



TEST REPORT

SCOPE: EMISSIONS, EFFICIENCY AND OUTPUT

FUEL: PELLET

TEST STANDARD: EPA

MODEL: EUROSTAR PELLET STOVE

Notice to reader: Our Eurostar pellet stove was tested as part of our Series 50 engine. Therefore, the Series 50 is referenced throughout the attached test report.



TEST REPORT

REPORT NUMBER: 100903464MTL-002
ORIGINAL ISSUE DATE: 11/20/12

EVALUATION CENTER
Intertek Testing Services NA Inc.
Intertek (Lachine)
1829 32nd Ave
Lachine, Qc

RENDERED TO

S.B.I.-Stove Builders International
250 Copenhagen Street
St-Augustin-de-Desmaures, QC G3A 2H3

PRODUCT EVALUATED:
Series 50: Eurostar & Osburn 5000

Report of Testing Pellet Stove Model Series 50: Eurostar & Osburn 5000 for compliance as an "Affected Facility" with the applicable requirements of the following criteria: EPA Method 28 "Certification and Auditing of Wood Heaters" and EPA Method 5G "Determination of Particulate Matter Emissions from Wood Heaters".

"This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program."

1 Table of Contents

I.	INTRODUCTION.....	4
I.A.	PURPOSE OF TEST	4
I.B.	LABORATORY	4
I.C.	DESCRIPTION OF UNIT.....	4
I.D.	REPORT ORGANIZATION	4
II.	SUMMARIZATION	5
II.A	PRETEST INFORMATION	5
II.B	INFORMATION LOG.....	5
II.C	SUMMARY OF INFORMATION	5
II.D	SUMMARY OF OTHER DATA.....	6
III.	PROCESS DESCRIPTION	8
III.A	TEST SET UP DESCRIPTION	8
III.B	AIR SUPPLY SYSTEM.....	8
IV.	SAMPLING SYSTEM.....	8
IV.A	SAMPLING LOCATIONS	8
IV.A.1	DILUTION TUNNEL	9
IV.B.	OPERATIONAL DRAWINGS	10
IV.B.1	STACK GAS SAMPLE TRAIN.....	10
IV.B.2	DILUTION TUNNEL SAMPLE SYSTEM	11
V.	SAMPLING METHODS.....	12
V.A.	PARTICULATE SAMPLING	12
VI.	QUALITY ASSURANCE	12
VI.A.	INSTRUMENT CALIBRATION	12
VI.A.1	DRY GAS METERS	12
VI.A.2	STACK SAMPLE ROTAMETER	12
VI.A.3	GAS ANALYZERS	13
VI.B.	TEST METHOD PROCEDURES	13
VI.B.1	LEAK CHECK PROCEDURES	13
VI.B.2	TUNNEL VELOCITY/FLOW MEASUREMENT	13
VI.B.3	PM SAMPLING PROPORTIONALITY	13
VII.	CONCLUSION	14
VII.A	RESULTS & OBSERVATIONS.....	14

Appendices

Appendix A: K List Drawings

Appendix B: Operation Manual

Appendix C: Sample Analysis

Appendix D: Calibrations

Appendix E: Sample Calculations

Appendix F: Test Data

I. Introduction

Intertek has conducted site-testing for S.B.I - Stove Builders International, on model Series 50: Eurostar & Osburn 5000 Pellet Stove, to evaluate all applicable performance requirements included in EPA Method 28 " Certification and auditing of wood heaters" and Method 5G " Determination of particulate matter emissions from wood heaters". The test was conducted at SBI facility situated at 250 Copenhagen Street St-Augustin-de-Desmaures, QC G3A 2H3

I.A Purpose of Test

The test was conducted to determine if the unit is in accordance with U.S EPA requirements under 40 CFR 60 SUBPART AAA, NSPS for Residential Wood Heaters.

This evaluation was conducted on September 17, 18, 19 and 20, 2012.

I.B Laboratory

The test on the model Series 50: Eurostar & Osburn 5000 Pellet Stove was conducted at SBI testing facility situated at 250 Copenhagen Street St-Augustin-de-Desmaures, QC G3A 2H3. The laboratory elevation is 171 feet above sea level.

I.C Description of Unit

The model Series 50: Eurostar & Osburn 5000 Pellet Stove is constructed of carbon steel. The outer dimensions are 24 3/16" Wide x 33 3/4" Deep x 36" High and weights 420 lb. The unit has a door located on the front with a viewing glass.

Proprietary drawings and manufacturing methods are on file at Intertek in Montreal office.

I.D Report Organization

This report includes summaries of all data necessary to determine compliance with the regulations. Raw data, calibrations records, intermediate calculations. Drawings, specifications and other supporting information are contained in appendices to this report.

II. Summarization

II.A Pretest Information

The unit was already installed when Intertek's representative arrived at SBI's facility. The unit was inspected and found to be in good condition. Prior to beginning the emissions tests the unit's chimney system and laboratory dilution tunnels were cleaned using standard wire brush chimney cleaning equipment. On September 14, 2012 the unit was set-up for testing.

II.B Information Log

Test Standard

September 17, 18, 19 and 20, 2012 the unit was tested for EPA emissions using method 28 and 5G3.

Deviations from Standard Method

No deviations from the standards were performed. However, only the applicable sections from each standard were used during all testing.

II.C Summary of Test Results

Run #1 9/17/2012 Air control is set to maximum burn time was 120 minutes with a burn rate of 1.95 Kg/hr. Pre burn Test Data failed to be acquired.

Run #2 9/18/2012 Air control is set to maximum burn time was 120 minutes with a burn rate of 1.34 Kg/hr. Pre burn Test Data failed to be acquired.

Run #3 9/18/2012 Air control is set to maximum, LED read out slide bar set at 25% of maximum, burn time was 120 minutes with a burn rate of 1.01 Kg/hr.

Run #4 9/18/2012 Air control is set to maximum, LED read out slide bar set at minimum, burn time was 120 minutes with a burn rate of 0.69 Kg/hr.

Run #5 9/19/2012 Air control is set to maximum, LED read out slide bar set at 75% of maximum, burn time was 120 minutes with a burn rate of 1.91 Kg/hr.

Run #6 9/19/2012 Air control is set to maximum, LED read out slide bar set at maximum, burn time was 120 minutes with a burn rate of 2.04 Kg/hr.

II.D Summary of Other Data

EMISSIONS

Run Number	Test Date	Burn Rate (kg/hr)	Emission Rate (g/hr)	Adjusted Emission Rate (g/hr)	Heating Efficiency (% LHV)
1	9/17/2012	1.95	1.38	2.38	69.88
2	9/18/2012	1.34	2.13	3.41	63.42
3	9/18/2012	1.01	1.41	2.42	56.71
4	9/18/2012	0.69	0.64	1.26	56.86
5	9/19/2012	1.91	1.46	2.49	66.98
6	9/19/2012	2.04	1.26	2.20	68.86

WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate	(E) Average Emission Rate g/hr	Heat Output (Btu/hr)	Probability	(K) Weighting Factor	(KxE)
4	.69	1.26	10,301	0.1442	0.3854	0.4856
3	1.01	2.42	15,078	0.3854	0.7530	1.8223
5	1.91	2.49	28,514	0.8972	0.5330	1.3272
6	2.04	2.20	30,456	0.9184	0.1028	0.2262
Totals:					1.7742	3.8612
Weighted average emission rate:						2.18*

*Since for the first two runs pre burn data failed to be acquired, only runs 3, 4, 5 and 6 were taken into consideration when calculating the Weighed Average Emission Rate

TEST FACILITY CONDITIONS

Run	Room Temp. °F before	Room Temp °F after	Baro. Pres. In. Hg before	Baro. Pres. In. Hg after	R.H. % before	R.H. % after	Air Vel. Ft/min before	Air Vel. Ft/min after
1	78.63	80.36	30.03	29.97	37	32	0	0
2	78.7	80.67	29.88	29.85	41	39	0	0
3	79.54	79.03	29.79	29.71	32	33	0	0
4	78.5	78.1	29.68	29.56	35	40	0	0
5	79.28	79.25	29.85	29.94	36	29	0	0
6	80.4	81.4	29.97	30.06	27	22	0	0

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

Run No.	Burn Time (min)	Velocity (ft/sec)	Volumetric Flow Rate (dscf/min)	Total Temp. (°R)	Volume Sample		Particulate Catch (mg)	
					1	2	1	2
1	120	7.218	129.47	593.185	18.277	14.571	3.5	2.4
2	120	6.99	128.04	578.008	18.480	15.387	5.2	4.2
3	120	7.503	138.42	571.946	18.500	14.830	2.9	2.7
4	120	7.772	144.57	564.777	18.216	17.151	1.2	1.4
5	120	7.576	137.09	585.938	18.338	16.514	3.3	2.9
6	120	7.836	141.11	591.169	17.951	17.017	2.8	2.4

DILUTION TUNNEL DUAL TRAIN PRECISION

Run No.	Sample Ratios		Total Emissions (g)		% Deviation	% Deviation of 7.5% of 7.5 grams*
	Train 1	Train 2	Train 1	Train 2		
1	850.0	1066.2	2.98	2.56	6.25	3.97
2	831.4	998.5	4.32	4.19	1.26	1.15
3	897.9	1120.0	2.60	3.02	6.20	3.99
4	952.4	1011.5	1.14	1.42	8.87	2.97
5	897.1	996.2	2.96	2.89	1.01	0.68
6	943.3	995.1	2.64	2.39	4.18	2.45

* = As described in Method 5G-3 section 16.2.5

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (°F)	Initial Draft (in/H ₂ O)	Run Time (min)	Average Draft (in/H ₂ O)
1	1.95	-3.72	Not recorded	120	Not recorded
2	1.34	-19.36	-0.0225	120	-0.025
3	1.01	-16.46	-0.0175	120	-0.017
4	0.69	-22.26	-0.01	120	-0.013
5	1.91	-4.84	-0.0375	120	-0.037
6	2.04	-9.4	-0.0375	120	-0.038

III. Process description

III.A Test Set-up Description

A standard 4" diameter single wall pipe and insulated chimney system was installed to 15' above the scale level.

III.B Air Supply System

Combustion air enters the firebox through an opening at the rear of the firebox. This air is controlled by a LCD screen located close to the rear, on the Right Hand Side of the appliance.

IV. Sampling Systems

IV.A 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. (See Figure 3) The sampling section is a continuous 13 foot section of 6 inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a standard Pitot tube located 60 inches from the beginning of the sampling section. The dry bulb thermocouple is located six inches downstream from the Pitot tube. Tunnel samplers are located 60 inches downstream of the Pitot tube and 36 inches upstream from the end of this section. (See Figure 1)

Stack gas samples are collected from the steel chimney section prior to the spark arrestor mounted on the rear of the appliance.

IV.A.(1) DILUTION TUNNEL

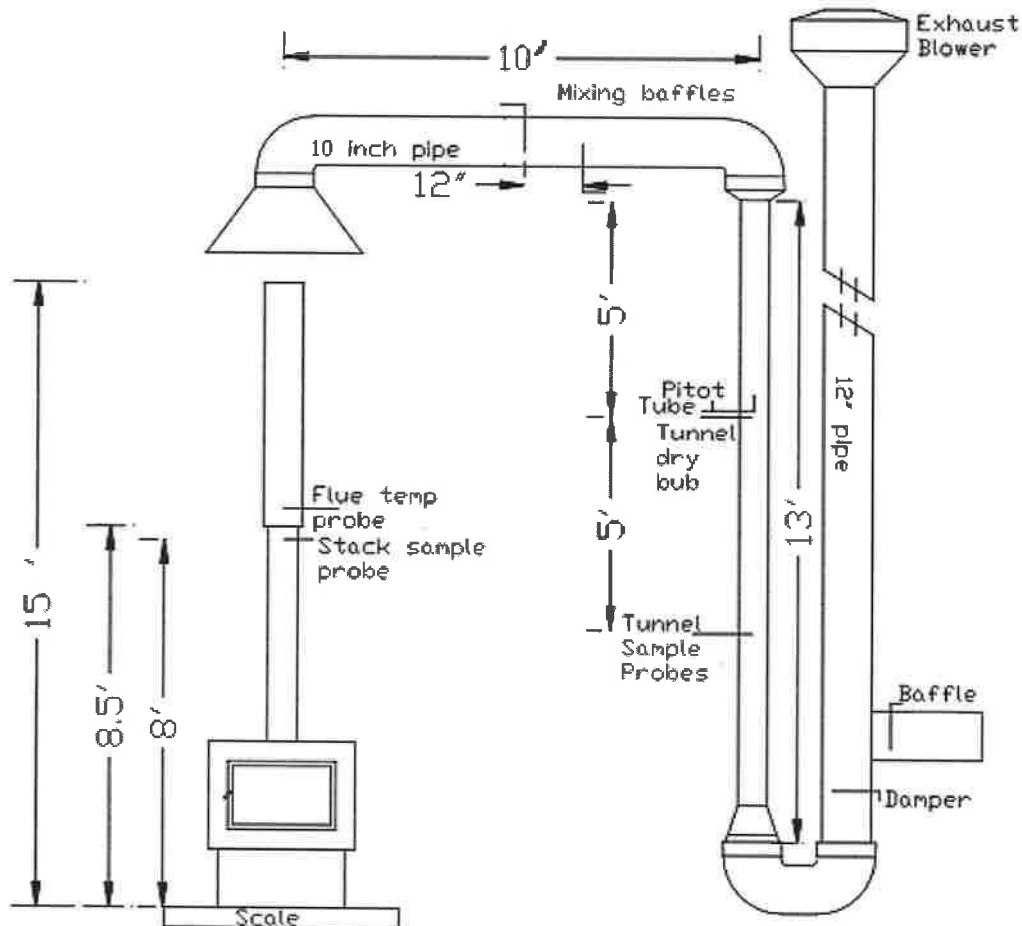
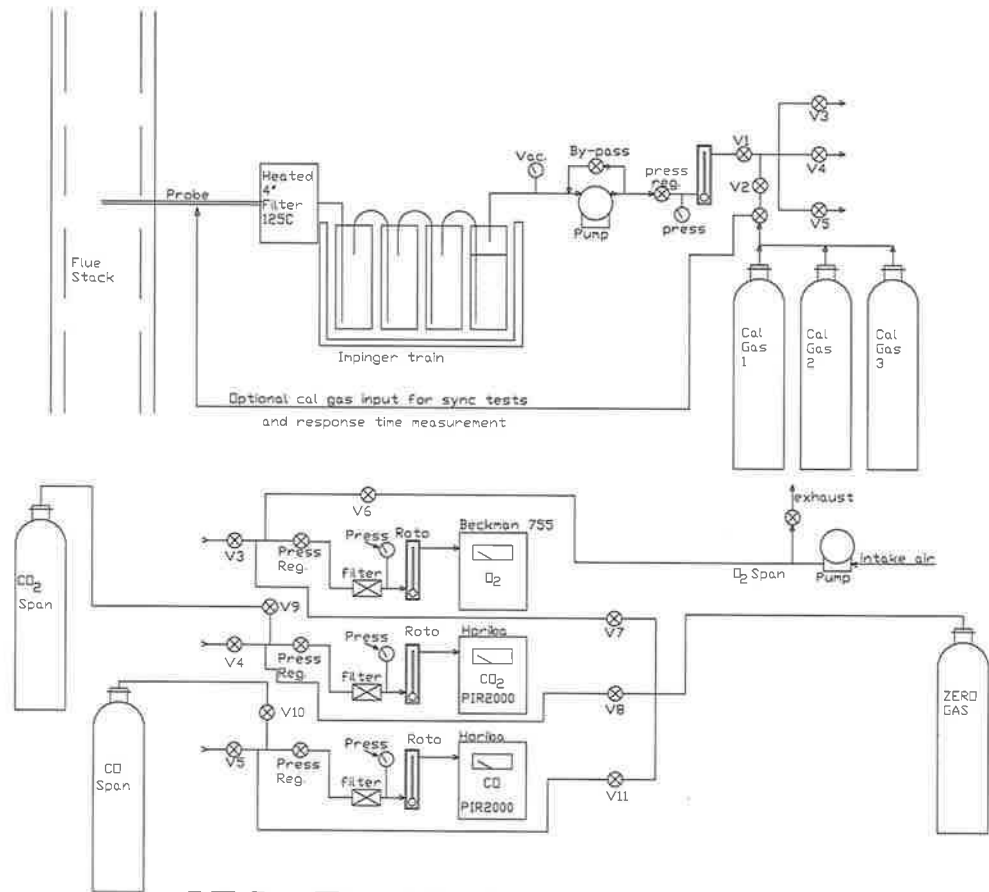


FIGURE 1

IV.B. OPERATIONAL DRAWINGS

IV.B.(1) STACK GAS SAMPLE TRAIN



ITS FLUE GAS SAMPLE TRAIN
FIGURE 2

IV.B.(2). DILUTION TUNNEL SAMPLE SYSTEMS

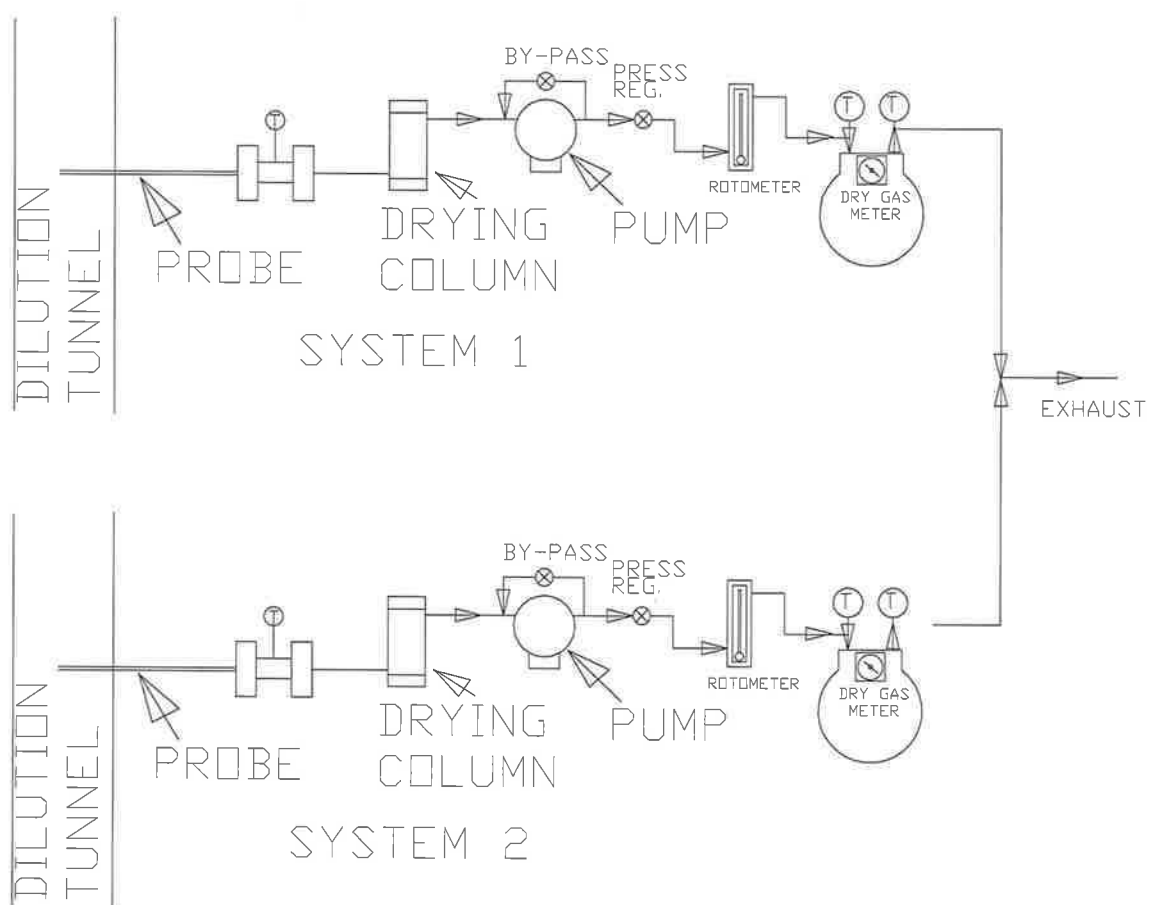


Figure 3

V. SAMPLING METHODS**V.A. PARTICULATE SAMPLING**

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

VI. QUALITY ASSURANCE**VI.A. INSTRUMENT CALIBRATION****VI.A. (1). DRY GAS METERS**

At the conclusion of each test program the dry gas meters are checked against our standard dry gas meter. Three runs are made on each dry gas meter used during the test program. The average calibration factors obtained are then compared with the six-month calibration factor and, if within 5%, the six-month factor is used to calculate standard volumes. Results of this calibration are contained in Appendix D.

An integral part of the post test calibration procedure is a leak check of the pressure side by plugging the system exhaust and pressurizing the system to 10" W.C. The system is judged to be leak free if it retains the pressure for at least 10 minutes.

The standard dry gas meter is calibrated annually by an accredited laboratory certified ISO 17025. The process involves sampling the train operation for 1 cubic foot of volume. With readings made to $.001 \text{ ft}^3$, the resolution is .1%, giving an accuracy higher than the $\pm 2\%$ required by the standard.

VI.A.(2). STACK SAMPLE ROTAMETER

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

VI.A.(3). GAS ANALYZERS

The continuous analyzers are zeroed and spanned before each test with appropriate 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. This calibration check 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. Data is also corrected for interferences as prescribed by the instrument manufacturer's instructions.

VI.B. TEST METHOD PROCEDURES**VI.B.(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, not just the dry gas meters. Pre-test and post-test leak checks are conducted with a vacuum of 10 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 was typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

VI.B.(2). TUNNEL VELOCITY/FLOW MEASUREMENT

The tunnel velocity is calculated from a center point Pitot 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.)

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

VI.B.(3). PM SAMPLING PROPORTIONALITY (5G-3)

Proportionality was calculated in accordance with EPA Method 5G-3. The data and results are included in Appendix C.

VII. CONCLUSION

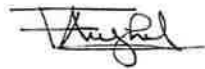
These tests demonstrate that this unit is an affected facility under the definition given in the regulation. The weighted average emission rate of 2.18 g/hr meets these requirements.

VII.A RESULTS AND OBSERVATIONS

The model Series 50: Eurostar & Osburn 5000 Pellet Stove has been found to be in compliance with the applicable performance and construction requirements of the following criteria: EPA Method 28 "Certification and auditing of wood heaters" and Method 5G-3 Determination of particulate matter emissions for pellet stoves."

INTERTEK TESTING SERVICES NA

Reported by:



Florin Anghel
Testing and Certification

Reported by:



John Voorhees
Operations Manager

Reviewed by:



Bruce S. Davis
Project Engineer

Appendix C

Sample Analysis

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbo PROJECT #: G100903464

DATE: 9/17/2012 RUN #: 1

SAMPLE TRAIN: A SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	1	118.7	115.6	
REAR FILTER CATCH	FILTER	2	118.4	118.2	
TOTAL TARE			237.10	233.80	3.30
PROBE & FILTER HOLDER	PROBE	17	139750.2	139750	0.20
				TOTAL:	3.50

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbi PROJECT #: G100903464

DATE: 9/17/2012 RUN #: 1

SAMPLE TRAIN: B SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	3	119.5	117.3	
REAR FILTER CATCH	FILTER	4	114.9	114.7	
TOTAL TARE			234.40	232.00	2.40
PROBE & FILTER HOLDER	PROBE	19	140116.2	140116.6	0.00
				TOTAL:	2.40

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbi PROJECT #: G100903

DATE: 9/18/2012 RUN #: 2

SAMPLE TRAIN: A SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	5	122	117.2	
REAR FILTER CATCH	FILTER	6	118.3	117.9	
TOTAL TARE			240.30	235.10	5.20
PROBE & FILTER HOLDER	PROBE	18	147881.6	147881.7	0.00
				TOTAL:	5.20

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbl PROJECT #: G100903464

DATE: 9/18/2012 RUN #: 2

SAMPLE TRAIN: B SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	7	119.5	115.7	
REAR FILTER CATCH	FILTER	8	117.5	117.1	
TOTAL TARE			237.00	232.80	4.20
PROBE & FILTER HOLDER	PROBE	20	139065.2	139065.3	0.00
				TOTAL:	4.20

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbi PROJECT #: G100903464

DATE: 9/18/2012 RUN #: 3

SAMPLE TRAIN: A SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	13	119.6	116.8	
REAR FILTER CATCH	FILTER	14	116.1	116	
TOTAL TARE			235.70	232.80	2.90
PROBE & FILTER HOLDER	PROBE	22	139576.3	139576.3	0.00
				TOTAL:	2.90

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbl PROJECT #: G100903464

DATE: 9/18/2012 RUN #: 3

SAMPLE TRAIN: B SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	15	118.6	116.2	
REAR FILTER CATCH	FILTER	16	113.8	113.6	
TOTAL TARE			232.40	229.80	2.60
PROBE & FILTER HOLDER	PROBE	25	136821	136820.9	0.10
			TOTAL:		2.70

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbl PROJECT #: G100903464

DATE: 9/18/2012 RUN #: 4

SAMPLE TRAIN: A SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	17	115.8	114.7	
REAR FILTER CATCH	FILTER	18	115.6	115.5	
TOTAL TARE			231.40	230.20	1.20
PROBE & FILTER HOLDER	PROBE	26	139814.4	139815	0.00
				TOTAL:	1.20

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbl PROJECT #: G100903464

DATE: 9/19/2012 RUN #: 5

SAMPLE TRAIN: A SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	25	118.4	115.8	
REAR FILTER CATCH	FILTER	26	115.2	115.2	
TOTAL TARE			233.60	231.00	2.60
PROBE & FILTER HOLDER	PROBE	32	136010.8	136010.1	0.70
				TOTAL:	3.30

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbi PROJECT #: G100903464

DATE: 9/19/2012 RUN #: 5

SAMPLE TRAIN: B SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	27	118.2	115.9	
REAR FILTER CATCH	FILTER	28	116.1	116.3	
TOTAL TARE			234.30	232.20	2.10
PROBE & FILTER HOLDER	PROBE	33	135992.2	135991.4	0.80
				TOTAL:	2.90

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3



CLIENT: SBI MODEL: Series 50/Eurostar/Osbi PROJECT #: G100903464

DATE: 9/19/2012 RUN #: 6

SAMPLE TRAIN: A SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	29	117.4	114.8	
REAR FILTER CATCH	FILTER	30	116.5	116.5	
TOTAL TARE			233.90	231.30	2.60
PROBE & FILTER HOLDER	PROBE	35	107840.3	107840.1	0.20
				TOTAL:	2.80

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL PARTICULATE CALCULATIONS
METHOD 5G3

Intertek

CLIENT: SBI MODEL: Series 50/Eurostar/Osbi PROJECT #: G100903464

DATE: 9/19/2012 RUN #: 6

SAMPLE TRAIN: B SAMPLE ID #: MTL 1209141624-001

INTERTEK EQUIPMENT #'s: SBI-206

SAMPLE COMPONENT	REAGENT	FILTER # OR PROBE #	WEIGHTS		
			FINAL, mg	TARE, mg	PARTIULATE, mg
FRONT FILTER CATCH	FILTER	31	117.9	115.5	
REAR FILTER CATCH	FILTER	32	114.9	114.9	
TOTAL TARE			232.80	230.40	2.40
PROBE & FILTER HOLDER	PROBE	36	108505.9	108506.4	0.00
				TOTAL:	2.40

ENGINEER: 

DATE: 10/23/2012

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/17/2012 Engineer: Florin Anghel Run #: 1 Sample Train #: ABalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>1</u>	Tare:	<u>0.1156</u>	Preliminary Wt:	<u>0.1185</u>	
Rear Filter #	<u>2</u>	Tare:	<u>0.1182</u>	Preliminary Wt:	<u>0.1182</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	<u>9/17/2012/16:00PM</u>			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>0.1185</u> <u>0.1182</u> <u>0.2367</u>	<u>0.2 =</u> <u>0.1999g</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>0.1187</u> <u>0.1184</u> <u>0.2371</u>	<u>0.2 =</u> <u>0.1999g</u>	<u>FA</u> ✓
Probe #:	<u>17</u>	Tare:	<u>139,7500</u>	Preliminary Wt:	<u>139,7495</u>	
Date/Time in dessicator:	<u>9/17/2012/16:00PM</u>					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>139,7503</u>	<u>100 =</u> <u>100.0079g</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>139,7502</u>	<u>100 =</u> <u>100.0079g</u>	<u>FA</u> ✓

Date: 9/25/2012Engineer signature: 

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000

Project #: G100903464 Sample ID #: MTL 1209141624-001

Date: 9/17/2012 Engineer: Florin Anghel Run #: 1 Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212

Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	3	Tare:	0.1173	Preliminary Wt:	0.1196	
Rear Filter #	4	Tare:	0.1147	Preliminary Wt:	0.1149	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	9/17/2012/16:00			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
9/19/2012	16:10	33	69.9	0.1196 0.1149 0.2345	0.2 = 0.1999	FA
9/20/2012	9:45	3	69.8	0.1195 0.1149 0.2344	0.2 = 0.1999	FA
Probe #:	19	Tare:	140,1166	Preliminary Wt:	140,1154	
Date/Time in dessicator:	9/17/2012/16:00					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
9/19/2012	16:10	33	69.9	140,1164	100 = 100.0079	FA
9/20/2012	9:45	3	69.8	140,1162	100 = 100.0079	FA

Date: 9/25/2012

Engineer signature: Florin Anghel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/18/2012 Engineer: Florin Anghel Run #: 2 Sample Train #: ABalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>5</u>	Tare:	<u>0.1172</u>	Preliminary Wt:	<u>0.1222</u>	
Rear Filter #	<u>6</u>	Tare:	<u>0.1173</u>	Preliminary Wt:	<u>0.1183</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	<u>9/18/2012/11:47</u>			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>0.1221</u> <u>0.1183</u> <u>0.2404</u>	<u>0.2 =</u> <u>0.1993</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>0.1220</u> <u>0.1183</u> <u>0.2403</u>	<u>0.2 =</u> <u>0.1993</u>	<u>FA</u>
Probe #:	<u>18</u>	Tare:	<u>147,8817</u>	Preliminary Wt:	<u>147,8812</u>	
Date/Time in dessicator:	<u>9/18/2012/11:47</u>					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>147,8818</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>147,8816</u>	<u>100 =</u> <u>100.0079</u>	<u>FA</u>

Date: 9/25/2012Engineer signature: FAnghe

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/18/2012 Engineer: Florin Anghel Run #: 2 Sample Train #: BBalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>7</u>	Tare:	<u>0.1157</u>	Preliminary Wt:	<u>0.1157</u>	
Rear Filter #	<u>8</u>	Tare:	<u>0.1171</u>	Preliminary Wt:	<u>0.1176</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	<u>9/18/2012/11:47</u>			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>0.1135</u> <u>0.1175</u> <u>0.2370</u>	<u>0.25</u> <u>0.1999</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>0.1135</u> <u>0.1175</u> <u>0.2370</u>	<u>0.25</u> <u>0.1999</u>	<u>FA</u>
Probe #:	<u>20</u>	Tare:	<u>139,0653</u>	Preliminary Wt:	<u>139,0652</u>	
Date/Time in dessicator:						
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>139,0654</u>	<u>100 =</u> <u>100.0079</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>139,0652</u>	<u>100 =</u> <u>100.0079</u>	<u>FA</u>

Date: 9/25/2012Engineer signature: Florin Anghel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/18/2012 Engineer: Florin Anghel Run #: 3 Sample Train #: ABalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>13</u>	Tare:	<u>0.1168</u>	Preliminary Wt:	<u>0.1195</u>	
Rear Filter #	<u>14</u>	Tare:	<u>0.1160</u>	Preliminary Wt:	<u>0.1161</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	<u>9/18/12/ 16:30</u>			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>0.1195</u> <u>0.1161</u> <u>0.2356</u>	<u>0.2 =</u> <u>0.1939</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>0.1196</u> <u>0.1161</u> <u>0.2357</u>	<u>0.2 =</u> <u>0.1939</u>	<u>FA</u>
Probe #:	<u>22</u>	Tare:	<u>139,5763</u>	Preliminary Wt:	<u>139,5756</u>	
Date/Time in dessicator:	<u>9/18/12/ 16:30</u>					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/19/2012</u>	<u>16:10</u>	<u>3.3</u>	<u>69.9</u>	<u>139,5766</u>	<u>100 =</u> <u>100.0079</u>	<u>FA</u>
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>139,5763</u>	<u>100 =</u> <u>100.0079</u>	<u>FA</u>

Date: 9/25/2012Engineer signature: FAngel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osborn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/18/2012 Engineer: Florin Anghel Run #: 3 Sample Train #: BBalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	15	Tare:	0.1162	Preliminary Wt:	0.1186	
Rear Filter #	16	Tare:	0.1136	Preliminary Wt:	0.1138	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	9/18/12/16:30			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
9/19/2012	16:10	3.3	69.9	0.1187 0.1137 0.2324	0.2 = 0.1933	FA
9/20/2012	9:45	3	69.8	0.1186 0.1138 0.2324	0.2 0.1993	FA
Probe #:	25	Tare:	136,8209	Preliminary Wt:	136,8208	
Date/Time in dessicator:	9/18/12/16:30					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
9/19/2012	16:10	3.3	69.9	136,8214	100 = 100.0079	FA
9/20/2012	9:45	3	69.8	136,8210	100 = 100.0079	FA

Date: 9/25/2012Engineer signature: Florin Anghel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000

Project #: G100903464 Sample ID #: MTL 1209141624-001

Date: 9/18/2012 Engineer: Florin Anghel Run #: 4 Sample Train #: A

Balance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212

Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>17</u>	Tare:	<u>0.1147</u>	Preliminary Wt:	<u>0.1158</u>	
Rear Filter #	<u>18</u>	Tare:	<u>0.1155</u>	Preliminary Wt:	<u>0.1156</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:		<u>9/18/2012/19:47</u>		Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>0.1158</u> <u>0.1156</u> <u>0.2314</u>	<u>0.2 =</u> <u>0.1333</u>	<u>FA</u>
<u>9/25/2012</u>	<u>10:00</u>	<u>3</u>	<u>69.9</u>	<u>0.1158</u> <u>0.1156</u> <u>0.2314</u>	<u>0.2 =</u> <u>0.1333</u>	<u>FA</u>
Probe #:	<u>26</u>	Tare:	<u>139,8150</u>	Preliminary Wt:	<u>139,8146</u>	
Date/Time in dessicator:		<u>9/18/2012/19:47</u>				
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>139,8143</u>	<u>100 =</u> <u>100.0073</u>	<u>FA</u>
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>139,8151</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>
<u>9/25/2012</u>	<u>10:00</u>	<u>3</u>	<u>69.9</u>	<u>139,8293</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>
<u>9/28/2012</u>	<u>11:00</u>	<u>3</u>	<u>70.0</u>	<u>139,8153</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>
<u>10/3/2012</u>	<u>10:55</u>	<u>3.4</u>	<u>70.1</u>	<u>139,8145</u>	<u>100 =</u> <u>100.0073</u>	<u>FA</u>
<u>10/4/2012</u>	<u>11:00</u>	<u>2.3</u>	<u>69.8</u>	<u>139,8144</u>	<u>100 =</u> <u>100.008</u>	<u>FA</u>

Date: 10/23/2012

Engineer signature: Florin Anghel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/18/2012 Engineer: Florin Anghel Run #: 4 Sample Train #: BBalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>19</u>	Tare:	<u>0.1142</u>	Preliminary Wt:	<u>0.1156</u>
Rear Filter #	<u>20</u>	Tare:	<u>0.1159</u>	Preliminary Wt:	<u>0.1162</u>
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:				Preliminary Wt:	
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>0.1154</u> <u>0.1162</u> <u>0.2316</u>	<u>0.2 =</u> <u>0.1999</u>
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>0.1154</u> <u>0.1161</u> <u>0.2315</u>	<u>0.2 =</u> <u>0.1999</u>
Probe #:	<u>27</u>	Tare:	<u>136,8932</u>	Preliminary Wt:	<u>136,8930</u>
Date/Time in dessicator:			<u>9/18/2012/19:47</u>		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)
<u>9/20/2012</u>	<u>9:45</u>	<u>3</u>	<u>69.8</u>	<u>136,8930</u>	<u>100 =</u> <u>100.0079</u>
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>136,8939</u>	<u>100 =</u> <u>100.0080</u>
<u>9/25/2012</u>	<u>10:00</u>	<u>3</u>	<u>69.9</u>	<u>136,9078</u>	<u>100 =</u> <u>100.0080</u>
<u>9/28/2012</u>	<u>11:00</u>	<u>3</u>	<u>70.0</u>	<u>136,8929</u>	<u>100 =</u> <u>100.0080</u>
<u>10/3/2012</u>	<u>10:55</u>	<u>3.4</u>	<u>70.1</u>	<u>136,8925</u>	<u>100 =</u> <u>100.0073</u>

Date: 10/23/2012Engineer signature: Florin Anghel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osborn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/19/2012 Engineer: Florin Anghel Run #: 5 Sample Train #: ABalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>25</u>	Tare:	<u>0.1158</u>	Preliminary Wt:	<u>0.1183</u>	
Rear Filter #	<u>26</u>	Tare:	<u>0.1152</u>	Preliminary Wt:	<u>0.1151</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	<u>9/19/2012/12:05</u>			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/20/2012</u>	<u>14:05</u>	<u>3</u>	<u>69.9</u>	<u>0.1182</u> <u>0.1151</u> <u>0.2333</u>	<u>0.2 =</u> <u>0.1999</u>	<u>FA</u>
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>0.1184</u> <u>0.1152</u> <u>0.2336</u>	<u>0.2 =</u> <u>0.1999</u>	<u>FA</u>
Probe #:	<u>32</u>	Tare:	<u>136,0101</u>	Preliminary Wt:	<u>136,0098</u>	
Date/Time in dessicator:						
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/20/2012</u>	<u>14:05</u>	<u>3</u>	<u>69.9</u>	<u>136,0107</u>	<u>100 =</u> <u>100.0073</u>	<u>FA</u>
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>136,0108</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>

Date: 9/25/2012Engineer signature: FA

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000

Project #: G100903464 Sample ID #: MTL 1209141624-001

Date: 9/19/2012 Engineer: Florin Anghel Run #: 5 Sample Train #: B

Balance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212

Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>27</u>	Tare:	<u>0.1159</u>	Preliminary Wt:	<u>0.1182</u>	
Rear Filter #	<u>28</u>	Tare:	<u>0.1163</u>	Preliminary Wt:	<u>0.1161</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	<u>9/19/2012/12:05</u>			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/20/2012</u>	<u>14:05</u>	<u>3</u>	<u>69.9</u>	<u>0.1183</u> <u>0.1163</u> <u>0.2346</u>	<u>0.2 =</u> <u>0.1999</u>	<u>FA</u>
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>0.1182</u> <u>0.1162</u> <u>0.2343</u>	<u>0.2 =</u> <u>0.1999</u>	<u>FA</u>
Probe #:	<u>33</u>	Tare:	<u>135,9914</u>	Preliminary Wt:	<u>135,9914</u>	
Date/Time in dessicator:	<u>9/19/2012/12:05</u>					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/20/2012</u>	<u>14:05</u>	<u>3</u>	<u>69.9</u>	<u>135,9919</u>	<u>100 =</u> <u>100.0073</u>	<u>FA</u>
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>135,9922</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>

Date: 10/23/2012

Engineer signature: FAngel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/19/2012 Engineer: Florin Anghel Run #: 6 Sample Train #: ABalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	<u>29</u>	Tare:	<u>0.1148</u>	Preliminary Wt:	<u>0.1175</u>	
Rear Filter #	<u>30</u>	Tare:	<u>0.1165</u>	Preliminary Wt:	<u>0.1164</u>	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	<u>9/19/2012/16:10</u>			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>0.1174</u> <u>0.1165</u> <u>0.2339</u>	<u>0.2 =</u> <u>0.1339</u>	<u>FA</u>
<u>9/25/2012</u>	<u>10:00</u>	<u>3</u>	<u>69.9</u>	<u>0.1174</u> <u>0.1165</u> <u>0.2339</u>	<u>0.2 =</u> <u>0.1339</u>	<u>FA</u>
Probe #:	<u>35</u>	Tare:	<u>107,8401</u>	Preliminary Wt:	<u>107,8400</u>	
Date/Time in dessicator:	<u>9/19/2012/16:10</u>					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
<u>9/24/2012</u>	<u>11:00</u>	<u>3.3</u>	<u>70.1</u>	<u>107,8404</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>
<u>9/25/2012</u>	<u>10:00</u>	<u>3</u>	<u>69.9</u>	<u>107,8513</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>
<u>9/28/2012</u>	<u>11:00</u>	<u>3</u>	<u>70.0</u>	<u>107,8402</u>	<u>100 =</u> <u>100.0080</u>	<u>FA</u>
<u>10/03/2012</u>	<u>10:55</u>	<u>3.4</u>	<u>70.1</u>	<u>107,8403</u>	<u>100 =</u> <u>100.0073</u>	<u>FA</u>

Date: 10/23/2012Engineer signature: Florin Anghel

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: Eurostar/Osburn 5000Project #: G100903464 Sample ID #: MTL 1209141624-001Date: 9/19/2012 Engineer: Florin Anghel Run #: 6 Sample Train #: BBalance Equipment #: SBI-206 Thermo/Hygro meter Equipment #: SBI-212Audit weight Equipment #: 180-195 (Balance audit mfr. std: 500 \pm 0.72 mg)

Front Filter #	31	Tare:	0.1155	Preliminary Wt:	0.1178	
Rear Filter #	32	Tare:	0.1143	Preliminary Wt:	0.1147	
Seal Set #		Tare:		Preliminary Wt:		
Date/Time in dessicator:	9/19/2012/16:10			Preliminary Wt:		
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
9/24/2012	11:00	3.3	70.1	0.1180 0.1148 0.2328	0.2 = 0.1995	FA
9/25/2012	10:00	3	69.9	0.1175 0.1143 0.2328	0.2 = 0.1995	FA
Probe #:	36	Tare:	108,5064	Preliminary Wt:	108,5063	
Date/Time in dessicator:	9/19/2012/16:10					
Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
9/24/2012	11:00	3.3	70.1	108,5070	100 = 100.0080	FA
9/25/2012	10:00	3	69.9	108,5174	100 = 100.0078	FA
9/28/2012	11:00	3	70	108,5062	100 = 100.0080	FA
10/03/2012	10:55	3.4	70.1	108,5059	100 = 100.0073	FA

Date: 10/23/2012Engineer signature: Florin Anghel

Projet: Série 50

Date: 2012-09-14

Tech: V. Pelletier

Standard:

Id. Filtres	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
RUN 5 25	0,1158	2012-09-14								
RUN 5 26	0,1151	0,1158								
RUN 5 27	0,1160	0,1153 ²								
RUN 5 28	0,1164	0,1159								
RUN 5 29	0,1148	0,1163								
RUN 5 30	0,1164	0,1148								
RUN 5 31	0,1155	0,1165								
RUN 5 32	0,1150	0,1155								
33	0,1169	0,1149								
34	0,1169	0,1168								
35	0,1151	0,1170								
36	0,1171	0,1150								
37	0,1177	0,1170								
38	0,1161	0,1177								
39	0,1171	0,1159								
40	0,1183	0,1170								
41	0,1232	0,1183								
42	0,1238	0,1232								
43	0,1230	0,1238								
44	0,1217	0,1230								
45	0,1230	0,1216								
46	0,1232	0,1230								
47	0,1226	0,1232								
48	0,1234	0,1226								
		0,1234								

Série 50

2012-09-14

V. Pelletier

Standard:

200.0000 =
200.0407

10:00 AM 8:30 AM

[illegible]

Projet: Série 50

Date: 2012-09-14

Tech: V. Pelletier

Standard:

Amédée Pelletier
200.000 g =
200.0137 g
0.2000 =
0.1998 g

10821

Id. Filtres	Date	Date 10:00AM	Date 8:30AM	Date	Date	Date	Date	Date	Date
	2012-09-14	2012-09-17	2012-09-18						
RUN 1	0,1156	0,1156							
RUN 2	0,1182	0,1182							
RUN 3	0,1171	0,1171							
RUN 4	0,1145	0,1145							
RUN 5	0,1173	0,1173							
RUN 6	0,1180	0,1179							
RUN 7	0,1158	0,1157							
RUN 8	0,1172	0,1171							
RUN 9	0,1172	0,1173							
RUN 10	0,1177	0,1178							
RUN 11	0,1156	0,1157							
RUN 12	0,1173	0,1173							
RUN 13	0,1169	0,1168							
RUN 14	0,1159	0,1160							
RUN 15	0,1162	0,1162							
RUN 16	0,1135	0,1136							
RUN 17	0,1147	0,1147							
RUN 18	0,1155	0,1155							
RUN 19	0,1143	0,1142							
RUN 20	0,1161	0,1159							
21	0,1229	0,1228							
22	0,1232	0,1233							
23	0,1189	0,1189							
24	0,1235	0,1233							

Appendix D

Calibrations

No du rapport d'étalonnage CA0003-088-032111

Mettler Toledo

Service Business Unit Industrial

1900 Polaris Parkway

Columbus, Ohio 43240

1-800-METTLER

METTLER TOLEDO

ISO 9001 Registered

ANSI/NCSL Z540 Accrédité



Accrédité par l'American Association of
Laboratory Accreditation (A2LA)

CERT.CALIBRATION #1902.02

Certificat d'étalonnage

Client

Société : SBI Fabricant de poêles International inc.
Adresse : 250, rue Copenhague
Ville : St-Augustin État/Province : Québec
Code postal : G3A 2V1 Astea Customer ID: C037589001001

Instrument

Constructeur : Rice Lake Modèle de terminal : IND560
Modèle : Roughdeck No de série du termin 00927396KL
No de série : B00927396KL No. Série Impr. N/A
Capacité : 625 kg Service/Pièce : Lab
Résolution : 0.02 kg Nbre de Divisions 31250
Classe : III Procédure utilisée : Canadien
Numéro/ID d'actif du clie SBI-013
Procédure: Le présent certificat est émis conformément aux conditions de certification accordées par l'A2LA, en vertu de la norme ISO/IEC 17025. A2LA a évalué la capacité de mesure du laboratoire et la traçabilité des normes nationales reconnues.

Date de calibrage : 21-mars-2011 Le prochain Cal Date 31-mars-2012
Signataire autorisé (A2LA) : Dany Careau Signature: ELECTRONIC SIGNATURE
Signature du client :

Étalons de travail

Traçabilité Les poids de test utilisés se réfèrent au National Institute of Standards and Technology.

Jeu de poids no :	Traçabilité NIST No.:	Classe ASTM/OIML	Date d'étalonnage :	Date proch. étalonnage
42268	M10-0278	M1	5-août-2010	5-août-2011
MTP1	MT0015626	F1	17-sept.-2010	17-sept.-2011
Kit S	1356103	M1	5-oct.-2010	5-oct.-2011

Résultats de mesure

La température : 70 °F

Les conditions ambiantes ont été vérifiées afin d'assurer l'exactitude de l'étalonnage.

Test de variation

<input type="checkbox"/> 1	<input type="checkbox"/> 2
<input type="checkbox"/> 4	<input type="checkbox"/> 3

Les poids Appliqués	Position	Avant Réglage	Après Réglage
		Valeur lue	Valeur lue
1: 125 kg	Position 1	125.02 kg	124.98 kg
2: 125 kg	Position 2	125.16 kg	125.02 kg
3: 125 kg	Position 3	125.16 kg	125.02 kg
4: 125 kg	Position 4	125.26 kg	125.00 kg
Erreur maximum :		0.26 kg	0.04 kg
Max Erreur Admissible :		0.10 kg	0.1 kg

Linéarité

	Avant réglage					Dans la Tolérance
	Les poids Appliqués	Valeur lue	Erreur		Erreur admissible	
Zero 1	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI
2	20.00 kg	20.02 kg	0.02 kg	1 d	2 d	OUI
3	40.00 kg	40.04 kg	0.04 kg	2 d	2 d	OUI
4	100.00 kg	100.12 kg	0.12 kg	6 d	5 d	NON
Max 5	200.00 kg	200.24 kg	0.24 kg	12 d	5 d	NON
6	100.00 kg	100.12 kg	0.12 kg	6 d	5 d	NON
7	40.00 kg	40.04 kg	0.04 kg	2 d	2 d	OUI
8	20.00 kg	20.02 kg	0.02 kg	1 d	2 d	OUI
Zero 9	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI

☐ Méthode de substitution utilisée

	Après réglage					Dans la Tolérance
	Les poids Appliqués	Valeur lue	Erreur		Erreur admissible	
Zero 1	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI
2	20.00 kg	20.00 kg	0.00 kg	0 d	2 d	OUI
3	40.00 kg	40.00 kg	0.00 kg	0 d	2 d	OUI
4	100.00 kg	100.02 kg	0.02 kg	1 d	5 d	OUI
Max 5	200.00 kg	200.02 kg	0.02 kg	1 d	5 d	OUI
6	100.00 kg	100.02 kg	0.02 kg	1 d	5 d	OUI
7	40.00 kg	40.00 kg	0.00 kg	0 d	2 d	OUI
8	20.00 kg	20.00 kg	0.00 kg	0 d	2 d	OUI
Zero 9	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI

☐ Méthode de substitution utilisée

Un réglage de la balance a été requis

Si NON, les résultats relatifs à l'état du système avant la prestation de service correspondent à l'état de

☒ OUI

☐ NON

Répétabilité

Poids appliqués : 100.00 kg

	Chargé	Vide	Différence
1	100.00 kg	0.00 kg	100 kg
2	100.02 kg	0.00 kg	100.02 kg
3	100.02 kg	0.00 kg	100.02 kg
Erreur maximale :		0.02 kg	1.0 d
Tolérance :		0.10 kg	5 d

Incertitude

Mesure de l'incertitude = 0.022 kg

Les meilleures incertitudes représentent les incertitudes étendues selon un facteur de sécurité K=2 générant un niveau de confiance approximatif de 95 %. Des dispositions doivent être prises en matière d'environnement au lieu d'étalonnage, d'incertitude induite par l'article en étalonnage et d'effets indésirables causés par le transport du matériel d'étalonnage. Ces facteurs pourraient entraîner une incertitude plus grande que le BMC.

Remarques

Aucune.

No du rapport d'étalonnage CA0003-086-032111

Mettler Toledo

Service Business Unit Industrial

1900 Polaris Parkway

Columbus, Ohio 43240

1-800-METTLER

METTLER TOLEDO

ISO 9001 Registered

ANSI/NCSL Z540 Accrédité



Accrédité par l'American Association of
Laboratory Accreditation (A2LA)

CERT.CALIBRATION #1902.02

Certificat d'étalonnage

Client

Société : SBI Fabricant de poêles International inc.
Adresse : 250, rue Copenhague
Ville : St-Augustin État/Province : Québec
Code postal : G3A 2V1 Astea Customer ID: C037589001001

Instrument

Constructeur : Weightronix Modèle de terminal : IND560
Modèle : DSL-6060 No de série du termin 00927386KL
No de série : B00927386KL No. Série Impr. N/A
Capacité : 500 kg Service/Pièce : LAB
Résolution : 0.02 kg Nbre de Divisions 25000
Classe : III Procédure utilisée : Canadien
Numéro/ID d'actif du clie SBI-014
Procédure: Le présent certificat est émis conformément aux conditions de certification accordées par l'A2LA, en vertu de la norme ISO/IEC 17025. A2LA a évalué la capacité de mesure du laboratoire et la traçabilité des normes nationales reconnues.

Date de calibrage : 21-mars-2011 Le prochain Cal Date 31-mars-2012
Signataire autorisé (A2LA) : Dany Careau Signature: ELECTRONIC SIGNATURE
Signature du client :

Étalons de travail

Traçabilité Les poids de test utilisés se réfèrent au National Institute of Standards and Technology.

Jeu de poids no :	Traçabilité NIST No.:	Classe ASTM/OIML	Date d'étalonnage :	Date proch. étalonnage
42268	M10-0278	M1	5-août-2010	5-août-2011
MTP1	MT0015626	F1	17-sept.-2010	17-sept.-2011
Kit S	1356103	M1	5-oct.-2010	5-oct.-2011

Résultats de mesure

La température : 70 °F

Les conditions ambiantes ont été vérifiées afin d'assurer l'exactitude de l'étalonnage.

Test de variation

<input type="checkbox"/> 1	<input type="checkbox"/> 2
<input type="checkbox"/> 4	<input type="checkbox"/> 3

Les poids Appliqués	Position	Avant Réglage	Après Réglage
		Valeur lue	Valeur lue
1: 125.00 kg	Position 1	125.00 kg	125.00 kg
2: 125.00 kg	Position 2	125.04 kg	125.00 kg
3: 125.00 kg	Position 3	125.00 kg	125.00 kg
4: 125.00 kg	Position 4	124.96 kg	125.00 kg
Erreur maximum :		0.08 kg	0.00 kg
Max Erreur Admissible :		0.10 kg	0.1 kg

Linéarité

	Avant réglage					Dans la Tolérance
	Les poids Appliqués	Valeur lue	Erreur		Erreur admissible	
Zero 1	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI
2	20.00 kg	20.00 kg	0.00 kg	0 d	2 d	OUI
3	40.00 kg	40.00 kg	0.00 kg	0 d	2 d	OUI
4	100.00 kg	100.02 kg	0.02 kg	1 d	5 d	OUI
Max 5	200.00 kg	200.04 kg	0.04 kg	2 d	5 d	OUI
6	100.00 kg	100.02 kg	0.02 kg	1 d	5 d	OUI
7	40.00 kg	40.00 kg	0.00 kg	0 d	2 d	OUI
8	20.00 kg	20.00 kg	0.00 kg	0 d	2 d	OUI
Zero 9	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI

☐ Méthode de substitution utilisée

	Après réglage					Dans la Tolérance
	Les poids Appliqués	Valeur lue	Erreur		Erreur admissible	
Zero 1	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI
2	20.00 kg	20.00 kg	0.00 kg	0 d	2 d	OUI
3	40.00 kg	40.00 kg	0.00 kg	0 d	2 d	OUI
4	100.00 kg	100.00 kg	0.00 kg	0 d	5 d	OUI
Max 5	200.00 kg	200.00 kg	0.00 kg	0 d	5 d	OUI
6	100.00 kg	100.00 kg	0.00 kg	0 d	5 d	OUI
7	40.00 kg	40.00 kg	0.00 kg	0 d	2 d	OUI
8	20.00 kg	20.00 kg	0.00 kg	0 d	2 d	OUI
Zero 9	0.00 kg	0.00 kg	0.00 kg	0 d	1 d	OUI

☐ Méthode de substitution utilisée

Un réglage de la balance a été requis

Si NON, les résultats relatifs à l'état du système avant la prestation de service correspondent à l'état de

☒ OUI

☐ NON

Répétabilité

Poids appliqués : 100.00 kg

	Chargé	Vide	Différence
1	100.00 kg	0.00 kg	100 kg
2	100.02 kg	0.00 kg	100.02 kg
3	100.00 kg	0.00 kg	100 kg
Erreur maximale :		0.02 kg	1.0 d
Tolérance :		0.10 kg	5 d

Incertitude

Mesure de l'incertitude = 0.022 kg

Les meilleures incertitudes représentent les incertitudes étendues selon un facteur de sécurité K=2 générant un niveau de confiance approximatif de 95 %. Des dispositions doivent être prises en matière d'environnement au lieu d'étalonnage, d'incertitude induite par l'article en étalonnage et d'effets indésirables causés par le transport du matériel d'étalonnage. Ces facteurs pourraient entraîner une incertitude plus grande que le BMC.

Remarques

Aucune.

No du rapport d'étalonnage CA0003-093-032111

Mettler Toledo

Service Business Unit Industrial

1900 Polaris Parkway

Columbus, Ohio 43240

1-800-METTLER

METTLER TOLEDO

ISO 9001 Registered

ANSI/NCSL Z540 Accrédité



Accrédité par l'American Association of
Laboratory Accreditation (A2LA)

CERT.CALIBRATION #1902.02

Certificat d'étalonnage

Client

Société : SBI Fabricant de poêles International inc.
Adresse : 250, rue Copenhague
Ville : St-Augustin État/Province : Québec
Code postal : G3A 2V1 Astea Customer ID: C037589001001

Instrument

Constructeur : Sartorius Modèle de terminal : N/A
Modèle : TE214S No de série du termin : N/A
No de série : 25851066 No. Série Impr. : N/A
Capacité : 210 g Service/Pièce : Lab
Résolution : 0.0001 g Nbre de Divisions : 2100000
Classe : I Procédure utilisée : Canadien
Numéro/ID d'actif du clié SBI-206
Procédure: Le présent certificat est émis conformément aux conditions de certification accordées par l'A2LA, en vertu de la norme ISO/IEC 17025. A2LA a évalué la capacité de mesure du laboratoire et la traçabilité des normes nationales reconnues.

Date de calibrage : 21-mars-2011 Le prochain Cal Date 31-mars-2012
Signataire autorisé (A2LA) : Dany Careau Signature: ELECTRONIC SIGNATURE
Signature du client :

Étalons de travail

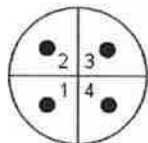
Traçabilité Les poids de test utilisés se réfèrent au National Institute of Standards and Technology.

Jeu de poids no :	Traçabilité NIST No. :	Classe ASTM/OIML	Date d'étalonnage :	Date proch. étalonnage
MTP1	MT0015626	F1	17-sept.-2010	17-sept.-2011

Résultats de mesure

La température : 70 °F

Les conditions ambiantes ont été vérifiées afin d'assurer l'exactitude de l'étalonnage.

Test de variation

Les poids Appliqués	Position	Avant Réglage	Après Réglage
		Valeur lue	Valeur lue
1: 50 g	Position 1	49.9999 g	50.0000 g
2: 50 g	Position 2	49.9999 g	50.0000 g
3: 50 g	Position 3	49.9999 g	50.0000 g
4: 50 g	Position 4	49.9999 g	50.0000 g
Erreur maximum :		0.0001 g	0.0000 g
Max Erreur Admissible :		0.0003 g	0.0003 g

Linéarité

	Avant réglage					
	Les poids Appliqués	Valeur lue	Erreur		Erreur admissible	Dans la Tolérance
Zero 1	0.0000 g	0.0000 g	0.0000 g	0 d	1 d	OUI
2	0.0100 g	0.0100 g	0.0000 g	0 d	1 d	OUI
3	0.1000 g	0.1000 g	0.0000 g	0 d	1 d	OUI
4	1.0000 g	1.0000 g	0.0000 g	0 d	1 d	OUI
5	10.0000 g	9.9999 g	-0.0001 g	1 d	2 d	OUI
6	20.0000 g	20.0000 g	0.0000 g	0 d	2 d	OUI
7	50.0000 g	49.9998 g	-0.0002 g	2 d	3 d	OUI
8	100.0000 g	99.9995 g	-0.0005 g	5 d	3 d	NON
9	150.0000 g	149.9989 g	-0.0011 g	11 d	3 d	NON
Max 10	200.0000 g	199.9982 g	-0.0018 g	18 d	3 d	NON
11	150.0000 g	149.9989 g	-0.0011 g	11 d	3 d	NON
12	100.0000 g	99.9995 g	-0.0005 g	5 d	3 d	NON
13	50.0000 g	49.9998 g	-0.0002 g	2 d	3 d	OUI
14	20.0000 g	20.0000 g	0.0000 g	0 d	2 d	OUI
15	10.0000 g	9.9999 g	-0.0001 g	1 d	2 d	OUI
16	1.0000 g	1.0000 g	0.0000 g	0 d	1 d	OUI
17	0.1000 g	0.1000 g	0.0000 g	0 d	1 d	OUI
18	0.0100 g	0.0100 g	0.0000 g	0 d	1 d	OUI
Zero 19	0.0000 g	0.0000 g	0.0000 g	0 d	1 d	OUI

☐ Méthode de substitution utilisée

	Après réglage					
	Les poids Appliqués	Valeur lue	Erreur		Erreur admissible	Dans la Tolérance
Zero 1	0.0000 g	0.0000 g	0.0000 g	0 d	1 d	OUI
2	0.0100 g	0.0100 g	0.0000 g	0 d	1 d	OUI
3	0.1000 g	0.1000 g	0.0000 g	0 d	1 d	OUI
4	1.0000 g	1.0000 g	0.0000 g	0 d	1 d	OUI
5	10.0000 g	10.0000 g	0.0000 g	0 d	2 d	OUI
6	20.0000 g	20.0000 g	0.0000 g	0 d	2 d	OUI
7	50.0000 g	50.0000 g	0.0000 g	0 d	3 d	OUI
8	100.0000 g	100.0000 g	0.0000 g	0 d	3 d	OUI
9	150.0000 g	150.0001 g	0.0001 g	1 d	3 d	OUI
Max 10	200.0000 g	200.0002 g	0.0002 g	2 d	3 d	OUI
11	150.0000 g	150.0001 g	0.0001 g	1 d	3 d	OUI
12	100.0000 g	100.0000 g	0.0000 g	0 d	3 d	OUI
13	50.0000 g	50.0000 g	0.0000 g	0 d	3 d	OUI
14	20.0000 g	20.0000 g	0.0000 g	0 d	2 d	OUI
15	10.0000 g	10.0000 g	0.0000 g	0 d	2 d	OUI
16	1.0000 g	1.0000 g	0.0000 g	0 d	1 d	OUI
17	0.1000 g	0.1000 g	0.0000 g	0 d	1 d	OUI
18	0.0100 g	0.0100 g	0.0000 g	0 d	1 d	OUI
Zero 19	0.0000 g	0.0000 g	0.0000 g	0 d	1 d	OUI

☐ Méthode de substitution utilisée

Un réglage de la balance a été requis

Si NON, les résultats relatifs à l'état du système avant la prestation de service correspondent à l'état de

☒ OUI

☐ NON

Répétabilité

Poids appliqués : 20.0000 g

	Chargé	Vide	Différence
1	20.0001 g	0.0000 g	20.0001 g
2	20.0002 g	0.0000 g	20.0002 g
3	20.0001 g	0.0000 g	20.0001 g
	Erreur maximale :	0.0002 g	2.0 d
	Tolérance :	0.0002 g	2 d

Incertitude

Mesure de l'incertitude = 0.00020 g

Les meilleures incertitudes représentent les incertitudes étendues selon un facteur de sécurité K=2 générant un niveau de confiance approximatif de 95 %. Des dispositions doivent être prises en matière d'environnement au lieu d'étalonnage, d'incertitude induite par l'article en étalonnage et d'effets indésirables causés par le transport du matériel d'étalonnage. Ces facteurs pourraient entraîner une incertitude plus grande que le BMC.

Remarques

Aucune.

Thermal Metering System Calibration

Y factor for Method 5G sampling

Manufacturer: American Meter Company
 Model: DTM-200A
 Serial Number: 90R054300

Previous Calibration Comparison

Date	2011-03-01	Acceptable	
		Deviation (5%)	Deviation
y Factor	1,003	0,05015	0,011
Acceptance	Acceptable		

**Average Gas
Meter y Factor**
1,014

Calibration Date: 09-29-11
 Calibrated by: Claude Paré
 Calibration Frequency: 6-month
 Next Calibration Due: 03-29-12
 Instrument Range: 1,000 cfm
 Standard Temp.: 77,4 °F
 Standard Press.: 29,92 "Hg
 Barometric Press.: 29,63 "Hg

Signature/Date: 2011-09-29

Current Calibration

Acceptable y Deviation	0,020
Maximum y Deviation	0,001
Acceptance	Acceptable

Reference Standard *

Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	21-mars-11	
	Calib. Value	1,0070	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0,00	0,00	0,00
dH ("H ₂ O)	0,00	0,00	0,00
Initial Reference Meter	760,2	765,5	771,1
Final Reference Meter	765,2	770,6	776,9
Initial DGM	698,092	703,412	709,07
Final DGM	703,059	708,484	714,848
Temp. Ref. Meter (°F), Tr	76,9	77,2	77,2
Temperature DGM (°F), Td	77,5	78,2	78,6
Time (Minutes)	77,0	28,0	17,0
Net Volume Ref. Meter, Vr	5,000	5,100	5,800
Net Volume DGM, Vd	4,967	5,072	5,778
Gas Meter y Factor =	1,015	1,014	1,013
Gas Meter y Factor Deviation (from avg.)	0,001	0,000	0,001
Orifice dH@	0,00	0,00	0,00
Orifice dH@ Deviation (from avg.)	0,000	0,000	0,000

where: 0,064506494

1. Deviation = |Average value for all runs - current run value|
2. $y = [Vr \times (y \text{ factor (ref)}) \times (Pb) \times (Td + 460)] / [Vd \times (Pb + (dH / 13.6)) \times (Tr + 460)]$
3. $dH@ = 0.0317 \times dH / (Pb (Td + 460)) \times [(Tr + 460) \times \text{time}] / Vr]^2$

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

Thermal Metering System Calibration

Y factor for Method 5G sampling

Manufacturer: American Meter Company
 Model: DTM-200A
 Serial Number: 98Z332226

**Average Gas
Meter y Factor**
1,011

Calibration Date: 09-29-11
 Calibrated by: Claude Paré
 Calibration Frequency: 6-month
 Next Calibration Due: 03-29-12
 Instrument Range: 1,000 cfm
 Standard Temp.: 78,3 °F
 Standard Press.: 29,92 "Hg
 Barometric Press.: 29,59 "Hg
 Signature/Date: 2011-09-29

Previous Calibration Comparision

Date	2011-03-01	Acceptable	
		Deviation (5%)	Deviation
y Factor	0,996	0,0498	0,015
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0,020
Maximum y Deviation	0,001
Acceptance	Acceptable

Reference Standard *

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	21-mars-11
	Calib. Value	1,0070 y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0,00	0,00	0,00
dH ("H ₂ O)	0,00	0,00	0,00
Initial Reference Meter	777,8	783,1	789,7
Final Reference Meter	782,8	789,2	799,6
Initial DGM	515,021	520,372	527,019
Final DGM	520,014	526,465	536,898
Temp. Ref. Meter (°F), Tr	77,6	78,0	78,1
Temperature DGM (°F), Td	78,6	79,1	79,5
Time (Minutes)	60,0	30,0	32,0
Net Volume Ref. Meter, Vr	5,000	6,100	9,900
Net Volume DGM, Vd	4,993	6,093	9,879
Gas Meter y Factor =	1,010	1,010	1,012
Gas Meter y Factor Deviation (from avg.)	0,000	0,001	0,001
Orifice dH@	0,00	0,00	0,00
Orifice dH@ Deviation (from avg.)	0,000	0,000	0,000

where: 0,083216667

1. Deviation = |Average value for all runs - current run value|
2. $y = [Vr \times (y \text{ factor (ref)}) \times (Pb) \times (Td + 460) / [Vd \times (Pb + (dH / 13.6)) \times (Tr + 460)]$
3. $dH@ = 0.0317 \times dH / (Pb (Td + 460)) \times [(Tr + 460) \times \text{time}] / Vr]^2$

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272

CERTIFICATE OF NIST TRACEABLE CALIBRATION

Calibration Certificate No: 24648

Customer Information

Customer: SBI St-Augustin

Address : 250, De Copenhague

Doors 11-12

St-Augustin-de-Desmaures

Customer PO #: 23966



**LABORATORY
ACCREDITATION
BUREAU**
ACCREDITED

Certificate # L2115-1 Calibration

ISO 17025-2005 ACCREDITED

Calibration Procedure Information

Procedure ID: GTP FLOW_INDI

Revision #: 3

Revision Date: 7/21/2008

Calibration Standards Information

<u>Graftel ID</u>	<u>Manufacturer</u>	<u>Model #</u>	<u>Description</u>	<u>CAL Due</u>
10159	HOBO	U12-011	Environment Monitor System	6/22/2011
60030	Paroscientific	760-100A	Pressure, 100 psia	8/24/2011
10128	Furness	FCO352	Diff Pressure	8/24/2011
10062	Graftel	9202	5-Channel Temperature Sensor	8/28/2012
10075	Meriam	50MJ10-9	Laminar Flowmeter	6/23/2011
51202	Paroscientific	760-100A	Pressure, 100 Psia	2/24/2012

Sensor Information

Manufacturer: American Meter

Description: Gas Meter

Method Used: Laminar

Model #: DTM-200A

Rated Accuracy: ± 1 % of Reading

Accuracy Specified By: American Met.

Instrument ID#: SBI-103

Range: 0 to 250 scfh

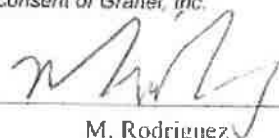
Condition: Functional

Serial #: 07J264834

Comments: Calibration Date: 03-21-2011

The instrument(s) listed on this certificate have been calibrated against standards traceable to the National Institute of Standards and Technology (NIST) or compared to nationally or internationally recognized consensus standards. The reported calibration uncertainty has a confidence level of 95% (K=2). A calibration uncertainty ratio of 4:1 was maintained unless required uncertainty support by analysis. Graftel, Inc. Quality Assurance System complies with applicable requirements of ISO/IEC-17025-2005, ANSI/NCSL Z540-1-1994 and ISO 9002, 1994(E). All results contained within this certification relate only to item(s) calibrated. This certificate shall not be reproduced except in full and with the written consent of Graftel, Inc.

Performed By:


M. Rodriguez
Calibration Technician

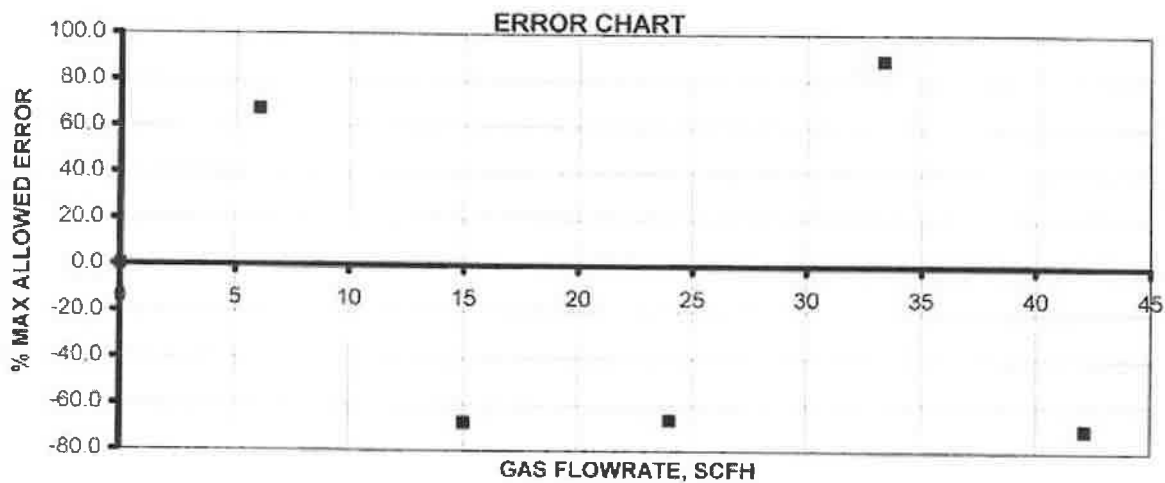
Date:

3/21/11

**ATTACHMENT TO CALIBRATION CERTIFICATE 24648
AS FOUND DATA**

Page 2 of 2

Air Flow Rate From Standard, scfh	Air Vol From Standard, scf	Air Vol From Meter, cf	Air vol From Meter, scf	Diff Air Vol STD - METER scf	% Proof	Measurement Uncertainty, scf	STATUS
6.069	0.2962	0.300	0.294	0.00	100.679	0.002	Pass
15.044	0.9576	1.000	0.964	-0.01	99.327	0.005	Pass
24.043	0.9605	1.000	0.967	-0.01	99.338	0.005	Pass
33.346	1.9576	2.000	1.940	0.02	100.896	0.010	Pass
42.149	1.935	2.000	1.949	-0.01	99.301	0.010	Pass



INSTRUMENT SPECIFICATIONS		
Test Gas	Air	
Standard Pressure, Meter	14.73	psia
Standard Temperature, Meter	60	F
Rated Accuracy	1	% Rding
Full Scale Flow Rate	250	scfh Natural Gas @ 1/2 inch WC
LABORATORY AMBIENT CONDITIONS		
Pressure	14.40	psia
Humidity	30.8	% RH
Temperature	69.6	F



www.grafel.com

Flow - Humidity - Temperature - Pressure - Design - Consulting - Engineering

NIST Traceable Calibration Data Sheet

Grafel, LLC, 870 Cambridge Drive, Elk Grove Village, IL 60007
P. 847-384-2600 F. 847-384-2899

Date: 12/1/2010

Equipment: SBI-134 (T1) Temperature: 72 F
Accuracy: 0.2 R.H.: 25%
Reference: SBI-096

S.D.		0.01	%	
R.M.U.		0.29	%	
O.M.U		1.28	%	
	Ave A.D.		0.57	%
Standard	Reading	A.D.		
70.0		69.6	0.57	
70.0		69.6	0.57	
70.0		69.6	0.57	

S.D.		0.01	%	
R.M.U.		0.10	%	
O.M.U		1.02	%	
	Ave A.D.		0.50	%
Standard	Reading	A.D.		
200.0		199.2	0.40	
200.0		199.2	0.40	
200.0		198.6	0.70	

S.D.		0.00	%	
R.M.U.		0.03	%	
O.M.U		0.30	%	
	Ave A.D.		0.14	%
Standard	Reading	A.D.		
600.0		599.2	0.13	
600.0		599.0	0.17	
600.0		599.2	0.13	

S.D.		0.00	%	
R.M.U.		0.02	%	
O.M.U		0.16	%	
	Ave A.D.		0.08	%
Standard	Reading	A.D.		
1000.0		999.2	0.08	
1000.0		999.2	0.08	
1000.0		999.2	0.08	

S.D.		0.00	%	
R.M.U.		0.01	%	
O.M.U		0.13	%	
	Ave A.D.		0.06	%
Standard	Reading	A.D.		
1400.0		1399.0	0.07	
1400.0		1399.2	0.06	
1400.0		1399.2	0.06	

Technician: Vincent Pelletier

Date: 12/1/2011

Equipment: SBI-134 (T2) Temperature: 72 F
Accuracy: 0.2 R.H.: 25%
Reference: SBI-096

S.D.	0.01	%	
R.M.U.	0.29	%	
O.M.U	0.95	%	
	Ave A.D.	0.38	%
Standard	Reading	A.D.	
70.0	70.2	0.29	
70.0	70.2	0.29	
70.0	70.4	0.57	

S.D.	0.00	%	
R.M.U.	0.10	%	
O.M.U	0.33	%	
	Ave A.D.	0.13	%
Standard	Reading	A.D.	
200.0	200.2	0.10	
200.0	200.4	0.20	
200.0	200.2	0.10	

S.D.	0.00	%	
R.M.U.	0.03	%	
O.M.U	0.08	%	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
600.0	600.0	0.00	
600.0	599.6	0.07	
600.0	600.0	0.00	

S.D.	0.00	%	
R.M.U.	0.02	%	
O.M.U	0.04	%	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1000.0	999.8	0.02	
1000.0	1000.0	0.00	
1000.0	1000.0	0.00	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	0.05	%	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
1400.0	1399.6	0.03	
1400.0	1399.6	0.03	
1400.0	1400.0	0.00	

Technician: Vincent Pelletier



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.: 280384
Identification: SBI-096
Description: CALIBRATOR, OMEGA CL23A
Size: TC K/J/T
Manufacturer: OMEGA
Model no.: CL23A
Serial no.: T-256137

Calibration date: August 25, 2011
Certificate issued: August 25, 2011
Interval: 12 months
Due date: August 25, 2012
Procedure no.: MET/CAL
Environment: CLAS Type 2 Laboratory
Temperature: $23 \pm 2^{\circ}\text{C}$
Humidity: 35 - 55% RH
Metrologist: NRS

Property of: SBI
250 RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Approved by:


David Llorens, VP Quality

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and QM-08. 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 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.

CALIBRATION DATA

See next page for measurement results.

Notes:

9V battery replaced.



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

Tél. (514) 831-8853
Fax (514) 831-8122
info@ulrich.ca
www.ulrich.ca

CALIBRATION DATA

Certificate no.: 280384
Identification: SBI-096
Description: CALIBRATOR THERMOMETER
Serial no.: T-256137
Procedure: Omega CL23A; 5520A-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
7870009	CALIBRATOR	FLUKE	5520A	2011/05/06	2012/05/06

MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE	TEST	ACCEPTANCE LIMITS		PASS/	TUR
	VALUE	RESULT	LOW	HIGH	FAIL	

Temperature measurements are performed by electrical simulation.

DISPLAY CALIBRATION

Did all segments of the display illuminate?
Result of Operator Evaluation

PASS

THERMOMETER CALIBRATION

K Type Thermocouple

-200.0degF	-201.0	-201.0	-199.0	PASS	1.7
-60.0degF	-60.4	-61.0	-59.0	PASS	3.1
-40.0degF	-40.5	-40.5	-39.5	PASS	1.5
32.0degF	31.5	31.5	32.5	PASS	1.7
1240.0degF	1239.5	1239.5	1240.5	PASS	1.1
1260.0degF	1259.5	1259.5	1260.5	PASS	1.1
2500.0degF	2499.3	2499.0	2501.0	PASS	1.4

J Type Thermocouple

-200.0degF	-200.7	-201.0	-199.0	PASS	2.1
-60.0degF	-60.4	-61.0	-59.0	PASS	3.5
-40.0degF	-40.5	-40.5	-39.5	PASS	1.7
32.0degF	31.6	31.5	32.5	PASS	2.0
1240.0degF	1239.6	1239.5	1240.5	PASS	1.6
1260.0degF	1259.7	1259.5	1260.5	PASS	1.6
1400.0degF	1399.6	1399.4	1400.6	PASS	1.8

T Type Thermocouple

T Type Thermocouple

-200.0degF	-200.2	-201.0	-199.0	PASS	2.3
-60.0degF	-60.0	-61.0	-59.0	PASS	2.3
-40.0degF	-40.1	-40.5	-39.5	PASS	1.2
32.0degF	31.9	31.5	32.5	PASS	1.7
750.0degF	749.8	749.5	750.5	PASS	2.0

CALIBRATOR CALIBRATION



Ulrich Metrologie inc.
Ulrich Metrology inc.
6612, Côte-de-Leslie
Montréal (Québec) H8T 1A1

Tél. (514) 831-8653
Fax (514) 831-8122
info@ulrich.ca
www.ulrich.ca

PARAMETER	TRUE	TEST	ACCEPTANCE LIMITS		PASS/	TUR
	VALUE	RESULT	LOW	HIGH	FAIL	
K Type Thermocouple						
-200.0degF		-199.4	-201.0	-199.0	PASS	1.7
-60.0degF		-59.8	-61.0	-59.0	PASS	3.1
-40.0degF		-39.8	-40.5	-39.5	PASS	1.5
32.0degF		32.1	31.5	32.5	PASS	1.7
1240.0degF		1239.5	1239.5	1240.5	PASS	1.1
1260.0degF		1259.5	1259.5	1260.5	PASS	1.1
2500.0degF		2499.0	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-200.0	-201.0	-199.0	PASS	2.1
-60.0degF		-60.2	-61.0	-59.0	PASS	3.5
-40.0degF		-40.0	-40.5	-39.5	PASS	1.7
32.0degF		31.8	31.5	32.5	PASS	2.0
1240.0degF		1239.5	1239.5	1240.5	PASS	1.6
1260.0degF		1259.5	1259.5	1260.5	PASS	1.6
1400.0degF		1399.5	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-199.2	-201.0	-199.0	PASS	2.3
-60.0degF		-59.9	-61.0	-59.0	PASS	2.3
-40.0degF		-39.7	-40.5	-39.5	PASS	1.2
32.0degF		32.1	31.5	32.5	PASS	1.7
750.0degF		749.6	749.5	750.5	PASS	2.0

End of Test Data



4850, bd Gouin est
Montréal-Nord, Qc
Canada H1G 1A2

www.chevrierinstruments.com

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

Tél. (514) 328-2550
1 800 522-1226
Fax (514) 327-0604

info@chevrierinstruments.com

Certificat d'étalonnage

Numéro du certificat: CE1638

Étalonnage effectué par :

LA CIE J. CHEVRIER INSTRUMENTS INC.
4850 GOUIN EST
MONTREAL, QC, CANADA H1G 1A2

Pour :

3424
SBI INC.
250, RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMANURES, QC G3A 2H3

Informations sur l'instrument

Description: MANOMETRE DIFFERENTIEL ANALOGIQUE

Manufacturier: DWYER

Modèle: 2000-00N

Plage: 0/0.20 POH2O

Précision: $\pm 4\%$ P.E.

Numéro de série :

I.D.: SBI-025

Etat de l'instrument: BON

Commentaire :

Date d'étalonnage : 2011-02-10

Échéance : 2012-02-10

Résultat de l'étalonnage: Conforme

Conditions ambiantes 20.9 °C / 29.9%HR

Technicien : Pierre Junior Berlus

PJB

C.Q.
PJB

POINTS D'ÉTALONNAGE

	Valeur Appliquée	Tolérance -	Lectures	Tolérance +	Verdict
Ascendant	0.0000 poH2O	-0.0100	0	0.0100	OK
Ascendant	0.0500 poH2O	0.0400	0.045	0.0600	OK
Ascendant	0.1000 poH2O	0.0900	0.095	0.1100	OK
Ascendant	0.1500 poH2O	0.1400	0.1425	0.1600	OK
Ascendant	0.2000 poH2O	0.1900	0.1925	0.2100	OK
	Valeur Appliquée	Tolérance -	Lectures	Tolérance +	Verdict
Descendant	0.2000 poH2O	0.1900	0.1925	0.2100	OK
Descendant	0.1500 poH2O	0.1400	0.1425	0.1600	OK
Descendant	0.1000 poH2O	0.0900	0.095	0.1100	OK
Descendant	0.0500 poH2O	0.0400	0.045	0.0600	OK
Descendant	0.0000 poH2O	-0.0100	0	0.0100	OK

Étalons utilisés traçable au C.N.R.C / N.I.S.T

I.D.	Certificat No	Description	Étalonné le	Échéance
CHEV175	12688334994	CALIBRATEUR DE PRESSION DH PPC4	2010-03-17	2011-03-17

Verdict * = Point non conforme

Page 1 of 2

Enregistré par le BNQ selon ISO 9001:2008

Certificat d'étalonnage

Numéro du certificat: CE1638

Procédures utilisées pour effectuer cet étalonnage

Procédure	Description
3PR500-01-CHE	ÉTALONNAGE DE MANOMÈTRE



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

Numéro du certificat: CE1639

Étalonnage effectué par :

LA CIE J. CHEVRIER INSTRUMENTS INC.
4850 GOUIN EST
MONTREAL, QC, CANADA H1G 1A2

Pour :

3424
SBI INC.
250, RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMANURES, QC G3A 2H3

Informations sur l'instrument

Description: MANOMETRE DIFFERENTIEL ANALOGIQUE

Manufacturier: DWYER

Modèle: 2000-00

Plage: 0/0.25 POH2O

Précision: $\pm 4\%$ P.E.

Numéro de série :

I.D.: SBI-027

Etat de l'instrument: BON

Commentaire :

Date d'étalonnage : 2011-02-10

Échéance : 2012-02-10

Résultat de l'étalonnage: Conforme

Conditions ambiantes 20,9 °C / 29.9%HR

Technicien : Pierre Junior Berlus

PJB



POINTS D'ÉTALONNAGE

	Valeur Appliquée	Tolérance -	Lectures	Tolérance +	Verdict
Ascendant	0.0000 poH2O	-0.0100	0	0.0100	OK
Ascendant	0.0500 poH2O	0.0400	0.045	0.0600	OK
Ascendant	0.1000 poH2O	0.0900	0.10	0.1100	OK
Ascendant	0.1500 poH2O	0.1400	0.15	0.1600	OK
Ascendant	0.2000 poH2O	0.1900	0.205	0.2100	OK
Ascendant	0.2450 poH2O	0.2350	0.25	0.2550	OK
	Valeur Appliquée	Tolérance -	Lectures	Tolérance +	Verdict
Descendant	0.2450 poH2O	0.2350	0.25	0.2550	OK
Descendant	0.2000 poH2O	0.1900	0.205	0.2100	OK
Descendant	0.1500 poH2O	0.1400	0.15	0.1600	OK
Descendant	0.1000 poH2O	0.0900	0.10	0.1100	OK
Descendant	0.0500 poH2O	0.0400	0.045	0.0600	OK
Descendant	0.0000 poH2O	-0.0100	0	0.0100	OK

Certificat d'étalonnage

Numéro du certificat: CE1639

Étalons utilisés traçable au C.N.R.C / N.I.S.T

I.D.	Certificat No	Description	Étalonné le	Échéance
CHEV175	12688334984	CALIBRATEUR DE PRESSION DH PPC4	2010-03-17	2011-03-17

Procédures utilisées pour effectuer cet étalonnage

Procédure	Description
3PR500-01-CHE	ÉTALONNAGE DE MANOMÈTRE



CHEVRIER
INSTRUMENTS INC.

4850, bd Gouin est
Montréal-Nord, QC
Canada H1G 1A2

www.chevrierinstruments.com

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

Tél. (514) 328-2550
1 800 522-1226
Fax (514) 327-0604

info@chevrierinstruments.com

Certificat d'étalonnage

Numéro du certificat: CE1640

Étalonnage effectué par :

LA CIE J. CHEVRIER INSTRUMENTS INC.
4850 GOUIN EST
MONTREAL, QC, CANADA H1G 1A2

Pour :

3424
SBI INC
250, RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Informations sur l'instrument

Description: MANOMETRE DIFFERENTIEL ANALOGIQUE
Manufacturier: DWYER
Modèle: 2000-00
Plage: 0/0.25 poH2O
Précision: $\pm 4\%$ P.E.
Numéro de série :
I.D.: SBI-101
Etat de l'instrument: BON

Date d'étalonnage : 2011-02-10

Échéance : 2012-02-10

Résultat de l'étalonnage: Conforme

Conditions ambiantes 20.9 °C / 29.9%HR

Technicien : Pierre Junior Berlus

PJB



POINTS D'ÉTALONNAGE

	Valeur Appliquée	Tolérance -	Lectures	Tolérance +	Verdict
Ascendant	0.0000 poH2O	-0.0100	0	0.0100	OK
Ascendant	0.0500 poH2O	0.0400	0.045	0.0600	OK
Ascendant	0.1000 poH2O	0.0900	0.10	0.1100	OK
Ascendant	0.1500 poH2O	0.1400	0.15	0.1600	OK
Ascendant	0.2000 poH2O	0.1900	0.20	0.2100	OK
Ascendant	0.2500 poH2O	0.2400	0.25	0.2600	OK
	Valeur Appliquée	Tolérance -	Lectures	Tolérance +	Verdict
Descendant	0.2500 poH2O	0.2400	0.25	0.2600	OK
Descendant	0.2000 poH2O	0.1900	0.20	0.2100	OK
Descendant	0.1500 poH2O	0.1400	0.15	0.1600	OK
Descendant	0.1000 poH2O	0.0900	0.10	0.1100	OK
Descendant	0.0500 poH2O	0.0400	0.045	0.0600	OK
Descendant	0.0000 poH2O	-0.0100	0	0.0100	OK

Certificat d'étalonnage

Numéro du certificat: CE1640

Étalons utilisés traçable au C.N.R.C / N.I.S.T

I.D.	Certificat No	Description	Étalonné le	Échéance
CHEV175	12688334994	CALIBRATEUR DE PRESSION DH PPC4	2010-03-17	2011-03-17

Procédures utilisées pour effectuer cet étalonnage

Procédure	Description
3PR500-01-CHE	ÉTALONNAGE DE MANOMÈTRE

Date: 3/28/2011

Equipment: SBI-214 (12%)
Accuracy: 0.1
Reference: SBI-153

Temperature: 65F
R.H.: 35%

S.D.	0.01	%	
R.M.U.	0.79	%	
O.M.U	2.23	%	
	Ave A.D.	0.79	%
Standard	Reading	A.D.	
12.7	12.8	0.79	

Equipment: SBI-214 (22%)
Accuracy: 0.1
Reference: SBI-153

Temperature: 65F
R.H.: 35%

S.D.	0.01	%	
R.M.U.	0.42	%	
O.M.U	1.90	%	
	Ave A.D.	0.85	%
Standard	Reading	A.D.	
23.6	23.8	0.85	

Technician: Claude Paré



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

Numéro du certificat: CE6926

Étalonnage effectué par :

LA CIE J. CHEVRIER INSTRUMENTS INC.
4850 GOUIN EST
MONTREAL, QC, CANADA H1G 1A2

Pour :

3424
SBI INC.
250, RUE DE COPENHAGUE
ST-AUGUSTIN-DE-DESMAURES, QC G3A 2H3

Informations sur l'instrument

Description: TUBE DE PITOT EN S

Manufacturier: DWYER

Modèle: 160S-24

Numéro de série :

I.D.: SBI-104

État de l'instrument: BON

Approuvé par :

Date d'étalonnage : 2011-08-17

Échéance : 2012-08-17

Résultat de l'étalonnage: Reçu Conforme

Conditions ambiantes: 21.7 °C / 42.5%hr

Technicien : Benjamin Ricard

C.Q.
B.R.

Commentaire :

Points d'étalonnage

Valeur Appliquée pi/min	Pitot Étalon "Ce	Pitot sous test "Ce	Facteur
297 pi/min	0.0055 poH2O	0.0058 poH2O	0.97
502 pi/min	0.0157 poH2O	0.0205 poH2O	0.88
799 pi/min	0.0398 poH2O	0.0593 poH2O	0.82
999 pi/min	0.0622 poH2O	0.0901 poH2O	0.83
1998 pi/min	0.2488 poH2O	0.3521 poH2O	0.84
2500 pi/min	0.3896 poH2O	0.5515 poH2O	0.84
2999 pi/min	0.5605 poH2O	0.7945 poH2O	0.84
3998 pi/min	0.9965 poH2O	1.3695 poH2O	0.85
5000 pi/min	1.5583 poH2O	2.1798 poH2O	0.85

Reproduction interdite sans consentement écrit

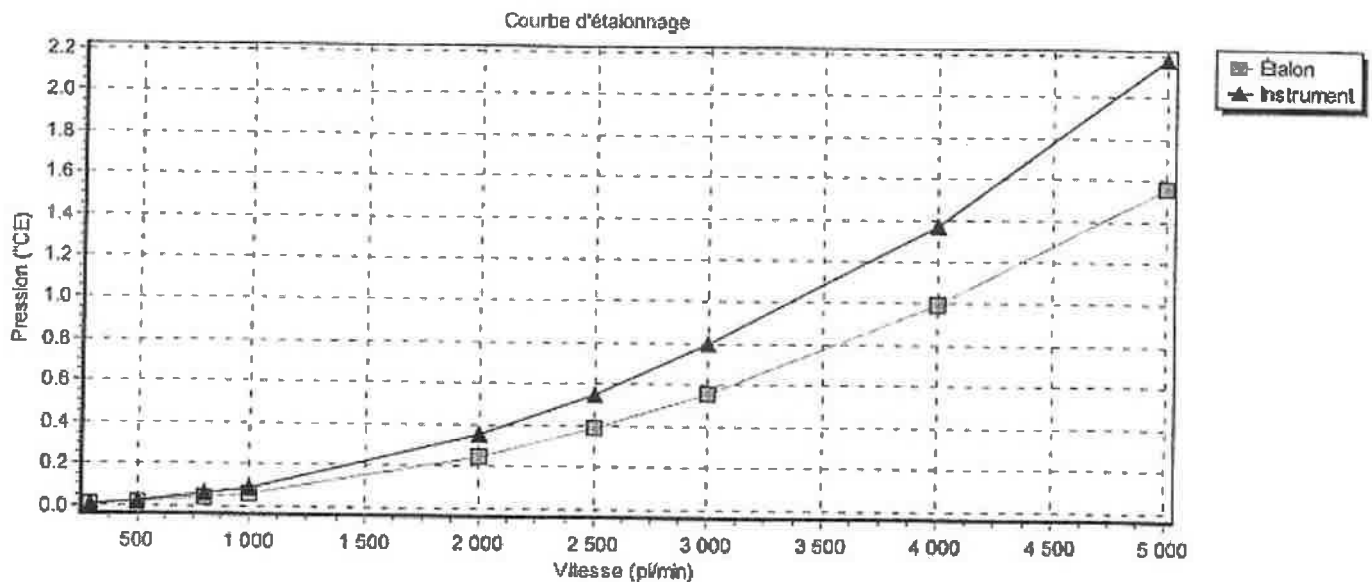
Verdict * = Point non conforme

Page 1 of 2

Enregistré par le BNQ selon ISO 9001:2008

Certificat d'Étalonnage

Numéro du certificat: CE6926



Étalons utilisés traçables au G.N.R.C / N.I.S.T ou non traçables

I.D.	Certificat No	Description	Étalonné le	Échéance
CHEV029	CE530	MANOMETRE NUMERIQUE FURNESS PPC500	2010-12-20	2011-12-20
CHEV031	CHEV121-100030	TUYÈRE AIRFLOW DEVELOPMENTS	2010-08-30	2011-08-30

Procédures utilisées dans cet étalonnage

Procédure	Description	Date de révision
3PR500-22-CHE	ÉTALONNAGE TUBE DE PITOT	

Reproduction interdite sans consentement écrit

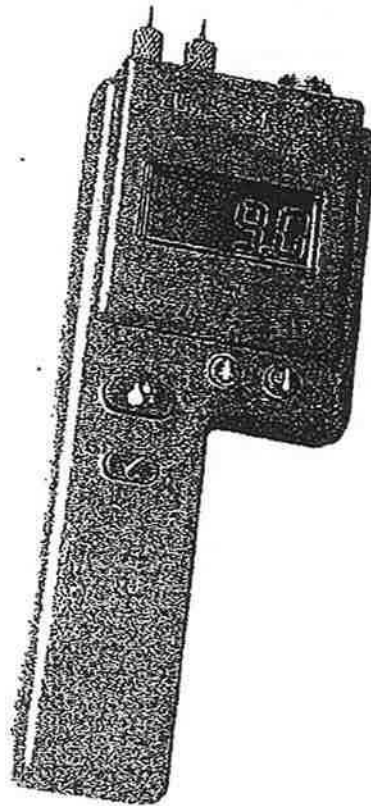
Verdict x = Point non conforme

Page 2 of 2

Enregistré par le BNC selon ISO 9001:2008

J-2000

owners manual

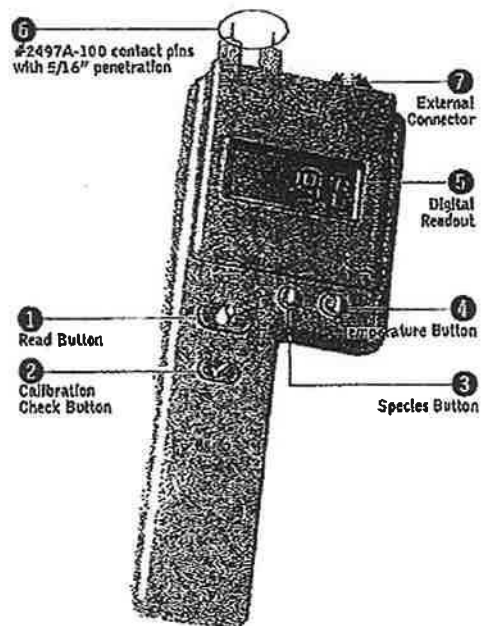


DELMHORST
INSTRUMENT CO.
WHEN ACCURACY IS THE POINT.™

TABLE OF CONTENTS

- 2 J-2000 Features
- 3 Before You Begin
- 3 Check Calibration
- 4 Set Species
- 5 Species Code Chart
- 6 Set Temperature
- 7 Set Pin Calibration
- 7 Taking a Reading
- 8 Information About Your Readings
 - 8 To Check Accumulated Readings
 - 8 To Reset Meter
- 9 Pin Talk
- 9 Care of Your Meter
- 10 Service For Your Meter
- 11 Warranty

DELMHORST J-2000



J-2000 FEATURES

- ▶ Resistance technology recognized worldwide as the most accurate method for measuring moisture
- ▶ 6% to 40% moisture range
- ▶ Digital readout
- ▶ Averages up to 100 accumulated readings
- ▶ Built-in correction for 48 different species
- ▶ Built-in temperature compensation both Fahrenheit and Celsius
- ▶ Proven microcontroller circuit for increased reliability and accuracy
- ▶ Easy one-hand operation
- ▶ Includes (1) 9-Volt Battery
- ▶ Includes sturdy carrying case
- ▶ One-year warranty
- ▶ Over fifty years of proven quality, accuracy and service

BEFORE YOU BEGIN

Button Functions

- ① **READ BUTTON** - Reads the Percent Moisture Content value (%MC), corrected for temperature and species.
- ② **CALIBRATION CHECK BUTTON** - Checks meter calibration. It also displays the average of up to 100 accumulated readings; displays the maximum stored reading; erases the readings.
- ③ **SPECIES BUTTON** - Sets the species code for the wood you are using. Species are numbered from 1 to 48 and are listed on the Species Code Chart. This button also acts as a scroll key, depending on the function.
- ④ **TEMPERATURE BUTTON** - Sets the wood temperature and changes the temperature mode (Fahrenheit or Celsius). This button also acts as a scroll key, depending on the function.


CHECK CALIBRATION






Press the calibration check button ② and read button ① simultaneously. Meter is in calibration if it displays 12% (+ or - .2).

If you check the calibration and the meter does not display 12% it is likely an indication of a low battery. If this occurs, change the battery immediately. Continued use with a low battery may cause the meter to go out of calibration. If you have a fresh battery and the instrument still does not indicate a proper calibration, return it to DELMHORST for service. See Service for your Meter section.

When the battery is removed and then reconnected, the meter displays its software version for one second and then turns itself off. After replacing the battery, you must reset the meter as described in Resetting the Meter section.

SET SPECIES

The J-2000 defaults to Species Code #1 - Douglas Fir - the USDA standard and basis for all calibrations. Because the electrical characteristics of different species vary, all species read differently at the same moisture content. For this reason you need to adjust for species. If you are working with a species other than Douglas Fir, set the species code using the species button , and the meter will make the necessary corrections.

- ▶ To change species press the species button . The meter will display the current species code for one second.
- ▶ To scroll forward through the species list hold the species button  while the current species code is displayed and scroll to the species number desired.
- ▶ To scroll backward through the species list, press and release the species button . Within one second, press and hold the temperature button . Continue to hold the temperature button  and the species number will decrease.
- ▶ When scrolling in either direction, release the button to stop at your desired species.

The J-2000 can be used to test more than just wood. It will also give a relative reading on plywood, OSB, particleboard and MDF or can be fitted with a 26-ES slide hammer for specific applications. Call Delmhorst at 1-877-DELMHORST or e-mail info@delmhorst.com for information on how to interpret the readings for other materials.






Species Code Chart

CODE / SPECIES	CODE / SPECIES
1 Fir, Douglas	25 Magnolia
2 Pine, Southern	26 Mahogany, African (also Khaya)
3 SPF	27 Mahogany, Honduras
4 Alder	28 Mahogany, Philippine
5 Apitong	29 Maple, Hard/Soft
6 Aspen	30 Meranti, Dark Red
7 Ash, White	31 Oak, Red
8 Basswood	32 Oak, White
9 Birch	33 Pecan
10 Cedar, Eastern Red	34 Pine, Longleaf
11 Cedar, Incense	35 Pine, Ponderosa
12 Cherry	36 Pine, Shortleaf
13 Cottonwood	37 Pine, Sugar
14 Cypress	38 Pine, White
15 Elm, American	39 Poplar, Yellow
16 Fir, Red	40 Ramin
17 Fir, White	41 Radiata Pine
18 Gum, Black	42 Redwood
19 Gum, Red	43 Spruce, Sitka
20 Hemlock, Western	44 SPF, COFI*
21 Hackberry	45 Teak
22 Hickory	46 Virola
23 Keruing	47 Walnut, Black
24 Larch	48 Western Hemlock - COFI*



*Species and temperature correction data for both Western Hemlock-COFI (code #48) and SPF-COFI (code #44) were developed by COFI. When comparing readings between the model RDM-2/COFI or the RDM-2S/COFI, used with type 26-E electrode with insulated pins, and the J-2000, be sure both meters are set to 2-pin electrode (insulated pins).

SET TEMPERATURE

The J-2000 defaults to a temperature of 70°F. As wood temperature increases, its electrical resistance decreases and indicated moisture content rises. Lower wood temperatures result in lower indicated moisture content. A correction is necessary if the wood temperature is outside the range of 50°F (10°C) to 90°F (32°C). Set the temperature accordingly and the meter will make the correction.

- ▶ To change temperature press and release the temperature button . The meter will display the current temperature for one second.
- ▶ To scroll forward through the temperature settings, press and hold the temperature button  while the current temperature is displayed.
- ▶ To scroll backward press and release the temperature button . Within one second, press and hold the species button . Continue to hold the species button  and the temperature will decrease.
- ▶ When scrolling in either direction, release the button to stop at the desired temperature.

Set Temperature Mode

- ▶ To change from Fahrenheit to Celsius mode or Celsius to Fahrenheit mode press the temperature button .
- ▶ Press the calibration check button  within one second and release when you are in the mode needed.
- ▶ The meter will display the current temperature setting in the new mode and will wait one more second until shutting off so that you may change the temperature value as described above.

If the meter is in Fahrenheit mode, the letter "F" will display in the left-hand corner. If it is in Celsius mode, no letter will appear in the display.

In the Fahrenheit mode, the temperature will change in increments of 5°F. In Celsius, the temperature will change in increments of either 2°C or 3°C depending on its conversion from Fahrenheit.

In the Fahrenheit mode, the temperature value will display in whole numbers. In the Celsius mode, positive values will display in whole numbers; negative values will display with a decimal point and a "-" sign in the left-hand corner. (i.e.: -17.0)

SET PIN CALIBRATION

The basic factory calibration of the J-2000 is for use with uninsulated pins – either the Integral pins ⑥ or with an optional external electrode, such as the #4-E. The difference in readings between insulated and uninsulated pins is small below 10% moisture content. The difference increases as moisture content increases above 10%. When using an electrode with insulated pins, such as the 26-ES, you can change the calibration to compensate for this difference.

- ▶ To change the pin setting, press and release the species button ③, then press the calibration check button ② within one second.
- ▶ The meter will display the current pin calibration as either 222 for insulated or 444 for uninsulated pins.
- ▶ If you continue to hold the calibration check button ②, the meter will change pin calibration. The new calibration will remain in "memory" until you change it again, or you remove the battery.

TAKING A READING

The contact pins ⑥ provided are best for stock up to 6/4. On stock over 6/4 or for hardwoods over 4/4 we recommend using a remote probe such as the 26-ES ram-type electrode. Mount the 26-ES directly to the external connector ⑦. See additional information under the Pin Talk section.

- ▶ Remove the protective cover to expose the pins. Check that the contact pins ⑥ are firmly hand tightened.
- ▶ To take a reading, align the contact pins ⑥ parallel to the grain and push them to their full penetration into the wood, if possible. Insulated pins read only at the tip and can be driven to the desired depth.
- ▶ Press the read button ① and read the moisture content on the meter scale. The meter displays the %MC for two seconds.
- ▶ To add a reading to the sum of all the previously stored readings, release the read button ① within 2 seconds.

INFORMATION ABOUT YOUR READINGS

Readings below 6% will be displayed as a numeric value, (-##.##), and will not be added to accumulation. A reading below 6% which is due to temperature and species adjustments will be shown as a numeric value with no minus sign and this reading will be added to the accumulation.

Readings above 40% are always displayed as 999 and are not added to the accumulation.

The meter will accumulate up to 100 readings. After all 100 readings are stored it will not add new readings until the memory has been cleared. It will also continue to display the average of all 100 readings as a reminder that the memory is full.

When taking and storing readings for a specific wood species, be sure to "clear" the meter before moving on to the next species. If you do not want to group all of the readings together.

TO CHECK ACCUMULATED READINGS

This feature allows you to view the total number of all accumulated readings, the average of those readings, and the highest stored reading.

- ▶ To view the readings press and release the calibration check button ②. First the meter displays the number of accumulated readings for one second, then the average of those readings for two seconds. Then it displays the highest stored reading for two seconds. The total "cycle" time is five seconds.
- ▶ To erase readings hold the calibration check button ② down for 5 seconds. All accumulated readings will be erased and the meter will display "0".

TO RESET METER

- ▶ Press and release the calibration check button ②.
- ▶ Within one second press the species button ③.
- ▶ The meter will reset itself and display "170" to indicate Species #1 (Douglas Fir) at 70°F. All of the readings in memory will be cleared.

PIN TALK

There are two types of contact pins - uninsulated, which were provided with your meter, and insulated. When using uninsulated pins, push them in to the wood to their full length, if possible. This will give you the highest measured reading. Insulated pins read only at the tip and can be driven to a desired depth to gather shell and core (gradient) information. Additional types and lengths of both the insulated and uninsulated pins are available for specific applications.

CARE OF YOUR METER

To keep your meter in good working order:

- ▶ Store your meter in a clean, dry place. The protective carrying case provided is an ideal storage place when the meter is not in use.
- ▶ Change the 9-Volt battery as needed. Continued use with a low battery may cause the meter to go out of calibration.
- ▶ Change contact pins as needed. Keep contact pins hand tightened.
- ▶ Clean the meter and contact pins with any biodegradable cleaner. Use the cleaner sparingly and on external parts only. Keep cleaner out of the external connector 7.
- ▶ Remove the battery if the meter will not be used for one month or longer.

SERVICE FOR YOUR METER

- ▶ Before sending in your meter we recommend you give one of our trained technicians a call. Many times troubleshooting can be taken care of over the phone. Call us at 1-877-DELMHORST.
- ▶ Pack your meter securely. Enclose a purchase order or letter with a brief description of the problem.
- ▶ There is no need to call us for a return authorization number. If you are within the U.S. Customers outside the U.S. must contact us for more specific instructions prior to returning a meter.
- ▶ Include your name, address, daytime phone and fax numbers or e-mail address. If you believe the meter is under warranty, please provide the original sales slip or invoice.
- ▶ Ship via UPS, Express Mail, Priority Mail, or any overnight courier who provides prompt service. Do not use standard parcel post.
- ▶ Insure your instrument for its full value and ship prepaid. We are not responsible for damage in transit.
- ▶ We do not accept COD shipments or cover any incoming freight or duty charges on returned merchandise.
- ▶ Turnaround time on repairs is approximately two weeks.
- ▶ We will call you with an estimate if you specifically request one, or if we determine that the meter may be too costly to repair.
- ▶ Non-warranty repairs will be returned via UPS/COD unless you have already established other payment terms. There is no COD service outside the U.S. To pay by credit card, include the card number and expiration date with your repair. We accept Visa/MasterCard and American Express.
- ▶ Warranty repairs will be returned at no charge if shipped within the U.S. via UPS Ground Service. Freight charges for expedited services (i.e., Federal Express, UPS/2 Day, UPS/1 Day, etc.) are the customer's responsibility and will be charged as per the above terms.

WARRANTY

Delmhorst Instrument Co., referred to hereafter as Delmhorst, guarantees its J-2000 meter for one year from date of purchase and any optional electrodes against defects in material or workmanship for 90 days. If, within the warranty period, you find any defect in material or workmanship return the meter following the instructions in the **Service for Your Meter** section. This limited warranty does not cover abuse, alteration, misuse, damage during shipment, improper service, unauthorized or unreasonable use of the meter or electrodes. This warranty does not cover batteries or contact pins. If the meter or any optional electrodes have been tampered with, the warranty shall be void. At our option we may replace or repair the meter.

Delmhorst shall not be liable for incidental or consequential damages for the breach of any express or implied warranty with respect to this product or its calibration. With proper care and maintenance the meter should stay in calibration; follow the instructions in the **Care of Your Meter** section.

Under no circumstances shall Delmhorst be liable for any incidental, indirect, special, or consequential damages of any type whatsoever, including, but not limited to, lost profits or downtime arising out of or related in any respect to its meters or electrodes and no other warranty, written, oral or implied applies. Delmhorst shall in no event be liable for any breach of warranty or defect in this product that exceeds the amount of purchase of this product.

The express warranty set forth above constitutes the entire warranty with respect to Delmhorst meters and electrodes and no other warranty, written, oral, or implied applies. This warranty is personal to the customer purchasing the product and is not transferable.

Appendix E

Sample Calculations

Equations and Sample Calculations - Method 5G

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

BR	Dry burn rate, kg/hr
m_p	Total particulate matter collected, mg
$V_{m(std)}$	Volume of gas sampled corrected to standard conditions, dscf
v_s	Average dilution tunnel gas velocity, ft/sec
C_s	Particulate concentration, g/dscf
Q_{sd}	Average dilution tunnel gas flow rate, dscf/min
E	Particulate emission rate, lbs/hr
PR	Proportional rate variation, %

Dry Burn Rate

Using equation 28-3:

$$BR = \frac{60 \times W_{wd}}{\theta} \times \frac{100 - \%M_w}{100}$$

Where,

- BR = Dry burn rate, lb/hr
- W_{wd} = Mass of wood burned (wet basis) during test run, lb
- θ = Total time of test run, minutes
- $\%M_w$ = Average moisture content of test fuel charge, wet basis percent

Sample Calculation:

Dry basis moisture of fuel = 20.03%

Using the equation 28-2 for converting dry basis moisture to wet basis moisture,

$$\%M_w = \frac{20.03 \times 100}{20.03 + 100}$$

$$\%M_w = 16.69\%$$

The wet weight of the fuel charge was 7.8 pounds. Converting pounds to kilograms yields a weight of 3.538 kg. The run time for this run was 180 minutes. Therefore, the burn rate equation appears thus:

$$BR = \frac{60 \times 3.538 \times (100 - 16.69)}{180 \times 100}$$

$$BR = 0.98 \text{ kg/hr} = 2.17 \text{ lb/hr}$$

Volume of Gas Sampled Corrected to Dry Standard Conditions

Using equation 5-1:

$$V_{m(std)} = V_m \times Y \times \left(\frac{T_{std}}{P_{std}} \right) \times \frac{(P_b + \frac{\Delta H}{13.6})}{T_m}$$

Where:

K = 17.64 °R/in. Hg

T_{std} = 528 °R

P_{std} = 29.92 in. Hg

V_m = Volume of gas sample measured at the dry gas meter, dcf

Y = Dry gas meter calibration factor, dimensionless

P_b = Barometric pressure at the testing site, in. Hg

ΔH = Average pressure differential across the orifice meter, in. H₂O

T_m = Absolute average dry gas meter temperature, °R

Sample Calculation:

$$V_{m(std)} = 98.434 \times 1.01 \times \left(\frac{528}{29.92} \right) \times \frac{30.03 + \frac{0.7}{13.6}}{532.5}$$

$$V_{m(std)} = 99.116 \text{ ft}^3$$

Dilution Tunnel Gas Velocity

Using equations 2-7 and 2-6, calculated at each recorded interval:

$$v_s = k_p \times C_p \times \sqrt{\Delta P} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

$$M_s = M_d \times (1 - B_{ws}) + 18.0 \times B_{ws}$$

Where:

- v_s = Average dilution tunnel gas velocity, ft/sec
- k_p = Pitot tube constant: $85.49 \frac{ft}{sec} \left[\frac{(lb/lb-mole) \times (inches\ Hg)}{(^{\circ}R) \times (inches\ H_2O)} \right]^{\frac{1}{2}}$
- C_p = Pitot tube coefficient (0.99 for standard pitot tube; 0.84 may be used for S-type pitot tubes constructed according to Method 2 procedures), unitless
- ΔP = ΔP measured during the pre-test flow traverse of the dilution tunnel; the square root of the ΔP values are averaged for this calculation, in. H_2O
- P_b = Barometric pressure at test site, in. Hg
- P_g = Static Pressure of tunnel, in. Hg
- P_s = Absolute tunnel pressure, $= P_b + P_g$
- M_d = Molecular weight of tunnel gas; assume $M_d = 29$ lb/lb-mole (per method 5G)
- B_{ws} = Moisture content of dilution tunnel gas, ratio; assume 4% (per method 5G)
- T_s = Dilution tunnel temperature, $^{\circ}R$; ($^{\circ}R = ^{\circ}F + 460$)

Sample calculation:

$$M_s = 29 \times (1 - 0.04) + 18.0 \times 0.04 = 28.56$$

$$v_s = 85.49 \times 0.99 \times \sqrt{0.0351} \times \sqrt{\frac{(548)}{(30.03 + \frac{-0.45}{13.6}) \times (28.56)}}$$

$$v_s = 12.69 \frac{ft}{sec}$$

Particulate Concentration

Using equation 5G-2:

$$C_s = 0.001 \frac{g}{mg} \times \frac{m_n}{V_{m(std)}}$$

Where:

C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, g/dscf

m_n = Total mass of particulate matter collected in the sampling train, mg

$V_{m(std)}$ = Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

$$C_s = \frac{0.001 \times 16.2}{99.116}$$

$$C_s = 0.000163 \text{ g/dscf}$$

Average Dilution Tunnel Gas Flow Rate

Using equation 2-8, calculated at each recorded interval:

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_{s(avg)}} \times \frac{P_s}{P_{std}}$$

Where:

Q_{sd}	=	Gas flow rate corrected to dry, standard conditions, dscf/hr
3600	=	Conversion from seconds to hours
B_{ws}	=	Moisture content of dilution tunnel gas, ratio; assume 4% (per method 5G)
v_s	=	Average dilution tunnel gas velocity, ft/sec
A	=	Cross sectional area of dilution tunnel, ft ²
T_{std}	=	Standard absolute temperature, 538°R
$T_{s(avg)}$	=	Average absolute dilution tunnel temperature, °R, (°R = °F + 460)
P_b	=	Barometric pressure at test site, in. Hg
P_g	=	Dilution tunnel static pressure, in. Hg
P_s	=	Absolute dilution tunnel gas pressure, in Hg, (Hg = $P_b + P_g$)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.04) \times 12.69 \times \frac{(\pi \times 3^2)}{144} \times \frac{528}{548} \times \frac{30.03 + \frac{-0.45}{13.6}}{29.92}$$

$$Q_{sd} = 8313.36 \text{ dscf/hr} = 138.56 \text{ dscf/min}$$

Particulate Emission Rate

Using equation 5G-3 and 5G-4:

$$E = C_s \times Q_{sd}$$

$$E_{adj} = K_3 \times E^{0.83}$$

Where:

- E = Particulate emission rate, g/hr
- E_{adj} = Particulate emission rate, adjusted, g/hr
- C_s = Concentration of particulate matter in the stack, corrected to dry, standard conditions, g/dscf
- Q_{sd} = Average dilution tunnel gas flow rate, dscf/hr
- K_3 = Constant, 1.82 for metric units, 0.643 for English units

Sample calculation:

$$E = 0.000163 \times 8313.36$$

$$E = 1.36 \text{ g/hr}$$

$$E_{adj} = 1.82 \times 1.36^{0.83}$$

$$E = 2.35 \text{ g/hr}$$

Proportional Rate Variation

Using equation 5H-9, calculated at each recorded interval:

$$PR = \frac{\theta \times (V_{ml} \times V_s \times T_m \times T_{st})}{10 \times (V_m \times V_{st} \times T_s \times T_{ml})} \times 100$$

Where:

- PR = Percent proportional rate
- θ = Time of test, min
- S_i = Measured tracer gas concentration for the "ith" interval, in this case, the inverse of the calculated flow in the stack based on CO₂ concentrations in the stack and in the dilution tunnel
- $V_{ml(st)}$ = Volume of gas sample measured by the dry gas meter during the "ith" 10 minute interval, dscf
- V_m = Volume of gas sample as measured by dry gas meter, dscf
- V_{st} = Average gas velocity in the dilution tunnel during each 10 minute interval, i, of the test run, m/sec
- V_s = Average gas velocity in the dilution tunnel, m/sec
- T_{ml} = Absolute average dry gas meter temperature during each 10 minute interval, i, of the test run, °R
- T_m = Absolute average dry gas meter temperature, °R
- T_{st} = Absolute average gas temperature in the dilution tunnel during each 10 minute interval, i, of the test run, °R
- T_s = Absolute average gas temperature in the dilution tunnel, °R

Sample calculation (for the reading at 50 minutes into test run 1):

$$PR = \frac{180 \times 5.6 \times 12.69 \times 533 \times 552}{10 \times 98.434 \times 12.63 \times 548 \times 532} \times 100$$

$$PR = 103.8\%$$

Appendix F

Test Data

**Stove Builders International
Series 50: Eurostar & Osburn 5000
Project Number G100903464**



Eurostar Front view



Eurostar Side view

EPA NSPS WEIGHTED AVERAGE CALCULATION

V 1.1

Manufact SBI
SBI - G100903464 - Pellet Stove model Series 50 Eurostar/Osburn 5000
Model: Eurostar/Osburn 5000
Date: Sept. 17 - Sept 19, 2012

Type of

Stove:

3

Weighted Average

1=cat

2=noncat

3=pellet

Project #: G100903464

(E) Ave.			Heat			(K)		
Test	Burn	Emission		Output		Weighting		
No.	Rate	Rate g/hr	(OHE)	(BTU/HR)	Prob.	Factor	(KxE)	KxOHE
4	0.69	1.26		10301.15	0.1442	0.3854	0.4856	0.00
3	1.01	2.42		15078.49	0.3854	0.7530	1.8223	0.00
5	1.91	2.49		28514.77	0.8972	0.5330	1.3272	0.00
6	2.04	2.20		30455.57	0.9184	0.1028	0.2262	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

Totals: 1.7742 3.8612 0.00

Weighted average emissions rate:	2.1763
Weighted Average OHE:	0.00

Manufacturer: SBI				VERSION 1.2				2/5/2010			
Model: Eurostar/Osburn 5000											
Date: 9/17/2012											
Run: 1											
Project #: G100903464											
Test Duration: 120											
Start				End							
Barometer (in.Hg):				30.032				29.97			
Dry Bulb (F):				79				80			
Humidity (%):				37				32			
Moisture content of wood (wet basis):				4.6802							
Average				0.23				16.63			
*				*				*			
CO				CO2				O2			
Flue Gas				Room Temp				Tunnel Dry Bulb			
Unit				Unit				Unit			
Back				R.Side				L.Side			
Unit				Unit				Unit			
Top				Top				Bottom			
589.25				868.83				442.64			
*				*				*			
595.5				875.2				435			
595.3				898.9				432.7			
572.6				852.5				436			
609.6				880.2				450.9			
604.1				883				451.5			
554.4				818.6				430.3			
571.4				820.1				435.9			
596.4				908.2				435.3			
591.4				884.3				447.9			
600.8				887.4				448.7			
626.2				926.2				459.7			
560.2				818.4				441			
582.4				841.8				449.4			
582.4				841.8				449.4			

		Manufacturer:		SBI					
		Model:		Eurostar/Osburn 5000					
		Date:		9/17/12					
		Run:		1					
		Project #:		G100903464					
		Test Duration:		120					
		Total Gas Volume (DGM 1):		18.266		Pitot Factor		0.83	
		Total Gas Volume (DGM 2):		14.556				(0.99 standard,	
		Average Barometric Pressure:		30.001				0.84 or Cal. Factor for S-Type)	
		Molecular Weight:		28.56					
		Pitot Correction:		0.998248595					
		Calibration Factor (DGM #1):		1.0140					
		Calibration Factor (DGM #2):		1.0110					
		(1) VS:		0.0400					
		(2) VS:		0.0502					
								Filter	Filter
								Face	Face
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2
0	708.955	76.36	76.2	333.907	75.98	76.51	132.3		
10	710.535	76.82	76.44	335.165	76.09	85.49	131.6	13.62	10.73
20	712.088	77.22	76.71	336.412	76.44	83.52	132.7	13.38	10.65
30	713.625	77.58	76.97	337.647	76.67	86.3	133.6	13.23	10.52
40	715.135	77.94	77.27	338.875	76.81	88.27	134.6	12.99	10.44
50	716.655	78.11	77.51	340.108	77.1	83.98	134.3	13.07	10.52
60	718.182	78.31	77.72	341.339	77.24	83.76	134.4	13.13	10.50
70	719.702	78.36	77.91	342.580	77.39	83.75	132.2	13.07	10.59
80	721.218	78.57	78.08	343.785	77.66	84.01	133.1	13.03	10.28
90	722.739	78.7	78.3	344.995	77.8	84.09	132.9	13.07	10.32
100	724.248	78.94	78.49	346.208	77.99	84.27	133.6	12.96	10.34
110	725.761	79.07	78.69	347.420	78.14	84.43	132.7	12.99	10.33
120	727.267	79.21	78.9	348.625	78.36	84.78	133.4	12.92	10.26

Proportional Rate Calculations				(EPA Formulas from PR5G)				
Stack area (ft2):		0.3491		Manufacturer:		SBI		
Wood moisture (% wet):		4.6802		Model:		Eurostar/Osburn 5000		
Load Weight (lbs wet):		9		Date:		9/17/12		
Burn Rate (Dry kg/hr):		1.946		Run:		1		
				Project No.:		G100903464		
Final Temperature (DGM #1) Degrees Rankin:				537.861				
Final Temperature (DGM #2) Degrees Rankin:				540.647				
Final Tunnel Temperature Degrees Rankin:				593.185				
Final Tunnel Velocity (feet per second):				7.217526				
Standardized Tunnel Flow (dscfm):				129.47				
		Average	Average					
		Inlet +	Inlet +					
		Outlet	Outlet	100.01	100.01	#1	#2	
Tunnel	Tunnel	Temp.	Temp.			dDGM	dDGM	
Velocity	Velocity	Meter 1	Meter 2			Vol.Std.	Vol.Std.	
Delta-P	Ft/Sec	Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time
0.015	7.212	536.3	536.2					0
0.015	7.208	536.6	540.8	103.66	102.47	1.580	1.245	10
0.015	7.215	537.0	540.0	101.92	101.82	1.552	1.236	20
0.015	7.220	537.3	541.5	100.89	100.64	1.535	1.220	30
0.015	7.226	537.6	542.5	99.14	99.96	1.507	1.211	40
0.015	7.224	537.8	540.5	99.73	100.71	1.517	1.220	50
0.015	7.225	538.0	540.5	100.16	100.56	1.523	1.219	60
0.015	7.212	538.1	540.6	99.50	101.18	1.516	1.228	70
0.015	7.217	538.3	540.8	99.27	98.27	1.511	1.192	80
0.015	7.216	538.5	540.9	99.55	98.64	1.516	1.197	90
0.015	7.220	538.7	541.1	98.79	98.91	1.503	1.199	100
0.015	7.215	538.9	541.3	98.94	98.73	1.507	1.198	110
0.015	7.219	539.1	541.6	98.51	98.16	1.499	1.190	120

Intertek Testing Services			
SFBA EPA ADJUSTED EMISSION RESULTS			
Manufacturer:	SBI	RESULTS	
Model:	Eurostar/Osburn 5000		
Date:	9/17/12	Average Adjusted Emissions Rate:	2.38
Run:	1	Average Unadjusted Emission Rate	1.38
Project #:	G100903464	Burn Rate (Dry kg/hr):	1.95
Test Duration (Minutes):	120		
Test Duration (Hours):	2.00		
BAROMETRIC PRESSURE			
			Average: 30.001
TEMPERATURE FACTORS			Start: 30.032
DGM #1: 0.9817			End: 29.97
DGM #2: 0.9766			
DRY GAS METER VALUES			
VOLUMES SAMPLED		DGM #1	Final: 727.267
	DGM #1: 18.277		Initial: 708.955
	DGM #2: 14.571		
		DGM #2	Final: 348.625
TOTAL TUNNEL VOLUME (scf):	15536		Initial: 333.907
SAMPLE RATIOS		TEMPERATURES (DEG. RANKIN)	
	Sample Train 1: 850.0	DGM #1:	537.86
	Sample Train 2: 1066.2	DGM #2:	540.65
TOTAL EMISSIONS		CALIBRATION FACTORS	
	Sample Train 1 (g): 2.98	DGM #1:	1.014
	Sample Train 2 (g): 2.56	DGM #2:	1.011
	Ave: 2.77		
EMISSION RATES		TUNNEL FLOW RATE:	129.5
	Sample Train 1 (g/hr): 1.49	PARTICULATE CATCH (mg)	
	Sample Train 2 (g/hr): 1.28	Sample Train 1:	
	Ave: 1.38	Filters 3.3	
ADJUSTED EMISSION RATES		Probe 0.2	
	Sample Train 1 (g/hr): 2.53	Total 3.5	
	Sample Train 2 (g/hr): 2.23	Sample Train 2:	
	Ave: 2.38	Filters 2.4	
DEVIATION:	6.25%	Probe 0	
		Total 2.4	
If deviation is greater than 7.5% due to low particulate catch			
The two emission rates shall not differ by 7.5%			
of the weighted average emission rate limit (4.1 or 7.5) (5g-3)			
Use the following:			
Catalytic units	7.26%		
7.5% of 4.1 g/hr			
Non catalytic units	3.97%		
7.5% of 7.5 g/hr			

REPORT DATA							
Client:		SBI					
Run:		1					
Date:		9/17/12					
Project No.:		G100903464					
Model:		Eurostar/Osburn 5000					
Fuel Moisture (Dry):		4.91					
Stack Static (neg):		-0.07					
Barometer:		30.001					
Average Room Temp:		79.55					
Change in stove temp:		-3.72					
Burn Rate:		1.946					
Adjusted Emission Rate:		2.382					
System 1:		2.531					
System 2:		2.233					
Deviation:		6.25%					
Filter 1:		83.86					
Filter 2:		77.44					
Tunnel:		133.18					
DGM 1:		77.86					
DGM 2:		80.65					
Water Collected:							
Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
Before	After	Before	After	Before	After	Before	After
79	80	30.03	29.97	37	32	0	0
Delta H Average							
DGM#1:	0						
DGM#2:	0						

Pellet Fuel Moisture Content Worksheet

Intertek

Intertek Montreal

Client SBI

Model Eurostar/Osburn 5000

Project No. G100903464

Sample Description Saw Dust Pellets

Container	Container ID No.	Date Placed in Oven	Time Placed in Oven	Container Tare Weight, Grams	Initial Gross Weight, Grams	Date Removed from Oven	Time Removed From Oven	Final Gross Weight, Grams	Moisture Content, Wet Basis, %	Moisture Content, Dry Basis, %
1		9/19/2012	12:00	190.4906	327.0401	9/20/2012	12:00	321.9121	3.7554	3.9019
2		9/19/2012	12:00	181.8458	323.8649	9/20/2012	12:00	318.5024	3.7759	3.9241

Average Moisture Content, Wet Basis **3.77** %

Average Moisture Content, Dry Basis **3.91** %

Method: ASTM D4442-92 Method A -- Oven Drying Method

Dry Basis, % = (Initial net - Final net) / Final net x 100

Wet Basis, % = (Initial net - Final net) / Initial net x 100

Engineer Signature Florin Anghel

Date 9/25/2012

[illegible]

		Manufacturer:	SBI						
		Model:	Eurostar / Osburn 5000						
		Date:	9/18/12						
		Run:	2						
		Project #:	G100903464						
		Test Duration:	120						
		Total Gas Volume (DGM 1):	18.469			Pitot Factor	0.83		
		Total Gas Volume (DGM 2):	15.370				(0.99 standard,		
		Average Barometric Pressure:	29.865				0.84 or Cal. Factor for S-Type)		
		Molecular Weight:	28.56						
		Pitot Correction:	0.902320748						
		Calibration Factor (DGM #1):	1.0140						
		Calibration Factor (DGM #2):	1.0110						
		(1) VS:	0.0393						
		(2) VS:	0.0472						
								Filter	Filter
								Face	Face
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2
0	727.301	75.57	75.46	348.686	75.19	76.35	117		
10	728.899	75.97	75.81	350.010	75.36	82.43	116.8	13.73	11.28
20	730.468	76.26	76.03	351.335	75.66	84.53	117.1	13.48	11.26
30	732.019	76.52	76.28	352.646	75.89	85.46	118	13.32	11.13
40	733.561	76.8	76.51	353.949	76	85.8	117.8	13.23	11.06
50	735.099	76.98	76.68	355.253	76.19	85.92	117.8	13.19	11.07
60	736.636	77.04	76.88	356.665	76.37	86.65	117.3	13.18	11.97
70	738.174	77.26	77.12	358.108	76.61	86.81	117.3	13.18	12.23
80	739.707	77.48	77.25	359.447	76.7	86.13	119	13.14	11.36
90	741.240	77.62	77.48	360.650	76.9	85.74	119	13.13	10.20
100	742.720	77.73	77.62	361.856	77.06	85.69	117.8	12.68	10.23
110	744.311	77.88	77.8	363.055	77.23	85.82	119.1	13.62	10.17
120	745.868	78.01	78	364.298	77.38	85.95	120.1	13.33	10.54

Proportional Rate Calculations				(EPA Formulas from PR5G)				
Stack area (ft2): 0.34907				Manufacturer: SBI				
Wood moisture (% wet): 3.76287				Model: Eurostar / Osburn 5000				
Load Weight (lbs wet): 6.15				Date: 9/18/12				
Burn Rate (Dry kg/hr): 1.342				Run: 2				
				Project No.: G100903464				
Final Temperature (DGM #1) Degrees Rankin:				536.925				
Final Temperature (DGM #2) Degrees Rankin:				540.608				
Final Tunnel Temperature Degrees Rankin:				578.008				
Final Tunnel Velocity (feet per second):				6.986913				
Standardized Tunnel Flow (dscfm):				128.04				
		Average	Average					
		Inlet +	Inlet +					
		Outlet	Outlet	99.99	100.01	#1	#2	
Tunnel	Tunnel	Temp.	Temp.			dDGM	dDGM	
Velocity	Velocity	Meter 1	Meter 2			Vol.Std.	Vol.Std.	
Delta-P	Ft/Sec	Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time
0.018	6.966	535.5	535.8					0
0.018	6.964	535.9	538.9	103.62	102.28	1.593	1.309	10
0.018	6.966	536.1	540.1	101.72	102.16	1.563	1.307	20
0.018	6.972	536.4	540.7	100.58	101.05	1.545	1.291	30
0.018	6.970	536.7	540.9	99.93	100.37	1.535	1.283	40
0.018	6.970	536.8	541.1	99.64	100.42	1.530	1.284	50
0.018	6.967	537.0	541.5	99.51	108.60	1.529	1.389	60
0.018	6.967	537.2	541.7	99.53	110.94	1.529	1.419	70
0.018	6.978	537.4	541.4	99.32	103.16	1.524	1.317	80
0.018	6.978	537.6	541.3	99.29	92.70	1.523	1.184	90
0.018	7.069	537.7	541.4	94.39	91.52	1.470	1.186	100
0.018	7.077	537.8	541.5	101.55	91.07	1.580	1.179	110
0.018	6.984	538.0	541.7	100.85	95.81	1.546	1.222	120

Intertek Testing Services			
SFBA EPA ADJUSTED EMISSION RESULTS			
Manufacturer:	SBI	RESULTS	
Model:	Eurostar / Osburn 5000		
Date:	9/18/12	Average Adjusted Emissions Rate:	3.41
Run:	2	Average Unadjusted Emission Rate	2.13
Project #:	G100903464	Burn Rate (Dry kg/hr):	1.34
Test Duration (Minutes):	120		
Test Duration (Hours):	2.00		
BAROMETRIC PRESSURE			
			Average: 29.865
TEMPERATURE FACTORS			Start: 29.88
DGM #1: 0.9834			End: 29.85
DGM #2: 0.9767			
DRY GAS METER VALUES			
VOLUMES SAMPLED		DGM #1	Final: 745.868
DGM #1: 18.480			Initial: 727.301
DGM #2: 15.387			
		DGM #2	Final: 364.298
TOTAL TUNNEL VOLUME (scf): 15365			Initial: 348.686
SAMPLE RATIOS		TEMPERATURES (DEG. RANKIN)	
Sample Train 1: 831.4		DGM #1:	536.92
Sample Train 2: 998.5		DGM #2:	540.61
TOTAL EMISSIONS		CALIBRATION FACTORS	
Sample Train 1 (g): 4.32		DGM #1:	1.014
Sample Train 2 (g): 4.19		DGM #2:	1.011
Ave: 4.26			
EMISSION RATES		TUNNEL FLOW RATE: 128.0	
Sample Train 1 (g/hr): 2.16		PARTICULATE CATCH (mg)	
Sample Train 2 (g/hr): 2.10		Sample Train 1:	
Ave: 2.13		Filters 5.2	
ADJUSTED EMISSION RATES		Probe 0	
Sample Train 1 (g/hr): 3.45		Total 5.2	
Sample Train 2 (g/hr): 3.36		Sample Train 2:	
Ave: 3.41		Filters 4.2	
DEVIATION: 1.26%		Probe 0	
		Total 4.2	
If deviation is greater than 7.5% due to low particulate catch			
The two emission rates shall not differ by 7.5%			
of the weighted average emission rate limit (4.1 or 7.5) (5g-3)			
Use the following:			
Catalytic units		2.10%	
7.5% of 4.1 g/hr			
Non catalytic units		1.15%	
7.5% of 7.5 g/hr			

REPORT DATA

Client: SBI

Run: 2

Date: 9/18/12

Project No.: G100903464

Model: Eurostar / Osburn 5000

Fuel Moisture (Dry): 3.91

Stack Static (neg): -0.0775

Barometer: 29.865

Average Room Temp: 79.60

Change in stove temp: 19.36

Burn Rate: 1.342

Adjusted Emission Rate: 3.408

System 1: 3.451

System 2: 3.365

Deviation: 1.26%

Filter 1: 86.06

Filter 2: 76.49

Tunnel: 118.01

DGM 1: 76.92

DGM 2: 80.61

Water Collected:

Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
Before	After	Before	After	Before	After	Before	After
79	81	29.88	29.85	41	39	0	0

Delta H Average

DGM#1: 0

DGM#2: 0

Pellet Fuel Moisture Content Worksheet

Intertek

Intertek Montreal

Client SBI

Model Eurostar/Osburn 5000

Project No. G100903464

Sample Description Saw Dust Pellets

Container	Container ID No.	Date Placed in Oven	Time Placed in Oven	Container Tare Weight, Grams	Initial Gross Weight, Grams	Date Removed from Oven	Time Removed From Oven	Final Gross Weight, Grams	Moisture Content, Wet Basis, %	Moisture Content, Dry Basis, %
1		9/19/2012	12:00	190.4906	327.0401	9/20/2012	12:00	321.9121	3.7554	3.9019
2		9/19/2012	12:00	181.8458	323.8649	9/20/2012	12:00	318.5024	3.7759	3.9241

Average Moisture Content, Wet Basis **3.77** %

Average Moisture Content, Dry Basis **3.91** %

Method: ASTM D4442-92 Method A -- Oven Drying Method

Dry Basis, % = (Initial net - Final net) / Final net x 100

Wet Basis, % = (Initial net - Final net) / Initial net x 100

Engineer Signature Florin Anghel

Date 9/25/2012

Manufacturer: SBI				VERSION 1.2		2/5/2010	
Model: Eurostar / Osburn 5000							
Date: 9/18/2012							
Run: 3							
Project #: G100903464							
Test Duration: 120							
Barometer (in.Hg):				Start	End		
				29.79	29.707		
Dry Bulb (F):				79.5	79.03		
Humidity (%):				32	33		
Moisture content of wood (wet basis):				3.76287			
Average				0.21	1.73	18.83	248.61
* *				*	*	*	*
Elapsed Time				CO	CO2	O2	Flue Gas
Weight Remaining				Room Temp			
0				4.63	2.1	18.77	252.3
10				4.29	1.68	18.89	244.7
20				3.88	0.21	1.49	246.8
30				3.51	0.22	1.79	254
40				3.16	0.22	1.62	240.7
50				2.74	0.2	1.75	253.8
60				2.34	0.22	1.76	249.4
70				1.96	0.23	1.4	246.2
80				1.58	0.21	1.65	248.8
90				1.21	0.19	1.21	242.1
100				0.79	0.19	1.74	255.8
110				0.43	0.18	1.73	242.7
120				0.00	0.2	1.94	254.6
						18.22	
						79.03	
						79.54	
						80.08	
						80	
						79.37	
						79.44	
						79.28	
						79.34	
						78.86	
						79.12	
						78.97	
						78.95	
						78.95	
						78.57	
						79.03	
						111.9	
						355.9	
						350.6	
						372.8	
						372.8	
						551.6	
						503.4	
						274.8	
						285.1	
						271.6	
						274.4	
						271.2	
						272	
						274.6	
						245	
						243.3	
						235.7	
						270.7	
						275.3	
						241.1	
						544.6	
						506.9	
						479.6	
						516.7	
						246.1	
						241.3	
						272.6	
						273.1	
						340.9	
						315	
						330.1	
						346.4	
						325.1	
						356.4	
						351.2	
						529.9	
						514.4	
						245.6	
						247.3	
						361.6	
						349.8	
						500.6	
						527	
						274.4	
						271.2	
						271.6	
						274.8	
						285.1	
						271.6	

		Manufacturer:	SBI						
		Model:	Eurostar / Osburn 5000						
		Date:	9/18/12						
		Run:	3						
		Project #:	G100903464						
		Test Duration:	120						
		Total Gas Volume (DGM 1):	18.491			Pitot Factor	0.83		
		Total Gas Volume (DGM 2):	14.818				(0.99 standard,		
		Average Barometric Pressure:	29.7485				0.84 or Cal. Factor for S-Type)		
		Molecular Weight:	28.56						
		Pitot Correction:	0.974351713						
		Calibration Factor (DGM #1):	1.0140						
		Calibration Factor (DGM #2):	1.0110						
			(1) VS:	0.0426					
			(2) VS:	0.0531					
								Filter	Filter
								Face	Face
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2
0	754.065	78.66	78.59	371.021	78.25	80.2	112		
10	755.681	79.01	79.12	372.319	78.53	84.89	111.6	13.75	10.96
20	757.264	78.92	79.12	373.588	78.56	86.27	112	13.47	10.70
30	758.834	78.98	79.09	374.847	78.54	86.65	112	13.36	10.61
40	760.399	78.98	79.14	376.128	78.6	86.62	111.6	13.32	10.80
50	761.959	78.96	79.11	377.374	78.61	86.46	112.2	13.28	10.50
60	763.515	78.82	79.12	378.642	78.47	86.69	112.1	13.24	10.69
70	765.067	78.88	79.09	379.915	78.52	86.61	112.2	13.21	10.73
80	766.665	78.85	79.12	381.168	78.54	86.72	112.2	13.60	10.56
90	768.163	78.77	79.01	382.420	78.47	86.49	111.6	12.75	10.56
100	769.705	78.71	78.98	383.682	78.37	86.44	112.7	13.13	10.64
110	771.247	78.62	78.95	384.931	78.41	86.37	111.2	13.13	10.53
120	772.794	78.49	78.83	386.170	78.37	85.3	111.9	13.17	10.46

Proportional Rate Calculations				(EPA Formulas from PR5G)				
Stack area (ft2): 0.34907				Manufacturer: SBI				
Wood moisture (% wet): 3.76287				Model: Eurostar / Osburn 5000				
Load Weight (lbs wet): 4.63				Date: 9/18/12				
Burn Rate (Dry kg/hr): 1.011				Run: 3				
				Project No.: G100903464				
Final Temperature (DGM #1) Degrees Rankin:				538.920				
Final Temperature (DGM #2) Degrees Rankin:				542.152				
Final Tunnel Temperature Degrees Rankin:				571.946				
Final Tunnel Velocity (feet per second):				7.503327				
Standardized Tunnel Flow (dscfm):				138.42				
		Average	Average					
		Inlet +	Inlet +					
		Outlet	Outlet	100.00	100.00	#1	#2	
Tunnel	Tunnel	Temp.	Temp.			dDGM	dDGM	
Velocity	Velocity	Meter 1	Meter 2			Vol.Std.	Vol.Std.	
Delta-P	Ft/Sec	Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time
0.018	7.504	538.6	539.2					0
0.018	7.501	539.1	541.7	103.49	102.92	1.595	1.271	10
0.018	7.504	539.0	542.4	101.42	100.52	1.563	1.241	20
0.018	7.504	539.0	542.6	100.58	99.70	1.550	1.231	30
0.018	7.501	539.1	542.6	100.22	101.40	1.545	1.252	40
0.018	7.505	539.0	542.5	99.96	98.70	1.540	1.218	50
0.018	7.504	539.0	542.6	99.70	100.42	1.536	1.240	60
0.018	7.505	539.0	542.6	99.45	100.83	1.532	1.245	70
0.018	7.505	539.0	542.6	102.40	99.23	1.578	1.225	80
0.018	7.501	538.9	542.5	95.96	99.13	1.479	1.224	90
0.018	7.508	538.8	542.4	98.88	100.03	1.523	1.234	100
0.018	7.498	538.8	542.4	98.76	98.87	1.523	1.222	110
0.018	7.503	538.7	541.8	99.17	98.24	1.528	1.213	120

Intertek Testing Services

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer:

SBI

RESULTS

Model: Eurostar / Osburn 5000

Date: 9/18/12

Run: 3

Project #: G100903464

Test Duration (Minutes): 120

Test Duration (Hours): 2.00

Average Adjusted Emissions Rate: 2.42

Average Unadjusted Emission Rate: 1.41

Burn Rate (Dry kg/hr): 1.01

BAROMETRIC PRESSURE

Average: 29.7485

TEMPERATURE FACTORS

Start: 29.79

DGM #1: 0.9797

End: 29.707

DGM #2: 0.9739

DRY GAS METER VALUES

VOLUMES SAMPLED

DGM #1 Final: 772.794

DGM #1: 18.500

Initial: 754.065

DGM #2: 14.830

DGM #2 Final: 386.17

TOTAL TUNNEL VOLUME (scf): 16610

Initial: 371.021

SAMPLE RATIOS

Sample Train 1: 897.9

TEMPERATURES (DEG. RANKIN)

DGM #1: 538.92

Sample Train 2: 1120.0

DGM #2: 542.15

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g): 2.60

DGM #1: 1.014

Sample Train 2 (g): 3.02

DGM #2: 1.011

Ave: 2.81

EMISSION RATES

TUNNEL FLOW RATE: 138.4

Sample Train 1 (g/hr): 1.30

PARTICULATE CATCH (mg)

Sample Train 2 (g/hr): 1.51

Sample Train 1:

Ave: 1.41

Filters: 2.9

ADJUSTED EMISSION RATES

Probe: 0

Sample Train 1 (g/hr): 2.27

Total: 2.9

Sample Train 2 (g/hr): 2.57

Sample Train 2:

Ave: 2.42

Filters: 2.6

DEVIATION: 6.20%

Probe: 0.1

Total: 2.7

If deviation is greater than 7.5% due to low particulate catch
 The two emission rates shall not differ by 7.5%
 of the weighted average emission rate limit (4.1 or 7.5) (5g-3)

Use the following:

Catalytic units 7.31%

7.5% of 4.1 g/hr

Non catalytic units 3.99%

7.5% of 7.5 g/hr

		Client:	SBI						
		Run:	3						
		Date:	9/18/12						
		Project No.:	G100903464						
		Model:	Eurostar / Osburn 5000						
Fuel Moisture (Dry):			3.91						
Stack Static (neg):			-0.075						
Barometer:			29.7485						
Average Room Temp:			79.27						
Change in stove temp:			16.46						
Burn Rate:			1.011						
Adjusted Emission Rate:			2.415						
System 1:			2.266						
System 2:			2.565						
Deviation:			6.20%						
Filter 1:			86.21						
Filter 2:			78.33						
Tunnel:			111.95						
DGM 1:			78.92						
DGM 2:			82.15						
Water Collected:									
Room Temp		Bar Pressure		Relative Humidity		Air Velocity			
Before	After	Before	After	Before	After	Before	After		
80	79	29.79	29.71	32	33	0	0		
Delta H Average									
DGM#1:	0								
DGM#2:	0								

VERSION 1.2

2/5/2010

Manufactur SBI

Model: Eurostar / Osburn 5000

E&E Tunnel Traverse Worksheet

Date: 41170

Run: 3

Project #: G100903464

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.018	111	0.1323
B CENTER	0.020	113	0.1414
A1	0.015	111	0.1225
A2	0.020	112	0.1414
A3	0.018	112	0.1323
A4	0.018	112	0.1323
B1	0.018	113	0.1323
B2	0.020	113	0.1414
B3	0.018	113	0.1323
B4	0.018	199	0.1323
AVERAGE	0.018	120.91	0.1333

Static Pressure:

**PITOT
CONSTANT:** 0.9744

Tunnel Diameter (in):	8
Tunnel Area (ft2)	0.349066
Tunnel Static Pressure	0.075

Pellet Fuel Moisture Content Worksheet

Intertek

Intertek Montreal

Client SBI

Model Eurostar/Osburn 5000

Project No. G100903464

Sample Description Saw Dust Pellets

Container	Container ID No.	Date Placed in Oven	Time Placed in Oven	Container Tare Weight, Grams	Initial Gross Weight, Grams	Date Removed from Oven	Time Removed From Oven	Final Gross Weight, Grams	Moisture Content, Wet Basis, %	Moisture Content, Dry Basis, %
1		9/19/2012	12:00	190.4906	327.0401	9/20/2012	12:00	321.9121	3.7554	3.9019
2		9/19/2012	12:00	181.8458	323.8649	9/20/2012	12:00	318.5024	3.7759	3.9241

Average Moisture Content, Wet Basis **3.77** %

Average Moisture Content, Dry Basis **3.91** %

Method: ASTM D4442-92 Method A -- Oven Drying Method

Dry Basis, % = (Initial net - Final net) / Final net x 100

Wet Basis, % = (Initial net - Final net) / Initial net x 100

Engineer Signature Florin Anghel

Date 9/25/2012

Manufacturer: SBI				VERSION 1.2				2/5/2010						
Model: Eurostar / Osburn 5000														
Date: 9/18/2012														
Run: 4														
Project #: G100903464														
Test Duration: 120														
Barometer (in. Hg):				Start	End									
				29.68	29.56									
Dry Bulb (F):				78.5	78.1									
Humidity (%):				35	40									
Moisture content of wood (wet basis):				3.76287										
Average				0.14	1.18	19.55	201.83	78.26	104.78	256.30	406.00	188.61	214.73	103.41
*				*	*	*	*	*	*	*	*	*	*	*
Elapsed Time	Weight Remaining	CO	CO2	O2	Flue Gas	Room Temp	Tunnel Dry Bulb	Unit Top	Unit Back	Unit R.Side	Unit L.Side	Unit Bottom		
0	3.14	0.15	1.32	19.4	202.7	78.48	104.9	267	434.6	189.3	208.4	104.8		
10	2.89	0.16	1.4	19.43	199.6	78.37	104.7	266.3	440.5	186.2	204.9	103.8		
20	2.62	0.15	1.29	19.43	200.3	78.39	104.6	263.1	429.1	186.7	206.4	103.2		
30	2.34	0.12	1.02	19.4	204.8	78.35	105.1	266	438.7	187.7	212.9	103.1		
40	2.09	0.12	0.88	19.46	207.3	78.21	105	256.7	427.2	190	218.2	103.1		
50	1.83	0.12	1.02	19.36	207.8	78.36	105.2	250.7	391.3	193.1	225.7	103.6		
60	1.56	0.15	1.14	19.38	201.8	78.46	104.7	243.6	374.8	190.6	221.9	103.8		
70	1.30	0.16	1.15	19.63	205.4	78.3	105.3	276.9	432.3	191.8	218.6	103.6		
80	1.05	0.13	1.11	19.8	197.2	78.21	104.6	251.2	393.1	187.9	213.9	103.3		
90	0.78	0.13	1.07	19.79	197.6	78.05	104.5	246.2	377.3	186.6	213.5	103.1		
100	0.51	0.17	1.34	19.53	204.4	78.15	104.9	268.9	416.2	188.6	216.5	102.9		
110	0.27	0.14	1.32	19.75	196.4	77.91	104	240.9	372.4	185.8	213.4	102.9		
120	0.00	0.16	1.3	19.77	198.5	78.11	104.6	234.4	350.5	187.6	217.2	103.1		

Manufacturer: SBI Model: Eurostar / Osburn 5000 Date: 9/18/12 Run: 4 Project #: G100903464													
782.17	77.74	78.04	84.08	395.05	77.60	84.77	77.43	0.02	0.013	0.00	233.81		
*	*	*	*	*	*	*	*	*	*				
DGM 1	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	DGM 2	Filter 2	Tunnel	Chimney	Visual	Average	Change in	
Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp	Velocity	Draft	Smoke	Stove	Surface	
772.823	77.87	77.85	78.43	386.212	77.59	78.03	77.69	0.018	0.010	Observed	Temp	Temp.	0
774.441	77.74	78.23	82.39	387.692	77.7	83.72	77.42	0.020	0.010		240.3	-0.48	
776.023	77.73	78.2	83.91	389.216	77.71	85.31	77.51	0.018	0.008		237.7	-3.12	
777.590	77.76	78.08	84.63	390.712	77.58	85.95	77.42	0.018	0.008		241.7	0.86	
779.143	77.68	78.03	84.89	392.222	77.62	85.9	77.46	0.018	0.008		239.0	-1.78	
780.695	77.73	78.07	84.9	393.640	77.66	85.46	77.39	0.018	0.008		232.9	-7.94	
782.225	77.75	78	85.07	395.048	77.61	85.56	77.41	0.018	0.008		226.9	-13.88	
783.757	77.81	78	85.13	396.585	77.57	85.88	77.52	0.018	0.075		244.6	3.82	
785.280	77.77	78.04	85.01	397.962	77.62	85.6	77.36	0.018	0.008		229.9	-10.94	
786.792	77.71	78.02	84.87	399.409	77.54	85.36	77.43	0.018	0.008		225.3	-15.48	
788.307	77.63	78.05	84.6	400.846	77.61	85.28	77.29	0.018	0.010		238.6	-2.2	
789.815	77.72	78.02	84.66	402.297	77.51	85.34	77.41	0.018	0.008		223.1	-17.74	
791.309	77.72	77.88	84.52	403.776	77.48	84.64	77.33	0.018	0.008		218.6	-22.26	-22.26

		Manufacturer:	SBI						
		Model:	Eurostar / Osburn 5000						
		Date:	9/18/12						
		Run:	4						
		Project #:	G100903464						
		Test Duration:	120						
		Total Gas Volume (DGM 1):	18.208			Pitot Factor	0.83		
		Total Gas Volume (DGM 2):	17.135				(0.99 standard,		
		Average Barometric Pressure:	29.62				0.84 or Cal. Factor for S-Type)		
		Molecular Weight:	28.56						
		Pitot Correction:	1.008121089						
		Calibration Factor (DGM #1):	1.0140						
		Calibration Factor (DGM #2):	1.0110						
			(1) VS:	0.0453					
			(2) VS:	0.0482					
								Filter	Filter
								Face	Face
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2
0	772.823	77.87	77.85	386.212	77.59	78.03	104.9		
10	774.441	77.74	78.23	387.692	77.7	83.72	104.7	13.74	12.46
20	776.023	77.73	78.2	389.216	77.71	85.31	104.6	13.43	12.82
30	777.590	77.76	78.08	390.712	77.58	85.95	105.1	13.31	12.57
40	779.143	77.68	78.03	392.222	77.62	85.9	105	13.19	12.69
50	780.695	77.73	78.07	393.640	77.66	85.46	105.2	13.18	11.92
60	782.225	77.75	78	395.048	77.61	85.56	104.7	12.99	11.84
70	783.757	77.81	78	396.585	77.57	85.88	105.3	13.01	12.92
80	785.280	77.77	78.04	397.962	77.62	85.6	104.6	12.93	11.58
90	786.792	77.71	78.02	399.409	77.54	85.36	104.5	12.84	12.17
100	788.307	77.63	78.05	400.846	77.61	85.28	104.9	12.87	12.09
110	789.815	77.72	78.02	402.297	77.51	85.34	104	12.81	12.20
120	791.309	77.72	77.88	403.776	77.48	84.64	104.6	12.69	12.45

Proportional Rate Calculations				(EPA Formulas from PR5G)				
Stack area (ft2): 0.34907				Manufacturer: SBI				
Wood moisture (% wet): 3.76287				Model: Eurostar / Osburn 5000				
Load Weight (lbs wet): 3.14				Date: 9/18/12				
Burn Rate (Dry kg/hr): 0.685				Run: 4				
				Project No.: G100903464				
Final Temperature (DGM #1) Degrees Rankin:				537.888				
Final Temperature (DGM #2) Degrees Rankin:				541.186				
Final Tunnel Temperature Degrees Rankin:				564.777				
Final Tunnel Velocity (feet per second):				7.772366				
Standardized Tunnel Flow (dscfm):				144.57				
		Average	Average					
		Inlet +	Inlet +					
		Outlet	Outlet	99.96	99.98	#1	#2	
Tunnel	Tunnel	Temp.	Temp.			dDGM	dDGM	
Velocity	Velocity	Meter 1	Meter 2			Vol.Std.	Vol.Std.	
Delta-P	Ft/Sec	Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time
0.018	7.732	537.9	537.8					0
0.020	8.265	538.0	540.7	98.75	95.21	1.593	1.446	10
0.018	7.730	538.0	541.5	103.21	104.65	1.558	1.487	20
0.018	7.734	537.9	541.8	102.28	102.72	1.543	1.459	30
0.018	7.733	537.9	541.8	101.37	103.68	1.530	1.472	40
0.018	7.734	537.9	541.6	101.32	97.41	1.529	1.383	50
0.018	7.731	537.9	541.6	99.84	96.68	1.507	1.373	60
0.018	7.735	537.9	541.7	100.02	105.57	1.509	1.499	70
0.018	7.730	537.9	541.6	99.37	94.54	1.500	1.343	80
0.018	7.729	537.9	541.5	98.65	99.37	1.489	1.412	90
0.018	7.732	537.8	541.4	98.89	98.71	1.492	1.402	100
0.018	7.726	537.9	541.4	98.35	99.60	1.485	1.416	110
0.018	7.730	537.8	541.1	97.50	101.64	1.472	1.444	120

Intertek Testing Services				
SFBA EPA ADJUSTED EMISSION RESULTS				
Manufacturer:	SBI	RESULTS		
Model:	Eurostar / Osburn 5000			
Date:	9/18/12	Average Adjusted Emissions Rate:	1.26	
Run:	4	Average Unadjusted Emission Rate	0.64	
Project #:	G100903464	Burn Rate (Dry kg/hr):	0.69	
Test Duration (Minutes):	120			
Test Duration (Hours):	2.00			
BAROMETRIC PRESSURE				
			Average: 29.62	
TEMPERATURE FACTORS			Start: 29.68	
DGM #1:	0.9816	End:	29.56	
DGM #2:	0.9756			
DRY GAS METER VALUES				
VOLUMES SAMPLED		DGM #1	Final: 791.309	
DGM #1:	18.216	Initial:	772.823	
DGM #2:	17.151			
			DGM #2	
TOTAL TUNNEL VOLUME (scf):	17349	Final:	403.776	
			Initial: 386.212	
SAMPLE RATIOS				
Sample Train 1:	952.4	TEMPERATURES (DEG. RANKIN)		
Sample Train 2:	1011.5	DGM #1:	537.89	
			DGM #2:	541.19
TOTAL EMISSIONS				
Sample Train 1 (g):	1.14	CALIBRATION FACTORS		
Sample Train 2 (g):	1.42	DGM #1:	1.014	
Ave:	1.28	DGM #2:	1.011	
EMISSION RATES				
Sample Train 1 (g/hr):	0.57	TUNNEL FLOW RATE:		
Sample Train 2 (g/hr):	0.71	PARTICULATE CATCH (mg)		
Ave:	0.64	Sample Train 1:		
ADJUSTED EMISSION RATES			Filters	1.2
Sample Train 1 (g/hr):	1.14	Probe	0	
Sample Train 2 (g/hr):	1.37	Total	1.2	
Ave:	1.26	Sample Train 2:		
DEVIATION:	8.87%	Filters	1.4	
			Probe	0
			Total	1.4
If deviation is greater than 7.5% due to low particulate catch				
The two emission rates shall not differ by 7.5%				
of the weighted average emission rate limit (4.1 or 7.5) (5g-3)				
Use the following:				
Catalytic units	5.43%			
7.5% of 4.1 g/hr				
Non catalytic units	2.97%			
7.5% of 7.5 g/hr				

REPORT DATA								
Client:		SBI						
Run:		4						
Date:		9/18/12						
Project No.:		G100903464						
Model:		Eurostar / Osburn 5000						
Fuel Moisture (Dry):		3.91						
Stack Static (neg):		-0.0725						
Barometer:		29.62						
Average Room Temp:		78.26						
Change in stove temp:		-22.26						
Burn Rate:		0.685						
Adjusted Emission Rate:		1.255						
System 1:		1.144						
System 2:		1.367						
Deviation:		8.87%						
Filter 1:		84.08						
Filter 2:		77.43						
Tunnel:		104.78						
DGM 1:		77.89						
DGM 2:		81.19						
Water Collected:								
Room Temp		Bar Pressure		Relative Humidity		Air Velocity		
Before	After	Before	After	Before	After	Before	After	
79	78	29.68	29.56	35	40	0	0	
Delta H Average								
DGM#1:	0							
DGM#2:	0							

100% 100% 100% 100% 100% 100% 100% 100% 100% 100%

Manufacturer SBI

Model: Eurostar / Osburn 5000

Date: 41170

Run: 4

Project #: G100903464

E&E Tunnel Traverse Worksheet

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.015	103	0.1225
B CENTER	0.018	104	0.1323
A1	0.013	104	0.1118
A2	0.018	104	0.1323
A3	0.015	104	0.1225
A4	0.018	100	0.1323
B1	0.018	104	0.1323
B2	0.020	104	0.1414
B3	0.018	105	0.1323
B4	0.015	95	0.1225
AVERAGE	0.0165	102.73	0.1284

Static Pressure:

**PITOT
CONSTANT:** 1.0081

Tunnel Diameter (in):	8
Tunnel Area (ft ²)	0.349066
Tunnel Static Pressure	0.0725

Manufacturer:	SBI
Model:	Eurostar / Osburn 5000
Date:	9/18/2012
Run:	4
Project #:	G100903464

Flue Gas	Room Temp	Tunnel Dry Bulb	Unit Top	Unit Bottom	Unit Back	Unit L.Side	Unit Right	Scale weight	Draft	Time
232.7	78.69	109.5	333.2	115.7	461.6	264.2	239.9	1.51	0.004	16.31
219.1	78.86	107.3	307.4	113.3	428	245.7	224.7	1.26	0.002	16.41
209.8	78.59	105.7	292.2	111.2	412.2	233.3	213.1	1.01	0.002	16.51
204.5	78.53	104.4	257.8	109.2	382.7	225	202.7	0.77	0.002	17.01
199.5	78.56	103.8	241.5	107.8	383.4	221.6	193.7	0.52	0.004	17.11
204	78.55	105	280.1	105.9	440.9	212.1	189.8	0.26	0.004	17.21
202.7	78.48	104.9	267	104.8	434.6	208.4	189.3	0	0.003	17.31

Pellet Fuel Moisture Content Worksheet



Intertek Montreal

Client SBI
 Model Eurostar/Osburn 5000
 Project No. G100903464
 Sample Description Saw Dust Pellets

Container	Container ID No.	Date Placed in Oven	Time Placed in Oven	Container Tare Weight, Grams	Initial Gross Weight, Grams	Date Removed from Oven	Time Removed From Oven	Final Gross Weight, Grams	Moisture Content, Wet Basis, %	Moisture Content, Dry Basis, %
1		9/19/2012	12:00	190.4906	327.0401	9/20/2012	12:00	321.9121	3.7554	3.9019
2		9/19/2012	12:00	181.8458	323.8649	9/20/2012	12:00	318.5024	3.7759	3.9241

Average Moisture Content, Wet Basis **3.77** %

Average Moisture Content, Dry Basis **3.91** %

Method: ASTM D4442-92 Method A -- Oven Drying Method

Dry Basis, % = (Initial net - Final net) / Final net x 100

Wet Basis, % = (Initial net - Final net) / Initial net x 100

Engineer Signature Florin Anghel

Date 9/25/2012

Manufacturer: SBI				VERSION 1.2				2/5/2010						
Model: Eurostar / Osburn 5000														
Date: 9/19/2012														
Run: 5														
Project #: G100903464														
Test Duration: 120														
Barometer (in. Hg):				Start	End									
				29.85	29.94									
Dry Bulb (F):				79.2	79.2									
Humidity (%):				36	29									
Moisture content of wood (wet basis):				3.76287										
Average				0.23	3.82	16.77	358.04	79.32	125.94	561.32	821.53	430.58	465.35	168.08
*				*	*	*	*	*	*	*	*	*	*	*
Elapsed Time	Weight Remaining	CO	CO2	O2	Flue Gas	Room Temp	Tunnel Dry Bulb	Unit Top	Unit Back	Unit R.Side	Unit L.Side	Unit Bottom		
0	8.77	0.23	3.78	17	359	79.28	125.4	572.3	845.9	435.7	467.3	172.3		
10	8.00	0.23	4.68	16.68	362.3	79.16	125.9	576.2	824.8	434.7	469.2	171		
20	7.25	0.25	3.44	16.18	363.1	79.57	126.3	588.8	847.1	438.1	473.8	170.9		
30	6.53	0.24	3.62	17.5	354.4	79.47	125.9	561.2	813.9	432.4	463.8	168.8		
40	5.80	0.23	3.45	16.95	355.4	79.4	125.9	559.5	804.6	427.8	461.1	169.3		
50	5.09	0.24	4.15	17.06	352.7	78.92	125.2	546.4	820.4	420.9	456.1	168.9		
60	4.34	0.24	3.37	16.68	361.9	79.15	126.4	574.3	825.3	433.3	470.8	171.2		
70	3.67	0.24	4.94	16.37	349.9	79.85	125.2	526	770.7	408.1	446.2	163.7		
80	2.94	0.23	3.15	16.94	352.3	79.41	125.7	535.6	778.2	415.9	451.1	164.5		
90	2.18	0.21	4.08	16.97	361	79.32	126.1	568.1	829.6	434.6	466.4	166		
100	1.43	0.2	3.84	15.86	365.9	79.06	126.6	565	840	444.2	481.5	165.6		
110	0.73	0.22	3.12	17.2	354.8	79.32	126	548.8	818.9	433.3	467	164.3		
120	0	0.23	3.98	16.62	361.8	79.25	126.6	574.9	860.5	438.5	475.3	168.5		

Manufacturer: SBI														
Model: Eurostar / Osburn 5000														
Date: 9/19/12														
Run: 5														
Project #: G100903464														
800.64	77.29	77.27	82.79	412.14	76.88	83.79	76.88	0.02	0.037	0.00	489.37			
*	*	*	*	*	*	*	*	*	*			Change in		
DGM 1	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	DGM 2	Filter 2	Tunnel	Chimney	Visual	Average	Surface		Elapsed
Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp	Velocity	Draft	Smoke	Stove	Temp.		Time
791.389	76.68	76.58	76.95	403.856	76.42	76.94	76.29	0.018	0.038		498.7	0	0	0
792.955	77.01	76.78	84.63	405.139	76.52	85.24	76.38	0.018	0.038		495.2	-3.52		10
794.513	77.03	76.86	87.69	406.397	76.48	87.85	76.66	0.018	0.040		503.7	5.04		20
796.056	77.12	76.87	82.3	407.862	76.6	84.24	76.55	0.018	0.035		488.0	-10.68		30
797.595	77.23	77.07	81.89	409.305	76.71	83.9	76.73	0.018	0.038		484.5	-14.24		40
799.129	77.36	77.2	86.18	410.721	76.89	83.51	76.94	0.018	0.038		482.5	-16.16		50
800.661	77.41	77.41	85.76	412.141	76.89	83.47	77.09	0.018	0.035		495.0	-3.72		60
802.190	77.46	77.43	82.02	413.542	77.01	83.88	76.99	0.018	0.038		462.9	-35.76		70
803.717	77.44	77.53	81.84	414.959	77.04	84.12	77.2	0.018	0.035		469.1	-29.64		80
805.242	77.57	77.57	81.8	416.371	77.18	84.13	77.06	0.018	0.038		492.9	-5.76		90
806.766	77.64	77.7	81.9	417.774	77.26	84.29	77.12	0.018	0.038		499.3	0.56		100
808.291	77.41	77.73	81.64	419.173	77.23	83.77	77.19	0.018	0.035		486.5	-12.24		110
809.807	77.43	77.72	81.68	420.586	77.19	83.98	77.28	0.018	0.038		503.5	4.84	4.84	120

		Manufacturer: SBI							
		Model: Eurostar / Osburn 5000							
		Date: 9/19/12							
		Run: 5							
		Project #: G100903464							
		Test Duration: 120							
	Total Gas Volume (DGM 1):			18.329		Pitot Factor	0.83		
	Total Gas Volume (DGM 2):			16.499			(0.99 standard,		
	Average Barometric Pressure:			29.895			0.84 or Cal. Factor for S-Type)		
	Molecular Weight:			28.56					
	Pitot Correction:			0.974351713					
	Calibration Factor (DGM #1):			1.0140					
	Calibration Factor (DGM #2):			1.0110					
			(1) VS:	0.0423					
			(2) VS:	0.0470					
							Filter Face	Filter Face	
Elapsed Time	DGM 1 Reading	DGM 1 Inlet T	DGM 1 Outlet T	DGM 2 Reading	DGM 2 Inlet T	DGM 2 Outlet T	Tunnel Dry Bulb	Velocity DGM 1	Velocity DGM 2
0	791.389	76.68	76.58	403.856	76.42	76.94	125.4		
10	792.955	77.01	76.78	405.139	76.52	85.24	125.9	13.45	10.90
20	794.513	77.03	76.86	406.397	76.48	87.85	126.3	13.38	10.66
30	796.056	77.12	76.87	407.862	76.6	84.24	125.9	13.25	12.46
40	797.595	77.23	77.07	409.305	76.71	83.9	125.9	13.21	12.27
50	799.129	77.36	77.2	410.721	76.89	83.51	125.2	13.16	12.05
60	800.661	77.41	77.41	412.141	76.89	83.47	126.4	13.14	12.08
70	802.190	77.46	77.43	413.542	77.01	83.88	125.2	13.11	11.91
80	803.717	77.44	77.53	414.959	77.04	84.12	125.7	13.10	12.05
90	805.242	77.57	77.57	416.371	77.18	84.13	126.1	13.08	12.00
100	806.766	77.64	77.7	417.774	77.26	84.29	126.6	13.07	11.92
110	808.291	77.41	77.73	419.173	77.23	83.77	126	13.08	11.90
120	809.807	77.43	77.72	420.586	77.19	83.98	126.6	13.00	12.01

Proportional Rate Calculations				(EPA Formulas from PR5G)				
Stack area (ft2): 0.34907				Manufacturer: SBI				
Wood moisture (% wet): 3.76287				Model: Eurostar / Osburn 5000				
Load Weight (lbs wet): 8.77				Date: 9/19/12				
Burn Rate (Dry kg/hr): 1.914				Run: 5				
				Project No.: G100903464				
Final Temperature (DGM #1) Degrees Rankin:				537.278				
Final Temperature (DGM #2) Degrees Rankin:				540.336				
Final Tunnel Temperature Degrees Rankin:				585.938				
Final Tunnel Velocity (feet per second):				7.57581				
Standardized Tunnel Flow (dscfm):				137.09				
		Average	Average					
		Inlet +	Inlet +					
		Outlet	Outlet	100.00	100.00	#1	#2	
Tunnel	Tunnel	Temp.	Temp.			dDGM	dDGM	
Velocity	Velocity	Meter 1	Meter 2			Vol.Std.	Vol.Std.	
Delta-P	Ft/Sec	Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time
0.018	7.572	536.6	536.7					0
0.018	7.576	536.9	540.9	102.11	91.98	1.560	1.265	10
0.018	7.578	536.9	542.2	101.61	90.00	1.552	1.237	20
0.018	7.576	537.0	540.4	100.59	105.12	1.536	1.445	30
0.018	7.576	537.2	540.3	100.30	103.56	1.532	1.424	40
0.018	7.571	537.3	540.2	99.89	101.58	1.527	1.398	50
0.018	7.579	537.4	540.2	99.84	101.98	1.524	1.402	60
0.018	7.571	537.4	540.4	99.54	100.46	1.521	1.382	70
0.018	7.574	537.5	540.6	99.44	101.63	1.519	1.398	80
0.018	7.577	537.6	540.7	99.33	101.29	1.517	1.392	90
0.018	7.580	537.7	540.8	99.29	100.66	1.516	1.383	100
0.018	7.576	537.6	540.5	99.32	100.37	1.517	1.380	110
0.018	7.580	537.6	540.6	98.78	101.42	1.508	1.394	120

Intertek Testing Services			
SFBA EPA ADJUSTED EMISSION RESULTS			
Manufacturer:	SBI	RESULTS	
Model:	Eurostar / Osburn 5000		
Date:	9/19/12	Average Adjusted Emissions Rate:	2.49
Run:	5	Average Unadjusted Emission Rate	1.46
Project #:	G100903464	Burn Rate (Dry kg/hr):	1.91
Test Duration (Minutes):	120		
Test Duration (Hours):	2.00		
BAROMETRIC PRESSURE			
			Average: 29.895
TEMPERATURE FACTORS			Start: 29.85
DGM #1:	0.9827	End:	29.94
DGM #2:	0.9772		
DRY GAS METER VALUES			
VOLUMES SAMPLED		DGM #1	Final: 809.807
DGM #1:	18.338	Initial:	791.389
DGM #2:	16.514		
		DGM #2	Final: 420.586
TOTAL TUNNEL VOLUME (scf):	16451	Initial:	403.856
SAMPLE RATIOS		TEMPERATURES (DEG. RANKIN)	
Sample Train 1:	897.1	DGM #1:	537.28
Sample Train 2:	996.2	DGM #2:	540.34
TOTAL EMISSIONS		CALIBRATION FACTORS	
Sample Train 1 (g):	2.96	DGM #1:	1.014
Sample Train 2 (g):	2.89	DGM #2:	1.011
Ave:	2.92		
EMISSION RATES		TUNNEL FLOW RATE: 137.1	
Sample Train 1 (g/hr):	1.48	PARTICULATE CATCH (mg)	
Sample Train 2 (g/hr):	1.44	Sample Train 1:	
Ave:	1.46	Filters	2.6
ADJUSTED EMISSION RATES		Probe	0.7
Sample Train 1 (g/hr):	2.52	Total	3.3
Sample Train 2 (g/hr):	2.47	Sample Train 2:	
Ave:	2.49	Filters	2.1
DEVIATION:	1.01%	Probe	0.8
		Total	2.9
If deviation is greater than 7.5% due to low particulate catch			
The two emission rates shall not differ by 7.5%			
of the weighted average emission rate limit (4.1 or 7.5) (5g-3)			
Use the following:			
Catalytic units	1.23%		
7.5% of 4.1 g/hr			
Non catalytic units	0.68%		
7.5% of 7.5 g/hr			

REPORT DATA

Client: SBI

Run: 5

Date: 9/19/12

Project No.: G100903464

Model: Eurostar / Osburn 5000

Fuel Moisture (Dry): 3.91

Stack Static (neg): -0.0875

Barometer: 29.895

Average Room Temp: 79.32

Change in stove temp: 4.84

Burn Rate:	1.914
-------------------	--------------

Adjusted Emission Rate: 2.495

System 1:	2.520
-----------	-------

System 2: 2.470

Deviation: 1.01%

Filter 1: 82.79

Filter 2:	76.88
-----------	-------

Tunnel:	125.94
---------	--------

DGM 1: 77.28

DGM 2:	80.34
--------	-------

Water Collected:

Room Temp

Before	After
--------	-------

79	79
----	----

Bar Pressure

Before

29.85

Relative Humidity

Before

36

After

29

Air Velocity

Before	After
--------	-------

0

0

Delta H Average

DGM#1: 0

DGM#2:	0
--------	---

Manufacturer: SBI

Model: Eurostar / Osburn 5000

Date: 19-Sep-12

Run: 5

Project #: G100903464

E&E Tunnel Traverse Worksheet

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.018	122	0.1323
B CENTER	0.020	129	0.1414
A1	0.018	123	0.1323
A2	0.020	124	0.1414
A3	0.018	124	0.1323
A4	0.015	120	0.1225
B1	0.018	128	0.1323
B2	0.020	128	0.1414
B3	0.018	128	0.1323
B4	0.018	107	0.1323
AVERAGE	0.018	123.25	0.1333

Static Pressure:

**PITOT
CONSTANT:** 0.9744

Tunnel Diameter (in):	8
Tunnel Area (ft ²):	0.349066
Tunnel Static Pressure:	0.0875

Manufacturer:		SBI													
Model:		Eurostar / Osburn 5000													
Date:		9/19/2012													
Run:		5													
Project #:		G100903464													
Flue	Room	Tunnel	Unit	Top	Unit	Bottom	Unit	Back	Unit	L.Side	Unit	Right	Scale		
Gas	Temp	Dry Bulb	Unit	Top	Unit	Bottom	Unit	Back	Unit	L.Side	Unit	Right	Scale	weight	Draft
323.7	78.39	121.5	524.1	128.9	782.5	386.3	343.9	4.45	0.002	8.54					
341.4	78.43	125.2	548	141.3	822	424.9	383.2	3.7	0.001	9.04					
350.7	78.59	126.7	592	149.7	890.7	447	410.3	2.95	0.001	9.14					
352.6	78.97	128.1	576.4	159.1	852.9	453.3	419.6	2.23	0.003	9.24					
354.9	78.72	128.7	581.7	162.4	837.2	463.7	428.8	1.48	0.003	9.34					
359.6	78.75	129.3	595.8	169.6	890.9	471.6	440.7	0.73	0.002	9.44					
359	79.28	125.4	572.3	172.3	845.9	467.3	435.7	0	0.002	9.54					

Pellet Fuel Moisture Content Worksheet

Intertek

Intertek Montreal

Client SBI

Model Eurostar/Osburn 5000

Project No. G100903464

Sample Description Saw Dust Pellets

Container	Container ID No.	Date Placed in Oven	Time Placed in Oven	Container Tare Weight, Grams	Initial Gross Weight, Grams	Date Removed from Oven	Time Removed From Oven	Final Gross Weight, Grams	Moisture Content, Wet Basis, %	Moisture Content, Dry Basis, %
1		9/19/2012	12:00	190.4906	327.0401	9/20/2012	12:00	321.9121	3.7554	3.9019
2		9/19/2012	12:00	181.8458	323.8649	9/20/2012	12:00	318.5024	3.7759	3.9241

Average Moisture Content, Wet Basis **3.77** %

Average Moisture Content, Dry Basis **3.91** %

Method: ASTM D4442-92 Method A -- Oven Drying Method

Dry Basis, % = (Initial net - Final net) / Final net x 100

Wet Basis, % = (Initial net - Final net) / Initial net x 100

Engineer Signature Florin Anghel

Date 9/25/2012

[illegible]

Manufacturer: SBI Model: Eurostar Date: 9/19/12 Run: 6 Project #: G100903464														
818.97	77.71	77.79	82.10	429.26	77.41	83.81	77.36	0.02	0.038	0.00	506.48			
*	*	*	*	*	*	*	*	*	*					
DGM 1	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	DGM 2	Filter 2	Tunnel	Chimney	Visual	Average	Change in		
Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp	Velocity	Draft	Smoke	Stove	Surface	Temp.	Elapsed
809.875	77.33	77.34	80.21	420.647	77	77.84	76.91	0.018	0.038	Observed	Temp	Temp.	0	Time
811.460	77.43	77.44	84.04	422.050	77.13	86.53	76.99	0.018	0.038		518.5	-12.26		0
813.070	77.49	77.51	82.52	423.445	77.18	83.86	77.08	0.018	0.038		506.3	-3.52		10
814.536	77.57	77.57	82.15	424.936	77.18	84.24	77.2	0.018	0.038		515.0	2.38		20
816.042	77.63	77.62	82.09	426.398	77.26	84.29	77.29	0.018	0.038		520.9	-9.96		30
817.538	77.66	77.72	82.22	427.852	77.35	83.92	77.29	0.018	0.038		508.6	-13		40
819.030	77.81	77.81	82.1	429.300	77.48	84.06	77.47	0.018	0.038		505.5	-24.68		50
820.509	77.98	77.97	81.9	430.735	77.53	84.28	77.64	0.018	0.038		493.8	-11.18		60
821.979	77.76	78.06	82.24	432.175	77.58	84.44	77.51	0.018	0.038		507.3	-22.1		70
823.435	77.98	78.1	82.37	433.595	77.66	84.17	77.65	0.018	0.038		496.4	-29.96		80
824.902	77.87	78.12	82.14	435.010	77.65	84.24	77.56	0.018	0.038		488.6	-10.3		90
826.381	77.82	78.08	81.97	436.422	77.66	84.33	77.54	0.018	0.038		508.2	-12.54		100
827.848	77.89	77.95	81.4	437.826	77.73	83.38	77.56	0.018	0.038		506.0	-9.4		110
											509.1	-9.4		120

		Manufacturer:	SBI						
		Model:	Eurostar						
		Date:	9/19/12						
		Run:	6						
		Project #:	G100903464						
		Test Duration:	120						
		Total Gas Volume (DGM 1):	17.943			Pitot Factor	0.83		
		Total Gas Volume (DGM 2):	17.001				(0.99 standard,		
		Average Barometric Pressure:	30.015				0.84 or Cal. Factor for S-Type)		
		Molecular Weight:	28.56						
		Pitot Correction:	1.005369714						
		Calibration Factor (DGM #1):	1.0140						
		Calibration Factor (DGM #2):	1.0110						
			(1) VS:	0.0443					
			(2) VS:	0.0468					
								Filter	Filter
								Face	Face
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2
0	809.875	77.33	77.34	420.647	77	77.84	130.9		
10	811.460	77.43	77.44	422.050	77.13	86.53	130.8	13.65	11.95
20	813.070	77.49	77.51	423.445	77.18	83.86	131.4	13.86	11.91
30	814.536	77.57	77.57	424.936	77.18	84.24	131.6	12.62	12.72
40	816.042	77.63	77.62	426.398	77.26	84.29	130.8	12.96	12.48
50	817.538	77.66	77.72	427.852	77.35	83.92	131.5	12.88	12.41
60	819.030	77.81	77.81	429.300	77.48	84.06	130.6	12.84	12.36
70	820.509	77.98	77.97	430.735	77.53	84.28	130.5	12.72	12.24
80	821.979	77.76	78.06	432.175	77.58	84.44	131.3	12.65	12.28
90	823.435	77.98	78.1	433.595	77.66	84.17	131.1	12.52	12.11
100	824.902	77.87	78.12	435.010	77.65	84.24	131	12.62	12.07
110	826.381	77.82	78.08	436.422	77.66	84.33	131.4	12.72	12.04
120	827.848	77.89	77.95	437.826	77.73	83.38	132.3	12.62	11.99

Proportional Rate Calculations				(EPA Formulas from PR5G)				
Stack area (ft2): 0.34907				Manufacturer: SBI				
Wood moisture (% wet): 3.76287				Model: Eurostar				
Load Weight (lbs wet): 9.33				Date: 9/19/12				
Burn Rate (Dry kg/hr): 2.036				Run: 6				
				Project No.: G100903464				
Final Temperature (DGM #1) Degrees Rankin:				537.750				
Final Temperature (DGM #2) Degrees Rankin:				540.614				
Final Tunnel Temperature Degrees Rankin:				591.169				
Final Tunnel Velocity (feet per second):				7.836184				
Standardized Tunnel Flow (dscfm):				141.11				
		Average	Average					
		Inlet +	Inlet +					
		Outlet	Outlet	100.00	100.00	#1	#2	
Tunnel	Tunnel	Temp.	Temp.			dDGM	dDGM	
Velocity	Velocity	Meter 1	Meter 2			Vol.Std.	Vol.Std.	
Delta-P	Ft/Sec	Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time
0.018	7.834	537.3	537.4					0
0.018	7.834	537.4	541.8	105.86	97.80	1.583	1.386	10
0.018	7.838	537.5	540.5	107.57	97.53	1.608	1.381	20
0.018	7.839	537.6	540.7	97.95	104.22	1.464	1.476	30
0.018	7.834	537.6	540.8	100.55	102.11	1.504	1.447	40
0.018	7.838	537.7	540.6	99.93	101.64	1.494	1.440	50
0.018	7.832	537.8	540.8	99.56	101.12	1.489	1.433	60
0.018	7.832	538.0	540.9	98.66	100.18	1.476	1.420	70
0.018	7.837	537.9	541.0	98.13	100.57	1.467	1.425	80
0.018	7.836	538.0	540.9	97.16	99.18	1.453	1.405	90
0.018	7.835	538.0	540.9	97.89	98.82	1.464	1.400	100
0.018	7.838	538.0	541.0	98.74	98.63	1.476	1.397	110
0.018	7.844	537.9	540.6	98.02	98.23	1.464	1.390	120

Intertek Testing Services

SFBA EPA ADJUSTED EMISSION RESULTS

Manufacturer: SBI
 Model: Eurostar
 Date: 9/19/12
 Run: 6
 Project #: G100903464
 Test Duration (Minutes): 120
 Test Duration (Hours): 2.00

RESULTS

Average Adjusted Emissions Rate:	2.20
Average Unadjusted Emission Rate	1.26
Burn Rate (Dry kg/hr):	2.04

BAROMETRIC PRESSURE

Average: 30.015

Start: 29.97

End: 30.06

TEMPERATURE FACTORS

DGM #1: 0.9819

DGM #2: 0.9767

DRY GAS METER VALUES

VOLUMES SAMPLED

DGM #1: 17.951

DGM #2: 17.017

DGM #1 Final: 827.848

Initial: 809.875

DGM #2 Final: 437.826

Initial: 420.647

TOTAL TUNNEL VOLUME (scf): 16933

SAMPLE RATIOS

Sample Train 1: 943.3

Sample Train 2: 995.1

TEMPERATURES (DEG. RANKIN)

DGM #1: 537.75

DGM #2: 540.61

TOTAL EMISSIONS

Sample Train 1 (g): 2.64

Sample Train 2 (g): 2.39

Ave: 2.51

CALIBRATION FACTORS

DGM #1: 1.014

DGM #2: 1.011

EMISSION RATES

Sample Train 1 (g/hr): 1.32

Sample Train 2 (g/hr): 1.19

Ave: 1.26

TUNNEL FLOW RATE: 141.1

PARTICULATE CATCH (mg)

Sample Train 1:

Filters 2.6

Probe 0.2

Total 2.8

ADJUSTED EMISSION RATES

Sample Train 1 (g/hr): 2.29

Sample Train 2 (g/hr): 2.11

Ave: 2.20

Sample Train 2:

Filters 2.4

Probe 0

Total 2.4

DEVIATION: 4.18%

If deviation is greater than 7.5% due to low particulate catch
 The two emission rates shall not differ by 7.5%
 of the weighted average emission rate limit (4.1 or 7.5) (5g-3)

Use the following:

Catalytic units 4.48%
 7.5% of 4.1 g/hr

Non catalytic units 2.45%
 7.5% of 7.5 g/hr

REPORT DATA

Client: SBI

Run: 6

Date: 9/19/12

Project No.: G100903464

Model: Eurostar

Fuel Moisture (Dry):	3.91
----------------------	------

Stack Static (neg):	-0.0775
---------------------	---------

Barometer:	30.015
------------	--------

Average Room Temp: 80.57

Change in stove temp:	-9.4
-----------------------	------

Burn Rate:	2.036
-------------------	--------------

Adjusted Emission Rate:	2.201
-------------------------	-------

System 1:	2.293
-----------	-------

System 2:	2.109
-----------	-------

Deviation:	4.18%
------------	-------

Filter 1: 82.10

Filter 2: 77.36

Tunnel:	131.17
---------	--------

DGM 1: 77.75

DGM 2: 80.61

Water Collected:

Room Temp

Before After

80

81

Bar Pressure

Before

29.97

After

30.06

Relative Humidity

Before

27.4

After

22.4

Air Velocity

Before

0

After

0

Delta H Average

DGM#1: 0

DGM#2:	0
--------	---

VERSION 1.2

2/5/2010

Manufacturer: SBI

Model: Eurostar

Date: 19-Sep-12

Run: 6

Project #: G100903464

E&E Tunnel Traverse Worksheet

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.018	129	0.1323
B CENTER	0.018	128	0.1323
A1	0.015	127	0.1225
A2	0.020	129	0.1414
A3	0.018	128	0.1323
A4	0.013	117	0.1118
B1	0.018	128	0.1323
B2	0.023	128	0.1500
B3	0.018	125	0.1323
B4	0.020	112	0.1414
AVERAGE	0.01775	125.11	0.1330

Static Pressure:

**PITOT
CONSTANT:** 1.0054

Tunnel Diameter (in):	8
Tunnel Area (ft ²)	0.349066
Tunnel Static Pressure	0.0775

Pellet Fuel Moisture Content Worksheet

Intertek

Intertek Montreal

Client SBI

Model Eurostar/Osburn 5000

Project No. G100903464

Sample Description Saw Dust Pellets

Container	Container ID No.	Date Placed in Oven	Time Placed in Oven	Container Tare Weight, Grams	Initial Gross Weight, Grams	Date Removed from Oven	Time Removed From Oven	Final Gross Weight, Grams	Moisture Content, Wet Basis, %	Moisture Content, Dry Basis, %
1		9/19/2012	12:00	190.4906	327.0401	9/20/2012	12:00	321.9121	3.7554	3.9019
2		9/19/2012	12:00	181.8458	323.8649	9/20/2012	12:00	318.5024	3.7759	3.9241

Average Moisture Content, Wet Basis **3.77** %

Average Moisture Content, Dry Basis **3.91** %

Method: ASTM D4442-92 Method A -- Oven Drying Method

Dry Basis, % = (Initial net - Final net) / Final net x 100

Wet Basis, % = (Initial net - Final net) / Initial net x 100

Engineer Signature Florin Anghel

Date 9/25/2012