: 01 Tech: ERIC LAFONTAINE Reviewer: _____

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

	SYSTEM 1		SYSTEM 2	
	Probe and Front Half Housing #	Filter Numbers	Probe and Front Half Housing #	Filter Numbers
	157	1 + 2	157-13	3 + 4

Post Test Weight:	33,2412 grams	0,2330 grams	33,4942 grams	0,2333 grams
Pre Test Weight:	33,2401 grams	0,2287 grams	33,4937 grams	0,2298 grams
Gain:	0,0011 grams	0,0043 grams	0,0005 grams	0,0035 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0,0054 grams a2 + b2 = 0,0040 grams

Pre-test Weight Record		SYSTEM 1			SYSTEM 2				
		Probe & Housing Number	Front Filter Number	Back Filter Number	Probe & Housing Number	Front Filter Number	Back Filter Number	TEMP	HUMI D
Date	Time	157	1	2	157-13	3	4	EF	%
18/09/06	18:30	33.2398	0.1071	0.1216	33.4935	0.1175	0.1124		
19/09/06	7:45	33.2401	0.1072	0.1215	33.4937	0.1174	0.1124		
		Total			Total				

Post-test Weight Record		SYSTEM 1		SYSTEM 2			
		Probe & Housing Number	Combined Filter Weight Number	Probe & Housing Number	Combined Filter Weight Number	TEMP	HUMI D
Date	Time	157	1 2	157-13	3 4	EF	%
19/09/06	15:30	33.2432	0.1109 0.1223	33.5127	0.1203 0.1129		
20/09/06	7:30	33.2410	0.1109 0.1223	33.4942	0.1203 0.1129		
20/09/06	15:55	33.2412	0.1108 0.1222	33.4942	0.1205 0.1128		

Intertek ETL SEMKO

Date: 19/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 01 Tech: ERIC CANTONNAUX Reviewer: ____

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 29,65 (inches Hg.) Static pressure (P_q) 0,14 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A- Centroid	3.00	0,055	115	0,2345
B - Centroid	3.00	0,045	112	0,2121
A-1	0.40	0,055	115	0,2345
A-2	1.50	0,060	115	0,2449
A-3	4.50	0,053	115	0,2291
A-4	5.60	0,080	108	0,2828
B-1	0.40	0,050	113	0,2236
B-2	1.50	0,055	115	0,2345
B-3	4.50	0,040	114	0,2000
B-4	5.60	0,060	97	0,2449
		AVERAGE	111,5	0,2368

$$Vs = K_p C_p \quad (\sqrt{\Delta_p})\ \text{avg.} \quad \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pitot tube coefficient, dimension less = 0.99 for standard pitot.
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_{qg}$
P_q = static pressure $\frac{\text{in. } H_2O}{\{\ 13.6\ \}}$
M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for English units)

$\Delta_p$avg. = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

Intertek ETL SEMKO

Date: 19/09/2006 Page ____ of ____

Manufacturer: FOYERS VAL COURT Model: FP8

Project #: 310 5271 Run: 01 Tech: E.CLAFONTAINE Reviewer: ____

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	506,758	949,858
Initial (ft^3)	475,733	926,274

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	29,65	29,65
Wet Bulb (EF)°F	69	69
Dry Bulb (EF)°F	82	82
Humidity (%)	51	51

Intertek **ETL SEMKO**

Project #: 310 5271 Client: FOVERSVALCOURT Date: 19/09/2006 Run #: 01 Sheet # _____ of _____

Time loaded: _____

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	6.35				529	80	129	764	246	305	350	347								77	77		77	77				
10	5.35				429	81	118	653	287	341	383	372								77	77		77	77				
20	4.40				425	81	118	675	323	387	418	374								77	78		77	77				
30	3.65				412	82	117	647	356	392	446	370								78	78		77	77				
40	3.05				391	82	115	609	378	411	460	380								78	78		77	77				
50	2.55				378	82	114	595	392	423	471	393								78	78		77	77				
60	2.10				367	82	113	586	415	434	479	409								78	78		77	77				

Technician: ERIC LAFONTAINE ☒ Pre Test ☐ Test

192-V-060

Intertek **ETL SEMKO**

Project #: 310 5271 Client: FOYER VAC COURT Date: 19/09/2006 Run #: 01 Sheet # _____ of _____

Time loaded: 10:58

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	10.45	0.32	5.72	14.3	425	82	145	567	425	434	472	417				475,733	45	926,274	40	78	78	80	78	78	83	0.045	0.065	OK
10	9.25	0.54	5.33	14.5	402	82	120	601	427	429	464	420				477,147	45	927,294	40	78	78	82	78	78	85	0.045	0.065	OK
20	8.35	0.52	5.06	14.3	391	82	117	592	401	417	457	407				478,527	45	928,294	40	78	78	81	78	78	84	0.045	0.060	OK
30	7.40	0.69	6.16	13.3	399	82	118	641	389	412	460	397				479,868	45	929,269	40	78	78	81	78	78	83	0.045	0.060	OK
40	6.30	0.86	7.24	12.4	423	82	120	710	389	418	479	387				481,192	45	930,258	40	79	78	81	78	78	83	0.045	0.065	OK
50	5.25	0.58	8.24	11.7	453	83	124	772	400	435	503	380				482,497	45	931,246	40	78	78	81	78	78	83	0.045	0.070	OK
60	4.30	0.67	8.32	11.9	447	84	124	731	417	453	519	375				483,794	45	932,228	40	79	78	81	78	78	84	0.0475	0.065	OK
70	3.50	0.64	7.25	12.6	430	84	122	686	437	467	524	374				485,094	45	933,212	40	79	78	81	78	78	84	0.0475	0.065	OK
80	2.95	0.40	6.55	13.3	411	83	120	652	465	477	521	379				486,379	45	934,193	40	79	78	81	78	78	84	0.0475	0.060	OK
90	2.45	0.28	5.78	14.0	391	83	118	618	486	518	518	384				487,663	45	935,171	40	79	79	81	78	78	84	0.050	0.060	OK
100	2.00	0.29	5.72	13.9	379	83	116	608	499	488	515	390				488,940	45	936,149	40	79	79	81	78	78	84	0.050	0.060	OK
110	1.80	0.52	4.49	15.3	352	83	114	549	506	488	500	397				490,223	45	937,129	40	79	79	81	78	78	84	0.050	0.055	OK
120	1.60	0.59	4.05	15.5	334	83	111	515	509	480	487	405				491,497	45	938,110	40	79	79	81	78	78	84	0.050	0.055	OK
130	1.50	0.70	3.89	15.7	321	84	110	496	510	472	475	411				492,778	45	939,094	40	79	79	81	78	78	84	0.050	0.050	OK
140	1.35	0.80	3.71	15.8	310	83	109	481	504	463	466	415				494,048	45	940,078	40	79	79	81	78	78	84	0.050	0.050	OK
150	1.20	0.83	3.51	15.9	301	83	107	470	498	456	459	423				495,325	45	941,059	40	79	79	80	79	78	83	0.050	0.050	OK
160	1.10	0.92	3.48	16.1	294	83	106	459	488	450	451	434				496,594	45	942,042	40	79	79	80	79	78	83	0.050	0.045	OK
170	0.95	0.98	3.38	16.2	288	82	105	447	478	442	442	436				497,870	45	943,026	40	79	79	80	79	79	83	0.0525	0.045	OK
180	0.85	0.99	3.23	16.3	282	82	104	438	469	435	433	433				499,143	45	944,012	40	79	79	80	79	79	83	0.055	0.0475	OK
190	0.65	1.15	3.07	16.4	16.4 277 EC	82	104	429	461	428	425	428				500,428	45	944,995	40	79	79	80	79	79	83	0.050	0.045	OK
200	0.50	0.87	3.05	16.6	273	82	103	422	447	421	416	431				501,685	45	945,990	40	79	79	80	79	79	83	0.0525	0.045	OK
210	0.35	0.87	2.92	16.8	268	82	102	412	432	413	407	434				502,949	45	946,966	40	79	79	80	79	79	83	0.050	0.045	OK
220	0.25	0.90	2.84	16.8	263	82	102	403	419	406	400	432				504,220	45	947,927	40	79	79	80	79	79	83	0.050	0.040	OK
230	0.10	0.97	2.71	16.9	259	82	101	396	409	400	392	429				505,483	45	948,888	40	80	80	80	79	79	83	0.050	0.045	OK

Technician: ERIC LAFONTAINE ☒ Pre Test ☒ Test

Intertek ETL SEMKO

Project #: 310 5271 Client: FOYER VALCOURT Date: 19/09/2006 Run #: 01 Sheet # ______ of ______

Time loaded: ______

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
240	0.00	0.95	2.48	17.2	254	81	101	387	399	392	386	428				506,758	45	949,858	40	79	79	80	79	79	83	0.055	0.04	ok

Technician: ERIC LAFONTAINE ☐ Pre Test ☒ Test

192-V-060

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Foyers valcourt
Model:	FP8
Date:	20/09/2006
Run:	2
Project #:	3105271
Test Duration: (minutes)	260

RESULTS

AVERAGE ADJUSTED EMISSION RATE: [redacted]

Burn Rate (Dry kg/hr): [redacted]

Category II

PRESSURE FACTOR: 0.99064

TEMPERATURE FACTORS

DGM #1:	0.98185
DGM #2:	0.98260

VOLUMES SAMPLED

DGM #1:	34.59692
DGM #2:	25.26349

TOTAL TUNNEL VOLUME (scf): 38675.483

SAMPLE RATIOS

Sample Train 1:	1117.888
Sample Train 2:	1530.884

TOTAL EMISSIONS

Sample Train 1 (g):	10.5081
Sample Train 2 (g):	9.6446

EMISSION RATES

Sample Train 1 (g/hr):	2.4250
Sample Train 2 (g/hr):	2.2257

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr):	3.7964
Sample Train 2 (g/hr):	3.5356

DEVIATION: 1.78%

BAROMETRIC PRESSURE

Average:	29.64
Start:	29.65
End:	29.63

DRY GAS METER VALUES

DGM #1	Final:	542.556
	Initial:	506.808
DGM #2	Final:	976.161
	Initial:	949.945

TEMPERATURES (DEG. RANKIN)

DGM #1:	537.759
DGM #2:	537.352

CALIBRATION FACTORS

DGM #1:	0.9950
DGM #2:	0.9900

TUNNEL FLOW RATE: 148.752

PARTICULATE CATCH (mg)

Sample Train 1:	9.4000
Sample Train 2:	6.3000

Intertek ETL SEMKO

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: ____

COMMENTS

8:39 START FIRE WITH KINDLING, DOOR CLOSE AFTER 1 MINUTE.

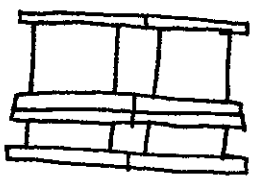
8:52 ADD PRETEST LOAD

9:37 TEST AIR CONTROL SETTING.

10:39 ADD TEST LOAD

10:49 TRAP CLOSE AFTER SIGN

TEST LOAD CONFIGURATION



Intertek **ETL SEMKO**

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: L

Pre/Post Checks

Moisture Meter Calibration Check:

Time:	X:	Y:	12:	22:

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	OK	OK
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	18-09-2006	
Date Dilution Tunnel Cleaned	18-09-2006	
Induced Draft Check	<0,005	<0,005
Tunnel Velocity	OK	
Flow Rate 140 cfm ±10%		148,752
Pitot Leak Check:		
Side A	OK	OK
Side B	OK	OK
Temperature System:		
Ambient (65°-90°F)	81,6 °F	
Wood Heater Surface (±125°F)	89,6 °F	
Proportional Checks:		
CO Analyzer Drift Check	OK	
CO_2 Analyzer Check	OK	
O_2 Analyzer Check	OK	
Thermocouple check	OK	

Sampling Train ID Numbers:

	Train 1	Train 2
Probe	158	158-B
Filter Front	5	7
Filter Back	6	8
Filter Thermocouple	30	33
Filter 5G-3 (<90°F)	81	84

Termocouple Identification Numbers:

Flue.....1	Room.....2	Dilution Tunnel Dry Bulb.....3
Dilution Tunnel Wet Bulb.....4	Top.....5	Back.....6
Right Side.....7	Left Side.....8	Bottom.....9
Catalyst /Combustion Chamber....10		

Intertek ETL SEMKO

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOVGERS VACCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: [signature]

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	SYSTEM 1		SYSTEM 2	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	506,808	542,720	949,945	976,394
Initial 1minute DGM (ft^3)	506,806	542,719	949,944	976,392
Change © (ft^3)	0,002	0,001	0,001	0,002
Allowable leakage .04 x Sample rate or .02cfm	0,006	0,006	0,004	0,004
Check OK	OK	OK	OK	OK

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	10	10
Flow Rate (CFM)	0,001	0,001
Allowable (.04 x Sample Rate)	0,005	0,005
Check OK	OK	OK

Intertek ETL SEMKO

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: [signature]

Pre-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	4,40 lbs, Class F	4,40 lbs
Wood	2,20 lbs, Class F	2,20 lbs
Analytical	100 mg, Class S	100 mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

Intertek ETL SEMKO

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOGHIS VALCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: ____

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.54	0.511
CO_2	0.03	0.00	17.10	17.1	4.49	5.05
O_2	00.0	00.0	21.2	21.2	6.5	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0,02	1.77	0.56	0,02	0,03	0,02	✓	
CO_2	0,04	16.80	4,47	0,01	0,30	0,02	✓	
O_2	00,0	21.0	06.5	00,0	0,2	0,0	✓	

- Greater than 5% of the range used.

Intertek ETL SEMKO

Date: 20/09/2006

Page____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: [illegible]

FUEL DATA

PRE-TEST LOAD

FUEL DESCRIPTION:

Kindling weight: 3.45 lbs. Consisting of: DOUGLAS FIR Fire lit Time: 8:39

Pre-test load weight: 11.80 lbs. Consisting of: 2X4X 10 inches Time loaded: 8:52

Pre-test moisture content: Corrected Dry: 20.8 % Wet: 17.2 %

Test Air Control Settings: CLOSED TO MINIMUM Time: 9:37

Test Unit Fan Settings: NO FAN Time:____

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	10.28 lbs.	11.42 lbs.	12.56 lbs.

Fire Box Volume:	1,624 ft.^{3}	Ideal Length:	inches
Load Volume:	0,251 ft.^{3}	Loading Density:	34,789 lbs/ft^3
Number of Spacers	:x12x5	Load Density:	6,403 lbs/ft^3

Piece Size	Weight	Meter Moisture Content (% dry)*		
1½ x 3½ x 12⅜ in.	1.24 lbs.	19.3 %	21.1 %	20.1 %
1½ x 3½ x 12⅜ in.	1.57 lbs.	18.1 %	19.7 %	18.4 %
3½ x 3½ x 12⅜ in.	3.28 lbs.	21.0 %	21.4 %	21.2 %
3½ x 3½ x 12⅜ in.	2.63 lbs.	19.5 %	20.0 %	19.9 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

***uncorrected range = 17.9% to 23.1%**

TEST LOAD WEIGHT: 10.40 lbs **DRY WEIGHT:** 3.93 kg.

AVERAGE MOISTURE CONTENT:

CORRECTED TO TWO PIN: (DRY) 20.0 % (WET) 16.7 %

COAL BED RANGE:

2.08 lbs. to 2.6 lbs. (20% to 25% of test load)

TEST CHARGE:

Time loaded: 10:39 Coal bed weight: 2.10 lbs. Coal bed weight = 20,2 % of test load weight

CHARCOALIZATION: good*--*poor

192-O-0603

Intertek **ETL SEMKO**

Date: 20/09/06

Manufacturer: FOWLERS VACCOUNT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC CARDWRING Reviewer: [illegible]

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

	SYSTEM 1		SYSTEM 2	
	Probe and Front Half Housing #	Filter Numbers	Probe and Front Half Housing #	Filter Numbers
	158	5 + 6	158-13	7 + 8
Post Test Weight:	34,6833 grams	0,2432 grams	33,7297 grams	0,2395 grams
Pre Test Weight:	34,6826 grams	0,2345 grams	33,7294 grams	0,2285 grams
Gain:	0,0007 grams	0,0087 grams	0,0003 or 0,0043 grams	0,0060 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0,0094 grams a2 + b2 = 0,0063 or 0,0043 grams

		SYSTEM 1			SYSTEM 2				
Pre-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	Probe & Housing Number	Front Filter Number	Back Filter Number	TEMP	HUMID
Date	Time	158	5	6	158-B	7	8	EF	%
19/09/06	16:00	34.6826	0.1238	0.1110	33.7296	0.1073	0.1216		
20/09/06	7:55	34.6826	0.1236	0.1109	33.7294	0.1072	0.1213		
		Total	Total						

		SYSTEM 1		SYSTEM 2			
Post-test Weight Record		Probe & Housing Number	Combined Filter Weight Number	Probe & Housing Number	Combined Filter Weight Number	TEMP	HUMID
Date	Time	158	5 6	158-B	7 8	EF	%
20/09/06	15:20	34.6849	0.1317 0.1116	33.7307	0.1129 0.1216		
21/09/06	7:45	34.6833	0.1316 0.1116	33.7297	0.1129 0.1316		
21/09/06	15:30	34.6833	0.1316 0.1116	33.7297	0.1129 0.1216		

Intertek ETL SEMKO

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC CHAFONTAINE Reviewer: [illegible]

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 29,65 (inches Hg.) Static pressure (P_q) 0,145 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A- Centroid	3.00	0,055	118	0,2345
B - Centroid	3.00	0,050	119	0,2236
A-1	0.40	0,058	118	0,2398
A-2	1.50	0,060	118	0,2449
A-3	4.50	0,050	116	0,2236
A-4	5.60	0,073	113	0,2693
B-1	0.40	0,063	119	0,2500
B-2	1.50	0,060	119	0,2449
B-3	4.50	0,055	119	0,2345
B-4	5.60	0,055	117	0,2345
		AVERAGE	116,1	0,2427

$$Vs = K_p C_p \quad (\sqrt{\Delta_p})\ \text{avg.} \quad \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pitot tube coefficient, dimension less = 0.99 for standard pitot.
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_{qg}$
P_q = static pressure $\frac{\text{in. } H_2O}{\{\ 13.6\ \}}$
M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for English units)

$\sqrt{\Delta_p}$avg. = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

Intertek ETL SEMKO

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: ____

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	542,556	976,161
Initial (ft^3)	506,808	949,945

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	29,65	29,63
Wet Bulb (EF)°F	67	66
Dry Bulb (EF)°F	81	81
Humidity (%)	48	46

Intertek **ETL SEMKO**

Project #: 310 5271 Client: FOYGELS VALCOURT Date: 20/09/2006 Run #: 02 Sheet # _____ of _____

Time loaded: 10:39

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	10,40	0.50	9.47	15.6	388	81	142	529	464	464	497	429				506,808	45	949,945	40	77	77	78	76	76	81	0,057S	0,06	Ok
10	9,75	0,57	1,97	17,2	351	80	113	485	430	439	450	427				508,236	45	950995	40	77	77	80	77	76	82	0,060	0,06	Ok
20	8,95	0,51	4,27	15,4	354	80	113	526	390	409	426	409				509,655	45	952,007	40	77	77	80	77	77	82	0,0625	0,06	Ok
30	8,00	0,58	5,50	14,1	377	81	115	590	372	398	425	397				511,055	45	953,017	40	77	77	80	77	77	82	0,065	0,06	Ok
40	6,90	0,56	7,68	11,8	428	81	120	725	376	405	449	389				512,456	45	954,026	40	77	77	80	77	77	82	0,055	0,065	Ok
50	5,70	0,47	8,25	11,8	453	81	123	759	394	428	477	381				513,852	45	955,023	40	78	77	80	77	77	82	0,057S	0,070	Ok
60	4,75	0,39	8,38	11,9	453	83	124	739	415	452	499	372				515,239	45	956,031	40	78	77	80	77	77	83	0,055	0,070	Ok
70	3,85	0,63	8,11	11,7	455	83	124	751	440	471	512	369				516,637	45	957,035	40	78	77	80	77	77	83	0,060	0,070	Ok
80	3,20	0,24	7,17	12,9	432	82	123	690	473	487	516	374				518,018	45	958,032	40	77	77	81	77	77	84	0,055	0,065	Ok
90	2,70	0,27	6,09	13,6	412	82	121	654	498	494	515	381				519,399	45	959029	40	77	77	81	77	77	84	0,055	0,060	Ok
100	2,25	0,24	5,94	13,7	398	83	120	631	513	498	514	389				520,772	45	960,031	40	78	77	81	77	77	84	0,055	0,055	Ok
110	2,00	0,50	4,48	15,4	368	82	116	568	517	496	503	397				522,138	45	961,034	40	78	77	81	77	77	84	0,055	0,055	Ok
120	1,80	0,42	4,04	15,5	345	82	114	527	520	490	490	404				523,508	45	962,038	40	78	78	81	77	77	84	0,055	0,050	Ok
130	1,65	0,52	3,90	15,7	329	82	111	503	517	482	479	408				524,875	45	963,038	40	78	78	80	77	77	84	0,055	0,050	Ok
140	1,50	0,60	3,77	15,8	317	82	110	488	512	475	469	411				526,237	45	964,042	40	78	78	80	77	77	83	0,055	0,050	Ok
150	1,40	0,68	3,68	15,9	308	82	109	475	504	467	459	413				527,601	45	965,050	40	78	78	80	78	77	83	0,055	0,050	Ok
160	1,25	0,76	3,71	16,0	301	82	108	464	496	460	451	413				528,971	45	966,055	40	78	78	80	78	77	83	0,055	0,050	Ok
170	1,10	0,84	3,49	16,1	295	82	107	455	486	452	499	414				530,336	45	967,065	40	78	78	80	78	78	83	0,055	0,050	Ok
180	1,00	0,88	3,32	16,2	289	82	106	445	478	444	436	413				531,688	45	968,072	40	78	78	80	78	78	82	0,055	0,050	Ok
190	0,85	0,94	3,16	16,3	284	82	105	438	468	438	428	409				533,048	45	969,079	40	78	78	80	78	78	82	0,060	0,050	Ok
200	0,70	0,94	3,13	16,3	280	82	104	431	461	433	421	408				534,413	45	970,095	40	78	78	80	78	78	82	0,057S	0,045	Ok
210	0,55	0,93	2,90	16,6	275	81	104	421	452	429	413	414				535,774	45	971,102	40	79	78	80	78	78	82	0,055	0,045	Ok
220	0,40	0,92	2,82	16,7	270	81	103	412	438	421	407	422				537,125	45	972,110	40	79	78	80	78	78	82	0,057S	0,045	Ok
230	0,30	0,95	2,73	16,7	266	81	102	403	424	414	399	423				538,482	45	973,122	40	79	78	80	78	78	82	0,057S	0,045	Ok

Technician: ERIC LAFONTAINE ☐ Pre Test ☒ Test

Intertek ETL SEMKO

Project #: 310 5271 Client: FOYERS VAC COURT Date: 20/09/2006 Run #: 02 Sheet # _____ of _____

Time loaded: _____

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
240	0.15	0.98	2,57	17.0	262	81	102	396	412	407	388	420				539,841	45	979,133	40	79	78	80	78	78	82	0,055	0,045	OK
250	0,05	1,11	2,31	17,2	258	81	101	386	400	378	378	416				541,161	45	975,149	40	79	78	79	78	78	82	0,055	0,045	OK
260	0,00	1,14	2,02	17,4	253	81	101	377	389	392	369	408				542,556	45	976,161	40	79	78	79	78	78	82	0,05	0,045	OK

Technician: ERIC LAFONTAINE ☐ Pre Test ☒ Test

Intertek ETL SEMKO

Project #: 310 5271 Client: FOYERS VALCOURT Date: 20/09/2006 Run #: 02 Sheet # _____ of _____

Time loaded: _____

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter # 1	Rotam	Dry gas meter # 2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	6.50				584	80	137	832	293	365	435	261								76	76		76	76				
10	5.30				477	80	123	723	344	410	467	293								76	76		76	76				
20	4.35				456	81	122	716	374	430	484	320								76	76		76	76				
30	3.50				443	81	120	708	405	449	504	346								76	76		76	76				
40	2.90				419	81	118	675	439	460	509	372								76	76		76	76				
50	2.40				395	81	116	608	457	464	514	397								76	76		76	76				
60	2.10				366	81	113	554	460	463	507	424								77	77		76	76				

Technician: ERIC LAFONTAINE ☒ Pre Test ☐ Test

192-V-060

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	Foyers Valcourt
Model:	FP8
Date:	21/09/2006
Run:	3
Project #:	0
Test Duration: (minutes)	202

RESULTS

AVERAGE ADJUSTED EMISSION RATE: [redacted]

Burn Rate (Dry kg/hr): [redacted]

Category III

PRESSURE FACTOR: 1.00100

TEMPERATURE FACTORS

DGM #1:	0.98216
DGM #2:	0.98320

VOLUMES SAMPLED

DGM #1:	24.67190
DGM #2:	18.67230

TOTAL TUNNEL VOLUME (scf): 29631.239

SAMPLE RATIOS

Sample Train 1:	1201.012
Sample Train 2:	1586.909

TOTAL EMISSIONS

Sample Train 1 (g):	10.0885
Sample Train 2 (g):	9.6801

EMISSION RATES

Sample Train 1 (g/hr):	2.9966
Sample Train 2 (g/hr):	2.8753

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr):	4.5255
Sample Train 2 (g/hr):	4.3730

DEVIATION: 0.86%

BAROMETRIC PRESSURE

Average:	29.95
Start:	29.95
End:	29.95

DRY GAS METER VALUES

DGM #1	Final:	567.978
	Initial:	542.757
DGM #2	Final:	995.517
	Initial:	976.353

TEMPERATURES (DEG. RANKIN)

DGM #1:	537.591
DGM #2:	537.023

CALIBRATION FACTORS

DGM #1:	0.9950
DGM #2:	0.9900

TUNNEL FLOW RATE: 146.689

PARTICULATE CATCH (mg)

Sample Train 1:	8.4000
Sample Train 2:	6.1000

3105271...

Intertek ETL SEMKO

Date: 21/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 03 Tech: ERIC LAFONTAINE Reviewer: ____

COMMENTS

8:40 START FIRE WITH KINDLING, DOOR CLOSE AFTER 1 MINUTE.

8:55 STIR THE FIRE, ADD PIECE TEST LOAD

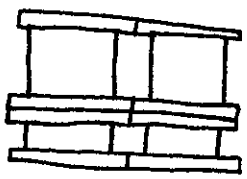
9:29 TEST AIR CONTROL SETTING

10:19 DOOR OPENED 10 SECOND, A PIECE OF WOOD WAS MOVED.

11:05 ADD TEST LOAD

11:10 TRAP CLOSE AFTER 5 MIN

TEST LOAD CONFIGURATION



Intertek ETL SEMKO

Date: 21/09/2006

Page ____ of ____

Manufacturer: FOYERS VALCOURT

Model: FP8

Project #: 310 5271

Run: 03

Tech: ERIC CAFONTAINE Reviewer: [illegible]

Pre/Post Checks

Moisture Meter Calibration Check:

Time:	X:	Y:	12:	22:

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	Ok	Ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	18-09-2006	
Date Dilution Tunnel Cleaned	18-09-2006	
Induced Draft Check	<0,005	<0,005
Tunnel Velocity	Ok	
Flow Rate 140 cfm ±10%		146,689
Pitot Leak Check:		
Side A	Ok	Ok
Side B	Ok	Ok
Temperature System:		
Ambient (65°-90°F)	81,5 °F	
Wood Heater Surface (±125°F)	-28 °F	
Proportional Checks:		
CO Analyzer Drift Check	Ok	
CO_2 Analyzer Check	Ok	
O_2 Analyzer Check	Ok	
Thermocouple check	Ok	

Sampling Train ID Numbers:

	Train 1	Train 2
Probe	159	159-13
Filter Front	9	11
Filter Back	10	12
Filter Thermocouple	30	33
Filter 5G-3 (<90°F)	83	85

Termocouple Identification Numbers:

Flue.....1	Room.....2	Dilution Tunnel Dry Bulb.....3
Dilution Tunnel Wet Bulb.....4	Top.....5	Back.....6
Right Side.....7	Left Side.....8	Bottom.....9
Catalyst /Combustion Chamber....10		

Intertek ETL SEMKO

Date: 21/09/2006 Page_____ of _____

Manufacturer: FOYERS VACCOUTT Model: FP8

Project #: 310 5271 Run: 03 Tech: ERIC LAFONTAINE Reviewer: _____

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	SYSTEM 1		SYSTEM 2	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	542,757	567,985	976,353	995,527
Initial 1minute DGM (ft^3)	542,756	567,984	976,352	995,525
Change © (ft^3)	0,001	0,001	0,001	0,002
Allowable leakage .04 x Sample rate or .02cfm	0,005	0,005	0,004	0,004
Check OK	Ok	Ok	Ok	Ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	10	10
Flow Rate (CFM)	0,001	0,001
Allowable (.04 x Sample Rate)	0,005	0,005
Check OK	Ok	Ok

Intertek ETL SEMKO

Date: 21/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 03 Tech: ELECTRONTECH Reviewer: _____

Pre-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	4,40 lbs, Class F	4,40 lbs
Wood	2,20 lbs, Class F	2,20 lbs
Analytical	100 mg, Class S	100 mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

Intertek **ETL SEMKO**

Date: 21/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 03 Tech: ERIC CHEONTAING Reviewer: ✓

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.54	0.511
CO_2	0.00	0.00	17.10	17.1	4.53	5.05
O_2	00.0	00.00	21.2	21.2	06.6	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.01	1.76	0.55	0,01	0,02	0,01	✓	
CO_2	0.03	16.83	4,94	0,03	0,27	0,09	✓	
O_2	00.0	21,1	06.6	00,0	0,1	0,0	✓	

- Greater than 5% of the range used.

Intertek ETL SEMKO

Date: 21/09/2006

Page____ of ____

Manufacturer: FOYERS VALCOURT

Model: FP8

Project #: 310 5271

Run: 03

Tech: ERIC LAFONTAINE

Reviewer: [signature]

FUEL DATA

PRE-TEST LOAD

FUEL DESCRIPTION:

Kindling weight: 3.6 lbs. Consisting of: DOUGLAS FIR

Fire lit Time: 8:40

Pre-test load weight: 12.54 lbs. Consisting of: 2X4X 9½ inches

Time loaded: 8:55

Pre-test moisture content: Corrected Dry: 22.2 % Wet: 18.2 %

Test Air Control Settings: ____ Time: 9:29

Test Unit Fan Settings: NO FAN Time: ____

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	10.28 lbs.	11.42 lbs.	12.56 lbs.

Fire Box Volume:	1,629 ft.^{3}	Ideal Length:	inches
Load Volume:	0,297 ft.^{3}	Loading Density:	39,659 lbs/ft^3
Number of Spacers	:x12x5	Load Density:	7,099 lbs/ft^3

Piece Size	Weight	Meter Moisture Content (% dry)*		
1½ x 3½ x 12¾ in.	1.75 lbs.	21.1 %	18.8 %	21.0 %
1½ x 3½ x 12¾ in.	1.73 lbs.	21.1 %	18.7 %	20.6 %
3½ x 3½ x 12¾ in.	3.17 lbs.	21.1 %	21.5 %	19.7 %
3½ x 3½ x 12¾ in.	3.14 lbs.	20.5 %	20.4 %	21.5 %
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

***uncorrected range = 17.9% to 23.1%**

TEST LOAD WEIGHT: 11.53 lbs **DRY WEIGHT:** 4,34 kg.

AVERAGE MOISTURE CONTENT:

CORRECTED TO TWO PIN: (DRY) 20.5 % (WET) 17.0 %

COAL BED RANGE:

2.31 lbs. to 2.88 lbs. (20% to 25% of test load)

TEST CHARGE:

Time loaded: 11:05 Coal bed weight: 2.85 lbs. Coal bed weight = 24.7 % of test load weight

CHARCOALIZATION: good*--*poor

192-O-0603

Intertek **ETL SEMKO**

Date: 21/09/2006

Manufacturer: FOYLES VACCOUCT Model: FP8

Project #: 310 5271 Run: 03 Tech: ERIC CARGUTAZNG Reviewer:

DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

	SYSTEM 1		SYSTEM 2	
	Probe and Front Half Housing # 159	Filter Numbers 9 + 10	Probe and Front Half Housing # 159-13	Filter Numbers 11 + 12
Post Test Weight:	30,6407 grams	0,2414 grams	30,9397 grams	0,2355 grams
Pre Test Weight:	30,6397 grams	0,2340 grams	30,9392 grams	0,2299 grams
Gain:	0,0010 grams	0,0074 grams	0,0005 grams	0,0056 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0,0084 grams a2 + b2 = 0,0061 grams

Pre-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Front Filter Number	SYSTEM 1 Back Filter Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Front Filter Number	SYSTEM 2 Back Filter Number	TEMP	HUMID
Date	Time	159	9	10	159-B	11	12	EF	%
20/09/06	15:45	30.6404	0.1141	0.1200	30.9398	0.1219	0.1079		
21/09/06	7:52	30.6399	0.1140	0.1200	30.9393	0.1221	0.1079		
21/09/06	10:02	30.6397	0.1140	0.1200	30.9392	0.1220	0.1079		
		Total		Total					

Post-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Combined Filter Weight Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Combined Filter Weight Number	TEMP	HUMID
Date	Time	159	9 10	159-B	11 12	EF	%
21/09/06	14:56	30.6462	0.1210 0.1205	30.9397	0.1224 0.1131		
22/09/06	7:30	30.6407	0.1210 0.1205	30.9397	0.1224 0.1132		
25/09/06	11:15	30.6407	0.1209 0.1205	30.9397	0.1224 0.1131		

Intertek ETL SEMKO

Date: 21/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 03 Tech: ERIC LAFONTAINE Reviewer: [signature]

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 29,95 (inches Hg.) Static pressure (P_q) 0,155 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A- Centroid	3.00	0,065	118	0,2550
B - Centroid	3.00	0,058	113	0,2398
A-1	0.40	0,058	118	0,2398
A-2	1.50	0,065	118	0,2550
A-3	4.50	0,058	117	0,2398
A-4	5.60	0,083	110	0,2872
B-1	0.40	0,058	116	0,2398
B-2	1.50	0,065	117	0,2550
B-3	4.50	0,055	116	0,2345
B-4	5.60	0,053	96	0,2291
		AVERAGE	113,5	0,2475

$$Vs = K_p C_p \quad (\sqrt{\Delta_p})\ \text{avg.} \quad \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pitot tube coefficient, dimension less = 0.99 for standard pitot.
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_{qg}$
P_q = static pressure $\frac{\text{in. } H_2O}{\{\ 13.6\ \}}$
M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for English units)

$\sqrt{\Delta_p}$avg. = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

Intertek ETL SEMKO

Date: 21/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 03 Tech: ERIC LAFONTAINE Reviewer: ____

TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	567,978	995,517
Initial (ft^3)	542,757	976,353

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	29,95	29,95
Wet Bulb (EF)°F	63	64
Dry Bulb (EF)°F	79	83
Humidity (%)	41	34

Intertek **ETL SEMKO**

Project #: 310 5271 Client: FOYERS VALCOURT Date: 21/09/2006 Run #: 03 Sheet # _____ of _____

Time loaded: 11:05

Elapsed time	Weight remaining	CO	CO²	O²	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	11.53	0.27	5.00	14.8	423	81	150	564	451	441	479	455				542,757	45	976,353	40	76	76	77	76	76	81	0.06	0.85 ea	ok
10	10.35	0.51	4.79	15.2	403	81	120	562	439	433	458	446				544,100	45	977,361	40	77	77	79	76	76	81	0.06	0.85 ea	ok
20	9.50	0.52	4.07	15.7	391	80	118	556	403	418	440	427				545,415	45	978,335	40	77	77	80	77	76	81	0.06	0.85 ea	ok
30	8.30	0.75	5.99	13.2	421	80	121	631	386	414	449	412				546,689	45	979,315	40	77	77	80	77	76	82	0.06	0.065	ok
40	7.10	0.70	7.16	12.9	449	81	125	685	387	427	472	407				547,941	45	980,268	40	77	77	81	77	77	82	0.06	0.070	ok
50	5.80	0.70	8.20	11.5	478	81	128	739	400	449	506	405				549,195	45	981,235	40	77	77	82	77	77	83	0.06	0.070	ok
60	4.55	0.70	8.60	11.1	493	82	131	795	422	476	533	403				550,447	45	982,200	40	78	77	83	77	77	83	0.06	0.070	ok
70	3.60	0.67	7.93	11.8	482	82	129	780	451	499	544	404				551,679	45	983,168	40	78	77	82	77	77	84	0.06	0.070	ok
80	2.90	0.18	6.94	12.8	461	82	127	724	477	514	545	409				552,919	45	984,112	40	78	77	82	77	77	84	0.0625	0.070	ok
90	2.30	0.14	6.07	13.6	438	82	125	673	498	522	544	416				554,156	45	985,069	40	78	77	82	77	77	85	0.060	0.065	ok
100	1.90	0.12	5.75	14.0	420	82	123	642	514	525	541	423				555,398	45	985,997	40	78	78	82	77	77	85	0.060	0.060	ok
110	1.60	0.39	4.96	14.7	397	82	121	599	525	524	529	429				556,640	45	986,924	40	78	78	82	77	77	84	0.060	0.060	ok
120	1.40	0.60	3.87	15.5	376	81	118	562	524	518	515	441				557,875	45	987,860	40	78	78	82	77	77	84	0.065	0.055	ok
130	1.25	0.72	3.77	15.6	360	82	115	537	513	509	502	449				559,108	45	988,785	40	78	78	81	77	77	84	0.060	0.055	ok
140	1.10	0.81	3.69	15.7	347	82	113	519	507	499	489	448				560,340	45	989,724	40	78	78	81	78	77	84	0.0625	0.055	ok
150	0.95	0.90	3.65	15.8	337	82	112	504	505	489	478	444				561,573	45	990,658	40	78	78	81	78	77	83	0.0650	0.055	ok
160	0.75	0.91	3.63	15.8	329	82	111	492	502	479	470	440 ea				562,813	45	991,599	40	78	78	81	78	77	83	0.065	0.0525	ok
170	0.55	0.95	3.57	15.9	323	82	110	481	500	470	462	436				564,050	45	992,534	40	78	78	81	78	77	83	0.0625	0.0525	ok
180	0.40	1.00	3.36	16.1	317	81	109	470	496	463	455	431				565,292	45	993,470	40	78	78	81	77	77	83	0.0650	0.050	ok
190	0.25	1.07	3.14	16.2	311	82	108	460	490	455	448	426				566,529	45	994,414	40	78	78	81	78	77	82	0.0625	0.050	ok
200	0.05	0.70	3.35	16.1	308	82	108	458	476	448	444	429				567,769	45	995,355	40	78	78	81	78	77	82	0.0625	0.050	ok
202	0.00	0.73	3.31	16.2	307	81	108	457	471	447	443	432				567,978	45	995,517	40	78	78	80	78	78	83	0.0625	0.050	ok

Technician: ERIC LAFONTAINE ☐ Pre Test ☒ Test

Intertek **ETL SEMKO**

Project #: 310 5271 Client: FOYERS VACCOURT Date: 21/09/2006 Run #: 03 Sheet # _____ of _____

Time loaded: _____

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	9.95				434	77	118	576	225	274	318	276								75	75		75	75				
10	9.00				356	77	109	488	251	297	331	298								75	75		75	75				
20	8.35				336	78	107	462	259	305	332	297								75	75		75	75				
30	7.65				356	78	113	483	263	316	337	288								75	76		75	75				
40	6.90				354	78	109	516	273	331	364	304								76	76		75	75				
50	6.05				395	79	115	582	286	344	388	340								76	76		75	75				
60	5.10				414	79	117	658	316	373	438	366								76	76		76	76				
70	4.20				429	80	118	684	357	405	471	392								76	76		76	76				
80	3.55				402	81	117	619	400	426	480	417								76	76		76	76				
90	3.05				391	81	115	592	428	437	482	440								76	76		76	76				

Technician: ERIC LAFONTAINE ☒ Pre Test ☐ Test

INTERTEK TESTING SERVICES NA Ltd.

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:	FOYERS VALCOURT	RESULTS	
Model:	FP8		
Date:	22/09/2006	AVERAGE ADJUSTED EMISSION RATE:	[redacted]
Run:	4		
Project #:	3105271	Burn Rate (Dry kg/hr):	[redacted]
Test Duration: (minutes)	80	Category IV	

PRESSURE FACTOR:		1.00769	BAROMETRIC PRESSURE		
				Average:	30.15
TEMPERATURE FACTORS				Start:	30.15
	DGM #1:	0.98395		End:	30.15
	DGM #2:	0.98456			
			DRY GAS METER VALUES		
VOLUMES SAMPLED			DGM #1	Final:	578.553
	DGM #1:	10.18425		Initial:	568.230
	DGM #2:	7.52472			
			DGM #2	Final:	1003.669
TOTAL TUNNEL VOLUME (scf):		10702.642		Initial:	996.008
SAMPLE RATIOS			TEMPERATURES (DEG. RANKIN)		
Sample Train 1:		1050.901		DGM #1:	536.611
Sample Train 2:		1422.330		DGM #2:	536.278
TOTAL EMISSIONS			CALIBRATION FACTORS		
Sample Train 1 (g):		3.8883		DGM #1:	0.9950
Sample Train 2 (g):		4.2670		DGM #2:	0.9900
EMISSION RATES			TUNNEL FLOW RATE:		133.783
Sample Train 1 (g/hr):		2.9163			
Sample Train 2 (g/hr):		3.2002	PARTICULATE CATCH (mg)		
			Sample Train 1:		3.7000
ADJUSTED EMISSION RATES			Sample Train 2:		3.0000
Sample Train 1 (g/hr):		4.4246			
Sample Train 2 (g/hr):		4.7794			

DEVIATION: 1.93%

Intertek ETL SEMKO

Date: 22/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 04 Tech: CHRIS CAFONTAINE Reviewer: [signature]

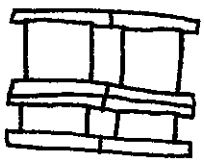
COMMENTS

9:06 START FIRE WITH KINDLING, DOOR CLOSE AFTER 1 MINUTE.

9:21 STIR THE FIRE, ADD PRETEST LOAD

10:26 ADD TEST LOAD AND CLOSE THE DOOR.

TEST LOAD CONFIGURATION



Intertek **ETL SEMKO**

Date: 22/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 04 Tech: ERIC LAFONTAINE Reviewer: [illegible]

Pre/Post Checks

Moisture Meter Calibration Check:	Time:	X:	Y:	12:	22:

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	<50 fpm	<50 fpm
Smoke Capture Check	Ok	Ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	18-09-2006	
Date Dilution Tunnel Cleaned	18-09-2006	
Induced Draft Check	<0,005	<0,005
Tunnel Velocity	Ok	
Flow Rate 140 cfm ±10%		133,78
Pitot Leak Check:		
Side A	Ok	Ok
Side B	Ok	Ok
Temperature System:		
Ambient (65°-90°F)	86.7 °F	
Wood Heater Surface (±125°F)	35,4 °F	
Proportional Checks:		
CO Analyzer Drift Check	Ok	
CO_2 Analyzer Check	Ok	
O_2 Analyzer Check	Ok	
Thermocouple check	Ok	

Sampling Train ID Numbers:	Train 1	Train 2
Probe	157	157-13
Filter Front	13	15
Filter Back	14	16
Filter Thermocouple	30	33
Filter 5G-3 (<90°F)	83	89

Termocouple Identification Numbers:

Flue 1	Room 2	Dilution Tunnel Dry Bulb 3
Dilution Tunnel Wet Bulb 4	Top 5	Back 6
Right Side 7	Left Side 8	Bottom 9
Catalyst /Combustion Chamber 10		

Intertek ETL SEMKO

Date: 22/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 04 Tech: ERIC LAFONTAINE Reviewer: [illegible]

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers

	SYSTEM 1		SYSTEM 2	
Unplugged Flow Rate = .25cfm	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5	5	5	5
Final 1minute DGM (ft^3)	568,230	578,002	996,011	003,718
Initial 1minute DGM (ft^3)	568,229	578,001	~~6~~ 996,010	003,716
Change © (ft^3)	0,001 ~~6~~	0,001	0,001	0,002
Allowable leakage .04 x Sample rate or .02cfm	0,005	0,005	0,004	0,004
Check OK	Ok	Ok	Ok	Ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Vacuum (inches Hg.)	5	5
Rotometer Reading (mm)	10	10
Flow Rate (CFM)	0,001	0,001
Allowable (.04 x Sample Rate)	0,005	0,005
Check OK	Ok	Ok

Intertek ETL SEMKO

Date: 22/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 04 Tech: ERIC LAFONTAINE Reviewer: [illegible]

Pre-Test Scale Audit

Scale Type	Audit Weight		Measured Weight	
Platform	4,40	lbs, Class F	4,40	lbs
Wood	2,20	lbs, Class F	2,20	lbs
Analytical	100	mg, Class S	100	mg

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%

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Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 04 Tech: ERIC LAFONTAINE Reviewer: ____

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.54	0.511
CO_2	0.00	0.00	17.03	17.1	4.51	5.05
O_2	00.0	00.0	21.2	21.2	06.6	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.00	1.74	0.54	0,00	0,00	0,00	✓	
CO_2	0.00	16.79	4.43	0,00	0,04	0,08	✓	
O_2	00.0	21.0	06.5	0,0	0,2	0,1	✓	

- Greater than 5% of the range used.

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FUEL DATA

PRE-TEST LOAD

FUEL DESCRIPTION:

Kindling weight: 2.80 lbs. Consisting of: DOUGLAS FIR Fire lit Time: 9:06

Pre-test load weight: 11.52 lbs. Consisting of: 2X4X 9½ inches Time loaded: 9:21

Pre-test moisture content: Corrected Dry: 19.3 % Wet: ____ %

Test Air Control Settings: ____ Time: ____

Test Unit Fan Settings: NO FAN Time: ____

TEST LOAD

	Lower Limit	Ideal	Upper Limit
Test Load Weight:	10,28 lbs.	11,42 lbs.	12,56 lbs.

Fire Box Volume:	1,624 ft.^{3}	Ideal Length:	inches
Load Volume:	0,246 ft.^{3}	Loading Density:	33,756 lbs/ft^3
Number of Spacers	:x12x5	Load Density:	6,607 lbs/ft^3

Piece Size	Weight	Meter Moisture Content (% dry)*		
1½ x3½x12⅛ in.	1.27 lbs.	19.8 ±.4%	19.2 ±.4%	18.8 ±.4%
1½ x3½x12⅛ in.	1.42 lbs.	18.6 ±.4%	18.8 ±.4%	18.7 ±.4%
3½ x3½x12⅛ in.	3.12 lbs.	19.2 ±.4%	18.4 ±.4%	19.0 ±.4%
3½ x3½x12⅛ in.	2.48 lbs.	19.7 ±.4%	18.3 ±.4%	18.2 ±.4%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%
x x in.	lbs.	%	%	%

***uncorrected range = 17.9% to 23.1%**

TEST LOAD WEIGHT: 10.73 lbs **DRY WEIGHT:** 4,080 kg.

AVERAGE MOISTURE CONTENT:

CORRECTED TO TWO PIN: (DRY) 19.3 % (WET) 16.2 %

COAL BED RANGE:

2.1 lbs. to 2.68 lbs. (20% to 25% of test load)

TEST CHARGE:

Time loaded: 10:26 Coal bed weight: 2.50 lbs. Coal bed weight = 23.3 % of test load weight

CHARCOALIZATION: good*--*poor

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DILUTION TUNNEL PARTICULATE SAMPLER DATA

FILTER TYPE: Gelman 47mm A/E

Samples in Desiccator Date: Time:

	SYSTEM 1		SYSTEM 2	
	Probe and Front Half Housing #	Filter Numbers	Probe and Front Half Housing #	Filter Numbers
	157	13 + 14	157-B	15 + 16
Post Test Weight:	33,2406 grams	0,2206 grams	33,4939 grams	0,2316 grams
Pre Test Weight:	33,2399 grams	0,2176 grams	33,4931 grams	0,2294 grams
Gain:	0,0007 grams	0,0030 grams	0,0008 grams	0,0022 grams
	a1	b1	a2	b2

Total Gain: a1 + b1 = 0,0037 grams a2 + b2 = 0,0030 grams

Pre-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Front Filter Number	SYSTEM 1 Back Filter Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Front Filter Number	SYSTEM 2 Back Filter Number	TEMP	HUMID
Date	Time	157	13	14	157-B	15	16	EF	%
21/09/06	16:15	33.2401	0.1091	0.1086	33.4933	0.1101	0.1196		
22/09/06	8:00	33.2399	0.1090	0.1086	33.4931	0.1099	0.1195		
		Total	Total						

Post-test Weight Record		SYSTEM 1 Probe & Housing Number	SYSTEM 1 Combined Filter Weight Number	SYSTEM 2 Probe & Housing Number	SYSTEM 2 Combined Filter Weight Number	TEMP	HUMID
Date	Time	157	13 14	157-B	15 16	EF	%
23/09/06	12:00	33.2913	0.1118 0.1088	33.4931	0.1119 0.1197		
25/09/06	8:30	33.2406	0.1118 0.1088	33.4939	0.1119 0.1197		
25/09/06	11:30	33.2406	0.1118 0.1088	33.4939	0.1119 0.1197		

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PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30,15 (inches Hg.) Static pressure (P_q) 0,16 (inches w.c.)
Inside diameter: Port A 6in. Port B 6in.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A- Centroid	3.00	0,068	146	0,2598
B - Centroid	3.00	0,063	145	0,2500
A-1	0.40	0,060	144	0,2449
A-2	1.50	0,065	146	0,2550
A-3	4.50	0,060	146	0,2449
A-4	5.60	0,060 cc	130	0,2449
B-1	0.40	0,065	144	0,2550
B-2	1.50	0,065	145	0,2550
B-3	4.50	0,055	145	0,2345
B-4	5.60	0,048	101	0,2179
		AVERAGE	137,625	0,2440

$$Vs = K_p C_p \quad (\sqrt{\Delta_p})\ \text{avg.} \quad \sqrt{\frac{T_s}{P_s M_s}}$$

Where,
C_p = pitot tube coefficient, dimension less = 0.99 for standard pitot.
Δ_p = manometer reading (inches H_2O)
T_s = average absolute dilution tunnel temperature (°F + 460)
P_s = absolute dilution tunnel gas pressure or $P_{bar} + P_{qg}$
P_q = static pressure $\frac{\text{in. } H_2O}{\{\ 13.6\ \}}$
M_s = 28.56, wet molecular weight of stack gas (alternatively, it may be measured)
K_p = 85.49 pitot tube constant, (conversion factor for English units)

$\overline{\sqrt{\Delta_p}}$avg. = average of the square roots of the velocity heads (Δ_p) measured at each traverse point.

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TEST DATA LOG

RAW DRY GAS METER READINGS

	System 1	System 2
Final (ft^3)	578,553	003,669
Initial (ft^3)	568,230	996,008

AMBIENT CONDITIONS

	Start	End
Barometer. (inches Hg)	30,15	30,15
Wet Bulb (EF)°F	65	66
Dry Bulb (EF)°F	82	81
Humidity (%)	39	46

Intertek ETL SEMKO

Project #: 310 5271 Client: FOYERS VALCOURT Date: 22/09/2006 Run #: 04 Sheet # _____ of _____

Time loaded: 10:26

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	10.73	0.34	10.28	9.5	677	83	213	852	486	479	519	379				568,230	45	996,008	40	76	76	78	76	76	81	0.060	0.09	Ok
10	7.70	0.43	10.67	9.1	699	84	173	880	518	523	561	408				569,532	45	997,021	40	76	76	83	76	76	84	0.060	0.09	Ok
20	5.70	0.23	10.21	9.7	704	85	175	887	518	563	590	401				570,784	45	997,997	40	76	76	82	76	76	86	0.060	0.09	Ok
30	3.85	0.26	10.41	9.3	722	87	179	921	531	598	614	394				572,048	45	998,929	40	77	76	82	76	76	87	0.060	0.09	Ok
40	2.40	0.18	9.64	10.3	706	89	176	934	551	626	627	396				573,346	45	999,855	40	77	76	81	76	76	88	0.060	0.09	Ok
50	1.35	0.13	8.44	11.5	660	89	171	856	571	637	621	403				574,638	45	000,799	40	77	77	81	76	76	89	0.06	0.085	Ok
60	0.65	0.09	6.24	13.5	601	88	162	761	590	639	608	414				575,927	45	001,755	40	77	77	82	77	76	89	0.06	0.08	Ok
70	0.15	0.12	5.50	14.1	562	88	155	719	604	630	594	428				577,241	45	002,711	40	77	77	82	77	77	89	0.0625	0.075	Ok
80	0.00	0.27	4.38	15.4	515	87	148	652	606	617	576	441				578,553	45	003,669	40	78	77	82	77	77	89	0.0625	0.075	Ok

Technician: ERIC LAFONTAINE ☐ Pre Test ☒ Test

192-V-060

Intertek **ETL SEMKO**

Project #: 310 5271 Client: FOYERS VALCOURT Date: 22/09/2006 Run #: 04 Sheet # _____ of _____

Time loaded: _____

Elapsed time	Weight remaining	CO	CO^2	O^2	Flue gas temp	Room temp.	Tunnel temp.	Unit top	Unit back	Unit R. Side	Unit L. Side	Unit bottom	Cat. Exit	Cat. Center	Gas samp Rotameter	Dry gas meter #1	Rotam	Dry gas meter #2	Rotam	Dry gas meter # 1			Dry gas meter # 2			Tun velo	Draft	smoke
																				Temp Inlet	Temp Outlet	Filter Temp	Temp Inlet	Temp outlet	Filter temp			
0	12.0				529	78	140	726	152	185	239	124								75	75		75	75				
10	10.95				345	77	135	426	187	240	269	169								75	75		75	75				
20	9.60				436	78	124	565	196	253	271	198								76	76		75	75				
30	7.95				509	78	137	707	229	291	319	229								76	76		75	75				
40	6.35				534	79	142	722	294	334	372	269								76	76		75	75				
50	4.55				603	80	151	811	379	393	438	311								76	76		76	76				
60	2.70				661	82	160	878	462	464	504	357								76	76		76	76				

Technician: ERIC LAFONTAINE ☒ Pre Test ☐ Test

APPENDIX B
Laboratory Operating Procedures

SFBA EMISSIONS AND EFFICIENCY TESTING
LABORATORY OPERATING PROCEDURE

INTRODUCTION

This document provides a step by step guide for the technician conducting tests to Oregon and/or EPA standard requirements. Procedures outlined here, when followed, will result in tests in conformance with Oregon Department of Environmental Quality Method Om42 and EPA Methods 28 and 5G.

The primary measurements to be made are particulate emissions rates. The technician's duties include the following steps.

1. Incoming inspection of test units.
2. Set-up of test units.
3. Preliminary testing to establish unit operating procedures and familiarity with operating controls.
4. Calibration of test equipment.
5. Set-up, checking and operation of sampling apparatus.
6. Conduct of tests including complete record keeping and data recording for non-automated functions.
7. Operation of hardware and software included in automatic data acquisition system.
8. Review and analysis of data at test completion to ensure test validity.

The technician running this test must be familiar with the following documents, which are to be kept in the laboratory at all, times.

EPA METHODS

a. Method 28
b. Method 28a
c. Method 5G

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Test forms are provided for all collected data and calibration records are found in appendix for each instrument.

I. APPLIANCE INSPECTION AND SET-UP

A. INCOMING INSPECTION

1. Check for completeness of unit including parts, accessories, installation and operating instructions, drawings and specifications etc. Note any discrepancies or missing parts or information.
2. Check for shipping damage. If damage has occurred, notify the laboratory manager. In some cases, repairs may be made, provided the manufacturer and laboratory manager concur that repairs will not affect the unit's performance. If damage is irrepairable, a new unit will need to be obtained.
3. Note whether unit is catalytic of non-catalytic.
4. Mark unit with manufacturer's name, model number, work order number and date received.
5. If unit is safety listed, note label data including listing agency and serial number. If unit is not listed, mark all data sheets "UNLISTED". Test results will not be released until unit passes safety tests without modification unless authorized by laboratory manager.

B. UNIT SET-UP

1. All new units must be operated for a breaking in period as follows.

    a) Non-catalytic units: Ten (10) hours at medium burn rate with Douglas Fir scrap or cordwood.
    b) Catalytic units: Fifty (50) hours at medium burn rate with Douglas Fir scrap or cordwood.

    During these break-in runs the unit may be connected to a lab chimney and fuel additions noted on data form no. 192-ai-9904. For catalytic units, a thermocouple must be installed in the catalyst.

    Record catalyst temperature at 1-hour intervals or on chart recorder. Operating should continue until data shows at least fifty (50) hours of operation with catalyst temperature in excess of 800 degrees Fahrenheit (active range).

    For non-catalytic units a stack thermocouple should be installed and stack temperature recorded at 1-hour intervals. Ten (10) hours minimum burn time with a stack temperature of at least 250 degrees Fahrenheit is required.

2. Once break-in is completed, allow unit to cool. Clean unit thoroughly.

3. Unit is to be placed on scale for testing. Prior to proceeding with verification process, scale should be turned on and allowed to warm up for one (1) hour minimum. Zero scale and check calibration with standard weights. One (1) 1 kg weight and one (1) 2 kg weight are provided for this purpose. Use scale verification test form no. 192-m-9904 to record results. If scale fails to reproduce weights within tolerance, check with laboratory manager before proceeding.
4. If scale checks out, place unit on scale and align so chimney will be centered in hood. Note unit weight on form no. 192-af-9904.
5. Attach chimney connector and chimney. Be sure all joints are sealed below sampling points. Chimney and connector should be cleaned with a wire brush. Be sure chimney connector terminates and chimney starts at proper level above scale platform. Chimney must be supported from scale so that it does not touch test enclosure or hood walls.
6. Thermocouples should be attached to surfaces of unit prior to testing. EPA requires a thermocouple on the bottom of the firebox. This must be installed prior to putting the unit on the scale. In some cases, the required thermocouple locations will be inaccessible on finished units. These units should have thermocouples installed by the manufacturer during construction. Check with the laboratory manager if problems are encountered in proper thermocouple attachment.
7. Measure firebox dimensions and record on data form nos. 192-ar-9905 and 192-aq-9905. Make a three dimensional sketch of the firebox including firebrick, baffles and obstructions. Calculate firebox volume in cubic feet. See Section 6.2.4 of EPA Method 28 for details of firebox volume determination.
8. If unit is catalytically equipped, additional thermocouples must be installed upstream and downstream of catalyst. Thermocouples should also be placed in the primary and secondary combustion chambers of all units.
9. Plug thermocouples into data acquisition system jacks making a record of locations and jack numbers for each test on data form no. 192-ah-9904.
10. Note that inserts are tested as if they are freestanding stoves.
11. Dilution tunnel should be cleaned prior to each certification test series and at anytime a higher burn rate follows a lower test burn rate.

II. SAMPLING SYSTEM – SET-UP

A. GAS ANALYSIS

1. Instruments should be turned on and allowed to warm up for one (1) hour minimum.

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2. Calibrate analyzers as follows:

NOTE : Prior to proceeding with calibration, make sure to use NIST tracable calibration gas bottles. Adjust flow meter if necessary at each instrument to required flow value.

a) Using span gas, adjust span control to values specified on calibration gas label.
b) Using nitrogene, adjust zero controls to provide a 0.00 analyzer readout.

c) Repeat a) and b) until no further adjustment is required.
d) Check readout vs. calibration gases (2) labels.

The CO_2 and CO analyzers are "ZEROED" on nitrogen. The O_2 analyzer is spanned on air and set for 20.9%. It is zeroed on nitrogen as well.

3. Check for response time synchronization.

a) With no fire in unit, allow reading to stabilize (O_2 should be 20.93, CO and CO_2 should equal O).
b) Flow the calibration gas in the unit and start stop watch. Note the time required for each unit to reach .90 of the calibration gas bottle value. If all three analyzers reach this value within 15 seconds of each other, synchronization is adequate. If not, contact the laboratory manager. Synchronization is adjusted by internal instrument setting.

4. Set-up sample clean-up and water collection train as follows.

a) Load impingers as follows:
Impinger #1: 100 ml distilled water and 5 ml H_2SO_4
Impinger #2: 100 ml distilled water and 5 ml H_2SO_4
Impinger #3: Empty
Impinger #4: 200 – 300 grams silica gel (dry)

b) Place impingers in container and connect with "U TUBES". Grease carefully on bottom half of ball joint so that grease will not get into tubes.
c) Connect filter to first impinger and sample line to last impinger.

e. Leak check system as follows.

1) Plug probe.

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2) Turn on sample system.
3) Observe sample flow rotometer and vacuum gauge. If necessary, use vacuum; adjust valve to set vacuum to the maximum inches Hg.
4) If the float in rotometer does not stabilize below 10 on scale, system must be resealed.
5) Repeat leak check procedure until satisfactory results are obtained.

f) Just prior to starting test, fill impinger container with water and ice and record ambiant conditions on data form no. 192-t-9904.

B. DILUTION TUNNEL SAMPLE TRAIN SET-UP

1. Filters and holders.

a) Clean probes and filter holder front housings carefully and desiccate for at least 24 hours prior to use.
b) Filters should be numbered and filter and probe combinations labeled prior to use.
c) Weigh desiccated filters and probe-filter units on analytical balance. Record weights data form no. 192-p-9904. Note that probe and front half of front filter are to be weighed as a unit.
d) Carefully assemble filter holder units and connect to sampling systems. Check "DRIERITE" columns for adequate dry absorbent (blue).

2. Leak checking.

a) Each sample system is to be checked for leakage prior to inserting probes in tunnel.
b) Plug probes and start samplers, adjust pump bypass valve to produce a vacuum reading of 5 inches Hg. (NOTE: During test, vacuum must not exceed 5 inches unless posttest leak check shows acceptable results.)

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c) Allow vacuum indication to stabilize for two (2) minutes, then record time and dry gas (DGM_1) and (DGM_2) meter readings. Wait ten (10) minutes and record dry gas meter readings again (DGM_3, DGM_4). NOTE: If mark, system is leaking too much and all seals should be checked.

d) Calculate leakage rate as follows.

1) System 1: $\frac{(DGM_3 - DGM_1)}{10} = CFM_1$

2) System 2: $\frac{(DGM_4 - DGM_2)}{10} = CFM_2$

If CFM_1 or CFM_2 is greater than .02 CFM, leakage is unacceptable and system must be resealed.

If CFM_1 or CFM_2 is greater than 0.04 X sample rate, leakage is unacceptable. For most tests, the sample rate will be about 0.15 CFM, thus leakage rates in excess of 0.04 X 0.15 = 0.006 CFM are not acceptable.

e) Once leakage check is satisfactory, unplug probe and set flow to appropriate rate for test. This should be done in the minimum amount of time necessary and with the probes in ambient air. Do not insert probes in tunnel until the start of the test run. When flow is established, replug probes to prevent contamination.

III. TEST CONDUCT

A. FUEL LOAD

1. Determine optimum load weight by multiplying firebox volume in cubic feet by 7. This is the load weight on an as-fired basis.
2. Determine piece size to obtain the requested load configuration and meet the test load weight criteria. The load should consist of the following: **TO BE DETERMINED**
3. Weigh out test load and adjust weight by shortening all pieces equally if necessary.

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4. Measure and record moisture content of each fuel piece using Delmhorst moisture meter. Determine if fuel load moisture content is in required range. If not, construct new load using wood with required moisture content. All wood in the humidity chamber should be within range. Contact project manager if you cannot find suitable pieces.

B. UNIT START-UP

1. Before lighting a fire, turn on dilution tunnel and set flow rate to 140 SCFM if burn rate is to be less than 3 kg/hr or to an appropriate rate from table provided in laboratory for higher burn rates. Record readings on data form no. 192-r-9904.
2. Check draft imposed on cold stove with all inlets closed and a draft gauge in the chimney. If draft is greater than 0.005 inches water column, adjust tunnel to stack gap until draft is less than 0.005.
3. Check for ambient airflow around unit with hot wire anomometer. Must be less than 50 ft/min.
4. Check all equipment for proper operation. Analyzers should be on and in sample mode. Computer should be loaded with test program and awaiting test start command.
5. Zero scale and start fire with uncolored newspaper and kindling representing 10 % of test load with the same type of fuel.
6. Once kindling is burning well after 5 minutes, add splitted pieces having a bottom surface around 4 sq. inches and representing 25% of test load weight. Operate at high fire for 15 minutes. Then adjust settings to intended test run levels as per the manufacturer's.
7. Following addition of pretest fuel load (splitted pieces), start computer for data logging.

C. TEST RUN

1. When the 15 minutes high fire pre-burn period is completed, the test is to be started as follows:

   a) Insert the sample probes into the tunnel being careful not to hit sides of tunnel with probe tip.
   b) Check tunnel pitot tube for proper position. (Pitot should be carefully cleaned prior to each test.)
   c) Turn on probe sample systems and stack sampler.
   d) Open stove door, rake coals and load stove as follows: **TO BE DETERMINED**
   e) Close door or follow manufacturer's start-up procedures. (Five (5) minutes maximum time before all doors and controls must be set to final positions for duration of test.)
   f) An alarm will sound an audible signal at the (10) minutes intervals. This signal a reading interval. You must record at each interval the following readings on data form no. 192-v-9904:

      1) Rotometer readings.
      2) Tunnel pitot tube reading.
      (Zero regularly between readings)
      3) Dry gas meter readings.
      4) Temperature readings.
      5) Draft reading
      6) Test laod weight
      7) CO, CO_2 and O_2 readings
      8) Observations of any unusual or non-routine events.

   g) During the test, any condition approaching unacceptable limits will be noted. The filter probes and housings are installed in small holders just outside the tunnel. If the filter temperature gets too high, you will have to increase the water flow through the cooling unit until acceptable temperatures are obtained. In between readings, check on other equipment. Be sure dryers and filters are working and monitor impinger train for proper water and ice levels etc.

   h) When the fuel charge is consumed, it will signal end of test and shut down the sampling systems. When this occurs, remove filter holder and probes from tunnel and impingers from sample line.

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IV. POST TEST PROCEDURES

A. SAMPLE RECOVERY – FILTER TRAINS

1. Carefully clean outside of probes and filter housings with alcohol.
2. Disassemble filter holder and transfer filters to clean petri dish. Scrape gasket with scalpel and collect any loose material on filters.
3. Place probe and front half of first filter holders (still assembled) and filters in desiccator. Allow 24-hour desiccation before weighing.
4. Weigh probe filter holder units and filters at two (2) hour intervals until weight change between weighings is less than 0.5 mg. Record all weights taken on data form no. 192-p-9904.

B. CALCULATION OF RESULTS

The computer program carries out all final calculations. When run, it will ask for data from forms used during the test. Enter data as called for.

C. OTHER TESTS

Fuel samples for each run should be tested for heating value and moisture content by ASTM D3286 and D4442 methods respectively.

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GENERAL

This guide cannot cover every possible contingency, which may develop during a particular test program. Many questions, which may arise, can be answered by a complete understanding of the test standards and their intent. When in doubt on any detail, check with the laboratory manager and be sure you understand the procedures involved.

It is critical that all spaces on the data forms be properly filled in. Each test must be represented by a complete record of what was done and when.

APPENDIX C
Sampling Proportionality Results

(EPA Formulas from PR5G)

Manufacturer: Foyers Valcourt
Model: FP8
Date: 19/09/2006
Run: 1

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
114.94	108.99	1.368	0.982	10
111.88	106.57	1.335	0.963	20
108.81	104.00	1.298	0.939	30
107.52	105.67	1.280	0.952	40
106.44	105.93	1.263	0.951	50
102.87	102.48	1.254	0.945	60
102.93	102.51	1.257	0.947	70
101.57	102.02	1.242	0.944	80
98.66	98.97	1.240	0.942	90
97.95	98.79	1.233	0.942	100
98.24	98.82	1.239	0.944	110
97.30	98.67	1.230	0.944	120
97.75	98.88	1.237	0.947	130
96.82	98.79	1.227	0.947	140
97.18	98.23	1.233	0.944	150
96.49	98.34	1.226	0.946	160
94.60	95.90	1.232	0.946	170
92.13	93.80	1.230	0.948	180
97.53	98.08	1.241	0.945	190
95.32	99.19	1.214	0.956	200
95.77	97.21	1.221	0.938	210
96.30	95.71	1.228	0.924	220
95.43	95.63	1.218	0.924	230
92.03	92.03	1.231	0.932	240

3105271...

(EPA Formulas from PR5G)

Manufacturer: Foyers valcourt
Model: FP8
Date: 20/09/2006
Run: 2

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
100.76	101.05	1.384	1.013	10
98.10	95.33	1.375	0.976	20
98.95	97.28	1.357	0.974	30
103.88	101.94	1.358	0.973	40
101.40	98.77	1.352	0.961	50
103.10	102.19	1.343	0.972	60
99.49	97.45	1.354	0.968	70
102.66	100.99	1.338	0.961	80
102.48	100.82	1.338	0.961	90
101.71	101.23	1.329	0.966	100
100.84	100.99	1.323	0.967	110
100.86	100.91	1.325	0.968	120
100.38	100.25	1.322	0.964	130
99.93	100.56	1.318	0.968	140
99.98	100.78	1.319	0.971	150
100.34	100.39	1.325	0.968	160
99.88	100.71	1.320	0.972	170
98.84	100.32	1.308	0.969	180
99.34	100.23	1.316	0.969	190
95.38	96.73	1.320	0.978	200
97.05	97.94	1.315	0.969	210
98.42	100.15	1.306	0.970	220
96.59	98.25	1.311	0.974	230
98.91	100.36	1.313	0.973	240
96.72	98.55	1.314	0.978	250
103.34	105.27	1.310	0.974	260

3105271...

(EPA Formulas from PR5G)

Manufacturer: Foyers Valcourt
Model: FP8
Date: 21/09/2006
Run: 3

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
109.03	107.77	1.315	0.984	10
106.57	103.86	1.288	0.950	20
103.51	104.77	1.248	0.956	30
102.08	102.14	1.226	0.929	40
102.50	103.90	1.228	0.942	50
102.50	103.95	1.225	0.940	60
100.70	104.10	1.205	0.943	70
99.13	99.30	1.213	0.920	80
100.76	102.57	1.210	0.932	90
100.90	99.29	1.214	0.904	100
100.73	99.01	1.214	0.903	110
99.90	99.71	1.207	0.912	120
95.58	94.43	1.205	0.901	130
99.23	99.60	1.204	0.915	140
97.22	96.89	1.205	0.909	150
95.78	95.64	1.212	0.916	160
95.47	94.95	1.209	0.910	170
97.67	96.94	1.214	0.912	180
95.30	95.69	1.209	0.919	190
97.42	97.28	1.212	0.916	200
82.10	83.66	0.204	0.158	202

(EPA Formulas from PR5G)

Manufacturer: FOYERS VALCOURT
Model: FP8
Date: 22/09/2006
Run: 4

PR1	PR2	#1 dDGM Vol.Std. (ft3)	#2 dDGM Vol.Std. (ft3)	Time
				0
101.52	106.36	1.286	0.995	10
97.78	102.63	1.237	0.959	20
98.93	98.32	1.247	0.916	30
101.35	97.45	1.281	0.910	40
100.40	98.96	1.274	0.928	50
99.45	99.40	1.271	0.939	60
98.77	96.76	1.295	0.938	70
97.96	96.41	1.292	0.940	80

3105271...

APPENDIX D
Calibration Data

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

EQUIPMENT LIST

And

CALIBRATION MATRIX

NO. EQUIP.	EQUIPMENT	FREQUENCY	AGENCY
180-318	Sling Psychrometer	None (mercury type)	n/a
180-169	Gas Analyzer	Each test (initial and final)	intertek
180-265	Calibration gases	On purchase	Air Liquide
180-442	Draft indicator	Annual	Chevrier
180-444/443	Vacuum gages (2)	Annual	Ulrich
180-311/365	Pressure gages (2)	None (indication only)	Ulrich
180-304/305	Reference Dry Gas Meter	Annual	Canadian Meter
180-175/176	Dry Gas Meter (metering system)	Semi-Annual and each series	Intertek
180-184	Pitot Tube "s"	Semi-Annual	Chevrier
180-290	Pitot Tube "s"	Semi-Annual	Chevrier
180-414	Hot Wire Anemometer	Semi-Annual	Chevrier
180-170	Analytical Balance	Semi-Annual	Intertek and Vacs
180-280	Scale 0-8000 gr.	Annual	Vacs
180-129/130	Readout for 1000lbs Scale	Annual	Vacs
180-110/195/302/303	Calibration weights	5 years	Marconi
180-355	Moisture Meter	Each series	Intertek
180-223	Calibrator t/c	Annual	Ulrich
180-004	temperature recorder	Semi-Annual	Intertek
180-300	Mercurial Barometer	None (mercury type)	n/a

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

GAZ ANALIZER

Intertek **ETL SEMKO**

Date: 19/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 01 Tech: GILLES LAFONTAINE Reviewer: ____

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.55	0.511
CO_2	0.00	0.00	17.12	17.1	4.49	5.05
O_2	00.0	00.0	21.2	21.2	6.6	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.02	1.78	0.57	0,02	0,04	0,02	✓	
CO_2	0.02	16.89	4.43	0,02	0,23	0,06	✓	
O_2	00.0	21.2	6.6	00,0	0,0	0,0	✓	

- Greater than 5% of the range used.

Intertek ETL SEMKO

Date: 20/09/2006 Page ____ of ____

Manufacturer: FOYGIES VALCOURT Model: FP8

Project #: 310 5271 Run: 02 Tech: ERIC LAFONTAINE Reviewer: ____

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.54	0.511
CO_2	0.03	0.00	17.10	17.1	4.49	5.05
O_2	00.0	00.0	21.2	21.2	6.5	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0,02	1.77	0.56	0,02	0,03	0,02	✓	
CO_2	0,04	16.80	4,47	0,01	0,30	0,02	✓	
O_2	00,0	21.0	06.5	00,0	0,2	0,0	✓	

- Greater than 5% of the range used.

Intertek ETL SEMKO

Date: 21/09/2006 Page ____ of ____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run: 03 Tech: ERIC CRAFONTAINE Reviewer: ____

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.54	0.511
CO_2	0.00	0.00	17.10	17.1	4.53	5.05
O_2	00.0	00.40	21.2	21.2	06.6	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.01	1.76	0.55	0,01	0,02	0,01	✓	
CO_2	0.03	16.83	4,94	0,03	0,27	0,09	✓	
O_2	00.0	21,1	06.6	00,0	0,1	0,0	✓	

- Greater than 5% of the range used.

Intertek ETL SEMKO

Date: 22/09/2006 Page ____ of ____

Manufacturer: FOYERS VALCOURT Model: FP8

Project #: 310 5271 Run: 04 Tech: ERIC LAFONTAINE Reviewer: ____

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.00	0.00	1.74	1.74	0.54	0.511
CO_2	0.00	0.00	17.03	17.1	4.51	5.05
O_2	00.0	00.0	21.2	21.2	06.6	6.68
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0.00	1.74	0.54	0.00	0.00	0.00	✓	
CO_2	0.00	16.79	4.43	0.00	0.04	0.08	✓	
O_2	00.0	21.0	06.5	0.0	0.2	0.1	✓	

- Greater than 5% of the range used.

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

CALIBRATION GASES

Intertek ETL SEMKO

Lachine, le 28 juin 2004

RAPPORT D'AUDIT

Date: Le 15 juin 2004

Endroit: À l'usine de Air Liquide Canada Inc
11201, boul. Ray-Lawson,
Anjou (Québec)

Personnes rencontrées:
Lucie Senécal, Représentante
Jacynthe Malenfant, Chimiste
François Grisé, Chimiste et Directeur de production

But: La visite a été effectuée dans le but d'auditer la façon de faire lors de l'analyse de la composition chimique d'une bouteille de gaz et les mesures prises afin d'assurer l'exactitude du certificat ainsi que la traçabililité de l'information.

La bouteille commandée et dont nous voulions superviser l'analyse est identifiée X297590 et la composition demandée est:

CO	1.7%
CO_2	17%
O_2	21.5%
N	balance

Il s'agit d'un gaz de calibration, il est donc traité selon la procédure des gaz spéciaux.

Fabrication et Analyse

Le mélange est préparé au poids selon les instructions du chimiste avec une balance précise à ± 0.1g puis il est analysé au laboratoire à l'aide des Chromatographes à phase Gazeuse à Détection par Conductibilité Thermique(GC-TCD)de modèles Sigma 3 et SRI. Le Sigma 3 est équipé d'un Servomex qui analyse directement l'oxygène par propriétés paramagnétiques.

Une ou plusieurs bouteilles standard se rapprochant le plus possible de la composition à analyser sont utilisées pour l'analyse au GC-TCD et au Servomex. Pour notre analyse, 2 standards ont été nécessaires (voir tableau).

Émis le: 28 juin 2004

Air Liquide Canada Inc.

1er standard (pour CO et O_2)	2e standard (pour CO_2)
CO 2.006% O_2 19.98% N_2 balance	CO 19.99% CO_2 19.98% N_2 balance

Pour chaque standard, au minimum 2 injections sont faites avec le standard afin de s'assurer de la stabilité de l'appareil, puis 2 injections sont prises de la bouteille à analyser, et à nouveau 2 autres injections du standard sont reprises pour s'assurer que les mesures ne dévient pas.

Le Servomex donne une lecture directe que l'on inscrit sur l'Ordre de Fabrication (O.F.), le nôtre porte le numéro 04-SGM-1349. Les résultats de chromatographie sont imprimés et les compositions sont calculées sur ordinateur par programme Excel avec lequel on s'assure que la marge d'erreur entre les valeurs de la bouteille standard est inférieure à 2% relatif sinon on recommence le tout. Tous les résultats sont consignés par la chimiste sur le O.F. et dans la base de données du laboratoire. L'étiquette est imprimée et le O.F. reçoit l'étampe "accepté, refusé ou réaffecté". Le O.F. et les chromatogrammes sont conservés pour une période de 7 ans.

Calibration

Pour ce qui est de la calibration de la balance, on utilise un jeu de poids standards retraçables au NIST et avant chaque mélange de gaz standard, on vérifie la linéarité de la balance à l'aide du jeu de poids. De ce fait la bouteille standard est retraçable au NIST La balance est aussi calibrée par un consultant à tous les 2 mois. Voir en annexe les preuves de calibration.

Les appareils GC et Servomex ne sont pas calibrés comme tel puisque à chaque analyse, on vérifie qu'ils donnent avec consistance les mêmes résultats et les compositions chimiques sont obtenues par comparaison avec le standard.

3105271...

Émis le: 28 juin 2004

Air Liquide Canada Inc.

Remarque:

On fait l'analyse de la bouteille en se branchant directement dessus et on calcule immédiatement les compositions sur ordinateur à partir des courbes obtenues du GC afin d'imprimer l'étiquette d'analyse. Mais une fois l'étiquette imprimée, elle est envoyée à la production pour qu'une tierce personne (de production) vienne apposer l'étiquette sur la bouteille. C'est donc le numéro de la bouteille, qui est aussi sur l'étiquette, qui est garant de l'exactitude de l'étiquette.

Conclusion:

Les éléments mentionnés dans ce rapport nous permettent de conclure que l'analyse des gaz effectuée chez Air Liquide Canada Inc. nous fournit la précision recherchée pour les gaz que nous employons.

Essais effectués par :

Martine Bourbonnais, ing.
Certification & essais physiques

Rédigé par :

Ghislaine Leduc
Rédactrice de rapport essais physiques
Certification & essais physiques

Vérifié par :

Claude Pelland, ing.
Directeur régional
Certification & essais physiques

3105271...

F.: 600 (02/03) REL CD

AIR LIQUIDE

*PROD	:	SPG-4MX0015338
DATE	:	2006-06-16
*OF	:	06-SGM-1947
*CYL/BOUT	:	H8011548
VOLUME	:	4.6740 M3
PRESS@15C	:	10125 kpa

CERTIFIED MIXTURE
MELANGE CERTIFIE

CO	0.511 %
CO2	5.05 %
O2	6.68 %
N2	BALANCE

CHEMIST, CHIMISTE
MOLAR CONCENTRATION / CONCENTRATION MOLAIRE

EMPTY — VIDE

IN USE — EN SERVICE

FULL — PLEINE

310-271...

F.: 600 (02/03) REL CD

AIR LIQUIDE

*PROD	:	SPG-4MX0005159
DATE	:	2006-05-10
*OF	:	06-SGM-1363
*CYL/BOUT	:	H815473A
VOLUME	:	4.6950 M3
PRESS@15C	:	9653 kpa

CERTIFIED MIXTURE
MELANGE CERTIFIE

CO	1.74 %
CO2	17.1 %
O2	21.2 %
N2	BALANCE

CHEMIST, CHIMISTE

MOLAR CONCENTRATION / CONCENTRATION MOLAIRE

EMPTY VIDE

IN USE EN SERVICE

FULL PLEINE

3105271...

ALPHAGAZ 1 N2

NITROGEN
SPG-NITIAL44

OF	:	05-SGM-1894
VOLUME	:	6.32 M3
PRESSURE/PRESSION	:	14965 KPA
PURITY/PURETE	:	99.999%

O2	<	2 PPM
H2O	<	3 PPM
THC	<	0.5 PPM

AIR LIQUIDE

7915 (00-07)CD

3105271...

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

DRAFT GAUGE

ULRICH

Ulrich Métrologie inc.
Ulrich Metrology Inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CALIBRATION CERTIFICATE

Certificate no.:	19845
Instrument ID:	83857-01 180-332
Type:	MANOMETER, DWYER MAGNEHELIC
Size:	0 TO 0.25 IN WATER
Manufacturer:	DWYER
Model no.:	MAGNEHELIC

Calibration date:	March 3, 2006
Certificate issued:	March 3, 2006
Interval:	12 Months
Due date:	March 3, 2007
Procedure:	SEE NEXT PAGE.
Environment:	CLAS Type 2 Laboratory
Temperature:	20 ± 2°C
Humidity:	35 - 55% RH
Metrologist:	DNR

Property of: SERVICES DESSAIS INTERTEK AN LTEE
1829, 32e Avenue
Lachine, QC H8T 3J1

Approved by: Nuccio Mercuri
Nuccio Mercuri, Lab Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.

CALIBRATION STANDARDS

See notes below.

MEASUREMENT UNCERTAINTY

The calibration was performed using a standard having a test ratio of four times or more greater than the unit being calibrated.

MEASUREMENT RESULTS

This gauge was subcontracted. See next page for measurement results.

3105271...

La Cie J. CHEVRIER INSTRUMENTS INC.

4850, bd Gouin est
Montréal-Nord, Qc
Canada H1G 1A2
www.chevrierinstruments.com

Tél. (514) 328-2550
1 800 522-1226
Fax (514) 327-0604
info@chevrierinstruments.com

Instruments de mesure et de régulation pour les procédés industriels et laboratoire d'étalonnage

Certificat d'étalonnage
Calibration certificate

Description	Manomètre différentiel Magnehelic Dwyer Modèle : 2000-00	*Numéro de série / Serial number*	—
Plage / Range	0/0.25 "CE	*Identification*	83857-01 180 - 332
Précision / Accuracy	±4% p.é.	*Reçu conforme / Received in specs*	Oui
Client / Customer	Ulrich Métrologie Inc. 17311	*Quitte conforme / Leaving in specs*	Oui
Bon de travail / Work order #	14198-01	*Réparation (o/n) / Repaired (y/n)*	Non

État instrument / Condition	Arrivée/In	Sortie/Out
	Moyen	Bon

Conditions d'étalonnage à l'ambiante / Ambient conditions at time of calibration	20 ± 1°C	35-55% H.R.

Remarque(s) / Comments: ***Fuite au niveau du couvercle (mal serré) / resserré**

Appliquée / Applied "CE	Lectures / Readings (ascendantes) (ascending)	Erreur / Error	Appliquée / Applied "CE	Lectures / Readings (descendantes) (descending)	Erreur / Error
0.0000	0.000	0.0000	0.0000	0.000	0.0000
0.0273	0.025	-0.0023	0.0235	0.025	0.0015
0.0501	0.050	-0.0001	0.0463	0.050	0.0037
0.0736	0.075	0.0014	0.0726	0.075	0.0024
0.1006	0.100	-0.0006	0.0977	0.100	0.0023
0.1211	0.125	0.0039	0.1205	0.125	0.0045
0.1452	0.150	0.0048	0.1433	0.150	0.0067
0.1712	0.175	0.0038	0.1709	0.175	0.0041
0.1934	0.200	0.0066	0.1928	0.200	0.0072
0.2194	0.225	0.0056	0.2182	0.225	0.0068
0.2487	0.250	0.0013	0.2487	0.250	0.0013

L'instrument ci-haut mentionné a été étalonné selon la méthode de comparaison en conformité avec la procédure PR004.
The above instrument was calibrated using the comparison method in conformance with the procedure PR004.

3105271...

Étalons utilisés traçable au C.N.R.C / N.I.S.T.– Standards used C.N.R.C / N.I.S.T. Traceable
***CHEV029**, manomètre/simulateur différentiel Fumess Controls PPC500 n/s 960294, 0.00008/8"CE, 0.0008/80"CE, 0/20 mA, 0/20 Vcc précision pression: ±0.1% v.m. ±1 chiffre, précision voltage et courant ±0.05%v.m. + 1chiffre, certifié NIST,*
Certificat: FC05-292-A01, date due 19 octobre 2006

C.Q. M.A.G.

Certifié par / Certified by Reda Aksas

Date 2006/mar/03

Date due / Due Date 2007/mar/03

Numéro du certificat / Certificate number 14198-01-17311

C.Q. R.A

H:\WPAT\CERTIFIC\Save\14198-01-17311.doc
Enregistré par le BNQ selon ISO 9001
À moins d'exception, le ratio d'incertitude étalon/instrument est d'au moins 4 pour 1. The test uncertainty ratio exceeds four to one unless otherwise indicated
Points non-conforme en ombragé. Out of tolerance readings shaded.

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

METERING SYSTEM 1 &2

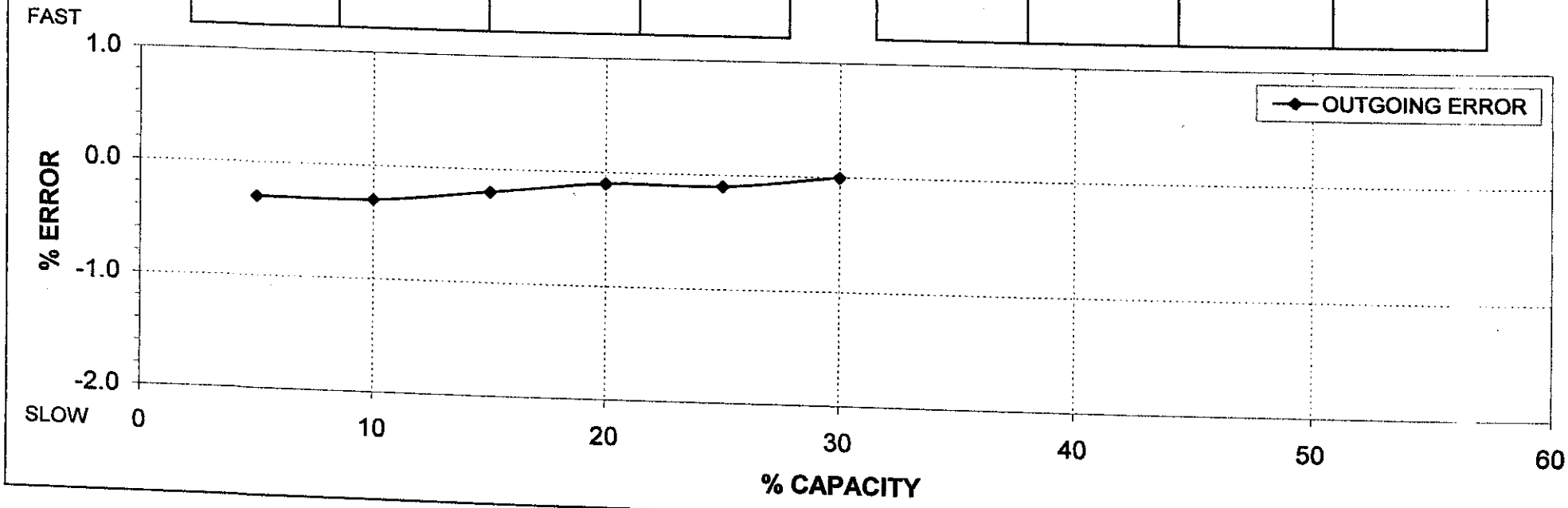
CANADIAN METER COMPANY INC.

CERT. 9385
01-J 006
JUNE

CALIBRATION CERTIFICATE

FLOWRATE (AIR) CFH	% CAPACITY (AIR)	INCOMING %PROOF	INCOMING %ERROR

FLOWRATE (AIR) CFH	% CAPACITY (AIR)	OUTGOING %PROOF	OUTGOING %ERROR
10	5	100.3	-0.3
20	10	100.3	-0.3
30	15	100.2	-0.2
40	20	100.1	-0.1
50	25	100.1	-0.1
60	30	100.0	0.0



% Proof = (Vp/Vm) x 100; Vm = Meter Volume
% Error =[(Vm-Vp / Vp] x 100; Vp = Prover Volume
% Accuracy = (Vm/Vp) x 100
1 L = 0.001 cu.M. = 0.03531 cu.ft.

Calibrated with air to Canadian Meter Co. flow standards with a process accuracy of ± 0.2%, which are traceable to the National Research Council - Ottawa Canada.
Meter tested on Certified Bell Prover QA-2BM-1

TECH. SERVICES: Lyal Ed Date: JUNE 1, 2006

METER MODEL: **DTM 200A**

DATE: 01-June-2006
CUSTOMER: Conval s/o 10062823
PIN (in. w.c.): 2.0
M.A.O.P.: 5 PSIG
SERIAL NO.: 02C056244
INDEX READING: 150.0 Ft^3

3105271..

INTERTEK TESTING [illegible] ICES NA LTD.
LACHINE, QUÉBEC, CANADA
SIX MONTH DRY GAS METER CALIBRATION DATA

Page ____

MANUFACTURER: ____ MODEL: ____ LTO: ____ DATE: 04/10/2006 TECHNICIAN: ERIC LAFONTAINE

BAROMETRIC PRESSURE: 29,90 CALIBRATION FACTOR DGM#1: 0,997 DGM#2: 1,004 STANDARDIZED DGM#3: 0,999

METER #1 180-176

FLOW RATE FT.³	STANDARD METER FINAL FT.³	STANDARD METER INITIAL FT.³	STANDARD METER CHANGE FT.³	STANDARD METER TEMP °F	STANDARD METER STD FT.³	METER #1 FINAL FT.³	METER #1 INITIAL FT.³	METER #1 CHANGE FT.³	METER #1 TEMP °F	METER #1 STD. FT.³	CAL. FACTOR
0.050 FT³/min	170,400	170,300	0,100	74,4	0,100	719,783	719,680	0,103	74,5	0,103	0,971
0.094 FT³/min	170,988	170,800	0,188	74,4	0,188	720,375	720,190	0,185	74,4	0,185	1,016
0.140 FT³/min	172,180	171,900	0,280	74,4	0,280	721,567	721,290	0,277	74,6	0,277	1,011
0.187 FT³/min	172,874	172,500	0,374	74,4	0,374	722,265	721,888	0,377	74,6	0,377	0,992
0.338 FT³/min	173,876	173,200	0,676	74,4	0,676	723,269	722,588	0,681	74,6	0,680	0,993

AVERAGE CALIBRATION FACTOR: 0,997

METER #2 180-175

FLOW RATE FT.³	STANDARD METER FINAL FT.³	STANDARD METER INITIAL FT.³	STANDARD METER CHANGE FT.³	STANDARD METER TEMP °F	STANDARD METER STD. FT.³	METER #2 FINAL FT.³	METER #2 INITIAL FT.³	METER #2 CHANGE FT.³	METER #2 TEMP °F	METER #2 STD. FT.³	CAL. FACTOR
0,052 FT³/min	174,503	174,400	0,103	75,7	0,103	104,604	104,503	0,101	75,0	0,101	1,018
2,092 FT³/min	174,983	174,800	0,183	94,6	0,183	105,084	104,903	0,181	74,8	0,181	1,011
2,137 FT³/min	176,074	175,800	0,274	74,6	0,274	106,173	105,898	0,275	74,8	0,275	0,997
2,217 FT³/min	177,033	176,600	0,433	74,6	0,433	107,102	106,663	0,439	74,8	0,438	0,987
2,339 FT³/min	177,977	177,300	0,677	74,5	0,677	108,031	107,357	0,674	74,7	0,673	1,005

AVERAGE CALIBRATION FACTOR: 1,004

3105271...

Intertek **ETL SEMKO**

MANUFACTURER: FOYGIES VAC COUILT MODEL: EP8 LTO: 310527/ DATE: 25/09/2006 TECHNICIAN: E.KZC. LAFOUNTAIN REVIEWER: _____

BAROMETRIC PRESSURE: 30,15 CALIBRATION FACTOR DGM#1: 0,995 DGM#2: 0,990 STANDARDIZED DGM#3: 1,0017

POST TEST DRY GAS METER CALIBRATION DATA

		STANDARD METER					METER #1					
TRAIL NO.	PRESS DROP	FINAL FT.^{3}	INITIAL FT.^{3}	CHANGE FT.^{3}	TEMP □F	STD FT.^{3}	FINAL FT.^{3}	INITIAL FT.^{3}	CHANGE FT.^{3}	TEMP □F	STD. FT.^{3}	CAL. FACTOR
1	0	155,800	155,600	0,200	70,6	0,204	579,040	578,840	0,200	71,5	0,203	1,002
2	0	156,200	156,000	0,200	70,7	0,204	579,443	579,241	0,202	71,6	0,205	0,992
3	0	156,600	156,400	0,200	70,6	0,204	579,843	579,643	0,200	71,6	0,203	1,002

AVERAGE CALIBRATION FACTOR:

PREVIOUS CAL. FACTOR	MINUS	AVERAGE CAL. FACTOR	DIVIDED BY	PREVIOUS CAL. FACTOR	MULTIPLIED *100	EQUALS	DEVIATION PERCENT
0,995	-	0,999	1	0,995	*100	=	-0.4 %

STANDARD METERMETER #2

TRAIL NO.	PRESS DROP	FINAL FT.^{3}	INITIAL FT.^{3}	CHANGE FT.^{3}	TEMP □F	STD. FT.^{3}	FINAL FT.^{3}	INITIAL FT.^{3}	CHANGE FT.^{3}	TEMP □F	STD. FT.^{3}	CAL. FACTOR
1	0	157,000	156,800	0,200	70,2	0,204	004,276	004,078	0,198	70,3	0,202	1,010
2	0	157,400	157,200	0,200	70,4	0,204	004,668	004,468	0,200	70,5	0,204	1,000
3	0	157,800	157,600	0,200	70,5	0,204	005,076	004,873	0,203	70,8	0,207	0,986

AVERAGE CALIBRATION FACTOR:

PREVIOUS CAL. FACTOR	MINUS	AVERAGE CAL. FACTOR	DIVIDED BY	PREVIOUS CAL. FACTOR	MULTIPLIED *100	EQUALS	DEVIATION PERCENT
0,990	-	0,999	1	0,990	*100	=	-0,9 %

3105271...

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

PITOT TUBE
TYPE "S"

La Cie J. CHEVRIER INSTRUMENTS INC.

4850, bd Gouin est
Montréal-Nord, Qc
Canada H1G 1A2
www.chevrierinstruments.com

Tél. (514) 328-2550
1 800 522-1226
Fax (514) 327-0604
info@chevrierinstruments.com

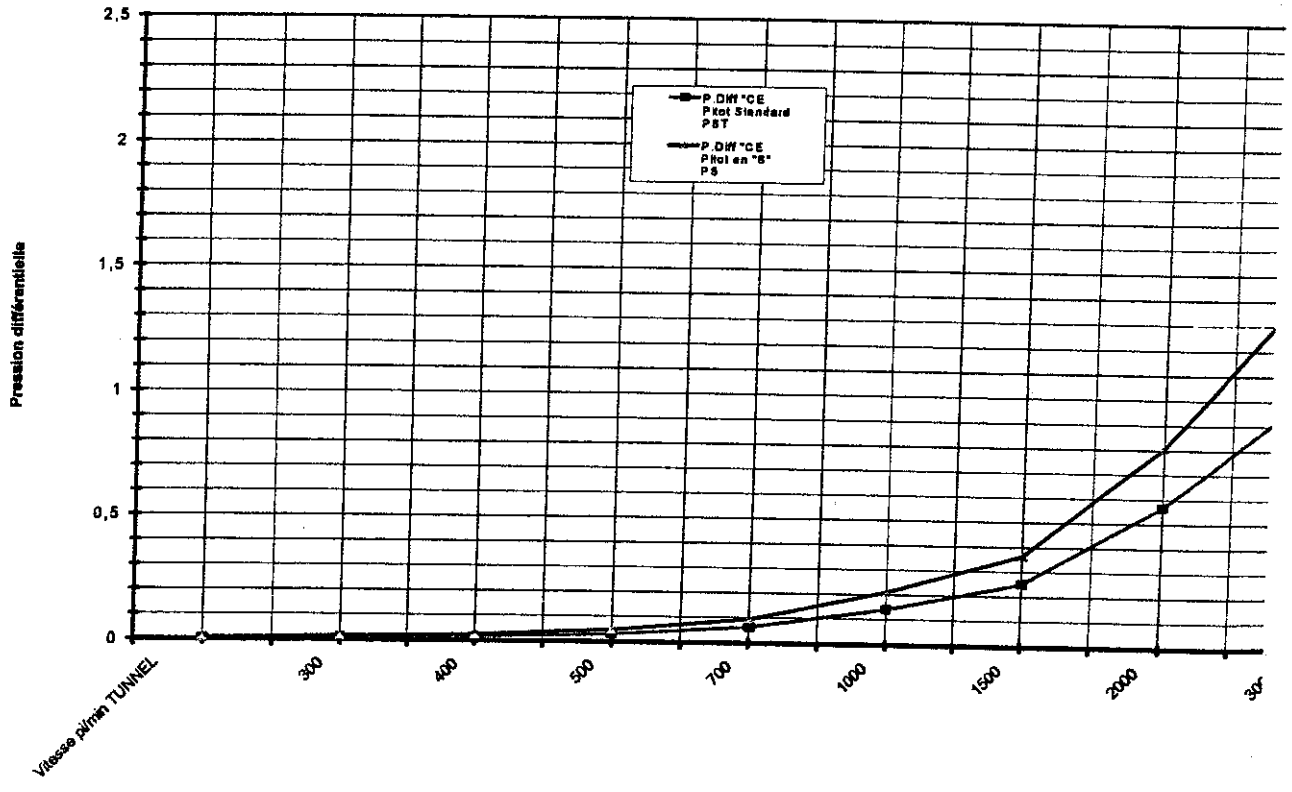
Instruments de mesure et de régulation pour les procédés industriels et laboratoire d'étalonnage

180-184

Certificat d'étalonnage
Calibration certificate

Description	Tube de Pitot en « S »	*Identification*	160S-18	
Client / Customer	ITS Services D'essais Intertek Ltée #1802	*État instrument Condition*	Arrivée/In Bon	Sortie/Out Bon
Bon de travail Work order #	15215-01	*Réparation (o/n) Repaired (y/n)*	Non	
Remarque(s) Comments				

Courbe d'étalonnage



Vitesse en pieds/minutes

C.Q. DC

3105271...

Points non-conforme en ombragé. Out of tolerance readings shaded.

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Enregistré par le BNQ selon ISO 9001

AU SERVICE DE L'INDUSTRIE depuis 1975

La Cie J. CHEVRIER INSTRUMENTS INC.

4850, bd Gouin est
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Canada H1G 1A2
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Instruments de mesure et de régulation pour les procédés industriels et laboratoire d'étalonnage

Température deg C	21.8	Humidité Relative %	49
Pression atm. Pa	101600	Facteur K	**1.003**

Vitesse pi/min TUNNEL	Pression différentielle "CE" Pitot Standard CHEV029	Vitesse Calculée pitot standard	Pression différentielle "CE" Pitot en "S" client	Vitesse calculée pitot en "S"	Facteur de correction Correction factor
300	0.0055	297	**0.0071**	338	0.8801
400	0.0103	407	**0.0151**	492	0.8259
500	0.0158	504	**0.0244**	626	0.8047
700	0.0309	704	**0.0473**	871	0.8083
1000	0.0630	1006	**0.0949**	1234	0.8148
1500	0.1421	1510	**0.2122**	1846	0.8183
2000	0.2518	2011	**0.3637**	2416	0.8321
3000	0.5676	3019	**0.8078**	3601	0.8382
4000	1.0049	4017	**1.4387**	4806	0.8357
5000	1.5728	5025	**2.2426**	6000	0.8375

L'instrument ci-haut mentionné a été étalonné selon la méthode de comparaison.
The above instrument was calibrated using the comparison method.

Étalons utilisés traçable au C.N.R.C / N.I.S.T.– Standards used C.N.R.C / N.I.S.T. Traceable

***CHEV029**, manomètre/simulateur différentiel Furness Controls PPC500 n/s 960294, 0.00008/8"CE, 0.0008/80"CE, 0/20 mA, 0/20 Vcc précision pression: ±0.1% v.m. ±1 chiffre, précision voltage et courant ±0.05%v.m. + 1chiffre, certifié NIST, Certificat: FC05-292-A01, date due 19 octobre 2006*

***CHEV031** Tuyère à jet d'air Airflow Developments type 83 FSL #VM7154670 et plaques orifices certifiées. Différentiel de pression mesuré avec transmetteur Kimo modèle CP303-MOP/SPI-1000, n/s 6030628, id. CHEV121, précision ±(0.5% v.m + 1Pa)., référencé BNM-COFRAC no.P05334, P05335, P05347, certificat no.AMA0602030609, date due 02 mars 2007.*

Certifié par
Certified by Trinh Thanh Tung

Date 2006/sep/01

Date due
Due Date 2007/sep/01

Numéro du certificat
Certificate number 15215-01-1802

C.Q. T.T.

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Points non-conforme en ombragé. Out of tolerance readings shaded.

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AU SERVICE DEPUIS 1975

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

HOT WIRE ANEMOMETER

La Cie J. CHEVRIER INSTRUMENTS INC.

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Instruments de mesure et de régulation pour les procédés industriels et laboratoire d'étalonnage

180-4114

Certificat d'étalonnage
Calibration certificate

Description	Anémomètre Omega modèle HHF42	*Numéro de série / Serial number*	Q117881
Plage / Range	40/3940 pi/min (0.2/20 m/s) 0/50 °C 32/122 °F	*Identification*	—
Précision / Accuracy	Vélocité : ±(5% v.m. + 1ch) ou ± (1%p.é.+1ch) Température : ±0.8°C (±1.5°F)	*Reçu conforme / Received in specs*	Non
Client / Customer	ITS Services D'essais Intertek Ltée #1802	*Quitte conforme / Leaving in specs*	Oui
Bon de travail / Work order # 15215-02	*État instrument / Condition* Arrivée/In: Bon; Sortie/Out: Bon	*Réparation (o/n) / Repaired (y/n)*	Non
Conditions d'étalonnage à l'ambiante / Ambient conditions at time of calibration	**20.5°C**		**35-55% H.R.**

Remarque(s)
Comments

Appliquée / Applied pi/min	Lectures avant / Before readings	Erreur / Error	Appliquée / Applied pi/min	Lectures après / After readings	Erreur / Error
50	44	-6	50	33	17
100	93	-7	100	85	15
200	166	-34	200	168	32
500	450	-50	500	465	35
800	746	-74	800	790	10
1000	932	-68	1000	996	4
2000	1974	-26	2000	2089	-89
3000	2970	-30	3000	3138	-138
Température °C					
22,1	21,4	-0,7	20,5	20,0	-0,5

Étalons utilisés traçable au C.N.R.C / N.I.S.T.– Standards used C.N.R.C / N.I.S.T. Traceable

Étalonné par la méthode de comparaison en conformité avec les spécifications du manufacturier avec:
CHEV031 *Tuyère à jet d'air Airflow Developments type 83 FSL #VM7154670 et plaques orifices certifiées. Différentiel de pression mesuré avec transmetteur Kimo modèle CP303-MOP/SPI-1000, n/s 6030628, id. CHEV121, précision ±(0.5% v.m + 1Pa)., référencé BNM-COFRAC no.P05334, P05335, P05347, certificat no.AMA0602030609, date due 02 mars 2007.*
CHEV033*, Thermomètre numérique COOPER PM200A, précision de ± 0.2 °C ou 0.5%v.m.,certificat #060628-CHEV033, référencé au NIST, date due 28 juin 2008.*

3105271...

C.Q. T.T.T.

Certifié par / Certified by Trinh Thanh Tung

Date 2006/sep/05 **Date due / Due Date** 2007/sep/05

Numéro du certificat / Certificate number 15215-02-1802

C.Q. DC

Points non-conforme en ombragé. Out of tolerance readings shaded.

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Enregistré par le BNQ selon ISO 9001

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

ANALYTICAL SCALE

METTLER TOLEDO

RAPPORT D'ESSAI EXHAUSTIF

Nom du client	ITS	N° DU TICKET SAV/ORDRE D'INTERVENTION	560461
Emplacement unité	LACHINE	N° du client	180 - 170
Marque/N° de modèle	OHAUS / AP3105	N° de série	1114501147
Capacité	310g kg ☐ lb ☐	Nb.Divisions	3100000
Taille Divisions	.00019		

L'équipement de pesage mentionné sur le présent rapport a été vérifié et/ou calibré en conformité avec la procédure Mettler Toledo Réf. VP0023IR, et la norme canadienne et/out le manuel NIST N°., le cas échéant

VÉRIFICATIONS DES COINS Poids Appliqué: 80g Erreur permissive 800D

Tel que trouvé	
80.00287g (2)	80.00257g (3)
80.00237g (1)	80.00197g (4)
J	

Tel que remis	
80.00119g (2)	80.00097g (3)
80.00069g (1)	80.00047g (4)
J	

Dans la tolérance sans réglage ☑

Dans la tolérance après réglage ☐

Hors tolérance ☐

Essai progressif	Poids Appliqué	Lecture tel que trouvé	Erreur: plus ou moins (d)	Erreur permissive (d)	Lecture tel que remis	Dans la Tolérance O/N
Zéro	0.00007g	0.00007g	0	1	0.00007g	O ☑ N ☐
	10.0000	10.0000	0	100	10.0000	O ☑ N ☐
	50.0000	50.0007	7	500	50.0000	O ☑ N ☐
	100.0000	100.0030	30	1000	100.0016	O ☑ N ☐
Charge Maximale*	300.0000	300.0066	66	3000	300.0036	O ☑ N ☐
	100.0000	100.0030	30	1000	100.0016	O ☑ N ☐
	50.0000	50.0007	7	500	50.0000	O ☑ N ☐
	10.0000	10.0000	0	100	10.0000	O ☑ N ☐
Zéro	0.0000	0.0000	0	1	0.0000	O ☑ N ☐

*Charge maximal utilisé pour l'essai

Dans la tolérance sans réglage ☑

OBSERVATIONS: CALIBRÉ

NUMÉROS D'IDENTIFICATION DES POIDS:	#3 7480, 7481 2FEV06 H		
N° du certificat de traçabilité du poids:	1342	DATE D'ÉTALONNAGE POUR CLIENT: 2FEV06	PROCHAIN ÉTALONNAGE POUR CLIENT: 1FEV07
RÉALISÉ PAR:	J. THIBAULT		
	Nom du technicien (en lettres capitales)		Signature du technicien
Le cas échéant:	*Nom du Client (en lettres capitales)*		*Signature du client*

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CERTIFICAT D'ÉTALONNAGE

N° de certificat : 1342

BALANCES

Pour l'étalonnage, nous utilisons les balances suivantes :

De > 200 g à 5 kg :	*Mettler PM5003, SNR 1115311634, max. 5100 g d = 0,00 1g*
De > 5 g à 200 g :	*Mettler AT-201, SNR 1115230146, max. 205 g d = 0,01 mg*
De 1 mg à 5 g :	*Mettler MT-5, SNR 1115252538, max. 5.1 g d = 0,1 µg*

INCERTITUDES

Les incertitudes que nous retrouvons comprennent :

1. *L'incertitude associée à l'opération de pesage.*
2. *L'incertitude associée à la densité de l'air.*
3. *L'incertitude associée à l'étalon utilisé.*
4. *L'incertitude associée à la densité de la masse à être étalonnée.*

L'incertitude de l'opération de pesage comprend la reproductibilité à long terme.

Les incertitudes précisées dans ce rapport sont des incertitudes élargies représentant un niveau de confiance d'approximativement 95 %, obtenu en multipliant ensemble l'incertitude-type composée par un facteur de couverture de k = 2. Pour de plus amples renseignements, veuillez consulter la publication GUM (Guide pour l'expression de l'incertitude de mesure, édition de 1995).

TRAÇABILITÉ

Le Service d'évaluation de laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et a certifié des capacités d'étalonnage spécifiques de ce laboratoire et leur traçabilité à des étalons nationaux de mesure reconnus et au Système international d'unités (SI). Ce certificat d'étalonnage est émis conformément aux conditions de certification accordées par CLAS et aux conditions d'accréditation accordées par le Conseil canadien des normes (CCN). Le CLAS pas plus que le CCN ne peut garantir l'exactitude des étalonnages individuels effectués par des laboratoires accrédités.

RÉFÉRENCES UTILISÉES			
Poids	***N° de série***	***Fabricant***	***Date étalonnage***
5 kg et 2 kg	*96-088850-3*	*Denver Instrument C.O.*	*9 janvier 2003*
2 kg	*PE-2-1*	*OHaus*	*9 janvier 2003*
1 kg à 200 g	*96-088850-2*	*Denver Instrument C.O.*	*9 janvier 2003*
100 g à 2 mg	*96-088850-1*	*Denver Instrument C.O.*	*9 janvier 2003*
1 kg	*29246*	*Troemner*	*9 janvier 2003*
100 g	*01-J54403-39*	*Troemner*	*9 janvier 2003*
10 g	*38827*	*Troemner*	*9 janvier 2003*
1 g	*42263*	*Troemner*	*9 janvier 2003*
100 mg	*42722*	*Troemner*	*9 janvier 2003*
10 mg	*48065*	*Troemner*	*9 janvier 2003*
1 mg	*21965 et 37759*	*Troemner*	*9 janvier 2003*
ÉTALONS DE RÉFÉRENCE CERTIFIÉS PAR LE CNRC			
1 kg	*96-088850-3*	*Denver Instrument C.O.*	*7 mai 2004*
100 g	*96-088850-2*	*Denver Instrument C.O.*	*7 mai 2004*

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

SCALE 0-8000 gr.

METTLER TOLEDO

RAPPORT D'ESSAI EXHAUSTIF

Nom du client	ITS		N° DU TICKET SAV/ORDRE D'INTERVENTION	560461	
Emplacement unité	LACHINE		N° du client	180-280	
Marque/N° de modèle	TOLEDO/PB8001-3		N° de série	1119053879	
Capacité	8 kg ☑ lb ☐	Nb.Divisions	40000	Taille Divisions	.1g

L'équipement de pesage mentionné sur le présent rapport a été vérifié et/ou calibré en conformité avec la procédure Mettler Toledo Réf. VP0023IR, et la norme canadienne et/out le manuel NIST N°., le cas échéant

VÉRIFICATIONS DES COINS

Poids Appliqué: 2kg Erreur permissive 20D

Tel que trouvé	
2000.2g (2)	2001.5g (3)
1998.4g (1)	1999.8g (4)
J	

Tel que remis	
2000.2g (2)	2001.5g (3)
1998.4g (1)	1999.8g (4)
J	

Dans la tolérance sans réglage ☑

Dans la tolérance après réglage ☐

Hors tolérance ☐

Essai progressif	Poids Appliqué	Lecture tel que trouvé	Erreur: plus ou moins (d)	Erreur permissive (d)	Lecture tel que remis	Dans la Tolérance O/N
Zéro	0.0g	0.0g	0	1	0.0g	O ☑ N ☐
	500.0	500.1	1	5	500.1	O ☑ N ☐
	2000.0	2000.0	0	20	2000.0	O ☑ N ☐
	4000.0	4000.0	0	40	4000.0	O ☑ N ☐
Charge Maximale*	8000.0	7999.3	7	80	7999.3	O ☑ N ☐
	4000.0	4000.0	0	40	4000.0	O ☑ N ☐
	2000.0	2000.0	0	20	2000.0	O ☑ N ☐
	500.0	500.1	1	5	500.1	O ☑ N ☐
Zéro	0.0	0.0	0	1	0.0	O ☑ N ☐

*Charge maximal utilisé pour l'essai

Dans la tolérance sans réglage ☑

OBSERVATIONS: ERREUR SUR LE SHIFT À L'INTÉRIEUR DES TOLÉRANCES DE .1%

NUMÉROS D'IDENTIFICATION DES POIDS:	~~7748~~ 7480, 7481 2FEV06		
N° du certificat de traçabilité du poids:	1342	DATE D'ÉTALONNAGE POUR CLIENT: 2FEV06	PROCHAIN ÉTALONNAGE POUR CLIENT: FEV 07
RÉALISÉ PAR:	J.THIBAULT		J.Thibault
	Nom du technicien (en lettres capitales)		Signature du technicien
Le cas échéant:	*Nom du Client (en lettres capitales)*		*Signature du client*

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TECHNISOL

325, rue de l'Espinay
Québec (Québec) G1L 2J2
Tél. : (418) 647-1402
Télec. : (418) 648-9288

CERTIFICAT D'ÉTALONNAGE

CLAS NRC-CNRC 2000-01

Client :	Mettler Toledo	***N° du certificat :***	1342
Adresse :	9280, rue du Parcours	***N° projet client :***	ME81310-160
	Anjou (Québec) H1J 2Z1	***Accréditation CCN n° :***	24
		Certification CLAS n° :	2000-01
		Classe d'exactitude :	OIML R-111, classe F2
Masse :	5 kg à 1 g	***Date d'étalonnage :***	29 avril 2005
Fabricant :		***Date du prochain étalonnage :***	Avril 2006

Condition d'essai : Temp. °C :	21,7	***Pression kPa :***	101,4	***Humidité % :***	35

Valeur nominale	*N° de série*	*N° d'inventaire*	*Masse conventionnelle telle que reçue Correction (mg)*	*↑ Masse conventionnelle correction après étalonnage (mg)*	*Tolérance (+ ou -) (mg)*	*Incertitudes (+ ou -) (mg)*
5 kg	7480	Jean Thibault	20,2		75,0	4,0
5 kg •	7481	Jean Thibault	8,5		75,0	4,0
2 kg	7480	Jean Thibault	2,8		30,0	1,7
2 kg •	7481	Jean Thibault	14,1		30,0	1,7
1 kg	7480	Jean Thibault	5,2		15,0	0,83
500 g	7480	Jean Thibault	2,3		7,5	0,9
200 g	7480	Jean Thibault	0,397		3,000	0,170
200 g •	7481	Jean Thibault	- 1,573		3,000	0,170
100 g	7480	Jean Thibault	1,202		1,500	0,100
50 g	7480	Jean Thibault	0,218		1,000	0,040
20 g	7480	Jean Thibault	0,262		0,800	0,025
20 g •	7481	Jean Thibault	0,157		0,800	0,025
10 g	7480	Jean Thibault	0,093		0,600	0,018
5 g	7480	Jean Thibault	0,1118		0,5000	0,0110
2 g	7480	Jean Thibault	0,0760		0,4000	0,0110

↑ S'applique seulement pour les masses qui ont été ajustées ** Ajusté* *** Hors-tolérance pour la classe spécifiée*

Pour l'étalonnage des masses, nous utilisons la procédure « Comparaison individuelle » IES 902 et la procédure « Détermination des incertitudes » IES 903. Nos étalons de référence sont étalonnés chaque année par le CNRC.

Remarques :

Effectué par : *J. Adey* *Approuvé par :* *S. Hamel, resp. SMM* *Date :* *29 avril 2005*

TECHNISOL

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Tél. : (418) 647-1402
Télec. : (418) 648-9288

CERTIFICAT D'ÉTALONNAGE

CLAS NIC-CNRC 2000-01

Client :	Mettler Toledo	*N° du certificat :*	1342
Adresse :	9280, rue du Parcours	*N° projet client :*	ME81310-160
	Anjou (Québec) H1J 2Z1	*Accréditation CCN n° :*	24
		Certification CLAS n° :	2000-01
Masse :	5 kg à 1 g	*Classe d'exactitude :*	OIML R-111, classe F2
Fabricant :		*Date d'étalonnage :*	29 avril 2005
		Date du prochain étalonnage :	Avril 2006
Condition d'essai : Temp. °C :	21,1	*Pression kPa :* 100,5	*Humidité % :* 35

Valeur nominale	*N° de série*	*N° d'inventaire*	*Masse conventionnelle telle que reçue Correction (mg)*	*♦ Masse conventionnelle correction après étalonnage (mg)*	*Tolérance (+ ou -) (mg)*	*Incertitudes (+ ou -) (mg)*
2 g •	7481	Jean Thibault	0,0837		0,4000	0,0110
1 g	7480	Jean Thibault	0,0370		0,3000	0,0110

♦ S'applique seulement pour les masses qui ont été ajustées ** Ajusté* *** Hors-tolérance pour la classe spécifiée*

Pour l'étalonnage des masses, nous utilisons la procédure « Comparaison individuelle » IES 902 et la procédure « Détermination des incertitudes » IES 903. Nos étalons de référence sont étalonnés chaque année par le CNRC. Ce certificat ne peut être reproduit sans la permission écrite de Technisol inc.

Remarques : _____

Effectué par : *J. Adey* *Approuvé par :* *S. Hamel, resp. SMM* *Date :* *29 avril 2005*

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

PLATFORM SCALE

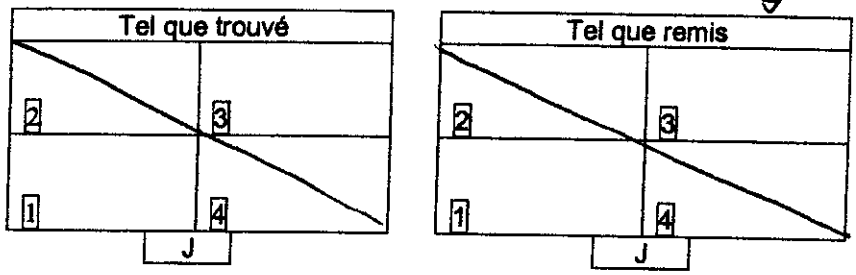
METTLER TOLEDO

RAPPORT D'ESSAI EXHAUSTIF

Nom du client	ITS	N° DU TICKET SAV/ORDRE D'INTERVENTION	560461
Emplacement unité	LACHINE	N° du client	180-129
Marque/N° de modèle	UMC/600	N° de série	L6990
Capacité	454 kg ☑ lb ☐	Nb.Divisions	22700
Taille Divisions	.02kg		

L'équipement de pesage mentionné sur le présent rapport a été vérifié et/ou calibré en conformité avec la procédure Mettler Toledo Réf. VP0023IR, et la norme canadienne et/out le manuel NIST N°., le cas échéant

VÉRIFICATIONS DES COINS Poids Appliqué: 100kg Erreur permissive 5D



Dans la tolérance sans réglage ☐

Dans la tolérance après réglage ☐

Hors tolérance ☐

Essai progressif	Poids Appliqué	Lecture tel que trouvé	Erreur: plus ou moins (d)	Erreur permissive (d)	Lecture tel que remis	Dans la Tolérance O/N
Zéro	0.00kg	0.00kg	0	1	0.00kg	O ☑ N ☐
	50.00	50.00	0	2	50.00	O ☑ N ☐
	100.00	100.00	0	5	100.00	O ☑ N ☐
	150.00	149.98	1	7	149.98	O ☑ N ☐
Charge Maximale*	200.00	199.94	3	10	199.94	O ☑ N ☐
	150.00	149.98	1	7	149.98	O ☑ N ☐
	100.00	100.00	0	5	100.06	O ☑ N ☐
	50.00	50.00	0	2	50.00	O ☑ N ☐
Zéro	0.00	0.00	0	1	0.00	O ☑ N ☐

*Charge maximal utilisé pour l'essai

Dans la tolérance sans réglage ☐

OBSERVATIONS: TEST DE COINS SANS OBJET → RESTRICTIONS PHYSIQUE			
NUMÉROS D'IDENTIFICATION DES POIDS:	1-7 20kg		
N° du certificat de traçabilité du poids:	1201954	DATE D'ÉTALONNAGE POUR CLIENT: 2 FEV 06	PROCHAIN ÉTALONNAGE POUR CLIENT: 1 FEV 07
RÉALISÉ PAR:	J. THIBAULT		
	Nom du technicien (en lettres capitales)		Signature du technicien
Le cas échéant:	*Nom du Client (en lettres capitales)*		*Signature du client*

3105271...

Measurement Canada / Mesures Canada

An Agency of Industry Canada / Un organisme d'Industrie Canada

CERTIFICATE OF DESIGNATION
GRAVIMETRIC STANDARDS
CERTIFICAT DE DÉSIGNATION
ÉTALONS GRAVIMÉTRIQUES

Issued to - Émis à		Weight Set No. - N° du jeu de poids
METTLER / TOLEDO		--
Address - Adresse		Issue Date - Date d'émission
9280 DU PARCOURS, ANJOU (QUÉBEC)		2005-07-15
Contact - Personne-ressource	Telephone number - N° de téléphone	Expiry Date - Date d'expiration
GÉRALD BERNIER	514-863-1441	2006-07-14

I, the undersigned, being authorized by the Minister of Industry to exercise the power of the Minister pursuant to section 13.(1) of the Weights & Measures Act hereby

a) certify that the standard(s) identified below has (have) been calibrated in accordance with Part III of the Weights and Measures Regulations in relation to Measurement Canada's reference standards which in turn have been calibrated in relation to Canada's prototype for the kilogram whose calibration is traceable to the International prototype for the kilogram maintained by the Bureau International des Poids et Mesures;

b) designate the said standard(s) as (a) local standard(s).

Je, soussigné(e), étant autorisé(e) par le ministre de l'Industrie à exercer les pouvoirs du ministre conformément à l'article 13.(1) de la Loi sur les poids et mesures

a) certifie que l'(les) étalon(s) identifié(s) ci-dessous a (ont) été étalonné(s) conformément à la Partie III du Règlement sur les poids et mesures par rapport aux étalons de référence de Mesures Canada, qui à leur tour ont été étalonnés par rapport au prototype canadien du kilogramme qui est étalonné et retraçable au prototype international du kilogramme conservé au Bureau International des Poids et Mesures;

b) fixe ledit (lesdits) étalon(s) à titre d'(un) d'étalon(s) local(aux).

Identification Number / Numéro d'identification	Nominal Value / Valeur nominale	Identification Number / Numéro d'identification	Nominal Value / Valeur nominale	Identification Number / Numéro d'identification	Nominal Value / Valeur nominale	Identification Number / Numéro d'identification	Nominal Value / Valeur nominale
T03	10 kg	17	10 kg	981112	10 kg		
1	10 kg	18	10 kg	981113	10 kg		
2	10 kg	19	10 kg	981114	10 kg		
3	10 kg	20	10 kg	981115	10 kg		
4	10 kg	94001	10 kg	981116	10 kg		
5	10 kg	94003	10 kg	981117	10 kg		
6	10 kg	981101	10 kg	981118	10 kg		
7	10 kg	981102	10 kg	981119	10 kg		
8	10 kg	981103	10 kg	981120	10 kg		
9	10 kg	981104	10 kg				
10	10 kg	981105	10 kg				
11	10 kg	981106	10 kg				
12	10 kg	981107	10 kg				
13	10 kg	981108	10 kg				
14	10 kg	981109	10 kg				
15	10 kg	981110	10 kg				
16	10 kg	981111	10 kg				

District	Certificate Number - N° du certificat	Position Title - Titre du poste
MONTRÉAL	1201954	GÉRANT DE DISTRICT INT.
Local Standard - Étalon local	Signature	
M31821		

J37bc (2005/03)

Canada

3105271 . . .

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

CALIBRATION WEIGHTS

cmc électronique

CMC Électronique Inc. - CMC Electronics Inc.
600, boulevard Dr.-Frederik-Philips, Ville Saint-Laurent (Québec) Canada H4M 2S9
Téléphone : (514) 748-3000 Télécopieur : (514) 748-3149
www.cmcelectronics.ca

912-0005-0383-3 7-01

No Certificat/Certificate CX11537

CERTIFICAT D'ÉTALONNAGE - CALIBRATION CERTIFICATE

Client
Customer ITS-INTERTEK

Instrument WEIGHT SET (8) **Type** 10 TO 500MG

Fabricant
Manufacturer RICE LAKE WEIGHING **No de série**
Serial No S864

No de stock du client
Customer inventory No 180-195 **Cycle d'étalonnage**
Calibration cycle 52 WEEKS

Procédé d'étalonnage
Calibration procedure ASTM E 617-97 **Date d'échéance**
Due date 19 December 2002

La présente sert à certifier que l'on a procédé à l'étalonnage de l'instrument décrit ci-dessus, avec les étalons de la Société, qui sont rattachables aux étalons du Conseil national de recherches Canada; et/ou par le National Institute of Standards and Technology des E.-U.

Ce certificat est la propriété exclusive de CMC Électronique Inc. et ne peut être reproduit en partie.

This is to certify that the instrument listed above was calibrated against Company Standards which are directly traceable to the National Research Council, Canada and/or the National Institute of Standards; and technology U.S.A.

This certificate is the exclusive property of CMC Electronics Inc. and cannot be reproduced partially.

certificat / certificate : #253.1
ISO 9001: 1994

ÉTAT DE L'INSTRUMENT/CONDITIONS OF INSTRUMENT

À la réception / Received

[X]	[ ]	[ ]
Selon les spéc. IN specs.	Hors des spéc. OUT of specs.	Réparation nécessaire Required repair

Au retour / Returned

[X]	[ ]
Selon les spéc. IN specs.	Hors des spéc. OUT of specs.

CONDITIONS DE MESURE/MEASUREMENT CONDITIONS

Température
Temperature 19.9 °C **Humidité**
Humidity 41 %

Étalons utilisés / Transfer standards SEE FOLLOWING SHEET

COMMENTAIRES / REMARKS

3105271...

20 December 2001
Date

Technicien / Technician

Approuvé par / Approved by

CMC Electronique Inc.
CMC Electronics Inc.
600, boulevard Dr.-Frederik-Philips,
Ville Saint-Laurent (Quebec) Canada H4M 2S9
Tel: (514) 748-3148 Telecopieur: 748-3149
www.cmcelectronics.ca

Calibration Data Sheet

CMC Certificate # CX 11537

Instrument: Weights

Model: 10 to 500 mg

Serial No.: S864

Manufacturer: Rice Lake

Customer Inv. No.: 180-195

Customer: ITS - Inertek

Procedure: ASTM E617-97

Class: ASTM " 1 "

Applied Mass mg	Actual Mass mg	Tolerance mg
10.00	9.998	+/-0,010
20.00	19.991	+/-0,010
20.00	19.995	+/-0,010
50.00	50.003	+/-0,010
100.00	99.994	+/-0,010
200.00	199.991	+/-0,010
200.00	199.993	+/-0,010
500.00	500.008	+/-0,010

The calibration was made in air having the following properties:

Temp:	20.05	Deg C
Pressure:	100430.00	Pascals
Humidity:	40.30	%RH
Density:	1.189	Kg/m cu.

The density of the weights' material is assigned as follows:

Stainless St	7900.00	Kg/m cu.
Aluminum	2700.00	Kg/m cu.
Tantalum	16600.00	Kg/m cu.
Nichrome	8500.00	Kg/m cu.

Metrologist: A. Bhattacharya Date : 20 Dec ' 2001

Approved :

3105271...

cmc électronique

CMC Électronique Inc.
600, boulevard Dr.-Frederik-Philips
Ville Saint-Laurent (Québec), Canada H4M 2S9
Téléphone: (514) 748-3148 Téléc: (514) 748-3014

 # Certificat / Certificate **CX11537**

Étalons Utilisés - Transfer Standards

Asset#	Mfg	Model	Description	Cal. due date (dd/mm/yy)
000178	METTLER	AT-106	MASS COMPARATOR	08/May/02
B03643	SEKO UNDER	CLASS "S"	METRIC WEIGHT SET	03/Feb/03

3105271...

20 Dec 01
Date

Technicien / Technician

Approuvé par / Approved by

cmc électronique

CMC Électronique Inc. - CMC Electronics Inc.
600, boulevard Dr.-Frederik-Philips, Ville Saint-Laurent (Québec) Canada H4M 2S9
Téléphone : (514) 748-3000 Télécopieur : (514) 748-3149
www.cmcelectronics.ca

912-0005-0383-3 7-01

No Certificat/Certificate CX11536

CERTIFICAT D'ÉTALONNAGE - CALIBRATION CERTIFICATE

Client
Customer ITS-INTERTEK

Instrument WEIGHT SET (4) **Type** 294P

Fabricant
Manufacturer OHAUS **No de série**
Serial No N/A

No de stock du client
Customer Inventory No 180-110 **Cycle d'étalonnage**
Calibration cycle 52 WEEKS

Procédé d'étalonnage
Calibration procedure ASTM E617-97 **Date d'échéance**
Due date 19 December 2002

La présente sert à certifier que l'on a procédé à l'étalonnage de l'instrument décrit ci-dessus, avec les étalons de la Société, qui sont rattachables aux étalons du Conseil national de recherches Canada; et/ou par le National Institute of Standards and Technology des E.-U.

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This is to certify that the instrument listed above was calibrated against Company Standards which are directly traceable to the National Research Council, Canada and/or the National Institute of Standards; and technology U.S.A.

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certificat / certificate : #253.1
ISO 9001: 1994

ÉTAT DE L'INSTRUMENT/CONDITIONS OF INSTRUMENT

À la réception / Received

[X]	[ ]	[ ]
Selon les spéc. IN specs.	Hors des spéc. OUT of specs.	Réparation nécessaire Required repair

Au retour / Returned

[X]	[ ]
Selon les spéc. IN specs.	Hors des spéc. OUT of specs.

CONDITIONS DE MESURE/MEASUREMENT CONDITIONS

Température
Temperature 19.9 °C **Humidité**
Humidity 42 %

Étalons utilisés / Transfer standards SEE FOLLOWING SHEET

COMMENTAIRES / REMARKS

3105271...

20 December 2001
Date

Technicien / Technician

Approuvé par / Approved by

CMC Electronique Inc.
CMC Electronics Inc.
600, boulevard Dr.-Frederik-Philips,
/ille Saint-Laurent (Quebec) Canada H4M 2S9
Tel: (514) 748-3148 Telecopieur: 748-3149
www.cmcelectronics.ca

Calibration Data Sheet

CMC Certificate # CX 11536

Instrument: Weights

Model: 294P

Serial No.: N/A

Manufacturer: Ohaus

Customer Inv. No.: 180-110

Customer: ITS - Inertek

Procedure: ASTM E617-97

Class: NIST " P "

Applied Mass gram	Actual Mass gram	Tolerance mg
100.00	100.00380	+/-4
200.00	200.0065	+/-8
200.00	200.0068	+/-8
500.00	500.009	+/-20

Metrologist: A. Bhattacharya Date : 20 Dec ' 2001

Approved :

3105271...

cmc électronique

CMC Électronique Inc.
600, boulevard Dr.-Frederik-Philips
Ville Saint-Laurent (Québec), Canada H4M 2S9
Téléphone: (514) 748-3148 Téléc: (514) 748-3014

 # Certificat / Certificate **CX11536**

Étalons Utilisés - Transfer Standards

Asset#	Mfg	Model	Description	Cal. due date (dd/mm/yy)
131707	METTLER TOLEDO	PR10003	COMPARATOR	01/May/02
B03775	SARTORIUS	2404	ANALYTICAL BALANCE	11/Sep/02
B05477	SARTORIUS	2462	BALANCE	14/Oct/02

3105271...

20 Dec 01
Date

Technicien / Technician

Approuvé par / Approved by

cmc électronique

CMC Électronique Inc. - CMC Electronics Inc.
600, boulevard Dr.-Frederik-Philips, Ville Saint-Laurent (Québec) Canada H4M 2S9
Téléphone : (514) 748-3000 Télécopieur : (514) 748-3149
www.cmcelectronics.ca

912-0005-0383-3 7-01

No Certificat/Certificate CX11539

CERTIFICAT D'ÉTALONNAGE - CALIBRATION CERTIFICATE

Client
Customer ITS-INTERTEK 180-302/303

Instrument WEIGHTS (2) **Type** 1KG / 2KG

Fabricant
Manufacturer PRICE LAKE WEIGHING **No de série**
Serial No S862/63

No de stock du client
Customer inventory No N/A **Cycle d'étalonnage**
Calibration cycle 52 WEEKS

Procédé d'étalonnage
Calibration procedure ASTM E617-97 **Date d'échéance**
Due date 20 December 2002

La présente sert à certifier que l'on a procédé à l'étalonnage de l'instrument décrit ci-dessus, avec les étalons de la Société, qui sont rattachables aux étalons du Conseil national de recherches Canada; et/ou par le National Institute of Standards and Technology des E.-U.

Ce certificat est la propriété exclusive de CMC Électronique Inc. et ne peut être reproduit en partie.

This is to certify that the instrument listed above was calibrated against Company Standards which are directly traceable to the National Research Council, Canada and/or the National Institute of Standards; and technology U.S.A.

This certificate is the exclusive property of CMC Electronics Inc. and cannot be reproduced partially.

certificat / certificate : #253.1
ISO 9001: 1994

ÉTAT DE L'INSTRUMENT/CONDITIONS OF INSTRUMENT

À la réception / Received

[X]	[ ]	[ ]
Selon les spéc. IN specs.	Hors des spéc. OUT of specs.	Réparation nécessaire Required repair

Au retour / Returned

[X]	[ ]
Selon les spéc. IN specs.	Hors des spéc. OUT of specs.

CONDITIONS DE MESURE/MEASUREMENT CONDITIONS

Température
Temperature 20.1 °C **Humidité**
Humidity 43 %

Étalons utilisés / Transfer standards SEE FOLLOWING SHEET

COMMENTAIRES / REMARKS 3105271...

21 December 2001
Date

Technicien / Technician

Approuvé par / Approved by

CMC Electronique Inc.
CMC Electronics Inc.
600, boulevard Dr.-Frederik-Philips,
Ville Saint-Laurent (Quebec) Canada H4M 2S9
Tel: (514) 748-3148 Telecopieur: 748-3149
www.cmcelectronics.ca

Calibration Data Sheet

CMC Certificate # CX 11539

Instrument: Weights

Model: 1kg,2kg

Serial No.: S862/63

Manufacturer: Price Lake Weighing

Customer Inv. No.: N/A

Customer: ITS - Intertek 180-302/303

Procedure: ASTM E617-97

Class: NIST " F "

Applied Mass gram	Actual Mass gram	Tolerance mg
1000.00	1000.035	+/-200
2000.00	2000.056	+/-400

Metrologist: A. Bhattacharya Date : 21 Dec ' 2001

Approved :

3105271...

cmc électronique

CMC Électronique Inc.
600, boulevard Dr.-Frederik-Philips
Ville Saint-Laurent (Québec), Canada H4M 2S9
Téléphone: (514) 748-3148 Téléc: (514) 748-3014

 # Certificat / Certificate **CX11539**

Étalons Utilisés - Transfer Standards

Asset#	Mfg	Model	Description	Cal. due date (dd/mm/yy)
131707	METTLER TOLEDO	PR10003	COMPARATOR	01/May/02
G03447	OHAUS	49016-01	CALIBRATION WEIGHT 1 KG	31/Jan/03
G03448	OHAUS	49026-01	CALIBRATION WEIGHT 2000 GR	31/Jan/03

3105271...

21 Dec '01
Date

Technicien / Technician

Approuvé par / Approved by

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

MOISTURE METER

Intertek ETL SEMKO

Lachine, le 5 mai 2006

Hygromètre

Marque : Delmhorst
Modèle : J2000
Numéro : 180-355

Procédure de calibration

La procédure de calibration décrite ci-dessous est effectuée en utilisant les étalons de référence MCS-1 de "Delmhorst Instrument Company". (pièce # 180-463)

Méthode

Appliquer une des pointes du lecteur sur le point commun de l'étalon (au centre) et l'autre pointe successivement sur l'indicateur 12% et 22%.

Calculer la différence entre les valeurs obtenues et les valeurs théoriques.

La plus grande différence sera considérée comme la précision de l'appareil.

Valeurs Théoriques	Valeurs Obtenues	Différence
12%	12 %	0
22%	22 %	0
Précision :		

3105271...

2/10/06

Services d'essais Intertek AN Ltée
Intertek Testing Services NA Ltd.
1829 32e Avenue, Lachine, Québec H8T 3J1 Canada
Téléphone: (514) 631-3100 Télécopieur: (514) 631-1133 www.intertek-etlsemko.com

DELMHORST
INSTRUMENT CO.

LETTER OF CERTIFICATION

December 12, 2005

ITM Instruments, Inc.
20701 Chemin Ste-Marie
Ste-Anne-De-Bellevue, QC H9X 6X5
Canada

Gentlemen:

Subject: Moisture Content Standard Model MCS-2 Serial #121205C

This is to certify that the primary calibration - electrical resistance - of the Delmhorst Moisture Meters for Paper has been tested on equipment whose accuracy is certified by:

General Radio Model No. 1644-A S/N 2526.
Keithley Model No. 197, S/N 283483.

The calibration of these instruments, certified by Industrial Process Measurement, Inc. with Report No. 28927-01, 28927-02 dated December 07, 2005, is traceable to the NIST.

The MCS-2 (Moisture Content Standard) is an external means to check the Delmhorst Moisture Meters' calibration at two points, 6% and 10% on the meter scale. The resistance values at said points, i.e., 2700 Megohms and 7.5 Megohms, verified with the same equipment as above are within ±10% of their specified values.

The analog Moisture Meters, checked with the "MCS-2" Standard, should read within (±) one division on the dial at the point(s) checked; the digital Moisture Meters should read within ±0.3 M.C. of the indicated values.

Sincerely,

John Laurenzi
VP Manufacturing

JCL:dm

3105271...

51 INDIAN LANE EAST, TOWACO, NEW JERSEY 07082
PHONE: 973-334-2557. FAX: 973-334-2657
www.delmhorst.com

Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

CALIBRATOR T/C

Ulrich Métrologie inc.
Ulrich Metrology Inc.
9912, Côte-de-Liesse
Montréal (Québec) H8T 1A1

Tél. (514) 631-6653
Fax (514) 631-6122
info@ulrich.ca
www.ulrich.ca

CALIBRATION CERTIFICATE

Certificate no.:	43520
Instrument ID:	180-223
Type:	CALIBRATOR, OMEGA CL23A
Size:	TC K/J/T
Manufacturer:	OMEGA
Model no.:	CL23A
Serial no.:	T-192959

Calibration date:	August 11, 2006
Certificate issued:	August 11, 2006
Interval:	12 Months
Due date:	August 11, 2007
Procedure:	MET/CAL
Environment:	CLAS Type 2 Laboratory
Temperature:	23 ± 2°C
Humidity:	35 - 55% RH
Metrologist:	MAR

Property of: SERVICES D ESSAIS INTERTEK AN LTEE
1829, 32E AVENUE
LACHINE, QC H8T 3J1

Approved by: Nuccio Mercuri
Nuccio Mercuri, Lab Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and QSM-06. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which

CALIBRATION STANDARDS

See notes below.

MEASUREMENT UNCERTAINTY

The above listed instrument meets or exceeds all specifications as stated in the reference procedure, unless noted otherwise. For measurement results associated with the conformance to a tolerance, the uncertainty in the measurement system did not exceed 25% (4:1 test uncertainty ratio) of the acceptable tolerance for each characteristic calibrated, unless otherwise noted in the report.

MEASUREMENT RESULTS

See next page for measurement results.

Notes:

EQUIPMENT RECEIVED OUT OF SPECIFICATIONS:

Calibrator mode at -40°F (type K) out of specifications (reading at -39.21°F instead of maximum -39.5°F).
Calibrator mode at 32°F (type K) out of specifications (reading at 32.59°F instead of maximum 32.5°F).
Calibrator mode at -40°F (type T) out of specifications (reading at -39.37°F instead of maximum -39.5°F).

It was adjusted.

3105271...

Ulrich Métrologie inc. • Ulrich Metrology Inc.
9912, Côte-de-Liesse Tél. (514) 631-6653
Lachine, QC H8T 1A1 Fax (514) 631-6122
www.ulrich.ca info@ulrich.ca

CALIBRATION DATA

Certificate No. 43520

Instrument ID: 180-223
Type: CALIBRATOR
Serial no.: T-192959
Procedure: Omega CL23A: 5520A-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Standard ID	Type	Manufacturer	Model no.	Cal. Date	Due Date
8608002	CALIBRATOR	FLUKE	5520A	2004/12/31	2006/12/31

MEASUREMENT RESULTS (Per METICAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
DISPLAY CALIBRATION						
Did all segments of the display illuminate? Result of Operator Evaluation					PASS	
THERMOMETER CALIBRATION						
K Type Thermocouple						
-200.0degF		-200.4	-201.0	-199.0	PASS	1.7
-60.0degF		-60.2	-61.0	-59.0	PASS	3.1
-40.0degF		-40.3	-40.5	-39.5	PASS	1.5
32.0degF		31.7	31.5	32.5	PASS	1.7
1240.0degF		1239.6	1239.5	1240.5	PASS	1.1
1260.0degF		1259.6	1259.5	1260.5	PASS	1.1
2500.0degF		2499.2	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-199.3	-201.0	-199.0	PASS	2.1
-60.0degF		-59.4	-61.0	-59.0	PASS	3.5
-40.0degF		-39.5	-40.5	-39.5	PASS	1.7
32.0degF		32.3	31.5	32.5	PASS	2.0
1240.0degF		1240.1	1239.5	1240.5	PASS	1.6

Ulrich Métrologie inc. • Ulrich Metrology Inc.
9912, Côte-de-Liesse Tél. (514) 631-6653
Lachine, QC H8T 1A1 Fax (514) 631-6122
www.ulrich.ca info@ulrich.ca

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
1260.0degF		1260.1	1259.5	1260.5	PASS	1.6
1400.0degF		1400.2	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-199.5	-201.0	-199.0	PASS	2.3
-60.0degF		-59.3	-61.0	-59.0	PASS	2.3
-40.0degF		-39.6	-40.5	-39.5	PASS	1.2
32.0degF		32.3	31.5	32.5	PASS	1.7
750.0degF		750.0	749.5	750.5	PASS	2.0
CALIBRATOR CALIBRATION						
K Type Thermocouple						
-200.0degF		-199.9	-201.0	-199.0	PASS	1.7
-60.0degF		-60.1	-61.0	-59.0	PASS	3.1
-40.0degF		-39.9	-40.5	-39.5	PASS	1.5
32.0degF		32.1	31.5	32.5	PASS	1.7
1240.0degF		1240.2	1239.5	1240.5	PASS	1.1
1260.0degF		1260.2	1259.5	1260.5	PASS	1.1
2500.0degF		2501.0	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-199.6	-201.0	-199.0	PASS	2.1
-60.0degF		-59.8	-61.0	-59.0	PASS	3.5
-40.0degF		-39.7	-40.5	-39.5	PASS	1.7
32.0degF		32.1	31.5	32.5	PASS	2.0
1240.0degF		1240.5	1239.5	1240.5	PASS	1.6
1260.0degF		1260.4	1259.5	1260.5	PASS	1.6
1400.0degF		1400.1	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-199.1	-201.0	-199.0	PASS	2.3
-60.0degF		-59.3	-61.0	-59.0	PASS	2.3

Ulrich Métrologie inc. • Ulrich Metrology Inc.
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Lachine, QC H8T 1A1 Fax (514) 631-6122
www.ulrich.ca info@ulrich.ca

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
-40.0degF		-39.9	-40.5	-39.5	PASS	1.2
32.0degF		31.9	31.5	32.5	PASS	1.7
750.0degF		749.9	749.5	750.5	PASS	2.0

End of Test Data

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Intertek ETL SEMKO

Report No. 3105271
Foyers Valcourt

Issued: November 17, 2006

TEMPERATURE RECORDER

Intertek **ETL SEMKO**

Date: 2006-08-01

Technicien: ERIC LAFONTAINE

d'équipement: 180-055 AVEC FLUKE 180-0041

Reviewer:

Vérifié avec l'appareil #: 180-223*1

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
0.0	± 0.1	0.1 - 0.0 - 0.1	0.07
33.0	± 0.1	33.2 - 33.2 - 33.2	0.2
66.0	± 0.1	66.4 - 66.3 - 66.3	0.33
100.0	± 0.1	99.0 - 99.0 - 99.0	1.0
150.0	± 0.1	149.1 - 149.1 - 149.1	0.9
250.0	± 0.1	249.4 - 249.4 - 249.4	0.6
400.0	± 0.1	399.9 - 399.8 - 400.0	0.1
550.0	± 0.1	550.1 - 550.1 - 550.1	0.1
750.0	± 0.1	750.4 - 750.4 - 750.4	0.4
900.0	± 0.1	900.8 - 900.8 - 900.7	0.8
		Précision de l'appareil:	± 2.0 °F

*1: Il est possible, si l'impédance de l'appareil de mesure est voisine de celle du calibrateur que la température lue par l'appareil à étalonner ne soit pas proche de celle injectée par le calibrateur. Dans ce cas le calibrateur ne peut être utilisé de la façon usuelle et doit être utilisé comme appareil de mesure qui lira une température créée par une source extérieure et lue par les deux appareils simultanément en des endroits rapprochés.

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192-bf-0510

Intertek **ETL SEMKO**

Date: 2006-08-01 Technicien: Eric Labo ERIC LAFONTAINE

d'équipement: 180-056 AVEC FLUKE 180-004 Reviewer: _____

Vérifié avec l'appareil #: 180-223*1

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
0.0	±0.1	0.0 - 0.1 - 0.1	0.07
33.0	±0.1	33.1 - 33.2 - 33.1	0.13
66.0	±0.1	66.3 - 66.3 - 66.3	0.3
100.0	±0.1	99.0 - 99.0 - 99.0	1.0
150.0	±0.1	149.1 - 149.1 - 149.1	0.9
250.0	±0.1	249.3 - 249.4 - 249.4	0.63
400.0	±0.1	399.9 - 399.9 - 399.9	0.1
550.0	±0.1	550.1 - 550.1 - 550.1	0.1
750.0	±0.1	750.5 - 750.4 - 750.5	0.47
900.0	±0.1	900.8 - 900.7 - 900.8	0.77
		Précision de l'appareil:	±2.0%

*1: Il est possible, si l'impédance de l'appareil de mesure est voisine de celle du calibrateur que la température lue par l'appareil à étalonner ne soit pas proche de celle injectée par le calibrateur. Dans ce cas le calibrateur ne peut être utilisé de la façon usuelle et doit être utilisé comme appareil de mesure qui lira une température créée par une source extérieure et lue par les deux appareils simultanément en des endroits rapprochés.

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192-bf-0510

Intertek **ETL SEMKO**

Date: 2006-08-01 Technicien: Eric Lafontaine ERIC LAFONTAINE

d'équipement: 180-OSB AVEC FLUKE 180-004 Reviewer: _____

Vérifié avec l'appareil #: 180-223*1

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
0.0	±0.1	0.1 - 0.2 - 0.2	0.17
33.0	±0.1	33.3 - 33.3 - 33.3	0.3
66.0	±0.1	66.4 - 66.4 - 66.4	0.4
100.0	±0.1	99.0 - 99.1 - 99.1	0.93
150.0	±0.1	149.1 - 149.1 - 149.1	0.9
250.0	±0.1	249.5 - 249.4 - 249.5	0.53
400.0	±0.1	399.9 - 399.9 - 399.9	0.1
550.0	±0.1	550.1 - 550.1 - 550.1	0.1
750.0	±0.1	750.5 - 750.5 - 750.5	0.5
900.0	±0.1	900.8 - 900.8 - 900.9	0.83
		Précision de l'appareil:	± 1.86 °F

*1: Il est possible, si l'impédance de l'appareil de mesure est voisine de celle du calibrateur que la température lue par l'appareil à étalonner ne soit pas proche de celle injectée par le calibrateur. Dans ce cas le calibrateur ne peut être utilisé de la façon usuelle et doit être utilisé comme appareil de mesure qui lira une température créée par une source extérieure et lue par les deux appareils simultanément en des endroits rapprochés.

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192-bf-0510

Intertek **ETL SEMKO**

Date: 2006-08-01 Technicien: GILLES LAFONTAINE

d'équipement: 180-059 AVEC FLUKE 180-004 Reviewer: _____

Vérifié avec l'appareil #: 180-223*1

T/C Calibrateur	Δerreur	T/C lecteur	ΔT/C
0.0	±0.1	0.0 - 0.0 - 0.0	0.0
33.0	±0.1	33.1 - 33.2 - 33.1	0.13
66.0	±0.1	66.3 - 66.3 - 66.3	0.3
100.0	±0.1	99.0 - 99.0 - 99.0	~~0.2~~ 1.0 °C
150.0	±0.1	149.1 - 149.1 - 149.0	0.07
250.0	±0.1	249.3 - 249.3 - 249.3	0.7
400.0	±0.1	399.8 - 399.8 - 399.9	0.17
550.0	±0.1	550.1 - 550.0 - 550.0	0.03
750.0	±0.1	750.4 - 750.4 - 750.4	0.4
900.0	±0.1	900.8 - 900.8 - 900.7	0.77
		Précision de l'appareil:	±2.0°F

*1: Il est possible, si l'impédance de l'appareil de mesure est voisine de celle du calibrateur que la température lue par l'appareil à étalonner ne soit pas proche de celle injectée par le calibrateur. Dans ce cas le calibrateur ne peut être utilisé de la façon usuelle et doit être utilisé comme appareil de mesure qui lira une température créée par une source extérieure et lue par les deux appareils simultanément en des endroits rapprochés.

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192-bf-0510

APPENDIX E
Drawings and Specifications

Section E-1: Fireplace and firebox dimensions
Section E-2: Fireplace fabrication drawings with components

APPENDIX G
Unit Pre-Burn Documentation

Intertek ETL SEMKO

Date: 15/09/2006 Page____ of____

Manufacturer: FOYERS VACCOURT Model: FP8

Project #: 310 5271 Run:____ Tech: ERIC CAFONI/ALUG Reviewer:____

Break-in Data log

Type of fuel used:

Moisture content corrected to 2-pin and for the type of fuel used.

Catalytic____ Non-catalytic X

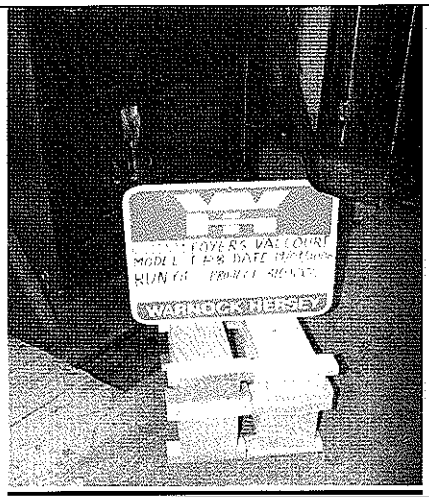
Date	Time	Flue Temp	fuel scale reading	Comb. cham. or Catalyst temp	lbs. Fuel weight added	Moisture content
15/09/2006	8:45	528	11,35		10,90	19,6
15/09/2006	9:45	512	4,60		0	—
15/09/2006	10:45	428	13,65		11,45	20,2
15/09/2006	11:45	506	6,4		0	—
15/09/2006	12:45	453	13,1		8,45	19,9
15/09/2006	13:45	493	7,05		0	—
15/09/2006	14:45	390	12,10		6,5	21,2
15/09/2006	15:45	422	7,95		0	—
15/09/2006	16:45	401	2,15		0	—
16/09/2006	7:45	439	12,30		11,65	20,6
16/09/2006	8:45	388	6,25		0	—
16/09/2006	9:45	333	2,05		0	—

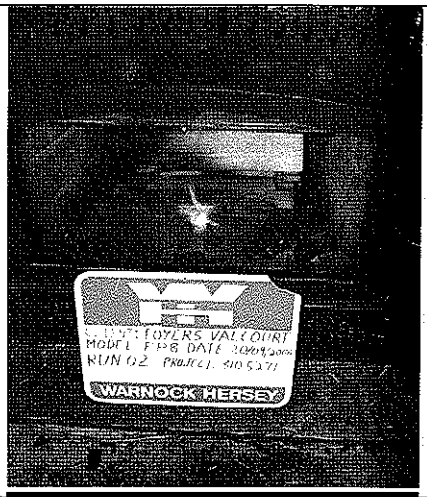
APPENDIX H
Photographs

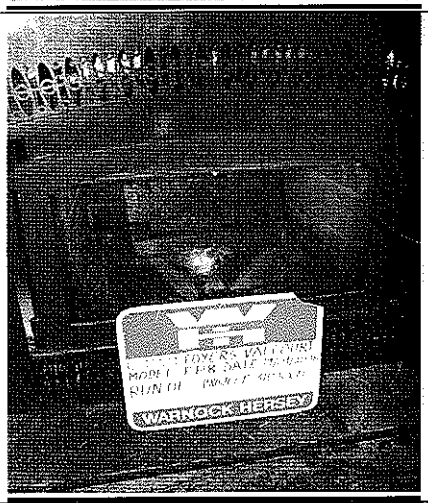
Intertek ETL SEMKO

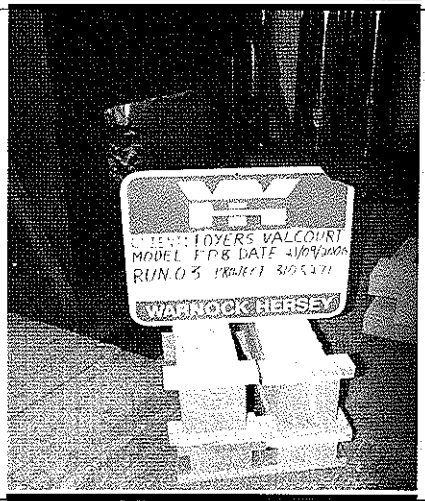
Report No. 3105271 Issued: November 17, 2006

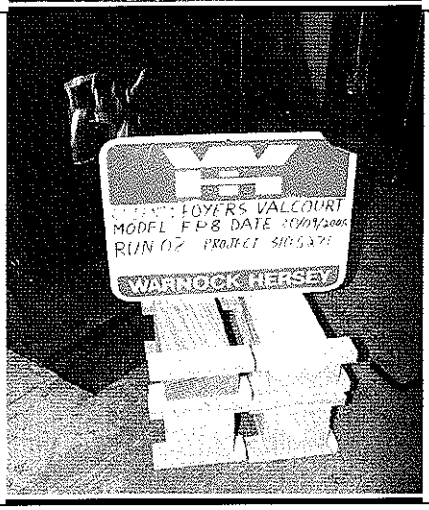
Foyers Valcourt

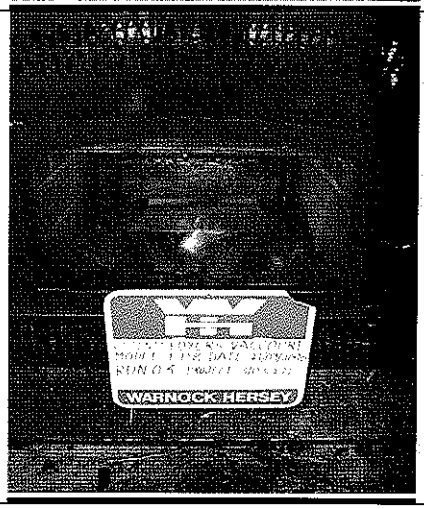








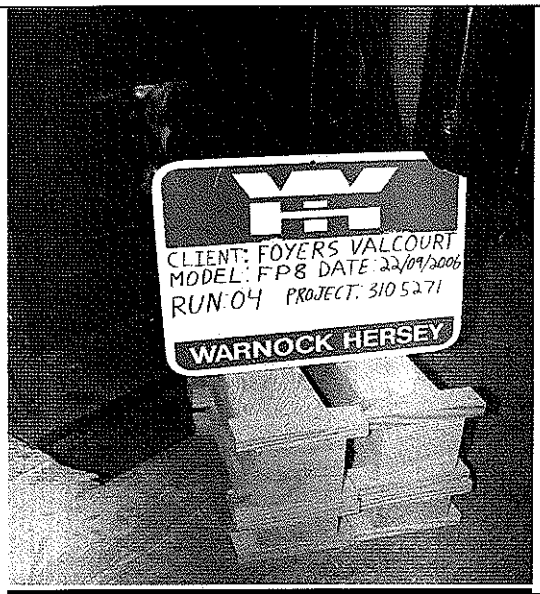


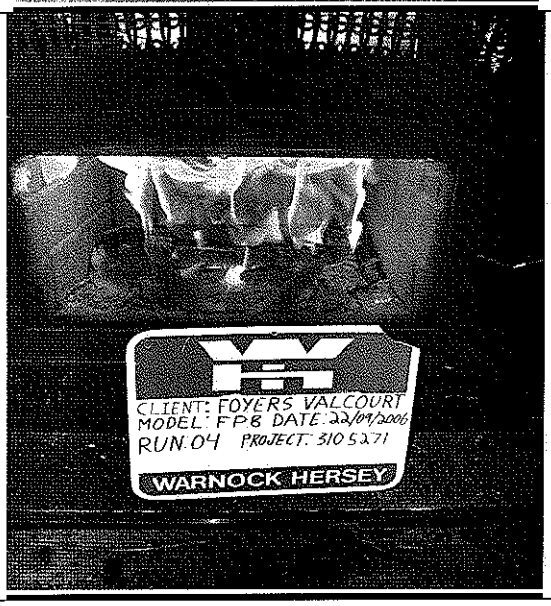


Intertek ETL SEMKO

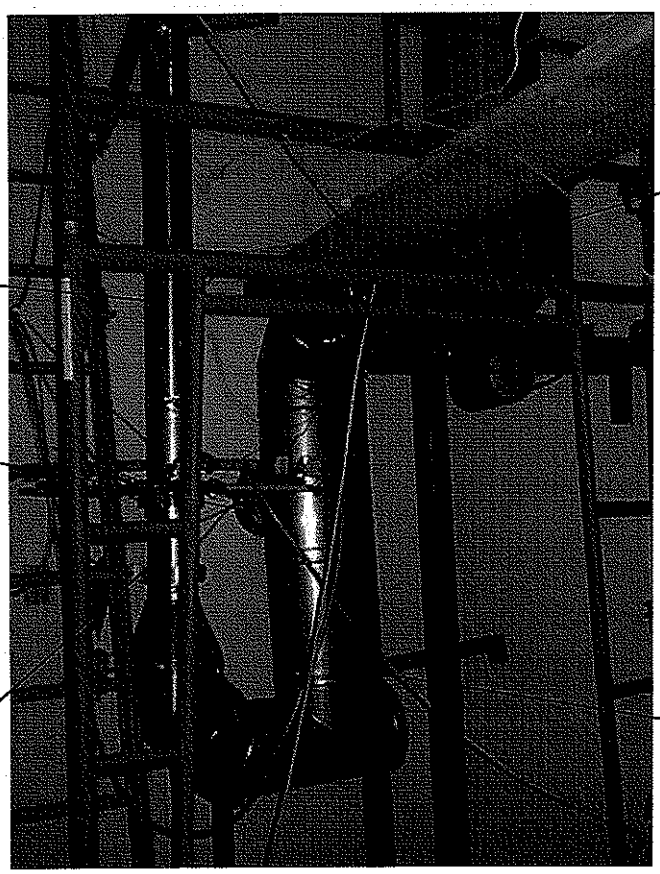
Report No. 3105271
Foyers Valcourt

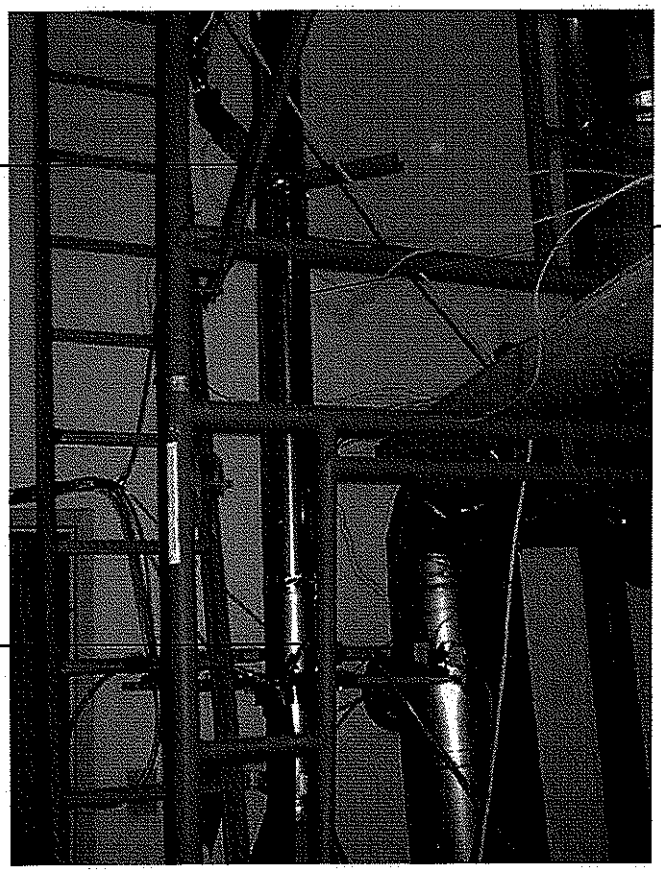
Issued: November 17, 2006





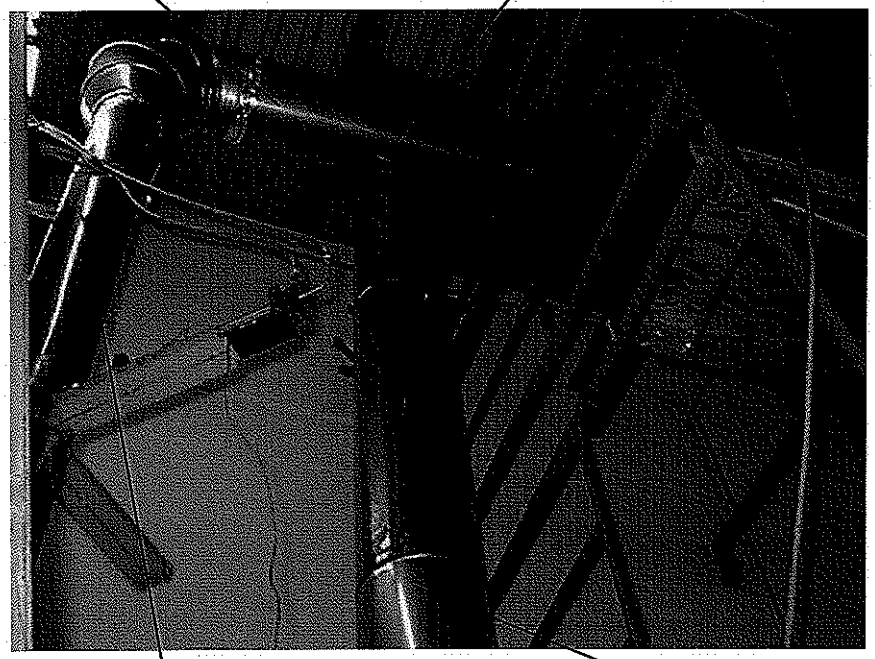
APPENDIX I
Drawings of stack gas sampling train and dilution tunnel system


Exhaust blower
6 in. dia. Stainless steel pipe
Air intake with damper to adjust flow rate
16 in. between sampling probe and lower elbow
12 in. dia. Stainless steel pipe


Velocity port
10 feet long dilution tunnel
49 inches
Sampling port, 2 sampling probes with 2 in. dia. Filter each. Filter used: Gelman 61631

12 in. dia. Stainless steel pipe

Mixing baffle (2) location; 1 foot between baffles



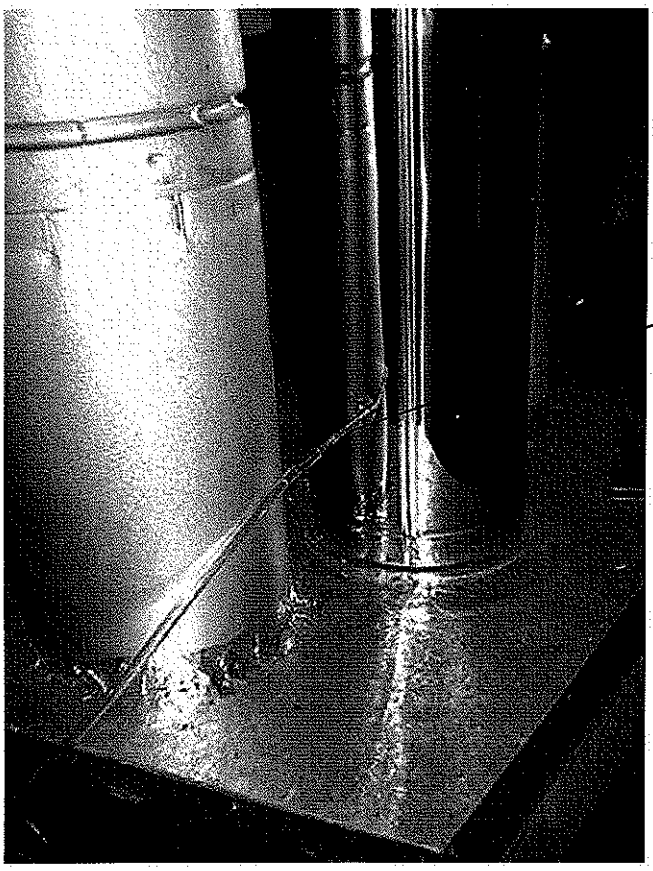
4 feet long between velocity port and upper elbow

12 in. dia. Stainless steel pipe

18 x 18 in. Galvanized steel smoke captures hood, located 10 feet away from dilution tunnel

Exhaust system support bracket

Temperature and gas analyser sampling ports located 9 feet above platform



Draft sampling port located 6 in. from flue outlet