TEST REPORT

SCOPE: EMISSIONS, EFFICIENCY AND OUTPUT

FUEL: EPA TEST FUEL (CRIBS)

TEST STANDARD: EPA

MODEL: S244 WOOD STOVE

TEST REPORT

REPORT NUMBER: 100517524MTL-002
REPORT DATE: March 12, 2012

EVALUATION CENTER

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Lachine, Qc

RENDERED TO

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PRODUCT EVALUATED:

Wood Stove Model S244

Report of Testing Model S244 Wood Fuel Room Heater 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".

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I. INTRODUCTION

Intertek Testing Services NA (Intertek) has witnesed testing for S.B.I.-Stove Builders International, on model S244 Wood Room Heater, to evaluate all applicable performance requirements included in EPA Method 28 “Certification and auditing of wood heaters” and Method 5G-3 “Determination of Particulate Matter Emissions from Wood Heaters.”

I.A PURPOSE OF TEST

The test was conducted to determine if the unit is in accordance with U.S EPA requirements for Residential Wood Fuel Room Heaters. This site-testing took place on December 5, 2011 – December 14, 2011.

I.B LABORATORY

The tests on the Wood Room Heater model S244 was conducted at the S.B.I’s testing facility located at 250 Copenhague Street, St-Augustin-de-Desmaures, PQ G3A 2H3.

I.C DESCRIPTION OF UNIT

The model S244 Wood Room Heater is constructed of carbon steel. The outer dimensions are 20.924 - inches deep, 25.735 -inches high, and 22.626 - inches wide and the unit tested was bearing the serial number MTL1111071416-001. (See product drawings.)

Proprietary drawings are on file at Intertek in Montreal.

I.D REPORT ORGANIZATION

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

II. SUMMARIZATION

II.A PRETEST INFORMATION

Prior to beginning the emissions tests the unit was operated for a minimum of one hour at the burn rate corresponding to the burn rate cathegory the unit was about to be tested.

On December 2 2011 the unit was set-up for testing.

II.B INFORMATION LOG

TEST STANDARD

From December 5, 2011 – December 14, 2011 the unit was tested for EPA emissions.

Deviation 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 (December 5, 2011) This test was filed as an R&D as it was a trial of the product prior to certification.

RUN #2 (December 6, 2011) Air control was half open until 3:45 min and was set at full closed position at 5 minutes. Burn time was 200 minutes with a category 2 burn rate of 0.9 Kg/hr. The fuel was loaded by 50 seconds and the door was closed by 95 seconds. The blower was off the first 30 minutes of the test and On-Low for the reminder of the test.

RUN #3 (December 7, 2011) Air control was open till 4:30 minutes and closed at 5 minutes. Burn time was 210 minutes with a category 2 burn rate of 0.86 kg/hr. The fuel was loaded by 60 seconds and the door was closed immediately after. The blower was off the first 30 minutes of the test and On-Low for the reminder of the test.

RUN #4 (December 8, 2011) Air control was closed at 5 minutes. Burn time was 220 minutes with a category 2 burn rate of 0.82 kg/hr. The fuel was loaded by 44 seconds and the door was closed at 90 seconds into the test. The blower was off the first 30 minutes of the test and On-Low for the reminder of the test.

RUN #5 (December 9, 2011) Air control was closed at 5 minutes. Burn time was 220 minutes with a category 2 burn rate of 0.82 kg/hr. The fuel was loaded by 44 seconds and the door was closed at 90 seconds into the test. The blower was off the first 30 minutes of the test and On-Low for the reminder of the test. This test was declared null due to Delta T outside the acceptable range.

RUN #6 (December 12, 2011) Air control was fully open. Burn time was 110 minutes with a category 4 burn rate of 1.67 kg/hr. The fuel was loaded by 45 seconds and the door was closed at 90 seconds into the test. The blower was off the first 30 minutes of the test and On-Low for the reminder of the test.

RUN #7 (December 13, 2011) Air control was fully open. Burn time was 100 minutes with a category 4 burn rate of 1.81 kg/hr. The fuel was loaded by 60 seconds and the door was closed at 90 seconds into the test. The blower was off the first 30 minutes of the test and On-Low for the reminder of the test.

RUN #8 (December 14, 2011) Air control was closed. Burn time was 160 minutes with a category 2 burn rate of 1.13 kg/hr. The fuel was loaded by 60 seconds and the door was closed at 90 seconds into the test. The blower was off for duration of the test run.

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)
2*	**12/06/2011**	**0.90**	**3.73**	**5.42**	**No flue gases for 20 minutes**
3	**12/07/2011**	**0.86**	**2.81**	**4.29**	**78.2**
4	**12/08/2011**	**0.82**	**3.20**	**4.78**	**75.4**
5	**12/09/2011**	**1.64**	**4.05**	**5.72**	**N/A**
6	**12/12/2011**	**1.67**	**1.94**	**3.15**	**68.5**
7	**12/13/2011**	**1.81**	**3.21**	**4.80**	**71.9**
8-Fan conf.	**12/14/2011**	**1.13**	**3.80**	**5.51**	**75.5**

WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate	(E) Average Emission Rate g/hr	Heat Output (Btu/hr)	Probability	(K) Weighting Factor	(KxE)
4	**0.82**	**4.78**	**9887.72**	**0.2336**	**0.2632**	**1.2581**
3	**0.86**	**4.29**	**10370.05**	**0.2632**	**0.5974**	**2.5628**
6	**1.67**	**3.15**	**20137.19**	**0.8310**	**0.6132**	**1.9316**
7	**1.81**	**4.80**	**21825.34**	**0.8764**	**0.1690**	**0.8112**
				Totals:	**1.6428**	**6.5637**
					Weighted average emission rate:	**3.9954****

* Run Test 2 was omitted on a two for one basis in accordance to EPA Rules
** Run Test 5 was omitted due to calculated Delta T results falling outside acceptable limits
* *The weighed average is calculated using only the runs 4, 3, 6 and 7

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
2	**88**	**84**	**30.17**	**30.12**	**31**	**31**	**0**	**0**
3	**83**	**83**	**29.97**	**29.84**	**28**	**28**	**0**	**0**
4	**85**	**78**	**29.75**	**29.95**	**36**	**35**	**0**	**0**
5	**73**	**86**	**30.19**	**30.15**	**35**	**35**	**0**	**0**
6	**66**	**81**	**30.42**	**30.40**	**39**	**38**	**0**	**0**
7	**74**	**83**	**30.36**	**30.34**	**28**	**28**	**0**	**0**
8	**88**	**82**	**30.42**	**30.36**	**30**	**29**	**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. (^{o}R)	Volume Sample		Particulate Catch (mg)	
					1	2	1	2
2	**200**	**6.65**	**131.53**	**540.25**	**21.073**	**18.288**	**10.0**	**8.6**
3	**210**	**7.36**	**143.32**	**544.64**	**24.758**	**23.814**	**8.3**	**7.6**
4	**220**	**7.94**	**154.35**	**544.41**	**25.708**	**24.883**	**8.7**	**8.8**
5	**110**	**7.93**	**144.79**	**585.86**	**12.267**	**12.366**	**N/A**	**N/A**
6	**110**	**7.79**	**144.20**	**582.25**	**12.223**	**12.749**	**2.5**	**3.1**
7	**100**	**8.17**	**149.97**	**586.53**	**11.540**	**11.957**	**4.1**	**4.3**
8	**160**	**7.22**	**142.27**	**546.92**	**19.936**	**20.018**	**9.1**	**8.7**

DILUTION TUNNEL DUAL TRAIN PRECISION

Run No.	Sample Ratios		Total Emissions (g)		% Deviation
	Train 1	Train 2	Train 1	Train 2	
2	**1247.889**	**1437.893**	**12.48**	**12.37**	**0.38**
3	**1215.15**	**1263.28**	**10.086**	**9.601**	**2.04**
4	**1320.297**	**1364.085**	**11.487**	**12.004**	**1.83**
5	**1298.358**	**1288.027**	**N/A**	**N/A**	**N/A**
6	**1296.96**	**1243.48**	**3.24**	**3.86**	**7.17**
7	**1298.81**	**1253.56**	**5.325**	**5.390**	**0.5**
8	**1141.30**	**1136.64**	**10.386**	**9.889**	**2.03**

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

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (^{o}F)	Initial Draft (in/H_2O)	Run Time (min)	Average Draft (in/H_2O)
2	**0.90**	**-22.9**	**-0.038**	**200**	**-0.040**
3	**0.86**	**-55.3**	**-0.055**	**210**	**-0.043**
4	**0.82**	**-68.54**	**-0.045**	**220**	**-0.045**
5	**1.64**	**-173.2**	**-0.090**	**110**	**-0.080**
6	**1.67**	**-113.6**	**-0.095**	**110**	**-0.078**
7	**1.81**	**-85.22**	**-0.080**	**100**	**-0.082**
8	**1.13**	**-28.02**	**-0.075**	**160**	**-0.054**

III. PROCESS DESCRIPTION

III.A TEST SET-UP DESCRIPTON

A standard 8” diameter single wall pipe and insulated chimney system was installed to 15’ above the scale level. The unit controls were set to the lowest setting during the test.

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 8 feet ± 6 inches above the scale platform. (See Figure 2)

IV.A.(1) DILUTION TUNNEL

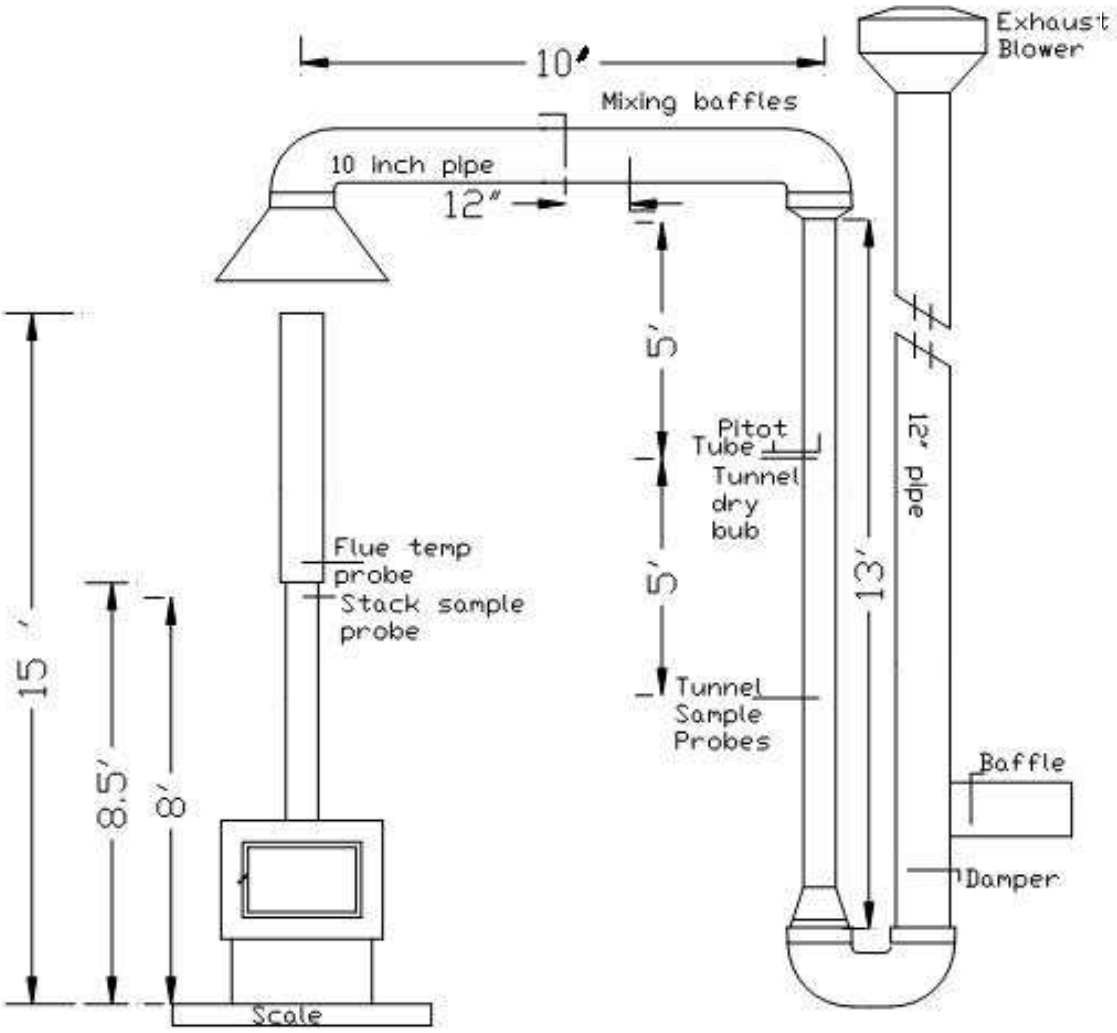
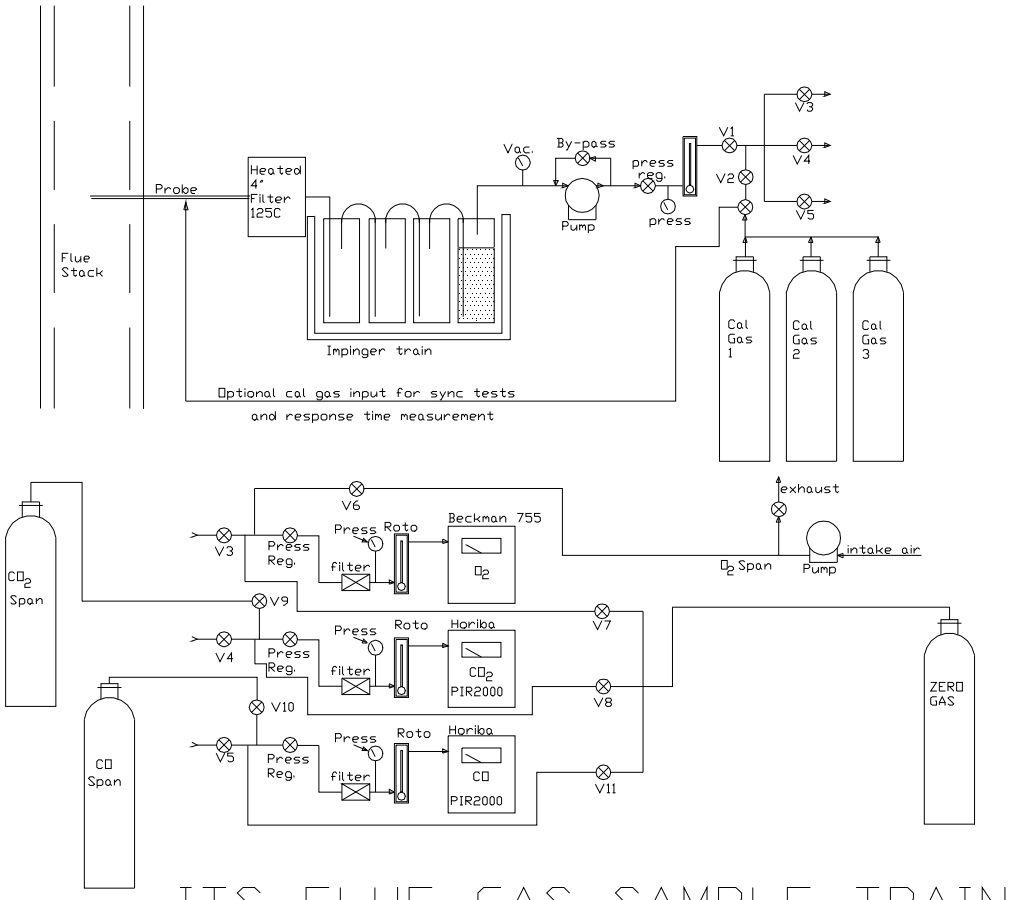


FIGURE 1

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

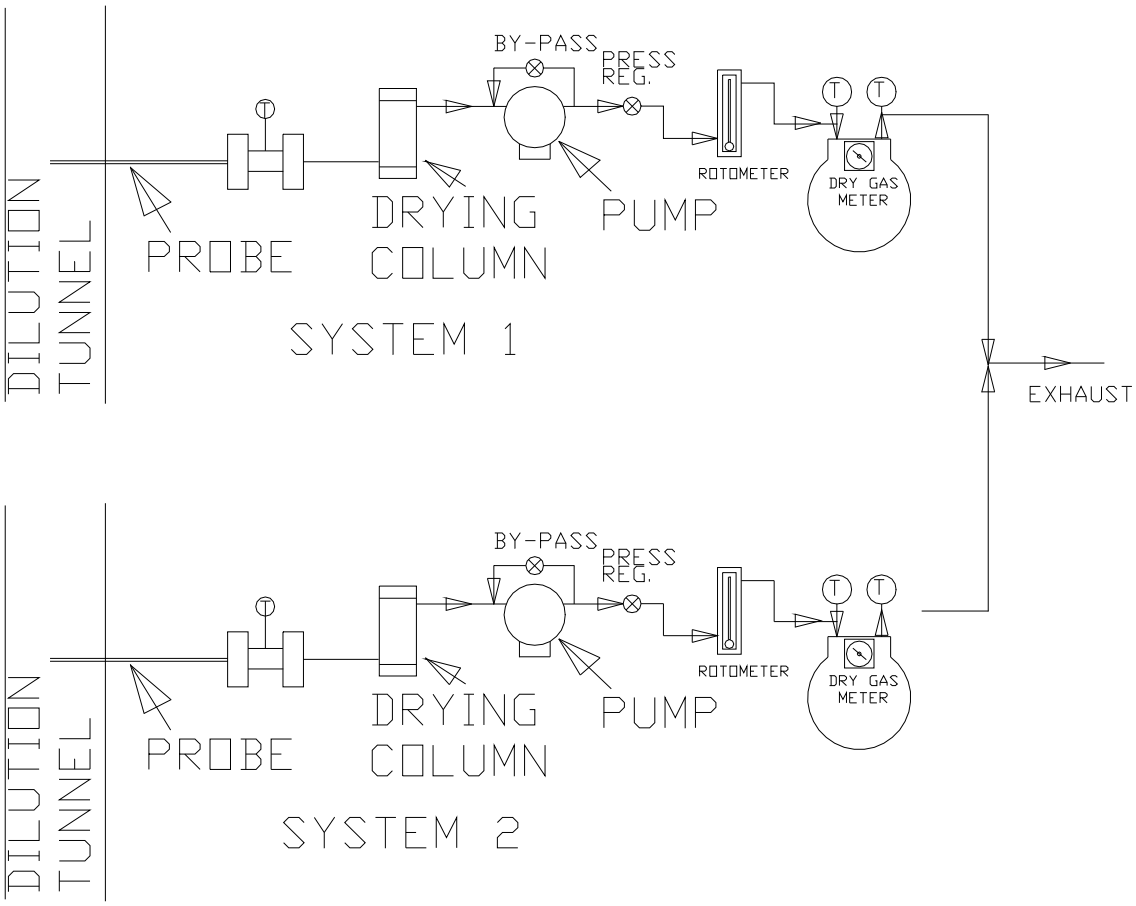


Figure 3

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 ft^3, the resolution is .1%, giving an accuracy higher than the ±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 3.9954 g/hr that meets the requirements.

VII.A RESULTS AND OBSERVATIONS

The Model S244 Wood Room Heater 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 from Wood Heaters.”

INTERTEK TESTING SERVICES NA

Reported by: _____
Florin Anghel,
Testing Engineer

Reviewed by:_____
Bruce S. Davis,
Project Engineer

Appendix C

Sample Analysis

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL1111071416-001
Test Date: December 5 2011
Test Run Number: 1

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	25		122.2	
B - Rear Filter Catch	Filter	26		122.5	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			254.6	244.7	9.9
Probe & Filter Holder	Probe	22	139579.1	139578.0	1.1
			Total Particulate, mg		11

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	27		122.4	
B - Rear Filter Catch	Filter	28		124	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			256.5	246.4	10.1
Probe & Filter Holder	Probe	31	137098.9	137098.0	0.9
			Total Particulate, mg		11

Test Engineer: _____

Date: 03/13/2012

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL1111071416-001
Test Date: December 6 2011
Test Run Number: 2

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	31		123.7	
B - Rear Filter Catch	Filter	32		121.8	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			254.3	245.5	8.8
Probe & Filter Holder	Probe	33	135994.8	135993.6	1.2
			Total Particulate, mg		**10**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	29		122	
B - Rear Filter Catch	Filter	30		123.2	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			252.8	245.2	7.6
Probe & Filter Holder	Probe	32	136018.2	136017.2	1.0
			Total Particulate, mg		**8.6**

Test Engineer: _____

Date: 03/13/2012

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 7-Dec-11
Test Run Number: 3

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	33		122.7	
B - Rear Filter Catch	Filter	34		123.2	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			252.9	245.9	7
Probe & Filter Holder	Probe	34	108411.5	108410.2	1.3
			Total Particulate, mg		**8.3**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	35		121.9	
B - Rear Filter Catch	Filter	36		122.8	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			251.5	244.7	6.8
Probe & Filter Holder	Probe	35	107838.0	107837.2	0.8
			Total Particulate, mg		**7.6**

Test Engineer: _____ Date: 03/13/2012

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 8-Dec-11
Test Run Number: 4

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	37		123.3	
B - Rear Filter Catch	Filter	38		122.2	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			253.5	245.5	8
Probe & Filter Holder	Probe	36	108503.0	108502.3	0.7
			Total Particulate, mg		**8.7**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	39		123.5	
B - Rear Filter Catch	Filter	40		123.3	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			255.1	246.8	8.3
Probe & Filter Holder	Probe	37	108382.8	108382.3	0.5
			Total Particulate, mg		**8.8**

Test Engineer: _____ Date: 03/13/2012

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 9-Dec-11
Test Run Number: 5

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	1		121.7	
B - Rear Filter Catch	Filter	2		123.1	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			247.9	244.8	3.1
Probe & Filter Holder	Probe	18	147891.6	147891.7	0.0
			Total Particulate, mg		**3.1**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	3		122.7	
B - Rear Filter Catch	Filter	4		123.3	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			249.2	246	3.2
Probe & Filter Holder	Probe	19	140124.8	140119.6	5.2
			Total Particulate, mg		**8.4**

Test Engineer: _____ Date: 03/13/2012

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 12-Dec-11
Test Run Number: 6

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	5		122.5	
B - Rear Filter Catch	Filter	6		123.4	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			247.4	245.9	1.5
Probe & Filter Holder	Probe	17	139750.1	139749.1	1.0
			Total Particulate, mg		**2.5**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	7		121.9	
B - Rear Filter Catch	Filter	8		122.7	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			247.1	244.6	2.5
Probe & Filter Holder	Probe	20	139068.1	139067.5	0.6
			Total Particulate, mg		**3.1**

Test Engineer: _____ Date: 03/13/2012

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 13-Dec-11
Test Run Number: 7

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	9		123.2	
B - Rear Filter Catch	Filter	10		121.9	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			247.6	245.1	2.5
Probe & Filter Holder	Probe	21	139249.3	139247.7	1.6
			Total Particulate, mg		**4.1**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	11		122.9	
B - Rear Filter Catch	Filter	12		123.6	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			249.3	246.5	2.8
Probe & Filter Holder	Probe	23	136188.9	136187.4	1.5
			Total Particulate, mg		**4.3**

Test Engineer: _____ Date: 03/13/2012

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 14-Dec-11
Test Run Number: 8 - Fan Confirmation

Intertek Equipment No.'s SBI-206

Sample Train - 1					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	13		121.8	
B - Rear Filter Catch	Filter	14		123	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			252.8	244.8	8
Probe & Filter Holder	Probe	24	136040.4	136039.3	1.1
			Total Particulate, mg		**9.1**

Sample Train - 2					
Sample Component	Component	ID Number	Weights		
			Final, mg	Tare, mg	Particulate, mg
A - Front Filter Catch	Filter	15		123.5	
B - Rear Filter Catch	Filter	16		122.8	
C - Seal Set	O-Ring				
Total, A+B+C-Tares			254.1	246.3	7.8
Probe & Filter Holder	Probe	25	136832.7	136831.8	0.9
			Total Particulate, mg		**8.7**

Test Engineer: _____ Date: 03/13/2012

Projet:
Date:
Tech: V. Pelletier
Standard: AUDIT 0.2 gr = 0.2002 gr 2011-12-07 | AUDIT 0.2 gr = 0.2002 gr 2011-12-08 | AUDIT 0.2 gr = 0.2001 gr 2011-12-09

Id. Filtres		Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
		9R:45	10R:00	9R:15							
RUN5	1	0.1218	0.1216	0.1219							
RUN5	2	0.1230	0.1231	0.1231							
RUN5	3	0.1228	0.1227	0.1227							
RUN5	4	0.1233	0.1232	0.1233							
RUN6	5	0.1224	0.1225	0.1225							
RUN6	6	0.1235	0.1234	0.1234							
RUN6	7	0.1218	0.1219	0.1219							
RUN6	8	0.1227	0.1227	0.1227							
RUN7	9	0.1232	0.1232	0.1232 FA							
RUN7	10	0.1220	0.1221	0.1219							
RUN7	11	0.1229	0.1229	0.1229							
RUN7	12	0.1236 FA	0.1235	0.1236							
RUN8	13	0.1218 FA	0.1217	0.1218							
RUN8	14	0.1230	0.1230	0.1230							
RUN8	15	0.1234	0.1235	0.1235							
RUN8	16	0.1228	0.1229 FA	0.1228							
	17	0.1228	0.1229	0.1229							
	18	0.1225	0.1227	0.1227							
	19	0.1234	0.1236	0.1236							
	20	0.1231	0.1231	0.1231							
	21	0.1226	0.1225	0.1226							
	22	0.1230	0.1230	0.1230							
	23	0.1186	0.1187	0.1186							
	24	0.1232	0.1232	0.1232							

03/13/2012

Projet:
Date:
Tech: C.Paré
Standard:

AUDIT 0.2 gr = 0.2001 gr.
AUDIT 0.2 gr = 0.2000 gr.
AUDIT 0.2 gr = 0.2002 gr

2011-12-01 2011-12-05 2011-12-06 2011-12-07

Id. Filtres	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
	11h32	8h30	8h45							
RUN 1 25	0,1223	0.1222								
RUN 1 26	0,1224	0.1225								
RUN 1 27	0,1224	0.1224								
RUN 1 28	0,1240	0.1240								
RUN 2 29	0,1221	0.1221	0.1220 ✓							
RUN 2 30	0,1232	0.1231	0.1232 ✓							
RUN 2 31	0,1236	0.1236	0.1237 ✓							
RUN 2 32	0,1218	0.1217	0.1218 ✓							
RUN 3 33	0,1227	0.1226	0.1227 ✓							
RUN 3 34	0,1232	0.1231	0.1232 ✓							
RUN 3 35	0,1220	0.1220	0.1219 ✓							
RUN 3 36	0,1228	0.1228	0.1228 ✓							
RUN 4 37	0,1233	0.1234	0.1233 ✓							
RUN 4 38	0,1222	0.1222	0.1222 ✓							
RUN 4 39	0,1237	0.1235	0.1235 ✓							
RUN 4 40	0,1233	0.1233	0.1233 ✓							
R 41	0,1229	0,1229	0.1229 ✓							
42	0,1234	0.1235	0.1235 ✓							
43	0,1227	0.1228	0.1227 ✓							
44	0,1214	0.1214	0.1215 ✓							
45	0,1227	0.1226	0.1226 ✓							
46	0,1228	0.1230 TA	0.1230 ✓							
47	0,1223	0.1224	0.1224 ✓							
48	0,1230	0.1230	0.1233	0.1231 ✓						

03/13/2012

Projet:
Date:
Tech: C.Paré
Standard:

Id. Probes		Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
			AUDIT 100 gr.= 100.0073 gr	AUDIT 100 gr= 100.0066 gr	AUDIT 100 gr = 100.0066 gr	AUDIT 100 gr = 100.0068 gr	AUDIT 100 gr = 100.0067 gr	AUDIT 100 = 100.0067 gr	AUDIT 100 = 100.0067 gr		
			2011-12-05	2011-12-06	2011-12-07	2011-12-08	2011-12-09	2011-12-12	2011-12-13		
			8h15	8h45	9h40	10h00	9:05	9:05	9:40		
RUN6	17				139,7488	139,7494	139,7488	139,7491			
RUN5	18				147,8910	147,8917	147,8917				
RUN5	19				140,1197	140,1200	140,1196				
RUN6	20				139,0671	139,0678	139,0675				
RUN7	21				139,2475	139,2480	139,2477				
RUN1	22	139,5781	139,5780								
RUN7	23				136,1873	136,1879	136,1874				
RUN8	24				136,0390	136,0395	136,0393				
RUN8	25				136,8318	136,8322	136,8318				
	26				139,8265	139,8270	139,8266				
	27				136,9021	136,9025	136,9022				
	28				136,2236	136,2242	136,2236	136,2229	136,2230		
	29										
	30										
RUN1	31	137,0976	137,0980								
RUN2	32	136,0166	136,0170	136,0172							
RUN2	33	135,9930	135,9938	135,9936							
RUN3	34	108,4101	108,4104	108,4102							
RUN3	35	107,8368	107,8373	107,8372							
RUN4	36	108,5022	108,5024	108,5023							
RUN4	37	108,3825	108,3826	108,3823							
	38										

03/13/2012

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/05/11 Engineer: Florin Anghel Run #: 1 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	25	Tare:	0.1222	Preliminary Wt:	0.1320
Rear Filter #	26	Tare:	0.1225	Preliminary Wt:	0.1232
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/05/2011 / 16:00			Preliminary Wt:	0.2552

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/06/11	16:00	29	69	0.2549	0.2= 0.2001	~~AA~~
12/07/11	10:00	28	68	0.2546	0.2= 0.2001	~~AA~~
12/07/11	16:00	27	68	0.2546	0.2= 0.2002	~~AA~~ ✓

Probe #:	22	Tare:	139,5780	Preliminary Wt:	139,5799
Date/Time in dessicator:	12/05/2011 / 16:00				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/06/11	16:00	29	69	139,5789	100= 100,0066	~~AA~~
12/07/11	10:00	28	68	139,5791	100= 100,0066	~~AA~~ ✓

Date: 03/13/12

Engineer signature: FAnghel

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/05/11 Engineer: Florin Anghel Run #: 1 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	27	Tare:	0.1224	Preliminary Wt:	0.1325
Rear Filter #	28	Tare:	0.1240	Preliminary Wt:	0.1246
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/05/2011/16:00			Preliminary Wt:	0.2571

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/06/11	16:00	29	69	0.2568	0.2 = 0.2001	~~TA~~
12/07/11	10:00	28	68	0.2565	0.2 = 0.2001	~~TA~~ ✓

Probe #:	31	Tare:	137,0980	Preliminary Wt:	137,0990
Date/Time in dessicator:	12/05/2011/16:00				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/06/11	16:00	29	69	137,0988	100 = 100,0066	~~TA~~
12/07/11	10:00	28	68	137,0989	100 = 100,0066	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: Florin Anghel

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/06/11 Engineer: Florin Anghel Run #: 2 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	31	Tare:	0.1237	Preliminary Wt:	0.1323
Rear Filter #	32	Tare:	0.1218	Preliminary Wt:	0.1226
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/06/2011/14:45			Preliminary Wt:	0.2549

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/07/11	16:00	27	68	0.2545	0.2= 0.2002	~~FA~~
12/08/11	17:30	29	68	0.2543	0.2= 0.2001	~~FA~~ ✓

Probe #:	33	Tare:	135,9936	Preliminary Wt:	135,9950
Date/Time in dessicator:	12/06/2011/14:45				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/07/11	16:00	27	68	135,9950	100= 100.0067	~~FA~~
12/08/11	17:30	29	68	135,9948	100= 100.0067	~~FA~~ ✓

Date: 03/13/2012

Engineer signature: ~~Florin Anghel~~

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/06/11 Engineer: Florin Anghel Run #: 2 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	29	Tare:	0.1220	Preliminary Wt:	0.1296
Rear Filter #	30	Tare:	0.1232	Preliminary Wt:	0.1238
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/06/2011/14:45			Preliminary Wt:	0.2534

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/07/11	16:00	29	68	0.2530	0.2= 0.2002	~~TA~~
12/08/11	17:30	29	68	0.2528	0.2= 0.2001	~~TA~~ ✓

Probe #:	32	Tare:	136,0172	Preliminary Wt:	136,0189
Date/Time in dessicator:	12/06/2011/14:45				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/07/11	16:00	27	68	136,0185	100= 100.0067	~~TA~~
12/08/11	17:30	29	68	136,0182	100= 100.0069	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/07/11 Engineer: Florin Anghel Run #: 3 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	33	Tare:	0.1227	Preliminary Wt:	0.1234
Rear Filter #	34	Tare:	0.1232	Preliminary Wt:	0.1237
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/07/2011 / 15:45			Preliminary Wt:	0.2531

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/08/11	17:30	28	68	0.2531	0.2= 0.2001	~~TA~~
12/09/11	13:00	29	69	0.2529	0.2= 0.2001	~~TA~~ ✓

Probe #:	34	Tare:	108,4102	Preliminary Wt:	108,4113
Date/Time in dessicator:	12/07/2011 / 15:45				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/08/11	17:30	28	68	108,4114	100= 100,0069	~~TA~~
12/09/11	13:00	29	69	108,4115	100= 100,0067	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/07/11 Engineer: Florin Anghel Run #: 3 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	35	Tare:	0.1219	Preliminary Wt:	0.1285
Rear Filter #	36	Tare:	0.1228	Preliminary Wt:	0.1232
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/07/2011 / 15:45			Preliminary Wt:	0.2517

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/08/11	17:30	28	68	0.2516	0.2 = 0.2001	~~TA~~
12/09/11	13:00	29	69	0.2515	0.2 = 0.2001	~~TA~~ ✓

Probe #:	35	Tare:	107,8372	Preliminary Wt:	107,8385
Date/Time in dessicator:	12/07/2011/15:45				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/08/11	17:30	28	68	107,8379	100 = 100.0067	~~TA~~
12/09/11	13:00	29	69	107,8380	100 = 100.0067	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: Florin Anghel

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/08/11 Engineer: Florin Anghel Run #: 4 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	37	Tare:	0.1233	Preliminary Wt:	0.1313
Rear Filter #	38	Tare:	0.1222	Preliminary Wt:	0.1226
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/08/2011/17:30			Preliminary Wt:	0.2539

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/11/11	12:20	6	67.5	0.2535	0.2 = 0.2002	~~TA~~
12/13/11	14:40	8	68.5	0.2535	0.2 = 0.2001	~~TA~~ ✓

Probe #:	36	Tare:	108,5023	Preliminary Wt:	108,5031
Date/Time in dessicator:	12/08/2011/17:30				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/11/11	12:20	6	67.5	108,5028	100 = 100.0066	~~TA~~
12/13/11	14:40	8	68.5	108.5030	100 = 100.0066	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/08/11 Engineer: Florin Anghel Run #: 4 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	39	Tare:	0,1235	Preliminary Wt:	0,1317
Rear Filter #	40	Tare:	0,1233	Preliminary Wt:	0,1238
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/08/2011/17:40			Preliminary Wt:	0,2555

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/11/11	12:20	6	67.5	0,2551	0.2= 0,2002	~~TA~~
12/13/11	14:40	8	68.5	0,2551	0.2= 0,2001	~~TA~~ ✓

Probe #:	37	Tare:	108,3823	Preliminary Wt:	108,3833
Date/Time in dessicator:	12/08/2011/17:40				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/11/11	12:20	6	67.5	108,3830	100= 100,0066	~~TA~~
12/13/11	14:40	8	68.5	108,3828	100= 100,0066	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: FAnghel

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/09/11 Engineer: Florin Anghel Run #: 5 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	1	Tare:	0.1217	Preliminary Wt:	0.1247
Rear Filter #	2	Tare:	0.1231	Preliminary Wt:	0.1232
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/09/2011/13:00			Preliminary Wt:	0.2479

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials

Probe #:	18	Tare:	147,8917	Preliminary Wt:	147,8916
Date/Time in dessicator:	12/09/2011/13:00				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials

Date: 3/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/09/11 Engineer: Florin Anghel Run #: 5 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	3	Tare:	0.1227	Preliminary Wt:	0.1258
Rear Filter #	4	Tare:	0.1233	Preliminary Wt:	0.1234
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/09/2011 / 13:00			Preliminary Wt:	0.2492

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials

Probe #:	19	Tare:	140,1196	Preliminary Wt:	140,1248
Date/Time in dessicator:	12/09/2011/13:00				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials

Date: 03/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/12/11 Engineer: Florin Anghel Run #: 6 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	5	Tare:	0.1225	Preliminary Wt:	0.1238
Rear Filter #	6	Tare:	0.1234	Preliminary Wt:	0.1238
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/11/2011 12:15			Preliminary Wt:	0.2476

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/13/11	14:40	8	68.5	0.2475	0.2= 0.2001	~~TA~~
12/14/11	14:30	8	68	0.2474	0.2= 0.2001	~~TA~~

Probe #:	17	Tare:	139,7491	Preliminary Wt:	139,7503
Date/Time in dessicator:	12/11/2011 12:15				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/13/11	14:40	8	68.5	139,7501	100= 100,0066	~~TA~~
12/14/11	14:30	8	68	139,7501	100= 100,0066	~~TA~~

Date: 03/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/12/11 Engineer: Florin Anghel Run #: 6 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	7	Tare:	0.1219	Preliminary Wt:	0.1240
Rear Filter #	8	Tare:	0.1227	Preliminary Wt:	0.1229
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/11/2011/12:15			Preliminary Wt:	0.2469

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/13/11	14:40	8	68.5	0.2469	0.2= 0.2001	~~TA~~
12/14/11	14:30	8	68	0.2471	0.2= 0.2001	~~TA~~ ✓

Probe #:	20	Tare:	139,0675	Preliminary Wt:	139,0689
Date/Time in dessicator:	12/11/2011/12:15				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/13/11	14:40	8	68.5	139,0684	100= 100.0066	~~TA~~
12/14/11	14:30	8	68	139,0681	100= 100,0066	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/13/11 Engineer: Florin Anghel Run #: 7 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	9	Tare:	0.1232	Preliminary Wt:	0.1254
Rear Filter #	10	Tare:	0.1219	Preliminary Wt:	0.1222
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/13/2011/14:50			Preliminary Wt:	0.2476

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/14/11	14:20	8	68	0.2477	0.2= 0.2001	~~TA~~
12/15/11	11:30	8	67.9	0.2476	0.2= 0.2001	~~TA~~

Probe #:	21	Tare:	139,2477	Preliminary Wt:	139,2473
Date/Time in dessicator:	12/13/2011/14:50				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/14/11	14:20	8	68	139,2479	100= 100.0066	~~TA~~
12/15/11	11:30	8	67.9	139,2489	100= 100.0069	~~TA~~
12/16/11	10:40	7	69.5	139,2493	100= 100,0066	~~TA~~

Date: 03/13/2012

Engineer signature: Florin Anghel

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/13/11 Engineer: Florin Anghel Run #: 7 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	11	Tare:	0,1229	Preliminary Wt:	0.1255
Rear Filter #	12	Tare:	0,1236	Preliminary Wt:	0.1240
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/13/2011/14:50			Preliminary Wt:	0.2495

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/14/11	14:20	8	68	0.2493	0.2= 0.2001	~~TA~~
12/15/11	11:30	8	67.9	0.2493	0.2= 0.2001	~~TA~~ ✓

Probe #:	23	Tare:	136,1874	Preliminary Wt:	136,1873
Date/Time in dessicator:	12/13/2011/14:50				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/14/11	14:20	8	68	136,1875	100= 100.0066	~~TA~~
12/15/11	11:30	8	67.9	136,1887	100= 100.0069	~~TA~~
12/16/11	10:40	7	69.5	136,1889	100= 100.0066	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: [signature]

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/14/11 Engineer: Florin Anghel Run #: 8 Sample Train #: A

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	13	Tare:	0.1218	Preliminary Wt:	0.1299
Rear Filter #	14	Tare:	0.1230	Preliminary Wt:	0.1236
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/14/2011/14:30			Preliminary Wt:	0.2535

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/16/11	10:40	7	69.5	0.2535	0.2 = 0.2001	~~TA~~
12/23/11	8:30	8	68.3	0.2530	0.2 = 0.2001	~~TA~~
12/23/11	15:00	8	69	0.2528	0.2 = 0.2001	~~TA~~ ✓

Probe #:	24	Tare:	136,0393	Preliminary Wt:	136,0398
Date/Time in dessicator:	12/14/2011/14:30				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/16/11	10:40	7	69.5	136,0407	100 = 100.0066	~~TA~~
12/23/11	8:30	8	68.3	136,0404	100 = 100.0066	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: _____

Intertek

DILUTION TUNNEL WORKSHEET - METHOD 5G3

Client: SBI Model: S244

Project #: G100517524 Sample ID #: MTL-1111071416-001

Date: 12/14/11 Engineer: Florin Anghel Run #: 8 Sample Train #: B

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

Audit weight Equipment #: 19749 (Balance audit mfr. std: 500 ± 0.72 mg)

Front Filter #	15	Tare:	0.1235	Preliminary Wt:	0.1319
Rear Filter #	16	Tare:	0.1228	Preliminary Wt:	0.1229
Seal Set #		Tare:		Preliminary Wt:	
Date/Time in dessicator:	12/14/2011/14:30			Preliminary Wt:	0.2548

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/16/11	10:40	7	69.5	0.2544	0.2= 0.2001	~~TA~~
12/23/11	8:30	8	68.3	0.2541	0.2= 0.2001	~~TA~~ ✓

Probe #:	25	Tare:	136,8318	Preliminary Wt:	136,8324
Date/Time in dessicator:	12/14/2011/14:30				

Date	Time	R/H %	Temp. (F)	Weight (grams)	Audit (grams)	Initials
12/16/11	10:40	7	69.5	136,8330	100= 100.0066	~~TA~~
12/23/11	8:30	8	68.3	136,8327	100= 100.0066	~~TA~~ ✓

Date: 03/13/2012

Engineer signature: Florin Anghel

Appendix D

Calibrations

No du rapport d'étalonnag CA0003-088-032111

Mettler Toledo
Service Business Unit Industrial
1900 Polaris Parkway
Columbus, Ohio 43240
1-800-METTLER

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

CERT.CALIBRATION #1902.02

METTLER TOLEDO

ISO 9001 Registered

ANSI/NCSL Z540 Accrédité

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

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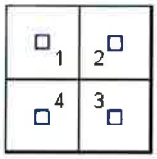
Résultats de mesure

La température : 70 °F

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

Test de variation



		Avant Réglage	*Après Réglage*
Les poids Appliqués	*Position*	*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					
	Les poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
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

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	Après réglage					
	Les poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
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.

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No du rapport d'étalonnag 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

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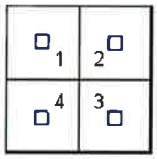
Résultats de mesure

La température : 70 °F

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

Test de variation



		Avant Réglage	*Après Réglage*
Les poids Appliqués	*Position*	*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					
	Les poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
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

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	Après réglage					
	Les poids Appliqués	*Valeur lue*	*Erreur*		*Erreur admissible*	*Dans la Tolérance*
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.

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No du rapport d'étalonnag 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 clie	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

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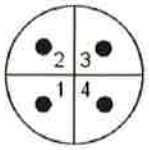
Résultats de mesure

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* *Valeur lue*	*Après Réglage* *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

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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

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	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**

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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.

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La Cie J. CHEVRIER INSTRUMENTS INC

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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 BR

C.Q.
B.R.

C.Q.
M.J.

Commentaire :

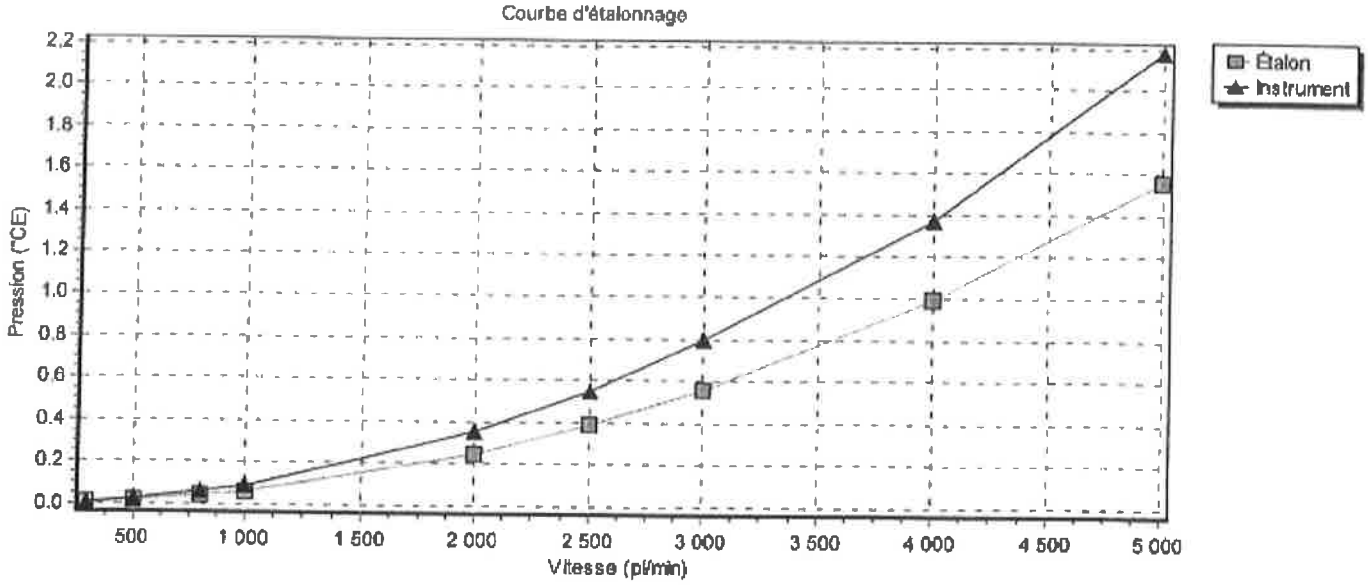
Points d'étalonnage

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

Certificat d'Étalonnage

Numéro du certificat: CE6926



Étalons utilisés traçables au C.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	CHEV121-100830	TUYÈRE AIRFLOW DEVELOPMENTS	2010-08-30	2011-08-30

Procedures utilisées dans cet étalonnage

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

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ULRICH

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

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

CALIBRATION CERTIFICATE

Certificate no.:	280384	**Calibration date**	August 25, 2011
Identification:	SBI-096	**Certificate issued**	August 25, 2011
Description:	CALIBRATOR, OMEGA CL23A	**Interval:**	12 months
Size:	TC K/J/T	**Due date:**	August 25, 2012
Manufacturer:	OMEGA	**Procedure no.:**	MET/CAL
Model no.:	CL23A	**Environment:**	CLAS Type 2 Laboratory
Serial no.:	T-256137	**Temperature:**	23 ± 2°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
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.

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166727 P

Ulrich Métrologie inc.
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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 VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	PASS/ FAIL	TUR
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						

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

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) Température: 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	

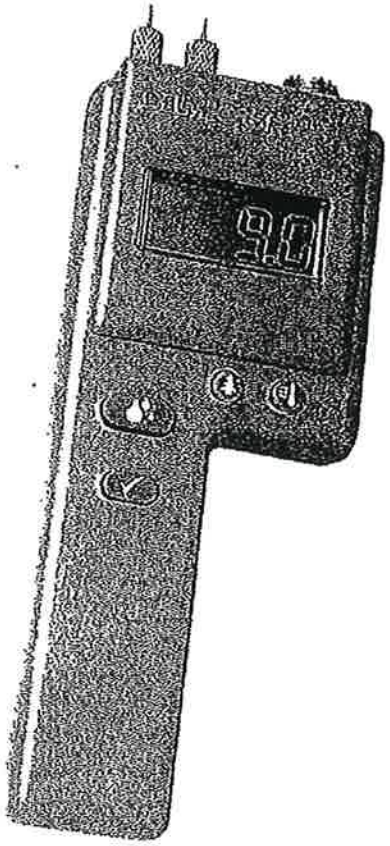
S.D.	0.00	%	
R.M.U.	0.02	%	
O.M.U	**0.04**	**%**	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
1000.0	999.8	0.02	
1000.0	1000.0	0.00	
1000.0	1000.0	0.00	

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

J-2000

owners manual



DELMHORST®
INSTRUMENT CO.
WHEN ACCURACY IS THE POINT.™

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3 Check Calibration

4 Set Species

5 Species Code Chart

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8 Information About Your Readings

8 To Check Accumulated Readings

8 To Reset Meter

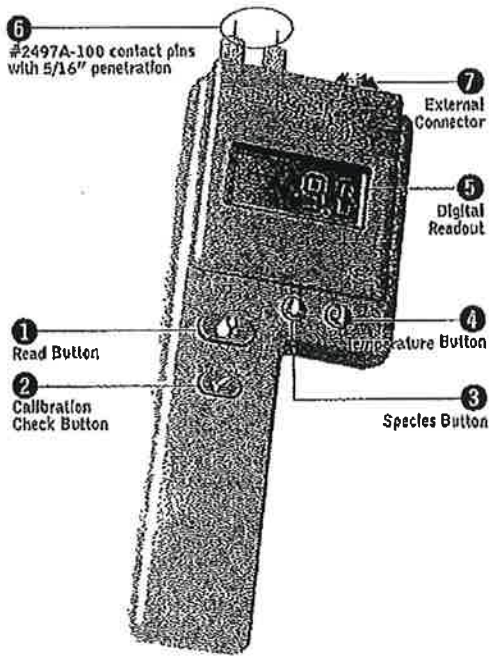
9 Pin Talk

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

❶ READ BUTTON - Reads the Percent Moisture Content value (%MC), corrected for temperature and species.

❷ 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.

❸ 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.

❹ 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 ❷ and read button ❶ 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 ❸, and the meter will make the necessary corrections.

- ▶To change species press the species button ❸. The meter will display the current species code for one second.
- ▶To scroll forward through the species list hold the species button ❸ 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 ❸. Within one second, press and hold the temperature button ❹. Continue to hold the temperature button ❹ 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 ❹. The meter will display the current temperature for one second.
- ▶To scroll forward through the temperature settings, press and hold the temperature button ❹ while the current temperature is displayed.
- ▶To scroll backward press and release the temperature button ❹. Within one second, press and hold the species button ❸. Continue to hold the species button ❸ 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 ❹.
- ▶Press the calibration check button ❷ 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 ❻ 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 ❸, then press the calibration check button ❷ 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 ❷, 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 ❻ 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 ❼. See additional information under the **Pin Talk** section.

- ▶Remove the protective cover to expose the pins. Check that the contact pins ❻ are firmly hand tightened.
- ▶To take a reading, align the contact pins ❻ 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 ❶ 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 ❶ 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 ❷. 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 ❷ 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 ❷.
- ▶Within one second press the species button ❸.
- ▶The meter will reset itself and display "170" to indicated 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 ❼.
- ▶ 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.

For more detailed information about using a wood moisture meter, call us toll-free at 1-877-DELMHORST. Ask for your free copy of "Measuring Wood Moisture Content: Straight Talk from Delmhorst". Or find it on our web site at www.delmhorst.com.

For over 60 years, Delmhorst has been the leading manufacturer of high-quality moisture meters and thermo-hygrometers. Today we offer the innovative KIL-MO-TROL® in-kiln monitoring system. We also offer a wide range of meters for a variety of applications including woodworking/lumber, agriculture, construction, paper, restoration, IAQ and flooring.

DELMHORST
INSTRUMENT CO.
WHEN ACCURACY IS THE POINT.™
51 Indian Lane East
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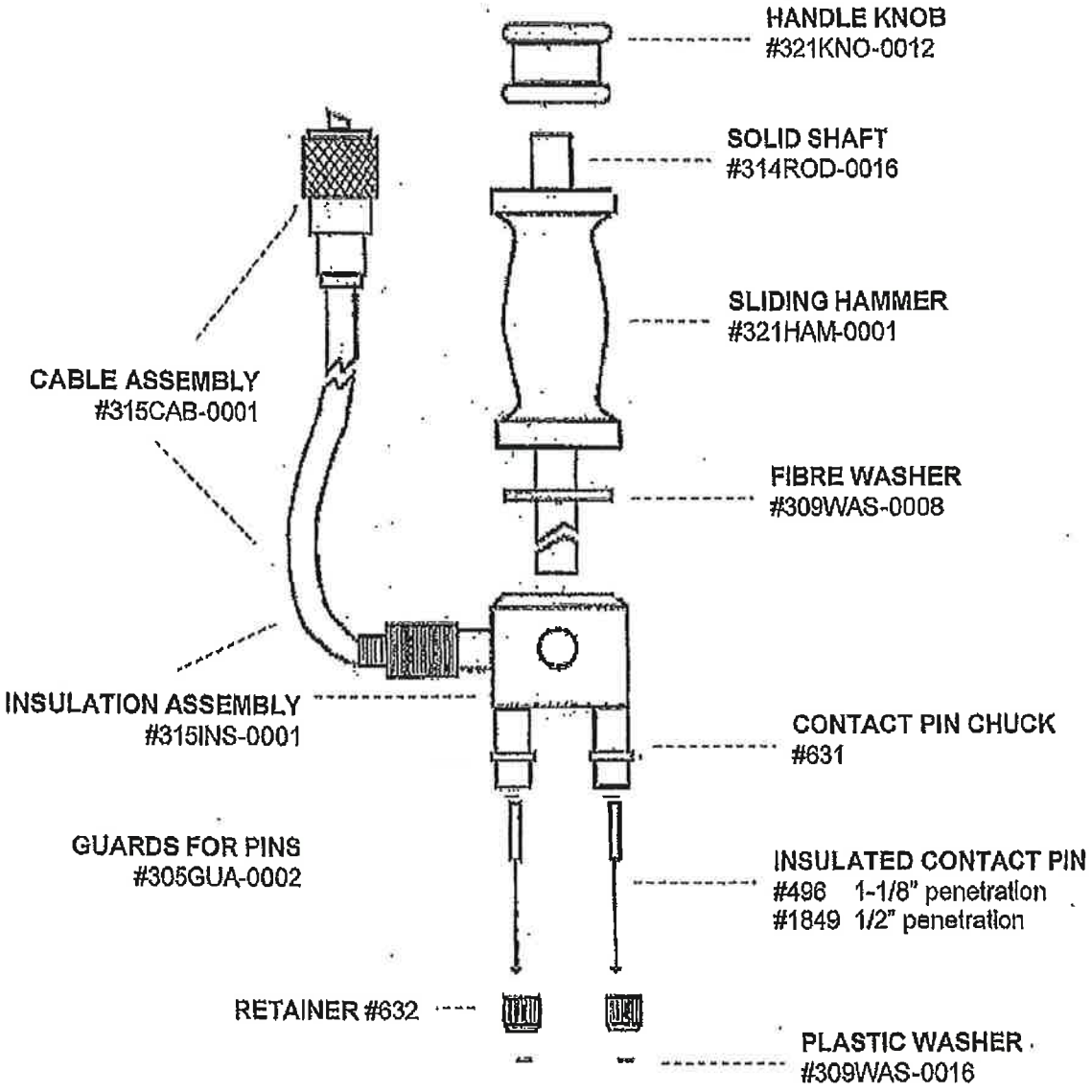
5101NS-0003 REV. 11/06

DELMHORST INSTRUMENT CO.

WHEN ACCURACY IS THE POINT.™

Parts List for 26-ES Electrode



Note: Type 26-ED electrode is fitted with hollow shaft assembly (with depth gauge) #315SHA-0002

Delmhorst Instrument Co. 51 Indian Lane East, Towaco, NJ 07082 Tel: 800.222-0638 Fax: 973.334.2657 www.delmhorst.com

La Cie J. CHEVRIER INSTRUMENTS INC.

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

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-DESMAURES, QC G3A 2H3

Informations sur l'instrument

Description: MANOMETRE DIFFERENTIEL ANALOGIQUE
Manufacturier: DWYER
Modèle: 2000-00N
Plage: 0/0.20 POH2O
Précision: ±4%P.E
Numéro de série :
I.D.: SBI-025
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

Commentaire :

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

Certificat d'étalonnage

Numéro du certificat: CE1638

Procédures utilisées pour effectuer cet étalonnage

Procédure	Description
3PR500-01-CHE	ÉTALONNAGE DE MANOMÈTRE

La Cie J. CHEVRIER INSTRUMENTS INC

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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.
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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: ±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

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	**0.10**	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

La Cie J. CHEVRIER INSTRUMENTS INC.

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

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:	±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

C.O PJB

Commentaire :

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

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_n	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:

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

$$BR = 0.98\ kg/hr = 2.17\ lb/hr$$

Volume of Gas Sampled Corrected to Dry Standard Conditions

Using equation 5-1:

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

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. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

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

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

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: $85.49 \frac{ft}{sec} \left[\frac{(lb/lb-mole) \times (inches\ Hg)}{(°R) \times (inches\ H_2O)}\right]^{\frac{1}{2}}$
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_s	=	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, °R; (°R = °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:

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

$$C_s = 0.000163 \ g/dscf$$

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:

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

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

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:

$$E = 0.000163 \times 8313.36$$

$$E = 1.36\ g/hr$$

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

$$E = 2.35\ g/hr$$

Proportional Rate Variation

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

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

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 CO_2 concentrations in the stack and in the dilution tunnel
$V_{mi(std)}$	=	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_{si}	=	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_{mi}	=	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_{si}	=	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

SBI
Model S244
G100517524

EPA NSPS WEIGHTED AVERAGE CALCULATION V 1.1

Sort data from lowest to highest burn rate and enter below.

Weighted Average

Type of Stove: 2
1=cat
2=noncat
3=pellet

Test No.	Burn Rate	(E) Ave. Emission Rate g/hr	(OHE)	Heat Output (BTU/HR)	Prob.	(K) Weighting Factor	(KxE)	KxOHE
4	0.82	4.78		9887.72	0.2336	0.2632	1.2581	0.00
3	0.86	4.29		10370.05	0.2632	0.5974	2.5628	0.00
6	1.67	3.15		20137.19	0.8310	0.6132	1.9316	0.00
7	1.81	4.80		21825.34	0.8764	0.1690	0.8112	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
						0.0000	0.0000	0.00
					Totals:	1.6428	6.5637	0.00

Weighted average emissions rate:	3.9954
Weighted Average OHE:	0.00

03/13/2012

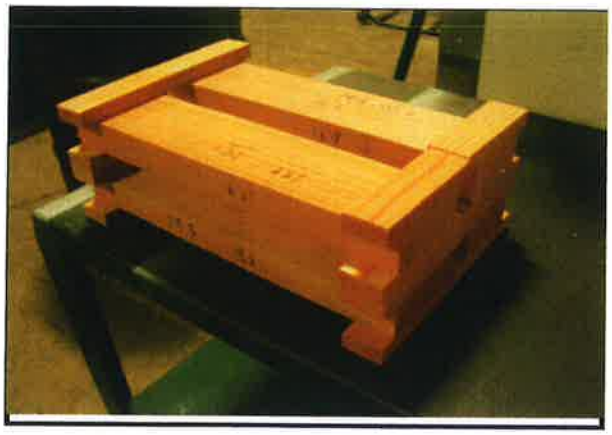
Run 1

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 5 2011
Test Run Number:	1
Date tunnel cleaned:	12/1/2011
Purpose of Test	Cat 1

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings	
Primary Air:	Closed
Secondary Air:	Fixed
Control Board:	N/A
Blower/Fan:	Off the first 30 minutes then On-Low for the reminder of the test.

Pre- Burn Activities

Time	Activity
0	Time=11:15
	When the weight was 2.4 lbs the primary air was shut and timer started.
60	The coal bed was leveled.

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 50 seconds.
Fuel-loading door :	Ajar until 90 seconds.
Primary air:	Opened half way at 2:30 min. then abruptly closed at 5 minutes into the test.
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	Off the first 30 minutes then On-Low for the reminder of the test.

Other Notes

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL1111071416-001
Test Date:	December 5 2011
Test Run No:	1

Temperature Data

Firebox Temp Start	378.88
Firebox Temp End	328.88
Firebox Delta-T	50.0

Max Filter Temps	
Train A	Train B
68.25	68.98

Interval	10	Duration of Test, Min	220

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	78.88	89.52	212.5	342	408.5	380.4	376.4	387.1		65.52	65.29	65.34	65.01
1	10	85.77	82.33	172.9	303.6	397.7	336.3	328.3	340.6		67.93	68.29	65.69	65.63
2	20	85.2	80.71	169.6	301.4	373.3	302.2	288.6	298.8		67.77	68.14	65.47	65.19
3	30	82.75	77.8	162.3	290.1	345.2	286.4	266	271.3		67.72	68.18	65.47	65.23
4	40	83.7	79.62	199.5	375.7	319.2	286.6	269.3	268.7		67.67	68.24	65.58	65.37
5	50	84.66	81.37	229.7	464.7	297.2	288.4	297.6	288.3		67.92	68.46	65.84	65.49
6	60	86.36	82.45	244	488.5	280.6	299	333.4	317.3		67.98	68.7	65.79	65.47
7	70	87.73	83.36	255.6	540.5	269.2	318.9	363.5	346.6		68.22	68.78	65.87	65.51
8	80	88.55	82.84	250.5	538.8	262.6	343	383.6	369.5		68.25	68.9	65.83	65.49
9	90	88.43	81.73	235.6	518.7	261.9	337.6	394.6	387.7		68.18	68.92	66	65.55
10	100	87.32	80.57	211.6	476.1	266.2	357.7	402.1	387		68.13	68.98	66.13	65.65
11	110	86.73	78.79	194.3	433.9	270	354.5	406.8	383.3		68.1	68.81	66.2	65.77
12	120	85.99	78.03	184.2	403.8	275.3	358.9	400.9	380.2		68.09	68.74	66.25	65.89
13	130	86.85	77.28	175.6	386.2	282.6	343.7	391	376.8		67.99	68.66	66.24	65.95
14	140	86.64	76.61	169.1	368.9	288.9	325.3	384.1	374.5		67.98	68.6	66.38	66.08
15	150	86.42	76.21	164.7	358.9	294.7	342.6	382	372.1		67.92	68.4	66.32	66.09
16	160	84.64	75.6	161.2	349.5	299	338.8	378.9	370.1		67.77	68.27	66.27	66.08
17	170	85.15	75.5	159.3	343	302.4	335.9	370.3	366.4		67.74	68.31	66.37	66.18
18	180	84.92	75.21	157.5	335.9	304.1	349.3	363.3	365.6		67.76	68.24	66.38	66.23
19	190	85.37	75.55	158.2	331.1	305.9	345.9	353.6	365.6		67.76	68.28	66.37	66.27
20	200	85.5	75.56	158.5	326.9	305.4	342.8	343.4	365.4		67.69	68.23	66.39	66.22
21	210	84.7	75.37	157.1	320.6	304.4	350.5	334.6	360.8		67.48	68.06	66.26	66.02
22	220	84.66	75.14	155	313	304.6	346.7	326.2	353.9		67.44	68.03	66.26	66.02

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 5 2011
Test Run Number:	1

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.21	28.9	Meter Box (A)	1.014
End	30.15	28.8	Meter Box (B)	1.011
Duration of Test, Min		220		

Leak Check, cfm @ in Hg	
Train A	Train B
0.025@5	0.02@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.018	0.00	0.00	-0.033	7.90	7.90	755.942	807.168	100.31	100.31		
10	0.017	0.00	0.00	-0.033	7.59	0.31	756.952	808.203	94.95	96.98		
20	0.015	0.00	0.00	-0.035	7.24	0.35	757.961	809.260	100.87	105.37		
30	0.015	0.00	0.00	-0.035	6.75	0.49	758.967	810.303	100.30	103.68		
40	0.015	0.00	0.00	-0.045	6.10	0.65	759.975	811.342	100.65	103.43		
50	0.015	0.00	0.00	-0.048	5.30	0.80	760.983	812.395	100.76	104.97		
60	0.015	0.00	0.00	-0.050	4.51	0.79	761.992	813.459	100.97	106.18		
70	0.015	0.00	0.00	-0.050	3.70	0.81	763.000	814.512	100.94	105.16		
80	0.015	0.00	0.00	-0.050	2.93	0.77	764.010	815.534	101.10	102.02		
90	0.015	0.00	0.00	-0.048	2.33	0.60	765.018	816.559	100.77	102.20		
100	0.015	0.00	0.00	-0.043	1.90	0.43	766.029	817.541	100.93	97.79		
110	0.015	0.00	0.00	-0.038	1.64	0.26	767.040	818.532	100.75	98.51		
120	0.015	0.00	0.00	-0.038	1.47	0.17	768.050	819.514	100.57	97.52		
130	0.015	0.00	0.00	-0.035	1.26	0.21	769.061	820.495	100.60	97.34		
140	0.015	0.00	0.00	-0.033	1.08	0.18	770.067	821.504	100.02	100.03		
150	0.015	0.00	0.00	-0.030	0.93	0.15	771.075	822.470	100.19	95.73		
160	0.015	0.00	0.00	-0.030	0.77	0.16	772.087	823.439	100.54	95.98		
170	0.015	0.00	0.00	-0.030	0.63	0.14	773.096	824.412	100.21	96.34		
180	0.015	0.00	0.00	-0.028	0.46	0.17	774.103	825.385	99.99	96.31		
190	0.015	0.00	0.00	-0.028	0.35	0.11	775.111	826.402	100.12	100.69		
200	0.015	0.00	0.00	-0.028	0.18	0.17	776.125	827.415	100.71	100.30		
210	0.015	0.00	0.00	-0.028	0.06	0.12	777.135	828.428	100.32	100.32		
220	0.015	0.00	0.00	-0.028	0.00	0.06	778.147	829.437	100.50	99.91		

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL1111071416-001
Test Date: December 5 2011
Test Run Number: 1

Dry Burn-Rate, kg/hr:	**0.82**	
Emission-Rate, g/hr:	**4.03**	
Adjusted Emission-Rate, g/hr :	**5.79**	
Duration of Test, Minutes	220	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	755.942	807.168
Dry Gas Meter Ending Reading, ft^3	778.147	829.437
Barometric Pressure Correction Factor	1.009	1.009
Dry Gas Meter Calibration Factors (γ factors)	1.014	1.011
Dry Gas Meter Temperature Factors	1.004	1.004
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**22.796**	**22.806**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**139.277**	
Total Tunnel Volume, scf	**30641.014**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	1344.129	1343.542
Sample Particulate Mass, mg	11.0	11.0
Total Emissions, grams	14.785	14.779
Emission-Rate, g/hr	4.03	4.03
Adjusted Emission Rates, g/hr	**5.79**	**5.79**
Deviation, %	0.02%	
Operating Parameters	Train A	Train B
Max Filter Temperature, °F	68.25	68.98
Post-Test Leak Check, cfm @ in. Hg vac.	0.025@5	0.02@5
Average Firebox Surface Temperture delta-T, °F	50	
Maximum Ambient Temperture, °F	89	
Mimimum Ambient Temperature, °F	79	
Fuel Properties		
Wet Fuel Load Weight, lb.	7.90	
Dry-Basis Fuel Load Moisture Content, %	19.83	
Wet-Basis Fuel Load Moisture Content, %	16.54	
Coal Bed Range, lb.	1.60	1.90
Actual Coal Bed, Lb.	1.96	

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 5 2011
Test Run Number:	1

EPA Method 28
Pre Burn Data

Coal Bed Range	1.6	to	1.9

Average Firebox Temp, °F	393.64

Final Coal Bed Wt, lb	1.96

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	71.83	153.9	506.4	504.4	82.72	193.1	190.6	207.3		-0.002	10.38	9.37
1	10	70.05	156.1	588.6	755.6	155.5	315.8	288.2	322.8		0	7.63	2.75
2	20	71.24	164.8	625.2	872.2	245.1	427.2	405.9	455.1		-0.001	4.80	2.83
3	30	87.31	163	615.2	828.7	340.7	549	512.6	551.2		0.001	2.46	2.34
4	40	90.22	137.4	484.2	689.9	419	544.2	556.6	592.5		0.001	1.51	0.95
5	50	82.29	180.1	395.2	554	463.6	526.6	547.1	567		-0.003	1.01	0.50
6	60	80.44	161.9	607.9	813	474.8	478.6	477.3	512.4		0.003	9.58	-8.57
7	70	84.19	168.6	632.3	907.4	458.8	538.9	502.3	553.5		0.002	6.52	3.06
8	80	90.56	159	590.7	908.4	460.5	603.5	551.7	612.8		-0.001	3.96	2.56
9	90	79.53	146.4	548.2	823.2	465.3	633.6	595.2	643.2		0.002	2.49	1.47
10	100	84.45	104	287.8	612.1	477.3	518.9	577.3	596		-0.003	2.31	0.18
11	110	82.78	95.72	230.7	516.6	472.1	447.4	529.3	536.6		-0.001	2.26	0.05
12	120	88.11	87.61	203.7	460.8	455.2	477.5	488.8	493		0.001	2.17	0.09
13	130	88.77	83.24	186.6	415.8	436.9	454.7	450.8	454.3		-0.002	2.14	0.03
14	140	86.56	81.74	175.5	386.4	422.9	426.5	415.8	423.5		-0.002	2.08	0.06
15	150	86.02	80.48	168.2	361.8	413.3	404.6	388.9	399.6		-0.002	1.96	0.12
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													

Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL1111071416-001
Test Date: December 5 2011
Test Run Number: 1

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0125	82	0.1118
A2	0.0150	82	0.1225
A3	0.0150	82	0.1225
A4	0.0125	81	0.1118
A Center	0.0150	82	0.1225
B1	0.0125	85	0.1118
B2	0.0150	84	0.1225
B3	0.0150	84	0.1225
B4	0.0125	84	0.1118
B Center	0.0150	85	0.1225
Averages	0.014	83.12	0.1171

Tunnel Diameter	8.000	inches
Tunnel Static	-0.063	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9564	factor
Baro. Pressure	30.21	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	6.993	Ft/ Sec
Initial Flow	**137.94**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 5 2011
Test Run Number:	1

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI214	Time:	9:50	Temp.,°F:	75
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	9.00	0.90	20.6	20.7	21.1
2	9.00	0.95	20.2	18.8	20.3
3	9.00	0.95	20.4	19.8	19.8
4	9.00	0.90	20.2	19.0	20.5
5	16.00	1.65	19.9	19.1	20.8
6	16.00	1.85	21.4	18.7	20.4
7	16.00	1.75	19.6	19.8	20.4
8	16.00	1.75	20.3	19.7	20.4
9					
10					
11					
12					
Total Weight		10.7	Average, %db		20.1

Allowable Fuel Load Range: **7.7** to **9.3**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI214		Time:	11:00	Temp.,°F:	75
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15,75	1.75		19.8	19.2	19.7
2	15,75	1.90		18.8	19.1	19.7
3	15,75	2.10		21.1	18.8	20.0
4	15,75	2.15		21.5	21.1	19.1
5						
6						
7						
8						
Totals		7.9	0.0			
% of Weight		100	0			
Total weight, wet, lb.		7.90		Average Moisture, dry		19.83
Total weight, dry, kg		2.99		Average Moisture, wet		16.54

Test Engineer: _____

Date: 03/13/2012

Run 2

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 6 2011
Test Run Number:	2
Date tunnel cleaned:	12/1/2011
Purpose of Test	Cat 2

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Test Settings	
Primary Air:	Half opened at 3:45 min and abruptly closed at 5 minutes.
Secondary Air:	Fixed
Control Board:	N/A
Blower/Fan:	OFF the first 30 minutes and On-LOW for the reminder of the test.

Pre- Burn Activities

Time	Activity
0	Time = 10:01AM
	When the scale indicated 2.4 lbs, the Primary air was closed and the timer started
59	The coal bed was leveled for 30 seconds

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 50 seconds.
Fuel-loading door :	Ajar for 1:45 minutes
Primary air:	Half opened at 3:45 min and abruptly closed at 5 minutes for the reminder of the test.
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	OFF the first 30 minutes and On-LOW for the reminder of the test.

Other Notes

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL1111071416-001
Test Date:	December 6 2011
Test Run No:	2

Temperature Data

Firebox Temp Start	377.72
Firebox Temp End	354.84
Firebox Delta-T	22.9

Max Filter Temps	
Train A	Train B
67.39	68.56

Interval	10	Duration of Test, Min	200

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	87.91	90.96	213.7	341.7	419	367.1	375.9	384.9		67.3	68.12	64.59	64.28
1	10	84.92	81.74	184.3	310.4	399.4	335.3	329.9	335		67.3	68.12	64.64	64.19
2	20	83.84	81.56	201.1	343.4	373.8	311.2	299.5	299.4		67.3	68.12	64.89	64.31
3	30	85.49	82.57	223.7	401.7	347.7	316.9	294.5	289.1		67.3	68.12	64.88	64.31
4	40	86.34	85.23	263.3	489.3	327.4	306.2	323.3	306.4		67.3	68.12	64.77	64.33
5	50	87.37	85.18	271.1	546.5	311.3	311	355.8	339.2		67.23	68.15	64.79	64.33
6	60	89.32	85.51	276.7	568.3	299.1	317.8	376.6	356.8		67.2	68.3	64.78	64.38
7	70	81.41	89.15	268.4	566.1	287.9	321.2	383.3	372.8		67.39	68.55	64.8	64.3
8	80	88.56	84	252	524.9	281.6	329.7	385.3	386.2		67.23	68.56	64.51	64.22
9	90	88.89	81.28	218.7	467.2	282	292.9	390.7	392.9		66.91	68.24	64.57	64.24
10	100	88.84	79.57	203.1	429.2	287.5	307.3	396.5	401.3		66.78	67.83	64.65	64.33
11	110	88.44	78.16	191.7	408	296.3	309.9	395.8	407.6		66.64	67.48	64.62	64.14
12	120	87.71	77.22	180.9	386.4	304.7	315.7	392.1	404.7		66.5	67.31	64.68	64.2
13	130	86.47	76.34	174.9	372.9	310.9	317.6	392.2	402.6		66.26	67.14	64.63	64.16
14	140	85.51	75.9	171.6	366.3	316.3	397.5	389	400.3		66.18	66.95	64.49	64.12
15	150	86.43	75.61	170.1	361.5	321	402.2	385.6	396.4		66.24	66.86	64.64	64.19
16	160	86.29	75.57	169.6	356.1	324.5	400.5	380.9	393.4		66.25	66.82	64.68	64.15
17	170	85.33	75.07	167.9	349.5	324.5	382.6	375	392.8		66.05	66.77	64.57	64.09
18	180	85.05	75.09	167.8	349	329	374.9	368.1	386.9		65.91	66.69	64.44	64.1
19	190	85.54	74.97	165.4	343.3	333	374.2	364.2	378.6		65.86	66.61	64.53	63.75
20	200	84.11	74.65	163.3	336	336.1	373.1	357.9	371.1		65.9	66.61	64.54	64.07

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 6 2011
Test Run Number:	2

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	30.17	31	Meter Box (A)	1.014
End	30.12	31	Meter Box (B)	1.011
Duration of Test, Min		200		

Leak Check, cfm @ in Hg	
Train A	Train B
0.002@5	0.001@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.015	0.00	0.00	-0.038	7.95	7.95	778.176	929.634	99.95	99.95		
10	0.015	0.00	0.00	-0.035	7.55	0.40	779.208	930.529	100.80	100.52		
20	0.015	0.00	0.00	-0.045	6.96	0.59	780.242	931.421	100.93	100.14		
30	0.015	0.00	0.00	-0.048	6.13	0.83	781.265	932.302	99.96	99.00		
40	0.015	0.00	0.00	-0.055	5.25	0.88	782.285	933.197	99.93	100.82		
50	0.015	0.00	0.00	-0.055	4.36	0.89	783.304	934.128	99.82	104.87		
60	0.015	0.00	0.00	-0.055	3.58	0.78	784.324	935.008	99.95	99.14		
70	0.015	0.00	0.00	-0.055	2.86	0.72	785.345	935.848	100.38	94.97		
80	0.015	0.00	0.00	-0.050	2.32	0.54	786.367	936.717	100.01	97.80		
90	0.015	0.00	0.00	-0.045	1.93	0.39	787.389	937.610	99.85	100.24		
100	0.015	0.00	0.00	-0.040	1.63	0.30	788.407	938.510	99.23	100.85		
110	0.015	0.00	0.00	-0.038	1.38	0.25	789.429	939.392	99.50	98.74		
120	0.015	0.00	0.00	-0.035	1.20	0.18	790.446	940.266	98.92	97.75		
130	0.015	0.00	0.00	-0.035	1.05	0.15	791.469	941.143	99.43	98.01		
140	0.015	0.00	0.00	-0.035	0.92	0.13	792.490	942.044	99.22	100.66		
150	0.015	0.00	0.00	-0.033	0.73	0.19	793.523	943.024	100.33	109.44		
160	0.015	0.00	0.00	-0.030	0.56	0.17	794.558	943.938	100.51	102.07		
170	0.015	0.00	0.00	-0.030	0.40	0.16	795.600	944.825	101.17	99.02		
180	0.015	0.00	0.00	-0.030	0.28	0.12	796.630	945.704	100.03	98.13		
190	0.015	0.00	0.00	-0.030	0.12	0.16	797.654	946.583	99.42	98.19		
200	0.015	0.00	0.00	-0.030	0.00	0.12	798.680	947.466	99.58	98.54		

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL1111071416-001
Test Date: December 6 2011
Test Run Number: 2

Dry Burn-Rate, kg/hr:	**0.90**	
Emission-Rate, g/hr:	**3.73**	
Adjusted Emission-Rate, g/hr :	**5.42**	
Duration of Test, Minutes	200	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	778.176	929.634
Dry Gas Meter Ending Reading, ft^3	798.68	947.466
Barometric Pressure Correction Factor	1.008	1.008
Dry Gas Meter Calibration Factors (γ factors)	1.014	1.011
Dry Gas Meter Temperature Factors	1.006	1.007
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**21.081**	**18.295**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**131.534**	
Total Tunnel Volume, scf	**26306.844**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	1247.889	1437.893
Sample Particulate Mass, mg	10.0	8.6
Total Emissions, grams	12.479	12.366
Emission-Rate, g/hr	3.74	3.71
Adjusted Emission Rates, g/hr	**5.44**	**5.40**
Deviation, %	0.38%	
Operating Parameters	Train A	Train B
Max Filter Temperature, °F	67.39	68.56
Post-Test Leak Check, cfm @ in. Hg vac.	0.002@5	0.001@5
Average Firebox Surface Temperture delta-T, °F	22.88	
Maximum Ambient Temperture, °F	89	
Mimimum Ambient Temperature, °F	81	
Fuel Properties		
Wet Fuel Load Weight, lb.	7.95	
Dry-Basis Fuel Load Moisture Content, %	19.97	
Wet-Basis Fuel Load Moisture Content, %	16.64	
Coal Bed Range, lb.	1.60	1.90
Actual Coal Bed, Lb.	1.96	

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 6 2011
Test Run Number:	2

EPA Method 28
Pre Burn Data

Coal Bed Range	1.6	to	1.9

Average Firebox Temp, °F	386.92

Final Coal Bed Wt, lb	1.96

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	78.68	168.7	400.5	536.1	454.9	544.2	525.8	555.3		0.001	10.65	[illegible]
1	10	86.87	160.1	587.2	791.7	465.8	519.5	464.4	484.6		-0.002	10.08	0.57
2	20	91.06	170.3	618.7	911.1	448	550.5	489.3	517.9		0.001	6.97	3.11
3	30	87.5	165.7	608.3	923.2	448.1	588.4	546.3	578.2		0.001	4.30	2.67
4	40	86.94	155.8	572.5	804	458.2	620.4	599.6	616.1		0.002	2.73	1.57
5	50	78.27	110.8	340.7	634.6	467.4	535.8	594.6	606.3		0.001	2.37	0.36
6	60	88.88	95.26	250.3	521	469.2	443	542.5	548.3		-0.003	2.26	0.11
7	70	81.39	93.73	219.3	460.9	464.1	456.5	495	499.2		0	2.18	0.08
8	80	79.17	89.87	199.6	417.6	449.8	410.9	450	457.1		0.002	2.09	0.09
9	90	88.07	83.23	184.4	390.6	437.1	369.6	416.6	426.4		0	2.03	0.06
10	100	87.79	81.21	175.7	367.6	425.2	351.2	390.5	400.1		-0.003	1.96	0.07
11													
12													
13													
14													
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30													

Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL1111071416-001
Test Date: December 6 2011
Test Run Number: 2

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0125	87	0.1118
A2	0.0150	87	0.1225
A3	0.0125	87	0.1118
A4	0.0100	86	0.1000
A Center	0.0150	88	0.1225
B1	0.0125	87	0.1118
B2	0.0150	87	0.1225
B3	0.0125	87	0.1118
B4	0.0100	86	0.1000
B Center	0.0150	88	0.1225
Averages	0.013	87.08	0.1115

Tunnel Diameter	8.000	inches
Tunnel Static	-0.063	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9106	factor
Baro. Pressure	30.17	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	6.686	Ft/ Sec
Initial Flow	**130.77**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL1111071416-001
Test Date:	December 6 2011
Test Run Number:	2

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	8:30	Temp.,°F:	77
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16.00	1.70	20.2	19.5	20.4
2	16.00	1.80	20.9	20.0	19.7
3	16.00	1.85	21.2	21.2	20.9
4	16.00	1.75	21.9	20.4	22.3
5	9.00	0.95	21.0	20.2	21.0
6	9.00	1.05	21.4	20.9	21.4
7	9.00	0.95	20.6	20.3	20.2
8	9.00	0.95	20.6	19.5	19.9
9					
10					
11					
12					
Total Weight		11.0	Average, %db		20.7

Allowable Fuel Load Range: **7.7** to **9.3**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214		Time:	9:45	Temp.,°F:	77
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15.50	2.15		18.9	19.3	19.4
2	15.50	1.90		22.0	22.0	20.3
3	15.50	1.80		20.2	19.7	19.3
4	15.50	2.10		20.0	19.8	18.7
5						
6						
7						
8						
Totals		8.0	0.0			
% of Weight		100	0			
Total weight, wet, lb.		7.95		Average Moisture, dry		19.97
Total weight, dry, kg		3.01		Average Moisture, wet		16.64

Test Engineer: _____

Date: 03/13/2012

Run 3

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	7-Dec-11
Test Run Number:	3
Date tunnel cleaned:	12/1/2011
Purpose of Test	Cat 1

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Test Settings	
Primary Air:	Closed.
Secondary Air:	Fixed.
Control Board:	N/A
Blower/Fan:	Off the first 30 minutes of the test and On-Low for the reminder of the test.

Pre- Burn Activities

Time	Activity
0	Time = 10:37. When the weight got to 2.4 lbs the timer was started and the primary air abruptly shut .
59	The Coal Bed was leveled for 30 seconds.
	The blower was shut.

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 60 seconds.
Fuel-loading door :	Closed after loading of fuel.
Primary air:	Fully open till 4:30 when it was half shut. Abruptly closed at 5 minutes.
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	Off the first 30 minutes of the test and On-Low for the reminder of the test.

Other Notes

None.

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL-111071416-001
Test Date:	7-Dec-11
Test Run No:	3

Temperature Data

Firebox Temp Start	386.72
Firebox Temp End	331.44
Firebox Delta-T	**55.3**

Max Filter Temps	
Train A	Train B
68.13	**69.02**

Interval	10	Duration of Test, Min	210

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	83.06	93.55	225.7	348.1	428.2	381.5	378	397.8		64.4	65.39	64.055	63.715
1	10	83.07	85.58	204.3	345.8	413.3	352.2	336.9	353.9		67.07	67.74	64.145	63.78
2	20	82.94	83.1	174.3	295.4	386.7	316.5	295.8	308.6		67.22	68.27	64.195	63.805
3	30	83.09	85.5	223.7	398	354.9	313.5	287.3	293.1		67.27	68.36	64.245	63.925
4	40	83.95	87.45	243	459.1	329.5	310	288.5	304.6		67.48	68.44	64.28	64.02
5	50	85.49	88.81	266.1	514.8	308.8	309	321.7	329.9		67.79	68.65	64.35	64.08
6	60	85.43	89.37	273.6	550.1	292.8	320.7	354.7	351.6		68.08	68.89	64.335	64.115
7	70	85.82	88.52	278.4	581	281.6	341.6	372.8	376.9		68.13	68.92	64.34	64.16
8	80	86.21	87.58	271.7	580	274.5	347	383.7	393.8		67.99	68.99	64.41	64.27
9	90	86.86	87.35	263.1	581.6	272.9	348.7	388.1	399.3		67.87	69.02	64.49	64.37
10	100	87.2	85.65	227.2	491.5	278.7	311.8	395.9	411.7		67.77	68.75	64.51	64.345
11	110	87.58	85.12	201.6	431.7	291.6	323.5	395.8	412		67.85	68.59	64.57	64.415
12	120	86.91	83.59	189.7	400.6	304.6	321.8	394.5	405.2		67.51	68.45	64.645	64.445
13	130	86.3	82.6	182.8	382.2	315.7	310.5	390.8	398.2		67.33	68.24	64.605	64.375
14	140	85.49	81.82	178.6	370.1	324.2	323.1	386.1	392.9		67.24	68.14	64.625	64.4
15	150	85.13	81.63	175	358.9	330	327.2	380.9	387		67.17	68.14	64.715	64.49
16	160	85.42	81.75	173.1	352.7	332.2	310.7	374.3	381.4		67.09	68.11	64.67	64.5
17	170	84.99	81.89	170.9	345.9	332.8	317	370.3	379.4		66.97	67.93	64.69	64.485
18	180	85.19	81.3	168.6	339.7	333	310.3	364.4	378.6		67.12	67.96	64.715	64.54
19	190	83.73	79.94	166.3	331.3	335.1	311.1	360.6	371.6		67	67.95	64.76	64.52
20	200	82.8	79.6	164.9	324.5	336.2	306.9	357.4	361.5		66.98	67.83	64.715	64.495
21	210	83.17	80.3	163.8	318.7	334.7	299	353.5	351.3		67.05	67.76	64.78	64.535

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	7-Dec-11
Test Run Number:	3

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	29.97	28	Meter Box (A)	1.014
End	29.84	28	Meter Box (B)	1.011
Duration of Test, Min		210		

Leak Check, cfm @ in Hg	
Train A	Train B
0.002@5	0.002@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.018	0.00	0.00	-0.055	7.90	7.90	798.760	947.524	99.95	99.96	0.00	0.00
10	0.018	0.00	0.00	-0.043	7.33	0.57	799.925	948.720	99.71	106.18	0.00	0.00
20	0.018	0.00	0.00	-0.040	6.96	0.37	801.092	949.782	99.64	94.06	0.00	0.00
30	0.018	0.00	0.00	-0.050	6.26	0.70	802.234	950.807	99.10	92.25	0.00	0.00
40	0.018	0.00	0.00	-0.055	5.58	0.68	803.385	951.874	98.65	94.84	0.00	0.00
50	0.018	0.00	0.00	-0.055	4.76	0.82	804.535	953.000	100.08	101.62	0.00	0.00
60	0.018	0.00	0.00	-0.055	3.95	0.81	805.682	954.234	99.87	111.42	0.00	0.00
70	0.018	0.00	0.00	-0.055	3.13	0.82	806.839	955.406	100.66	105.73	0.00	0.00
80	0.018	0.00	0.00	-0.055	2.49	0.64	807.982	956.477	99.35	96.51	0.00	0.00
90	0.018	0.00	0.00	-0.050	1.93	0.56	809.126	957.550	99.40	96.66	0.00	0.00
100	0.018	0.00	0.00	-0.045	1.54	0.39	810.275	958.656	99.67	99.48	0.00	0.00
110	0.018	0.00	0.00	-0.040	1.41	0.13	811.431	959.835	100.22	105.98	0.00	0.00
120	0.018	0.00	0.00	-0.040	1.26	0.15	812.595	960.908	100.76	96.31	0.00	0.00
130	0.018	0.00	0.00	-0.035	1.08	0.18	813.763	962.042	101.02	101.71	0.00	0.00
140	0.018	0.00	0.00	-0.035	0.94	0.14	814.929	963.217	100.77	105.30	0.00	0.00
150	0.018	0.00	0.00	-0.035	0.82	0.12	816.092	964.352	100.47	101.68	0.00	0.00
160	0.018	0.00	0.00	-0.035	0.67	0.15	817.259	965.413	100.84	95.06	0.00	0.00
170	0.018	0.00	0.00	-0.032	0.54	0.13	818.410	966.481	99.47	95.70	0.00	0.00
180	0.018	0.00	0.00	-0.032	0.37	0.17	819.566	967.665	99.84	106.03	0.00	0.00
190	0.018	0.00	0.00	-0.032	0.24	0.13	820.728	968.741	100.22	96.24	0.00	0.00
200	0.018	0.00	0.00	-0.032	0.08	0.16	821.879	969.822	99.25	96.66	0.00	0.00
210	0.018	0.00	0.00	-0.032	0.00	0.08	823.038	970.936	99.99	99.67	0.00	0.00

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 7-Dec-11
Test Run Number: 3

Dry Burn-Rate, kg/hr:	**0.86**	
Emission-Rate, g/hr:	**2.81**	
Adjusted Emission-Rate, g/hr :	**4.29**	
Duration of Test, Minutes	210	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	798.76	947.524
Dry Gas Meter Ending Reading, ft^3	823.038	970.936
Barometric Pressure Correction Factor	0.999	0.999
Dry Gas Meter Calibration Factors (γ factors)	1.014	1.011
Dry Gas Meter Temperature Factors	1.007	1.007
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**24.769**	**23.825**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**143.323**	
Total Tunnel Volume, scf	**30097.808**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	1215.148	1263.281
Sample Particulate Mass, mg	8.3	7.6
Total Emissions, grams	10.086	9.601
Emission-Rate, g/hr	2.88	2.74
Adjusted Emission Rates, g/hr	**4.38**	**4.21**
Deviation, %	2.04%	
Operating Parameters	Train A	Train B
Max Filter Temperature, °F	68.13	69.02
Post-Test Leak Check, cfm @ in. Hg vac.	0.002@5	0.002@5
Average Firebox Surface Temperture delta-T, °F	55.28	
Maximum Ambient Temperture, °F	88	
Mimimum Ambient Temperature, °F	83	
Fuel Properties		
Wet Fuel Load Weight, lb.	7.90	
Dry-Basis Fuel Load Moisture Content, %	19.73	
Wet-Basis Fuel Load Moisture Content, %	16.48	
Coal Bed Range, lb.	1.60	1.90
Actual Coal Bed, Lb.	1.69	

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	7-Dec-11
Test Run Number:	3

EPA Method 28
Pre Burn Data

Coal Bed Range	1.6	to	1.9

Average Firebox Temp, °F	391.42

Final Coal Bed Wt, lb	1.69

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	88.84	157.8	601.9	719.3	502.4	514.4	457.1	467.7		0.001	10.21	8.52
1	10	94.77	166.1	643.4	875.4	475.8	509.6	469	498.7		-0.002	7.10	3.11
2	20	86.96	165.2	617.3	899.2	466.7	559.8	517.5	557.4		0.003	4.52	2.58
3	30	89.37	154.2	570.4	827.6	473.1	611.2	571.8	613.1		0.001	3.06	1.46
4	40	83.75	136.6	482.6	684.5	487.8	609.1	585.4	630.3		0	2.40	0.66
5	50	83.42	102	270.6	538	499.3	590	539.3	574.8		-0.001	2.37	0.03
6	60	81.65	95	225.8	467.9	485.8	508.9	489.2	517		0.001	2.31	0.06
7	70	80.82	90.74	205.7	423.5	463.4	474.4	448.7	469.9		-0.002	2.23	0.08
8	80	84.16	84.74	193.5	399	449	440.9	418.8	435.8		0.001	2.01	0.22
9	90	86.68	86.15	184	379.4	437.5	418.1	396.7	418		0	1.90	0.11
10	100	82.82	114.3	232.8	352.4	429.3	395.4	379.7	400.3		0.001	1.69	0.21
11													
12													
13													
14													
15													
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28													
29													
30													

Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 7-Dec-11
Test Run Number: 3

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0150	84	0.1225
A2	0.0175	84	0.1323
A3	0.0150	84	0.1225
A4	0.0125	84	0.1118
A Center	0.0175	84	0.1323
B1	0.0150	86	0.1225
B2	0.0175	86	0.1323
B3	0.0150	86	0.1225
B4	0.0125	85	0.1118
B Center	0.0175	86	0.1323
Averages	0.0155	84.98	0.1223

Tunnel Diameter	8.000	inches
Tunnel Static	-0.073	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9242	factor
Baro. Pressure	29.97	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.340	Ft/ Sec
Initial Flow	**143.15**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	7-Dec-11
Test Run Number:	3

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI214	Time:	8:30	Temp.,°F:	78
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	9.00	0.80	21.2	21.3	20.4
2	9.00	1.20	19.8	21.6	19.3
3	9.00	1.20	20.3	20.8	19.5
4	9.00	0.80	22.1	21.9	22.7
5	16.00	2.10	21.3	20.2	20.3
6	16.00	1.95	20.1	20.0	20.5
7	16.00	1.45	21.7	21.2	21.5
8	16.00	1.40	23.1	21.9	22.5
9					
10					
11					
12					
Total Weight		10.9	Average, %db		21.1

Allowable Fuel Load Range: **7.7** to **9.3**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI214	Time:		Temp.,°F:	78
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis	
1	15.38	2.15		18.9	19.4	18.8
2	15.38	1.60		20.2	19.7	20.2
3	15.38	2.15		20.2	21.2	20.9
4	15.38	2.00		19.4	18.4	19.4
5						
6						
7						
8						
Totals		7.9	0.0			
% of Weight		100	0			
Total weight, wet, lb.		7.90		Average Moisture, dry		19.73
Total weight, dry, kg		2.99		Average Moisture, wet		16.48

Test Engineer: _____

Date: 03/13/2012

Run 4

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	8-Dec-11
Test Run Number:	4
Date tunnel cleaned:	12/1/2011
Purpose of Test	Cat 1

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Test Settings	
Primary Air:	Closed.
Secondary Air:	Fixed.
Control Board:	N/A
Blower/Fan:	Off for the first 30 minutes. On-Low for the reminder of the test.

Pre- Burn Activities

Time	Activity
0	Time=12:24; When the weight was 2.4 lbs the timer was started and the blower turned on-low position.
59	The coal bed was leveled for 30 seconds.

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 44 seconds
Fuel-loading door :	Ajar first 90 seconds
Primary air:	Open for the first 5 minutes then abruptly closed.
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	Blower off the first 30 minutes and On-Low for the reminder of the test.

Other Notes

None.

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL-111071416-001
Test Date:	8-Dec-11
Test Run No:	4

Temperature Data

Firebox Temp Start	380.98
Firebox Temp End	312.44
Firebox Delta-T	**68.5**

Max Filter Temps	
Train A	Train B
68.57	**69.34**

Interval	10	Duration of Test, Min	220

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	85.17	97.66	230.5	359.3	393.8	357.6	396.7	397.5		66.04	65.47	64.605	64.335
1	10	83.63	85.61	202	333.7	381.8	332.8	346.4	348.5		68.06	67.91	64.765	64.455
2	20	81.82	82.21	172.4	292.6	359.3	300	300.1	302.1		67.92	68.49	64.845	64.625
3	30	83.12	84.73	196.4	330.6	334.3	281.5	279.7	280		67.9	68.4	64.915	64.64
4	40	82.84	86.09	224.8	410.5	312.6	270.1	283.5	283.3		68.08	68.6	65.035	64.83
5	50	83.05	88.8	278.6	539.3	294.3	274.6	303.9	313.3		68.36	68.89	65.155	64.91
6	60	84.25	89.33	289.8	575.9	280	293.2	332.9	352.8		68.46	69.13	65.12	64.89
7	70	85.44	90.06	292.2	597.8	271.1	304.6	358.2	382.7		68.57	69.33	65.195	64.955
8	80	85.92	88.62	272.2	573.6	267.1	334.2	373.9	398.1		68.5	69.34	65.225	64.99
9	90	88.36	86.96	245.7	518.8	266.4	350.6	386.4	401.3		68.53	69.23	65.235	64.96
10	100	85.44	85.19	224.9	470.8	269.1	353.5	393.8	405.9		68.38	69.05	65.175	64.945
11	110	84.86	83.44	204.8	425.3	273.2	343.6	390.3	402		68.01	68.87	65.24	64.995
12	120	83.93	82.33	194.8	398.4	277.1	331.3	380.6	394.5		67.81	68.67	65.285	65.025
13	130	83.33	81.58	188.6	383.3	282	321.1	377.9	384.5		67.58	68.34	65.17	64.9
14	140	82.48	81.14	185.8	378	286.5	297.2	376.4	378.3		67.59	68.33	65.265	65.025
15	150	82.04	80.48	180.7	364	291.4	289.8	371.7	377.5		67.41	68.18	65.205	65.01
16	160	81.94	80.53	177.1	355.1	296.5	286.2	366.5	376.9		67.48	68.2	65.28	65.045
17	170	82.06	80.33	174.3	348.5	301.3	288.9	363.4	373.8		67.46	68.21	65.295	65.105
18	180	83.55	81.52	172.2	342.7	304.4	290.4	361.5	370.7		67.47	68.19	65.36	65.135
19	190	83.04	81.15	170.6	337.8	306.5	290.6	358.3	366.3		67.48	68.25	65.385	65.21
20	200	79.91	81.64	169.3	332.6	307.4	276.7	354.3	360		67.5	68.2	65.37	65.175
21	210	79.11	81.25	166.2	323.1	307.1	270.5	347.2	351.8		67.47	68.25	65.285	65.13
22	220	78.47	80.86	162.7	311.8	306.2	264.3	338.2	341.7		67.38	68.14	65.305	65.07

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	8-Dec-11
Test Run Number:	4

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	29.75	36	Meter Box (A)	1.014
End	29.95	35	Meter Box (B)	1.011
Duration of Test, Min		220		

Leak Check, cfm @ in Hg	
Train A	Train B
0.004@5	0.002@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.020	0.00	0.00	-0.045	7.95	0.00	823.153	970.961	99.95	99.94	0.00	0.00
10	0.020	0.00	0.00	-0.045	7.45	0.50	824.332	972.140	102.77	105.93	0.00	0.00
20	0.020	0.00	0.00	-0.040	7.14	0.31	825.496	973.262	101.13	100.46	0.00	0.00
30	0.020	0.00	0.00	-0.045	6.63	0.51	826.648	974.436	100.31	105.35	0.00	0.00
40	0.020	0.00	0.00	-0.050	5.95	0.68	827.799	975.657	100.32	109.67	0.00	0.00
50	0.020	0.00	0.00	-0.050	5.08	0.87	828.955	976.778	100.98	100.92	0.00	0.00
60	0.020	0.00	0.00	-0.060	4.12	0.96	830.105	977.840	100.51	95.66	0.00	0.00
70	0.020	0.00	0.00	-0.060	3.25	0.87	831.261	978.917	101.09	97.06	0.00	0.00
80	0.020	0.00	0.00	-0.055	2.58	0.67	832.420	979.985	101.21	96.12	0.00	0.00
90	0.020	0.00	0.00	-0.055	2.13	0.45	833.571	981.151	100.36	104.79	0.00	0.00
100	0.020	0.00	0.00	-0.050	1.77	0.36	834.730	982.247	100.91	98.34	0.00	0.00
110	0.020	0.00	0.00	-0.045	1.55	0.22	835.875	983.343	99.52	98.17	0.00	0.00
120	0.020	0.00	0.00	-0.045	1.38	0.17	837.030	984.433	100.27	97.53	0.00	0.00
130	0.020	0.00	0.00	-0.040	1.21	0.17	838.180	985.540	99.79	99.00	0.00	0.00
140	0.020	0.00	0.00	-0.040	1.01	0.20	839.313	986.633	98.26	97.69	0.00	0.00
150	0.020	0.00	0.00	-0.040	0.85	0.16	840.436	987.747	97.34	99.51	0.00	0.00
160	0.020	0.00	0.00	-0.040	0.72	0.13	841.565	988.861	97.86	99.51	0.00	0.00
170	0.020	0.00	0.00	-0.040	0.55	0.17	842.700	990.062	98.35	107.25	0.00	0.00
180	0.020	0.00	0.00	-0.040	0.44	0.11	843.843	991.065	99.14	89.66	0.00	0.00
190	0.020	0.00	0.00	-0.040	0.30	0.14	844.980	992.175	98.59	99.18	0.00	0.00
200	0.020	0.00	0.00	-0.040	0.14	0.16	846.122	993.283	99.07	99.05	0.00	0.00
210	0.020	0.00	0.00	-0.035	0.04	0.10	847.281	994.393	100.52	99.20	0.00	0.00
220	0.020	0.00	0.00	-0.035	0.00	0.04	848.440	995.498	100.48	98.73	0.00	0.00

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 8-Dec-11
Test Run Number: 4

Dry Burn-Rate, kg/hr:	**0.82**	
Emission-Rate, g/hr:	**3.20**	
Adjusted Emission-Rate, g/hr :	**4.78**	
Duration of Test, Minutes	220	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	823.153	970.961
Dry Gas Meter Ending Reading, ft^3	848.44	995.498
Barometric Pressure Correction Factor	0.998	0.998
Dry Gas Meter Calibration Factors (γ factors)	1.014	1.011
Dry Gas Meter Temperature Factors	1.005	1.006
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**25.719**	**24.894**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**154.350**	
Total Tunnel Volume, scf	**33957.094**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	1320.297	1364.085
Sample Particulate Mass, mg	8.7	8.8
Total Emissions, grams	11.487	12.004
Emission-Rate, g/hr	3.13	3.27
Adjusted Emission Rates, g/hr	**4.70**	**4.87**
Deviation, %	1.83%	
Operating Parameters	Train A	Train B
Max Filter Temperature, °F	68.57	69.34
Post-Test Leak Check, cfm @ in. Hg vac.	0.004@5	0.002@5
Average Firebox Surface Temperture delta-T, °F	68.54	
Maximum Ambient Temperture, °F	88	
Mimimum Ambient Temperature, °F	78	
Fuel Properties		
Wet Fuel Load Weight, lb.	7.95	
Dry-Basis Fuel Load Moisture Content, %	19.53	
Wet-Basis Fuel Load Moisture Content, %	16.34	
Coal Bed Range, lb.	1.60	1.90
Actual Coal Bed, Lb.	1.68	

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	8-Dec-11
Test Run Number:	4

EPA Method 28
Pre Burn Data

Coal Bed Range	1.6	to	1.9

Average Firebox Temp, °F	396.5

Final Coal Bed Wt, lb	1.68

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	83.37	138.6	553.3	686.1	333.3	351	336.4	337.6		0	10.17	[illegible]
1	10	83.03	157.3	620.6	849	322.5	421.4	406.5	416.9		0.001	7.58	2.59
2	20	85.42	162.1	635.2	908.1	341.2	510.9	490.8	504.8		-0.003	4.92	2.66
3	30	88.19	160.7	624.2	842.8	372.6	594.6	557.4	555.9		0	3.02	1.90
4	40	93.96	113.3	394.1	685.9	404.2	516.9	583.5	578.3		0.002	2.21	0.81
5	50	83.87	101.7	274.2	547	422	485	537.6	536.9		0.001	2.06	0.15
6	60	88.65	93.03	231.1	477.5	422.5	425.1	496.6	494.7		-0.002	1.96	0.10
7	70	89.68	89.14	209.3	434.8	416.3	435.7	462.7	463.2		-0.002	1.88	0.08
8	80	88.64	87.19	196.5	406.2	406.2	398.3	434.4	436.6		0	1.80	0.08
9	90	86.48	85.56	188.1	385	397.6	371.8	413.2	414.9		-0.003	1.68	0.12
10													
11													
12													
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30													

Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 8-Dec-11
Test Run Number: 4

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0150	88	0.1225
A2	0.0175	87	0.1323
A3	0.0150	87	0.1225
A4	0.0125	87	0.1118
A Center	0.0175	88	0.1323
B1	0.0150	87	0.1225
B2	0.0175	87	0.1323
B3	0.0175	87	0.1323
B4	0.0125	86	0.1118
B Center	0.0175	87	0.1323
Averages	0.01575	87	0.1235

Tunnel Diameter	8.000	inches
Tunnel Static	-0.075	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9335	factor
Baro. Pressure	29.75	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.455	Ft/ Sec
Initial Flow	**143.80**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	8-Dec-11
Test Run Number:	4

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI 214	Time:	8:30	Temp.,°F:	77
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	9.00	0.85	19.4	19.3	20.5
2	9.00	0.85	19.4	19.4	20.9
3	9.00	1.20	21.7	21.2	21.4
4	9.00	1.15	21.5	20.4	21.5
5	16.00	1.50	20.0	19.5	21.0
6	16.00	1.65	21.9	21.0	21.9
7	16.00	2.10	21.9	20.9	21.9
8	16.00	2.15	19.9	19.3	20.2
9					
10					
11					
12					
Total Weight		11.5	Average, %db		20.7

Allowable Fuel Load Range: **7.7** to **9.3**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI 214		Time:	9:30	Temp.,°F:	77
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15.38	1.70		19.5	18.7	18.9
2	15.38	2.10		19.1	19.5	19.0
3	15.38	2.00		20.3	21.2	20.0
4	15.38	2.15		19.2	19.7	19.2
5						
6						
7						
8						
Totals		8.0	0.0			
% of Weight		100	0			
Total weight, wet, lb.		7.95		Average Moisture, dry		19.53
Total weight, dry, kg		3.02		Average Moisture, wet		16.34

Test Engineer: _____

Date: 03/13/2012

Run 5

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	9-Dec-11
Test Run Number:	5
Date tunnel cleaned:	12/1/2011
Purpose of Test	Cat 4

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Test Settings	
Primary Air:	Fully open.
Secondary Air:	Fixed
Control Board:	N/A
Blower/Fan:	Off the first 30 minutes and On-Low for the reminder of the test.

Pre- Burn Activities

Time	Activity
0	Time=9:51. The blower was on-Low position and the primary air fully open.
65	The coal bed was leveled within seconds.

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 42 seconds
Fuel-loading door :	Closed immediately after the charge was loaded
Primary air:	Fully open.
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	Off the first 30 minutes and on-low for the reminder of the test.

Other Notes

Additional leak cheks were done on both trains. The presented result is based only on the preliminary weighing.
Delta T was over 125 degrees. Result = Run Null.

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL-1111071416-001
Test Date:	9-Dec-11
Test Run No:	5

Temperature Data

Firebox Temp Start	529.56
Firebox Temp End	356.4
Firebox Delta-T	173.2

Max Filter Temps	
Train A	Train B
79.31	80.11

Interval	10	Duration of Test, Min	110

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	72.9	139	452.2	586.6	474.8	491	529.8	565.6		65.5	65.52	63.98	63.795
1	10	82.72	166.3	681.4	885	483.2	497.4	505.6	577.6		78.01	77.99	64.275	64.095
2	20	85.7	169.9	700.6	923	469.1	527	524.3	601.1		79.31	80.11	64.56	64.365
3	30	87.41	154.1	600.1	877.9	462.2	583	562.3	629.4		76.57	76.31	64.645	64.46
4	40	87.9	132.8	475.4	671.2	464	528.9	585.7	608.1		73.28	74.44	64.755	64.565
5	50	85.95	123	418.6	564.6	464.8	523.4	558.5	563.3		72.96	75.28	64.85	64.715
6	60	88.58	114.6	384.8	512.4	463.9	519.6	525.9	531.8		73.11	75.21	64.985	64.825
7	70	86.73	110.3	353.5	464.9	456.6	504.9	494.3	499		72.16	74.41	65.035	64.93
8	80	85.43	105.1	326	420.2	440.5	461.6	459.5	461.6		71.62	73.41	65.04	64.945
9	90	85.8	99.89	299.7	379.3	419.4	416.8	425.1	424.1		70.83	72.47	65.025	64.95
10	100	87.64	98.57	279.8	346.1	397.2	380	393.8	391.2		70.21	71.88	64.885	64.755
11	110	86.05	96.81	263.1	320.1	374.9	355.2	369.1	362.7		69.77	71.19	64.89	64.8

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	9-Dec-11
Test Run Number:	5

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.19	35	Meter Box (A)	1.014
End	30.15	35	Meter Box (B)	1.011
Duration of Test, Min		110		

Leak Check, cfm @ in Hg	
Train A	Train B
.003@5	.002@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.018	0.00	0.00	-0.090	7.90	7.90	848.501	995.521	99.41	99.62		
10	0.018	0.00	0.00	-0.100	5.46	2.44	849.588	996.705	108.48	116.91		
20	0.018	0.00	0.00	-0.100	3.16	2.30	850.643	997.798	105.53	108.18		
30	0.018	0.00	0.00	-0.095	1.50	1.66	851.617	998.878	96.18	105.52		
40	0.020	0.00	0.00	-0.085	0.98	0.52	852.673	999.944	95.82	95.70		
50	0.020	0.00	0.00	-0.085	0.74	0.24	853.771	1001.050	98.78	98.44		
60	0.020	0.00	0.00	-0.075	0.57	0.17	854.879	1002.189	98.93	100.62		
70	0.020	0.00	0.00	-0.075	0.39	0.18	855.987	1003.255	98.55	93.80		
80	0.020	0.00	0.00	-0.065	0.27	0.12	857.095	1004.337	98.10	94.77		
90	0.020	0.00	0.00	-0.065	0.17	0.10	858.205	1005.400	97.83	92.68		
100	0.020	0.00	0.00	-0.060	0.09	0.08	859.315	1006.465	97.74	92.78		
110	0.020	0.00	0.00	-0.060	0.00	0.09	860.425	1007.573	97.58	96.36		

Test Engineer: _____

Date: 03/13/2012

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	9-Dec-11
Test Run Number:	5

EPA Method 28
Pre Burn Data

Coal Bed Range	1.6	to	1.9

Average Firebox Temp, °F	199.114

Final Coal Bed Wt, lb	1.89

Duration, Minutes	Temperature Data									Flue Draft	Fuel Weight	Weight Loss
	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet			
0	71.41	140.6	355.4	324.8	90.27	182.2	190.8	207.5			11.89	10.00
	74.25	114.1	401.8	419.9	165.2	226.5	232.5	264.4			10.29	1.60
	78.21	124.8	458.2	514.6	234.7	318.1	289.7	308.1			8.46	1.83
	83.74	135.4	549.2	645.4	297	326.1	355.8	364.2			6.50	1.96
	86.52	145.7	600.8	790.6	350.4	386.6	434.9	438.4			4.59	1.91
	82.55	149.8	596.6	846.1	399.9	522.3	514.4	515.6			2.82	1.77
	80.69	134.3	502.9	709.6	446.8	432.8	539.3	563			1.89	0.93

Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 9-Dec-11
Test Run Number: 5

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0150	136	0.1225
A2	0.0175	136	0.1323
A3	0.0150	136	0.1225
A4	0.0125	129	0.1118
A Center	0.0175	137	0.1323
B1	0.0150	135	0.1225
B2	0.0175	135	0.1323
B3	0.0150	136	0.1225
B4	0.0125	129	0.1118
B Center	0.0175	135	0.1323
Averages	0.0155	134.4	0.1223

Tunnel Diameter	8.000	inches
Tunnel Static	-0.085	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9242	factor
Baro. Pressure	30.19	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.638	Ft/ Sec
Initial Flow	**137.57**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	9-Dec-11
Test Run Number:	5

Firebox Volume, ft^3:	1.219

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI-214	Time:	8:15	Temp.,°F:	78
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	9.00	0.95	21.4	19.2	21.5
2	9.00	0.95	22.0	18.0	22.1
3	9.00	0.95	22.0	19.2	22.2
4	9.00	1.20	23.3	21.9	22.0
5	16.00	2.05	21.0	20.1	21.4
6	16.00	1.75	22.5	18.8	22.2
7	16.00	1.85	21.6	20.5	23.0
8	16.00	1.80	23.8	26.3	23.8
9					
10					
11					
12					
Total Weight		11.5	Average, %db		21.7

Allowable Fuel Load Range: **8.5** to **9.3**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI-214		Time:	9:00	Temp.,°F:	78
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15.50	1.85		19.2	19.1	19.5
2	15.50	2.00		19.7	20.0	19.3
3	15.50	2.20		20.3	19.4	19.2
4	15.50	1.85		18.1	19.4	20.6
5						
6						
7						
8						
Totals		7.9	0.0			
% of Weight		100	0			
Total weight, wet, lb.		7.90		Average Moisture, dry		19.48
Total weight, dry, kg		3.00		Average Moisture, wet		16.31

Test Engineer: _____ Date: 03/13/2012

Run 6

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	12-Dec-11
Test Run Number:	6
Date tunnel cleaned:	12/1/2011
Purpose of Test	Cat 4

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Test Settings	
Primary Air:	Fully open
Secondary Air:	Fixed
Control Board:	N/A
Blower/Fan:	Off the first 30 minutes and on-low for the reminder of the test.

Pre- Burn Activities

Time	Activity
0	Time=9:05. The blower was set on-low and the timewatch started.
42	The coal bed was stirred within 30 seconds.
62	The coal bed was leveled.

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 45 seconds
Fuel-loading door :	Ajar for 90 seconds.
Primary air:	Fully open
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	Off the first 30 minutes and on-low for the reminder of the test.

Other Notes

The data acquisition system was started only after 30 minutes into the preburn.
At the end of the run, additional leack checks were performed on system 1.

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL-1111071416-001
Test Date:	12-Dec-11
Test Run No:	6

Temperature Data

Firebox Temp Start	482.74
Firebox Temp End	369.14
Firebox Delta-T	113.6

Max Filter Temps	
Train A	Train B
75.75	75.7

Interval	10	Duration of Test, Min	110

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	65.93	124.5	354.7	465.3	459	470.9	507.1	511.4		64.450	63.940	62.910	62.715
1	10	81	138.5	555.7	710.7	445.9	427.7	453.2	465.3		72.360	71.650	63.260	63.09
2	20	80.58	151.7	619.4	848.4	425.3	479.4	457.4	498.8		75.390	75.140	63.440	63.25
3	30	86.52	155.7	636.5	915.3	416	522.2	496.5	559.7		75.750	75.620	63.850	63.585
4	40	85.24	138.2	511.6	723.8	417.3	462	537.8	593.2		73.310	74.110	64.155	63.915
5	50	87.79	125.4	443.6	599.8	418.4	423.7	537.9	578.4		74.160	75.700	64.325	64.085
6	60	91.75	114.1	396.5	527.3	421.7	439.2	525.6	543.7		72.990	75.380	64.500	64.335
7	70	85.65	116	372.9	486.6	420.7	424.1	500.9	513.4		72.540	74.270	64.595	64.465
8	80	87.92	111.1	347.9	450.6	417.2	427.8	477.9	484.5		71.670	73.650	64.730	64.585
9	90	88.53	100.6	320.1	409.8	408	421.5	447.6	448.1		71.000	72.890	64.740	64.585
10	100	87.7	96.51	295.4	372	394.2	404.5	416.1	413.5		70.270	71.990	64.780	64.64
11	110	80.51	94.72	271.5	336.9	376.5	365.9	384.4	382		69.650	71.030	64.725	64.615

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	12-Dec-11
Test Run Number:	6

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	30.42	39	Meter Box (A)	1.014
End	30.40	38	Meter Box (B)	1.011
Duration of Test, Min		110		

Leak Check, cfm @ in Hg	
Train A	Train B
0.06@5	0.015@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.018	0.00	0.00	-0.095	8.05	8.05	860.457	7.595	99.77	99.86	0.00	0.00
10	0.018	0.00	0.00	-0.090	6.32	1.73	861.554	8.780	106.39	109.89	0.00	0.00
20	0.018	0.00	0.00	-0.095	4.30	2.02	862.610	9.898	103.50	104.78	0.00	0.00
30	0.018	0.00	0.00	-0.095	2.37	1.93	863.633	10.988	100.51	102.43	0.00	0.00
40	0.018	0.00	0.00	-0.085	1.41	0.96	864.648	12.073	98.24	100.43	0.00	0.00
50	0.018	0.00	0.00	-0.080	1.03	0.38	865.691	13.229	99.83	105.82	0.00	0.00
60	0.020	0.00	0.00	-0.075	0.77	0.26	866.765	14.253	95.20	86.79	0.00	0.00
70	0.020	0.00	0.00	-0.070	0.59	0.18	867.844	15.421	95.78	99.13	0.00	0.00
80	0.018	0.00	0.00	-0.065	0.43	0.16	868.924	16.492	102.03	96.74	0.00	0.00
90	0.018	0.00	0.00	-0.065	0.26	0.17	870.026	17.640	103.14	102.74	0.00	0.00
100	0.020	0.00	0.00	-0.060	0.11	0.15	871.132	18.773	96.47	94.49	0.00	0.00
110	0.020	0.00	0.00	-0.055	0.00	0.11	872.239	19.916	96.41	95.18	0.00	0.00

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 12-Dec-11
Test Run Number: 6

Dry Burn-Rate, kg/hr:	**1.67**	
Emission-Rate, g/hr:	**1.94**	
Adjusted Emission-Rate, g/hr :	**3.15**	
Duration of Test, Minutes	110	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	860.457	7.595
Dry Gas Meter Ending Reading, ft^3	872.239	19.916
Barometric Pressure Correction Factor	1.016	1.016
Dry Gas Meter Calibration Factors (γ factors)	1.014	1.011
Dry Gas Meter Temperature Factors	1.007	1.008
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**12.230**	**12.756**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**144.203**	
Total Tunnel Volume, scf	**15862.368**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	1296.964	1243.483
Sample Particulate Mass, mg	2.5	3.1
Total Emissions, grams	3.242	3.855
Emission-Rate, g/hr	1.77	2.10
Adjusted Emission Rates, g/hr	**2.92**	**3.37**
Deviation, %	7.17%	
Operating Parameters	Train A	Train B
Max Filter Temperature, °F	75.75	75.7
Post-Test Leak Check, cfm @ in. Hg vac.	0.06@5	0.015@5
Average Firebox Surface Temperture delta-T, °F	113.6	
Maximum Ambient Temperture, °F	92	
Mimimum Ambient Temperature, °F	66	
Fuel Properties		
Wet Fuel Load Weight, lb.	8.05	
Dry-Basis Fuel Load Moisture Content, %	19.58	
Wet-Basis Fuel Load Moisture Content, %	16.37	
Coal Bed Range, lb.	1.70	2.00
Actual Coal Bed, Lb.	1.59	

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	12-Dec-11
Test Run Number:	6

EPA Method 28
Pre Burn Data

Coal Bed Range	1.7	to	2.0

Average Firebox Temp, °F	

Final Coal Bed Wt, lb	1.59

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0												-1.59
1													
2													
3	30	75.4	151.5	625.3	893.3	336	472.5	501.2	544.9		0.001	4.04	-4.04
4	40	72.44	4139.7	593.6	851.5	404.8	510.2	562.2	601.5		0.001	2.28	1.76
5	50	70.79	122.1	451.5	628.1	454.1	565.6	571.6	580.7		0.001	1.75	0.53
6	60	64.87	113.2	386.8	504.9	457.5	500.9	515.8	521.1		0	1.59	0.16
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													

Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 12-Dec-11
Test Run Number: 6

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0175	131	0.1323
A2	0.0200	129	0.1414
A3	0.0175	129	0.1323
A4	0.0150	122	0.1225
A Center	0.0200	132	0.1414
B1	0.0175	130	0.1323
B2	0.0200	130	0.1414
B3	0.0175	129	0.1323
B4	0.0150	122	0.1225
B Center	0.0200	131	0.1414
Averages	0.018	128.42	0.1321

Tunnel Diameter	8.000	inches
Tunnel Static	-0.095	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9342	factor
Baro. Pressure	30.42	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	8.181	Ft/ Sec
Initial Flow	**149.99**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	12-Dec-11
Test Run Number:	6

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:		Time:	8:30	Temp.,°F:	
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	9.00	0.95	19.9	18.9	20.3
2	9.00	1.00	21.7	18.9	20.6
3	9.00	1.10	22.7	21.4	22.1
4	9.00	1.00	22.6	22.1	22.0
5	16.00	1.75	20.9	18.8	21.5
6	16.00	1.80	21.7	19.9	21.9
7	16.00	1.95	21.5	20.4	21.5
8	16.00	2.05	21.0	19.3	20.3
9					
10					
11					
12					
Total Weight		11.6	Average, %db		20.9

Allowable Fuel Load Range: **7.7** to **9.3**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:			Time:	8:45	Temp.,°F:	
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15.50	1.80		18.9	19.2	18.9
2	15.50	2.20		20.2	20.2	19.7
3	15.50	2.05		20.1	19.8	20.0
4	15.50	2.00		19.4	19.2	19.3
5						
6						
7						
8						
Totals		8.1	0.0			
% of Weight		100	0			
Total weight, wet, lb.		8.05		Average Moisture, dry		19.58
Total weight, dry, kg		3.05		Average Moisture, wet		16.37

Test Engineer: _____

Date: 03/13/2012

Run 7

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	13-Dec-11
Test Run Number:	7
Date tunnel cleaned:	12/1/2011
Purpose of Test	Cat. 4

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Test Settings	
Primary Air:	Fully Open.
Secondary Air:	Fixed
Control Board:	N/A
Blower/Fan:	Off the first 30 minutes and on-low for the reminder of the test run.

Pre- Burn Activities

Time	Activity
0	Time=11:42. At this time the blower was set on and on the low position for all duration of the preburn.
42	The coal bed was stirred within 20 seconds
64	The coal bed was leveled for 30 seconds and the door closed.

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 60 seconds.
Fuel-loading door :	Ajar for 90 seconds.
Primary air:	Fully Open
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	Off the first 30 minutes and on-low for the reminder of the test run.

Other Notes

The data acquisition system was started at the same time as the preburn but didn't aquire data the first 10 minutes.

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL-1111071416-001
Test Date:	13-Dec-11
Test Run No:	7

Temperature Data

Firebox Temp Start	476.52
Firebox Temp End	391.3
Firebox Delta-T	85.2

Max Filter Temps	
Train A	Train B
76.87	78.61

Interval	10	Duration of Test, Min	100

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	73.68	129.7	375.8	477.4	457.1	422.2	510.9	515		66.09	65.72	64.8	64.72
1	10	86.1	140.9	562.5	719.2	446.1	663.6	452.5	480.9		73.28	73.07	64.95	64.845
2	20	86.27	159.2	653.8	893.5	428.2	565.8	456.1	508.9		76.86	77.32	65.2	65.06
3	30	87.71	158.1	638.1	884.3	421.3	491.6	488.1	563.5		76.87	78.27	65.405	65.235
4	40	82.36	137.3	524.9	727.1	422.1	477.4	543.8	588.2		76.7	78.45	65.5	65.36
5	50	87.36	127.8	453.2	615.3	428	471.3	559	578.4		75.64	78.61	65.665	65.455
6	60	88.07	118.3	408.1	541.4	432.6	444.6	539	541.9		74.35	77.65	65.805	65.575
7	70	88.48	113.9	375.8	491.6	428.9	424.4	509.9	508.9		73.95	76.76	65.845	65.655
8	80	81.34	107.4	345	447.6	423.5	409	479.6	474.3		72.79	75.84	66.01	65.76
9	90	89.26	98.38	317	403.6	414.9	375.7	448.8	439.1		72.09	74.84	66.07	65.89
10	100	82.6	100.9	292.3	363.2	401.8	372.4	413.5	405.6		71.46	73.83	66.015	65.87

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	13-Dec-11
Test Run Number:	7

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.36	28	Meter Box (A)	1.014
End	30.34	28	Meter Box (B)	1.011
Duration of Test, Min		100		

Leak Check, cfm @ in Hg	
Train A	Train B
0.001@5	0.002@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.020	0.00	0.00	-0.080	7.95	7.95	872.322	19.937	99.99	100.05	0.00	0.00
10	0.020	0.00	0.00	-0.095	6.23	1.72	873.432	21.110	99.70	101.41	0.00	0.00
20	0.018	0.00	0.00	-0.100	4.19	2.04	874.516	22.255	104.14	105.87	0.00	0.00
30	0.018	0.00	0.00	-0.110	2.32	1.87	875.577	23.388	101.80	104.64	0.00	0.00
40	0.020	0.00	0.00	-0.090	1.41	0.91	876.647	24.582	95.72	102.81	0.00	0.00
50	0.020	0.00	0.00	-0.085	0.93	0.48	877.748	25.717	97.68	96.93	0.00	0.00
60	0.020	0.00	0.00	-0.080	0.64	0.29	878.870	26.822	98.71	93.58	0.00	0.00
70	0.020	0.00	0.00	-0.070	0.49	0.15	879.996	28.030	98.67	101.90	0.00	0.00
80	0.020	0.00	0.00	-0.065	0.21	0.28	881.163	29.151	101.65	94.01	0.00	0.00
90	0.020	0.00	0.00	-0.065	0.05	0.16	882.324	30.348	100.31	99.56	0.00	0.00
100	0.020	0.00	0.00	-0.065	0.00	0.05	883.496	31.545	101.50	99.78	0.00	0.00

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 13-Dec-11
Test Run Number: 7

Dry Burn-Rate, kg/hr:	**1.81**	
Emission-Rate, g/hr:	**3.21**	
Adjusted Emission-Rate, g/hr :	**4.80**	
Duration of Test, Minutes	100	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	872.322	19.937
Dry Gas Meter Ending Reading, ft^3	883.496	31.545
Barometric Pressure Correction Factor	1.014	1.014
Dry Gas Meter Calibration Factors (γ factors)	1.014	1.011
Dry Gas Meter Temperature Factors	1.005	1.005
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**11.546**	**11.963**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**149.966**	
Total Tunnel Volume, scf	**14996.551**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	1298.805	1253.556
Sample Particulate Mass, mg	4.1	4.3
Total Emissions, grams	5.325	5.390
Emission-Rate, g/hr	3.20	3.23
Adjusted Emission Rates, g/hr	**4.77**	**4.82**
Deviation, %	0.50%	
Operating Parameters	Train A	Train B
Max Filter Temperature, °F	76.87	78.61
Post-Test Leak Check, cfm @ in. Hg vac.	0.001@5	0.002@5
Average Firebox Surface Temperture delta-T, °F	85.22	
Maximum Ambient Temperture, °F	89	
Mimimum Ambient Temperature, °F	74	
Fuel Properties		
Wet Fuel Load Weight, lb.	7.95	
Dry-Basis Fuel Load Moisture Content, %	19.58	
Wet-Basis Fuel Load Moisture Content, %	16.37	
Coal Bed Range, lb.	1.60	1.90
Actual Coal Bed, Lb.	1.75	

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	13-Dec-11
Test Run Number:	7

EPA Method 28
Pre Burn Data

Coal Bed Range	1.6	to	1.9

Average Firebox Temp, °F	519.72

Final Coal Bed Wt, lb	1.75

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0											12.10	10.35
1	10	76.45	142.9	582.1	714.8	168.5	239.4	291.1	320.3		0	9.94	2.16
2	20	80.15	152	627	826.2	252.5	364.4	380.6	419.6		-0.002	7.29	2.65
3	30	80.55	159.3	656.9	923.1	330.4	448	463.2	517.9		-0.002	4.62	2.67
4	40	87.3	152.5	612.8	893.4	394.5	432.7	533.9	599.3		-0.003	2.68	1.94
5	50	76.24	131.6	484.9	675.6	446.5	436.8	569.4	601.1		0.003	1.95	0.73
6	60	78.43	118.9	414.4	545.8	460.3	509.3	538.4	544.8		-0.001	1.75	0.20
7													
8													
9													
10													
11													
12													
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30													

Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-1111071416-001
Test Date: 13-Dec-11
Test Run Number: 7

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0175	155	0.1323
A2	0.0175	155	0.1323
A3	0.0150	155	0.1225
A4	0.0125	147	0.1118
A Center	0.0175	157	0.1323
B1	0.0175	156	0.1323
B2	0.0175	155	0.1323
B3	0.0150	155	0.1225
B4	0.0125	150	0.1118
B Center	0.0175	157	0.1323
Averages	0.016	154.2	0.1247

Tunnel Diameter	8.000	inches
Tunnel Static	-0.093	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9427	factor
Baro. Pressure	30.36	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.897	Ft/ Sec
Initial Flow	**138.45**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-1111071416-001
Test Date:	13-Dec-11
Test Run Number:	7

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:		Time:	8:30	Temp.,°F:	
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	9.00	1.00	20.6	19.3	21.5
2	9.00	1.00	21.0	19.3	21.2
3	9.00	1.00	21.4	21.1	21.2
4	9.00	1.00	20.9	19.5	21.0
5	17.00	1.95	21.7	19.7	21.4
6	17.00	2.00	21.9	20.3	22.3
7	17.00	2.05	22.1	21.2	22.2
8	17.00	2.05	22.3	19.7	22.0
9					
10					
11					
12					
Total Weight		12.1	Average, %db		21.0

Allowable Fuel Load Range: **7.7** to **9.3**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:			Time:	9:10	Temp.,°F:	
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15.50	2.00		20.3	20.0	18.8
2	15.50	2.15		19.7	19.3	19.9
3	15.50	1.95		19.8	19.5	19.5
4	15.50	1.85		19.2	19.9	19.0
5						
6						
7						
8						
Totals		8.0	0.0			
% of Weight		100	0			
Total weight, wet, lb.		7.95		Average Moisture, dry		19.58
Total weight, dry, kg		3.02		Average Moisture, wet		16.37

Test Engineer: _____

Date: 03/13/2012

Run 8

Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	14-Dec-11
Test Run Number:	8 - Fan Confirmation
Date tunnel cleaned:	12/1/2011
Purpose of Test	Fan Confirmation

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	1.219	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Test Settings	
Primary Air:	Closed
Secondary Air:	Fixed
Control Board:	N/A
Blower/Fan:	Off

Pre- Burn Activities

Time	Activity
0	Time=10:34. The Primary air was shut when the weight was 2.65 lbs. The timer was started at the same time. The blower was unplugged the whole day.
59	The coad bed was leveled for 30 seconds.

Start-Up Procedure	
Loading of fuel, sec. :	Loaded by 60 seconds.
Fuel-loading door :	Ajar for 90 seconds.
Primary air:	Closed
Secondary air:	Fixed
Control board:	N/A
Blower / fan:	Off

Other Notes

None

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID No:	MTL-111071416-001
Test Date:	14-Dec-11
Test Run No:	8 - Fan Confirmation

Temperature Data

Firebox Temp Start	384.24
Firebox Temp End	356.22
Firebox Delta-T	**28.0**

Max Filter Temps	
Train A	Train B
70.84	**72**

Interval	10	Duration of Test, Min	160

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Train B Filter	Train A DGM	Train B DGM
0	0	87.53	92.24	223.4	347.4	406.4	384.6	390.1	392.7		65.18	64.67	65.045	64.715
1	10	87.97	88.28	236.4	381.1	387.6	352.7	352.1	354		68.87	68.66	65.265	65.015
2	20	86.56	91.18	256.9	444.9	367.7	339.4	336.1	341.3		69.18	69.76	65.31	65.095
3	30	84.47	98.08	297.2	569.7	345.5	339.8	343.8	352.9		69.78	70.64	65.395	65.135
4	40	80.72	101.8	327.4	659.4	326.4	347.2	366.9	384.8		70.52	71.61	65.475	65.245
5	50	88.15	95.71	312.5	658.8	312.4	365.3	392	417.6		70.84	72	65.45	65.16
6	60	91.79	88.35	278.1	588.2	307.8	378	409.2	431.5		70.07	71.5	65.48	65.185
7	70	93.72	85.49	245.4	518.7	306.7	385.3	412.9	432.4		69.44	70.8	65.505	65.23
8	80	76.51	88.75	225.8	465.4	302.3	389.6	409.7	423.2		69.1	70.44	65.56	65.4
9	90	73.04	83.1	209.3	424.4	296.1	394.9	408.3	411.4		68.89	70.1	65.66	65.485
10	100	72.09	81.28	200.1	402.5	295.1	395.6	406	403.3		68.46	69.59	65.625	65.455
11	110	70.83	80.04	195.1	390.8	297	394.3	403.3	397.6		68.11	69.25	65.55	65.365
12	120	70.6	80.11	190.5	381.7	301.3	390.7	404.6	394.1		68.03	68.98	65.56	65.36
13	130	70.45	79.87	187.8	375.6	304.7	382.6	399.5	388.8		67.86	68.88	65.56	65.395
14	140	73.13	79.18	184	366.8	306.3	373.1	391.6	382.6		67.81	68.74	65.555	65.375
15	150	79.42	81.78	180.6	362	314.8	363.8	390.6	383.1		67.78	68.69	65.49	65.275
16	160	81.38	82.45	178.9	351.4	318.8	352.5	382.2	376.2		67.87	68.84	65.515	65.235

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	14-Dec-11
Test Run Number:	8 - Fan Confirmation

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.42	30	Meter Box (A)	1.014
End	30.36	29	Meter Box (B)	1.011
Duration of Test, Min		160		

Leak Check, cfm @ in Hg	
Train A	Train B
0.001@5	0.002@5

Maximum Vacuum	
Train A	Train B
0.00	0.00

	Particulate Sampling Data											
Time	Tunnel Delta-P	Train A Delta-H	Train B Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train B Volume	Train A Proportional Rate	Train B Proportional Rate	Train A Vacuum, In. Hg	Train B Vacuum, In. Hg
0	0.018	0.00	0.00	-0.075	8.00	8.00	883.515	31.570	99.96	99.96	0.00	0.00
10	0.018	0.00	0.00	-0.055	7.06	0.94	884.710	32.815	99.37	102.85	0.00	0.00
20	0.018	0.00	0.00	-0.065	6.08	0.98	885.888	34.010	98.21	98.97	0.00	0.00
30	0.018	0.00	0.00	-0.065	4.91	1.17	887.076	35.212	99.64	100.16	0.00	0.00
40	0.018	0.00	0.00	-0.070	3.77	1.14	888.260	36.419	99.62	100.89	0.00	0.00
50	0.018	0.00	0.00	-0.065	2.77	1.00	889.445	37.627	99.17	100.44	0.00	0.00
60	0.018	0.00	0.00	-0.060	2.12	0.65	890.652	38.837	100.33	99.93	0.00	0.00
70	0.018	0.00	0.00	-0.055	1.69	0.43	891.860	40.051	100.15	99.99	0.00	0.00
80	0.018	0.00	0.00	-0.055	1.48	0.21	893.067	41.264	100.36	100.18	0.00	0.00
90	0.018	0.00	0.00	-0.050	1.17	0.31	894.284	42.488	100.65	100.55	0.00	0.00
100	0.018	0.00	0.00	-0.045	0.94	0.23	895.495	43.707	99.99	99.97	0.00	0.00
110	0.018	0.00	0.00	-0.045	0.76	0.18	896.712	44.877	100.38	95.86	0.00	0.00
120	0.018	0.00	0.00	-0.045	0.57	0.19	897.920	46.110	99.65	101.03	0.00	0.00
130	0.018	0.00	0.00	-0.040	0.39	0.18	899.122	47.317	99.13	98.87	0.00	0.00
140	0.018	0.00	0.00	-0.040	0.23	0.16	900.332	48.534	99.73	99.63	0.00	0.00
150	0.018	0.00	0.00	-0.040	0.11	0.12	901.552	49.737	100.80	98.74	0.00	0.00
160	0.018	0.00	0.00	-0.040	0.00	0.11	902.788	50.971	102.18	101.36	0.00	0.00

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 14-Dec-11
Test Run Number: 8 - Fan Confirmation

Dry Burn-Rate, kg/hr:	**1.13**	
Emission-Rate, g/hr:	**3.80**	
Adjusted Emission-Rate, g/hr :	**5.51**	
Duration of Test, Minutes	160	
Dry Gas Meter Standardization	Train A	Train B
Dry Gas Meter Beginning Reading, ft^3	883.515	31.57
Dry Gas Meter Ending Reading, ft^3	902.788	50.971
Barometric Pressure Correction Factor	1.016	1.016
Dry Gas Meter Calibration Factors (γ factors)	1.014	1.011
Dry Gas Meter Temperature Factors	1.005	1.005
Dry Gas Meter Delta-H Correction Factors	1.000	1.000
Dry Gas Meter STD Volume Sampled, ft^3	**19.945**	**20.027**
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**142.272**	
Total Tunnel Volume, scf	**22763.595**	
Emission Caclulations	Train A	Train B
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	1141.298	1136.639
Sample Particulate Mass, mg	9.1	8.7
Total Emissions, grams	10.386	9.889
Emission-Rate, g/hr	3.89	3.71
Adjusted Emission Rates, g/hr	**5.63**	**5.40**
Deviation, %	2.03%	
Operating Parameters	Train A	Train B
Max Filter Temperature, °F	70.84	72
Post-Test Leak Check, cfm @ in. Hg vac.	0.001@5	0.002@5
Average Firebox Surface Temperture delta-T, °F	28.02	
Maximum Ambient Temperture, °F	94	
Mimimum Ambient Temperature, °F	70	
Fuel Properties		
Wet Fuel Load Weight, lb.	8.00	
Dry-Basis Fuel Load Moisture Content, %	19.91	
Wet-Basis Fuel Load Moisture Content, %	16.60	
Coal Bed Range, lb.	1.60	2.00
Actual Coal Bed, Lb.	2.03	

Intertek

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	14-Dec-11
Test Run Number:	8 - Fan Confirmation

EPA Method 28
Pre Burn Data

Coal Bed Range	1.6	to	2.0

Average Firebox Temp, °F	416.7

Final Coal Bed Wt, lb	2.03

Interval	10

Time		Temperature Data											
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	0	70.46	174	415.5	558.7	455.9	561.9	538.1	557.9		0	11.10	9.07
1	10	77.08	162.4	623.3	851.2	467.2	509.4	480.7	493.8		0	9.69	1.41
2	20	79.09	168.6	648	931.2	449.2	513	504.1	532.7		0.001	6.60	3.09
3	30	82.66	161.9	627	915.1	450.1	600	553.8	594.4		0.001	4.04	2.56
4	40	80.84	142.5	558.2	839.5	461.4	682.6	601.3	641.1		0.001	2.65	1.39
5	50	82.32	108.1	311.5	605.8	474.9	601.4	568	598.1		0.001	2.54	0.11
6	60	84.52	100.1	255	513.8	468	569.4	519.9	540.8		0	2.36	0.18
7	70	82.94	97.38	228.4	460.7	455	512.5	484.5	497.8		-0.003	2.24	0.12
8	80	89.75	88.36	209.4	421.9	439.2	463.4	454.4	461.6		-0.001	2.10	0.14
9	90	88.72	85.87	195.6	386.6	422.1	424.7	422.7	427.4		0.001	2.03	0.07
10													
11													
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Test Engineer: _____

Date: 03/13/2012

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G100517524
Manufacturer: SBI
Model: S244
Sample ID Number: MTL-111071416-001
Test Date: 14-Dec-11
Test Run Number: 8 - Fan Confirmation

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0150	95	0.1225
A2	0.0175	95	0.1323
A3	0.0150	95	0.1225
A4	0.0125	91	0.1118
A Center	0.0175	95	0.1323
B1	0.0150	96	0.1225
B2	0.0175	96	0.1323
B3	0.0150	96	0.1225
B4	0.0100	95	0.1000
B Center	0.0175	96	0.1323
Averages	0.01525	94.96	0.1208

Tunnel Diameter	8.000	inches
Tunnel Static	-0.700	in. H2O
Tunnel Area	0.34907	Ft2
Pitot Correction	0.9130	factor
Baro. Pressure	30.42	
Pitot Factor	0.88	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	7.269	Ft/ Sec
Initial Flow	**141.31**	Ft3/min

Test Engineer: _____

Date: 03/13/2012

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G100517524
Manufacturer:	SBI
Model:	S244
Sample ID Number:	MTL-111071416-001
Test Date:	14-Dec-11
Test Run Number:	8 - Fan Confirmation

Calibration Reference ID	180-463	
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES

Eq. ID No.:	SBI214	Time:	8:30	Temp., °F:	77
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	9.00	0.95	22.1	22.2	22.1
2	9.00	1.05	22.6	22.0	23.3
3	9.00	1.00	22.2	19.8	22.1
4	9.00	1.00	23.3	22.2	23.2
5	16.00	1.85	22.2	21.3	21.5
6	16.00	1.70	22.4	21.0	22.7
7	16.00	1.70	21.9	21.2	22.7
8	16.00	1.80	22.1	22.1	20.6
9					
10					
11					
12					
Total Weight		11.1	Average, %db		22.0

Allowable Fuel Load Range: **7.7** to **9.3**

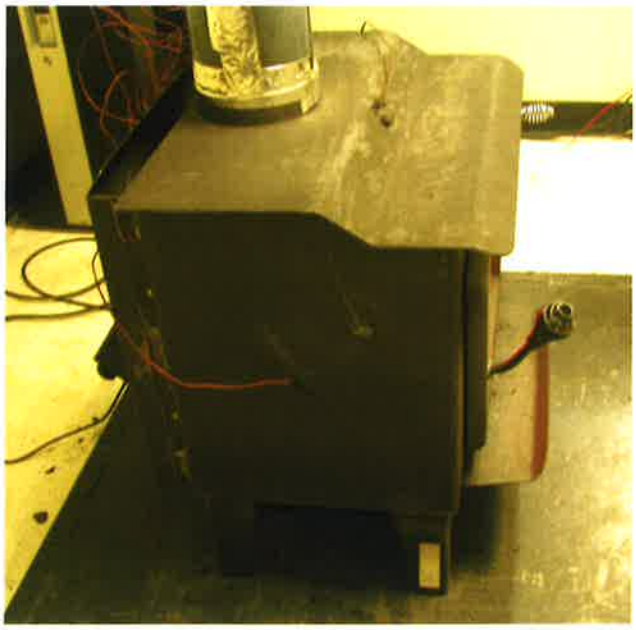
TEST FUEL LOAD PROPERTIES

Eq. ID No.:	SBI214		Time:	9:30	Temp., °F:	77
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15.50	2.20		19.2	18.6	21.0
2	15.50	1.95		19.7	18.8	19.2
3	15.50	2.00		21.9	21.7	20.9
4	15.50	1.85		20.0	19.3	18.6
5						
6						
7						
8						
Totals		8.0	0.0			
% of Weight		100	0			
Total weight, wet, lb.		8.00		Average Moisture, dry		19.91
Total weight, dry, kg		3.03		Average Moisture, wet		16.60

Test Engineer: _____

Date: 03/13/2012

S.B.I model S244



Side View

Sealed Unit

Intertek

John Dupree
US Environmental Protection Agency
1200Pennsylvania Ave NW
Washington DC, 20460

January 11, 2012

Subject: SBI Stove model S244

Dear Mr. Dupree,

Stove Builders International has asked Intertek to write this letter on their behalf regarding data contained in an EPA certification report for the stove model S244. During the preburn of test run number six conducted December 12, 2011 a final coal bed weight was recorded 0.11 pounds outside the acceptable range for the fuel load. At the completion of the same test filter train 1 failed a post test leak check. Investigation of the data found the deviation between the two filters did meet the 7.5 % requirement stipulated in method 5G.

It is Stove Builders International's opinion that the two issues in this data are not significant enough to have an overall affect that would push final weighted average results outside the 7.5 gram per hour limit required for certification. They are therefore asking for a variance on the issues and the report be considered for certification.

If I can be of any assistance in this consideration please feel free to contact me at your convenience.

Bruce Davis

Intertek
Project Engineer

22887 NE Townsend Way
Fairview Oregon, 97024

Telephone: 503-676-2311
Facsimile: 503-676-2350
www.intertek.com

September 13, 2012

Letter Report No. 100709683PRT-001
Project No. G100709683

Pierre Pleau
Stove Builders International Inc.
250 Rue de Copenhague
St-Augustine-de-Desmaures QC G3A 2H3

Ph: 418-527-3060

email:ppleau@sbi-international.com

Subject: Comparative evaluation of six wood burning stoves designed after the 1.3 Series

Dear Mr. Pleau,

This letter represents the results of an evaluation on stove models Century S244, Century S245, Drolet Pyropak, Drolet Rocket, Enerzone Solution 1.3, and the Osburn 900.

This investigation was authorized by Quote number 500393418 dated July 11, 2012. Design drawings were received on September 11, 2012 and evaluated on September 12, 2012 at the Portland Oregon facility.

Six stove models share similar features and are designed after an EPA certified room Heater Model Series 1.3.

Design drawings were evaluated to determine similarities of the six units in overall size, shape, combustion air controls and fire box insulation. Drawings show internal fire box size to be the same at 10 3/16" deep, 8 ¼" high, and 18" wide. All appliances share a 6" flue collar and have the same primary air intake controls. Fire box insulation such as refractory appears to be the same in shape, size, and location. Insulation in the baffle also is similar in all units by location, shape, and size. In three appliances, the Century S244, Drolet Pyropak, and the Drolet Rocket there is a 1.5 inch high step in the fire box top. Distance from the top front edge of the baffle to the bottom of the top plate is the same in all six units, while area above the baffle is increased by this step. Other differences noted were cosmetic with the use of ash pans, legs, and pedestals on different models. Secondary air used as an emissions control devise is the same in all six appliances in location and design. All external shielding appeared to be similar on the six models.

This letter report completes our evaluation of the six stove models.

If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

Please note, this Letter Report does not represent authorization for the use of any Intertek certification marks.

Completed by:	Bruce S Davis	Reviewed by:	Jared Sorenson
Title:	Project Engineer	Title:	Senior Associate Engineer/Team Leader
Signature:		Signature	

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